CMAC 2504 - APRIL 1962 HEARINGS

Case of

2501

Petition, Transcript,

Bill Exhibits, &c.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 2504
Order No. R-2259

APPLICATION OF CONSOLIDATED OIL & GAS, INC.
FOR AN AMENDMENT OF ORDER NO. R-1670-C,
CHANGING THE ALLOCATION FORMULA FOR THE
BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA
AND SANDOVAL COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on April 18, 1962, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 7th day of June, 1962, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That by Order No. R-1670-C, entered in Case No. 2095 effective February 1, 1961, the Basin-Dakota Gas Pool was created and prorated under an allocation formula based on seventy-five (75) percent acreage times deliverability plus twenty-five (25) percent acreage.

(3) That the applicant, Consolidated Oil & Gas, Inc., seeks the amendment of said Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool based on forty (40) percent acreage times deliverability plus sixty (60) percent acreage.

(4) That the evidence presented at the hearing of this case concerning recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula.

IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR AN ORDER ESTABLISHING A SPECIAL FORMULA FOR THE DETERMINATION OF ALLOWABLES IN THE BASIN DAKOTA GAS POOL.

Case No. 2576

APPLICATION

TO THE HONORABLE COMMISSION:

Comes now Consolidated Oil & Gas, Inc., 2112 Tower Building, 1700 Broadway, Denver 2, Colorado, hereinafter referred to as "Applicant", by its undersigned Attorneys, and alleges and states as follows:

I.

Applicant is a Colorado corporation with a permit to do business in the State of New Mexico.

II.

Applicant has developed and will continue to develop various lands and leases for the drilling of oil and gas wells in the Basin Dakota gas pool in Northwest New Mexico.

III.

By virtue of Order No. R-1670-C, the Commission provided among other things that the General Rules applicable to prorated gas pools in Northwest New Mexico, as set forth in Order No. 1670, shall apply to the Basin Dakota gas pool. Rule 9-C of said General Rules provides in substance that the gas allocation formula for the gas pools of Northwest New Mexico shall be based on seventy-five percent (75%) acreage times deliverability plus twenty-five (25%) acreage.

IV.

Applicant submits that because the wells in the Basin Dakota

gas pool have an abnormally high deliverability and because the present Rule 9-C creates waste, does not properly recognize correlative rights, and permits and will increasingly permit non-ratable taking of gas from the pool and drainage between producing tracts in the pool which is not equalized by counter drainage, a special formula should be adopted pertaining to the Basin Dakota gas pool, reading as follows:

> "The pool allowable remaining each month after deducting the total allowable assigned to marginal wells shall be allocated among the non-marginal wells entitled to an allowable in the following manner:
>
> > "1. Forty percent (40%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's 'AD Factor' bears to the total 'AD Factor' for all non-marginal wells in the pool.
> >
> > "2. Sixty percent (60%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's acreage factor bears to the total acreage factor for all non-marginal wells in the pool."

V.

The granting of the relief sought in this Application will prevent waste and will distribute the allowable production among the producers in the pool on a reasonable basis and will not violate or prejudice correlative rights and will prevent premature abandonment of wells which are uneconomic under the present formula established by Rule 9-C.

VI.

The Commission has jurisdiction to hear and determine this cause.

WHEREFORE, Applicant respectfully requests:

That this matter be set for hearing before the Commission as soon as possible, since Applicant, as well as other operators in the Basin Dakota gas pool, is suffering and will increasingly suffer economic hardships as a result of the present formula; and

That, upon due notice and hearing, the Commission issue its Order establishing a gas allocation formula for the Basin Dakota gas pool based on forty percent (40%) acreage times deliverability plus sixty percent (60%) acreage.

Respectfully submitted this 23rd day of February, 1962.

HOLME, ROBERTS, MORE & OWEN
and TED P. STOCKMAR
1700 Broadway
Denver 2, Colorado

KELLAHIN & FOX

By /s/ Jason W. Kellahin
54½ East San Francisco Street
Santa Fe, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR AN ORDER ESTABLISHING A SPECIAL FORMULA FOR THE DETERMINATION OF ALLOWABLES IN THE BASIN DAKOTA GAS POOL.

Case No. 2504

RESPONSE TO APPLICATION

Comes now PUBCO PETROLEUM CORPORATION by W. A. Keleher, its Attorney, and in response to the Application herein, alleges and says:

Pubco objects to the granting of the order prayed for by the Applicant, Consolidated Oil & Gas, Inc., and respectfully submits to the Commission:

1.

That the granting of the order in whole or in part will seriously affect Pubco in and about its operation, present and future, in the Basin Dakota Gas Pool, and will result in Pubco's abandonment in whole or in part of the drilling of scheduled wells for 1962. That Pubco respectfully objects and excepts to consideration by the Commission of any contemplated establishment of minimum and maximum allowables for such Pool.

2.

That the proration formula presently in effect is a just and workable formula and gives each well its fair share of the existing market commensurate with the recoverable gas reserves of the individual wells.

3.

That any refinement or change in the existing formula should be in favor of deliverability and a reduction in the acreage factor in that it is Pubco's position that well deliverability more truly reflects recoverable reserves.

4.

That it is Pubco's position that an increase in the acreage factor at the expense of deliverability would in effect violate correlative rights and permit the weaker wells with less reserves to ultimately produce gas from the common source of supply in amounts in excess of their actual reserves.

5.

That the existing formula provides a 25 percent acreage factor, which in effect allocates a basic allowable to all wells regardless of their deliverabilities merely because of their existence.

6.

That it has been demonstrated that major changes occur within the Basin Dakota pool in porosity, permeability, connate water saturation, and sand thickness, all of which are the major and important factors in determining the actual recoverable reserves within a given Dakota drillsite. Pubco proposes to undertake to demonstrate the direct relationship between deliverability and recoverable reserves.

7.

Pubco contends that if the Commission should consider any change in the proration formula, that such a change should be in favor of 100 percent deliverability.

8.

Pubco objects to the introduction of minimum or maximum allowables in the field because such introduction would result in substantially changing the proration formula in favor of a straight acreage allocation of market and would be a violation of correlative rights.

9.

That the Applicant acquired the acreage complained of, and has drilled its wells with full knowledge of then and now existing Commission orders governing the field.

Respectfully submitted,

PUBCO PETROLEUM CORPORATION

By _____
EXECUTIVE VICE-PRESIDENT

_____
ATTORNEY for PUBCO PETROLEUM CORP.
First National Bank Building
Albuquerque, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE No. 2504
Order No. R-2259-A

APPLICATION OF CONSOLIDATED OIL & GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for reconsideration upon the petition of Consolidated Oil & Gas, Inc. for a rehearing in Case No. 2504, Order No. R-2259, heretofore entered by the Commission on June 7, 1962.

NOW, on this 7th day of July, 1962, the Commission, a quorum being present, having considered the petition for rehearing,

FINDS:

(1) That petitioner, Consolidated Oil & Gas, Inc., in its petition for rehearing proposes that rehearing in the subject case consist of two parts: (a) a preliminary hearing before an examiner to take evidence concerning basic factual data relating to each well in the Basin-Dakota Gas Pool, and (b) a subsequent hearing before the Commission itself at which time additional testimony, evidence and expert opinions would be received.

(2) That a rehearing in the subject case should be granted, and that the scope of such rehearing should be limited to matters concerning recoverable gas reserves in the pool.

(3) That the rehearing should be held before the full Commission; the referral of any matter to an examiner should be at the Commission's discretion upon motion made at such rehearing.

IT IS THEREFORE ORDERED:

(1) That a rehearing in the subject case is hereby granted, and is set for the regular Commission hearing on August 15, 1962.

(2) That the scope of such rehearing shall be limited to matters concerning recoverable gas reserves in the Basin-Dakota Gas Pool.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 2504
Order No. R-2259-B

APPLICATION OF CONSOLIDATED OIL & GAS, INC.,
FOR AN AMENDMENT OF ORDER NO. R-1670-C,
CHANGING THE ALLOCATION FORMULA FOR THE
BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA
AND SANDOVAL COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for rehearing at 9 o'clock a.m. on February 14, 1963, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 3rd day of July, 1963, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That Order No. R-1670-C, entered by the Commission on November 4, 1960, established Special Rules and Regulations for the Basin-Dakota Gas Pool and adopted, by reference, Rule 9(C) of the General Rules applicable to prorated gas pools in Northwest New Mexico, as set forth in Order No. R-1670.

(3) That Rule 9(C) of the General Rules applicable to prorated gas pools in Northwest New Mexico, as set forth in Order No. R-1670, allocates production on the basis of 25 percent acreage plus 75 percent acreage times deliverability, hereinafter referred to as the 25-75 formula.

(4) That the applicant, Consolidated Oil & Gas, Inc., seeks amendment of the Special Rules and Regulations for the Basin-Dakota Gas Pool to allocate production on the basis of 60 percent acreage plus 40 percent acreage times deliverability.

(5) That the initial recoverable gas reserves in the Basin-Dakota Gas Pool, insofar as can be determined, total approximately 2.255 trillion cubic feet, of which approximately 96 billion cubic feet is attributed to marginal wells, which are permitted to produce at capacity.

(6) That the initial recoverable gas reserves underlying each non-marginal tract in the Basin-Dakota Gas Pool are as shown in Column C, Tract Reserves, of Exhibit A attached hereto and made a part hereof.

(7) That the percent of the total pool reserves attributable to each non-marginal tract in the Basin-Dakota Gas Pool is as shown in Column D, Percent of Pool Reserves, of Exhibit A.

(8) That it is impracticable to allocate production solely on the basis of the percentage of pool reserves due to the continuous fluctuation in reserve computations resulting from new completions in the pool and re-evaluation of reserves of existing wells.

(9) That the tract acreage factor for each non-marginal well in the Basin-Dakota Gas Pool is as shown in Column A of Exhibit A; that the deliverability for each non-marginal well, insofar as can be determined, is as shown in Column B of Exhibit A.

(10) That in the Basin-Dakota Gas Pool there is no direct correlation between deliverability and reserves, or acreage and reserves, and that, therefore, neither should be used as the sole criterion for distributing the total pool allowable among the tracts.

(11) That the most reasonable basis for allocating production in the Basin-Dakota Gas Pool is to determine, for each proposed formula, the percentage of total pool allowable apportioned to each non-marginal tract as compared to its percentage of total pool reserves, said relationship hereinafter referred to as the tract's A/R Factor, and to select the allocation formula that will allow the maximum number of wells in the pool to produce with an ideal tract A/R Factor of 1.0, or with a tract A/R Factor of from 0.7 to 1.3, which, due to inherent variance in interpreting and computing reserves, is within a reasonable tolerance.

(12) That the percentage of deliverability and the percentage of acreage included in the allocation formula affect the percentage of the total pool allowable assigned to each non-marginal well in the pool, thereby affecting the number of wells in the pool producing with a tract A/R Factor of from 0.7 to 1.3.

(13) That under the present 25-75 formula, correlative rights are not being adequately protected; that the protection of correlative rights is a necessary adjunct to the prevention of waste, and that waste will result unless the Commission acts to protect correlative rights.

(14) That, based upon the December 1962 pool allowable, a comparison of the number of non-marginal wells producing with a tract A/R Factor of from 0.7 to 1.3 under each formula as identified by an asterisk in Columns G and J of Exhibit A, and of the total volume of gas allocated to the wells in the 0.7 to 1.3 range under each formula, establishes that the proposed formula of 60 percent acreage plus 40 percent acreage times deliverability will more adequately protect correlative rights and prevent waste by permitting more wells to receive their just and equitable share of the gas in the pool, insofar as can be determined.

(15) That numerous wells in the Basin-Dakota Gas Pool are capable of draining more than their just and equitable share of the gas in the pool, and that an allocation formula of 60 percent acreage plus 40 percent acreage times deliverability will, insofar as is practicable, prevent drainage between producing tracts which is not equalized by counter drainage.

(16) That an allocation formula of 60 percent acreage plus 40 percent acreage times deliverability will, insofar as it is practicable to do so, afford to the owner of each property in the pool the opportunity to use his just and equitable share of the reservoir energy.

(17) That Order No. R-1670-C should be amended to provide an allocation formula for the Basin-Dakota Gas Pool in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, based 60 percent on acreage and 40 percent on acreage times deliverability.

(18) That, due to the time required to administer a new allocation formula for a prorated gas pool, this order should not be effective until August 1, 1963, the beginning of the next six-month proration period for the Basin-Dakota Gas Pool.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Basin-Dakota Gas Pool, as promulgated by Order No. R-1670-C, are hereby amended by adoption of the following:

RULE 9(C): The pool allowable remaining each month after deducting the total allowable assigned to marginal wells shall be allocated among the non-marginal wells entitled to an allowable in the following manner:

1. Forty percent (40%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's "AD Factor" bears to the total "AD Factor" for all non-marginal wells in the pool.

2. Sixty percent (60%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's acreage factor bears to the total acreage factor for all non-marginal wells in the pool.

(2) That Order No. R-2259 is hereby superseded.

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

(4) That this order shall be effective August 1, 1963, the beginning of the next six-month proration period for the Basin-Dakota Gas Pool.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JACK M. CAMPBELL, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

esr/

EXHIBIT A

ORDER NO. R-2259-B

ALLOCATION FORMULAE 25 PERCENT ACREAGE 75 PERCENT ACREAGE TIMES DELIVERABILITY

AND

60 PERCENT ACREAGE 40 PERCENT ACREAGE TIMES DELIVERABILITY

BASIN DAKOTA TRACT/POOL RESERVES AND ALLOCATION

ARRANGED IN THE ORDER OF PIPELINE AND OPERATOR

DESCRIP. WELL S T R	COL A AF	COL B DAILY DELIV	COL C TRACT RES. MMCF	COL D PCT. POOL RES.	25-75 FORMULA COL E MCF ALLOW	COL F PCT. POOL ALLOW	COL G A/R FACTOR	60-40 FORMULA COL H MCF ALLOW	COL I PCT. POOL ALLOW	COL J A/R FACTOR
EL PASO NATURAL GAS PIPELINE SYSTEM										
ADOBE OIL COMPANY										
1 B E 2 0 3 1 1 3	9 2	3 3 0	9 4 7	.0 4 3 8 6	3 8 7 4	.0 5 6 2	**1.28	6 3 3 2	.0 9 1 7	2.0 9
1 G G 2 0 2 7 1 1	1 9 0	1 3 3 3	3 7 8 0	.1 7 5 0 8	9 4 7 7	.1 3 7 5	**.79	9 6 8 0	.1 4 0 5	*2.8 0
1 G N 2 2 0 3 1 1	9 2	3 7 9	9 5 0	.0 4 4 0	4 1 1 1	.0 5 9 7	1.36	6 4 4 8	.0 9 3 6	2.1 3
1 G N 2 2 8 3 1 1	1 0 0	5 6 3	1 7 3 5	.0 0 8 6	5 4 3 4	.0 7 8 9	**.98	7 5 2 4	.1 0 9 2	.9 3 6
1 A K 2 2 5 3 1 1	1 0 0	5 5 6	2 0 9	.0 0 7	5 5 3 4	.0 7 8 0	**.81	7 5 0 5	.1 0 8 0	*1.5 1 2
1 K N 2 2 4 3 1 1	1 0 0	4 3 8	2 2 5 5	.0 0 9	4 7 7 8	.0 6 9 3	1.10	7 1 7 4	.1 0 4 1	1.1 0 0
1 K N 2 1 1 3 1 1	9 8	1 6 3	2 2 3 3	.0 1 0	3 2 6 7	.0 4 7 4	**.44	6 2 7 6	.0 9 1 1	*1.8 6
1 K K 3 3 3 1 1 3	1 0 0	3 7 5	2 1 3 0	.0 0 9	4 4 4 7	.0 6 4 5	**.65	6 9 9 8	.1 0 1 5	*1.0 3 3
1 G G 2 1 3 1 1 3	1 0 0	5 5 1	1 0 0 0	.0 0 4	5 3 7 1	.0 7 7 9	1.68	7 4 9 1	.1 0 8 7	2.3 5
AINSLIE OIL & GAS INC										
1 M 2 0 5 9 1 0	0 0	9 3 0	1 2 0 5	.0 0 5 5	7 3 6 1	.1 0 6 8	1.92	8 5 5 2	.1 2 4 1	2.2 3
AMERADA HESS CORPORATION										
3 N 2 2 3 5 5 5	1 0 0	1 6 8	2 3 5 0	.0 2 3	3 3 6 0	.0 4 8 8	2 1	6 4 1 8	.0 9 3 1	4.0
6 E 2 2 6 5 5 5	1 0 0	9 9 5	1 1 2 0	.0 1 1	4 5 5 2	.0 6 6 1	5 5	7 0 5 4	.1 0 2 4	*8.5 5
6 D 2 2 2 5 5 5	1 0 0	9 4 9	1 1 5 0	.0 1 1	4 7 1 9	.0 7 9 4	1 1	7 2 0 6	.1 4 9 0	*4.5 5
9 D 1 6 2 2 5 5	1 0 0	7 7 4	2 2 5 0	.0 1 1	5 4 3 9	.0 3 5 4	0 0	3 1 7 6	.0 2 5 5	9 2.1 1
9 A 2 0 2 2 4 5	1 0 0	2 3 6	1 5 0 0	.0 0 6	9 4 7 4	.0 2 1 4	0 0	1 2 4 8	.1 8 1 2	2.6 1
AZTEC OIL & GAS COMPANY										
3 D C 3 4 0 1 3	1 0 0	4 3 5	8 3 1 5	.1 4 6	5 5 4 8	.0 7 0 9	4 8	7 2 3 0	.1 0 4 9	*7.2
4 D D 3 4 2 2 1	1 0 0	2 2 3	1 3 3 7	.1 5 6	6 3 2 8	.1 2 9	**.83	9 3 9 5	.1 3 6 3	**.87
2 D D 2 2 2 8 1	1 0 0	2 5 8	8 3 0 9	.1 4 3	3 3 0 1	.2 3 3 2	1.63	1 3 1 9 5	.1 9 1 5	1.3 4
BAYVIEW OIL CORP										
1 M 7 2 7 1 2	4 8	1 8 6	3 7 2 6	.1 7 2 5 8	1 6 5 8	.0 2 4 1	1.4	3 1 0 5	.0 4 5 1	2.6
BENSON-MONTIN-GREER DRILLING CORP										
1 A 1 8 2 7 1 2	1 0 0	1 2 6	3 3 0 2	.1 1 0	3 1 4 0	.0 4 5 6	4 3	6 3 0 0	.0 9 1 4	*8.6
X 1 E 1 2 2 7 1 3	1 0 0	1 6 6	2 3 6 9	.1 1 6	5 0 9 4	.1 5 5 0	**.94	1 0 4 8 7	.1 5 2 2	**.91
1 A 3 4 2 2 8 1 3	1 0 0	6 6 0	2 2 9 0	.1 1 2	5 0 4 4	.0 3 8 5	**.77	7 7 9 6	.1 1 3 1	**.94

DESCRIP WELL	S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
2 D	28	28	13	100	160	1856	.085996	33188	.04822	.56	63966	.09288	*1.08
1 A	13	27	13	1000	1762	52933	.245162	1173300	.17022	.69	1088826	.15799	.64
2 K	13	27	13	1000	678	40000	.185276	60388	.08766	.47	78466	.11399	.61
1 D	17	28	13	1000	125	12337	.055729	31334	.04555**	.79	62298	.09144	1.60
1 O	1	27	13	100	1758	29225	.135488	117099	.16999	*1.25	1087 71	.15777	*1.16
BLACKWOOD				AND	NICHOLS		COMPANY						
1 H	27	31	7	100	157	29337	.136033	33302	.04799	.35	63887	.09277	.68
5 8 A	13	31	7	100	117	29337	.136033	30922	.04499	.33	62755	.09111	.67
M. J. BRANN													
1 D	20	25	9	100	416	12688	.058733	46622	.06777	*1.15	71122	.10321	1.76
1 A	28	25	9	100	240	23888	.110611	37388	.05422	.49	66230	.09611	*.87
THE BRITISH AMERICAN OIL PRODUCING COMPANY													
1 M	34	27	11	100	2996	18299	.084711	18210	.26422	*3.12	143388	.20861	2.46
6 E	11	27	11	100	1711	32005	.148222	114652	.16633	**1.12	107399	.15588	*1.05
7 K	11	27	11	100	1211	31700	.146822	88837	.12822	*.87	93399	.13555	*.92
A. N. BROWN													
2	34	27	10	50	274	45155	.209122	19588	.02844	.14	33577	.04877	.23
3	34	27	10	50	154	38433	.178002	16433	.00238	.13	31899	.04633	.22
4 N	34	27	10	100	261	55722	.258007	38488	.05588	.22	66788	.09669	.33
ALEXANDER CAMPBELL													
1 B	23	27	12	100	442	17545	.081244	47999	.06966*	.86	71857	.10433	*1.28
CAULKINS OIL COMPANY													
1 D	24	26	6	100	1359	59422	.275222	96144	.13955	.51	97753	.14155	.51
COMPASS EXPLORATION INCORPORATED													
2	35	30	14	100	5014	14006	.065122	28806	.41800	6.42	199891	.29014	4.45
1 H	33	30	13	1000	158	21000	.097266	33308	.04800	.49	63990	.09277	*.95
1 A	33	30	13	1000	347	15300	.069488	43300	.06224*	.90	69199	.10044	1.45
1 A	22	27	13	1000	664	25077	.116122	59655	.08666*	.75	78077	.11333	*.98
1 K	33	26	7	1000	596	30000	.138955	56088	.08144	.59	76177	.11055	*.80
1 O	25	30	14	100	2509	15005	.069447	156522	.22271	3.27	129744	.18833	2.71
CONSOLIDATED OIL AND GAS INCORPORATED													
1	30	12	10	100	273	18000	.083377	39122	.05688	.68	67122	.09744	*1.17
1 N	31	13	11	1000	143	22000	.100190	32299	.04669	.46	63488	.09211	*.90
1	30	11	11	1000	934	18000	.083377	73822	.10071*	1.28	85633	.12433	1.49
1 M	26	31	3	1000	300	9500	.044009	41018	.05599	1.35	68813	.09889	.25
1 2 E	8	26	3	100	228	25007	.115739	36755	.05333	.46	65586	.09556	*.93
CONTINENTAL OIL COMPANY													
1 J	9	24	5	1000	617	7800	.036124	57139	.08330	2.30	76755	.11145	3.08
2 D	16	24	5	1000	1000	7500	.034745	77299	.11222	3.23	87488	.12699	3.65
3	16	24	5	1000	1374	8000	.037065	96933	.14077	3.80	97955	.14211	3.83
4 E	21	24	5	100	1822	15007	.069447	120455	.17488	2.52	110500	.16044	2.51
DELHI TAYLOR OIL CORPORATION													
1 H	28	26	11	1000	649	30744	.142388	58866	.08544	.60	77655	.11277	*.79
1 D	13	30	13	1000	803	38866	.180433	66944	.09711	2.37	81966	.11899	2.90
2 D	23	26	11	1000	579	34944	.161833	55188	.08001	.49	75699	.10988	.68
STELLA DYSART													
31 K	36	30	14	104	1032	14007	.064844	82133	.11922	1.84	91911	.13334	2.06

DESCRIP WELL	S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
21	8	27	11	100	420	2926	.135552	46833	.06800	.50	71234	.10344	*.76
3L	21	27	11	100	4172	2560	.118557	243855	.35399	2.98	176311	.25599	2.16
LAKELAND PETROLEUM CORPORATION													
2A	23	31	12	100	1406	3683	.170599	9861	.1431	*.84	9885	.1434	*.84
GULF OIL CORPORATION													
8DD	8	24	5	100	414	3788	.175444	4652	.06753	.38	7107	.1031	.59
9DD	17	24	5	100	8700	7588	.035111	70466	.10023	2.91	83884	.12177	3.47
10	1	24	5	100	4072	21644	.100233	46155	.06700	.67	70877	.11028	*1.03
11	8	24	5	100	9088	10003	.046322	72466	.10551	2.27	84900	.12326	2.66
12	17	24	5	100	2231	16233	.075175	141933	.20066	*.74	121955	.17770	2.35
13	7	24	5	100	1286	36800	.170455	92311	.13340	*.79	95499	.13866	*.81
14DD	18	24	5	100	5966	21644	.100233	56088	.08814	*.81	76177	.11055	*1.10
15DD	17	24	5	100	3022	12999	.060160	40664	.05590	*.98	67933	.09866	*1.64
1C	21	26	11	100	2988	37733	.174766	181688	.26636	1.51	143155	.20778	*1.19
1C	22	26	11	100	4023	42003	.194533	236022	.34225	1.76	172144	.24988	*1.28
1L	36	31	13	100	606	1262	.058455	56600	.08221	1.40	76455	.11109	1.90
W. H. HUDSON													
1A	14	27	13	100	5233	3600	.166744	29956	.4347	2.61	206022	.29900	1.79
KAY KIMBELL													
1	22	22	11	100	1947	46455	.215144	127019	.18433	*.86	114009	.16547	*.77
2	28	22	5	100	2204	11239	.055155	35080	.05551	*.99	65109	.09462	*.83
4	27	22	5	100	3058	16044	.074202	40880	.05592	*.80	68028	.09873	*1.33
KMZ	22	22	9	11	5755	39669	.183833	54987	.07799	*.43	75588	.10997	*.60
A	22	22	9	11	2251	12440	.055743	37996	.05555	*.96	66530	.09654	*.68
DMZ	22	22	5	11	2990	27887	.129029	145039	.21055	*.63	123614	.17946	*.39
HOD	22	22	5	5	4888	23811	.110228	55044	.07330	*.66	73143	.10614	*.96
M	22	22	5	7	2276	10882	.050115	36700	.05343	*.33	65583	.09552	*.91
2	33	22	5	6	4644	22088	.102154	49143	.07132	*.33	72473	.10515	*.49
3DD	34	22	5	6	1795	43288	.201485	119043	.17272	*.16	109743	.15933	*.07
2	36	22	5	6	5912	22446	.104403	55811	.08107	*.78	76033	.11036	*.06
M	6	22	5	6	546	2727	.012631	53455	.07760	.61	74577	.10854	*.86
KING WOOD OIL COMPANY													
1C	18	22	7	10	659	17499	.081012	59388	.08622	*1.06	77093	.11131	1.40
LA DELAWARE GATHERING SYSTEM													
1	22	22	6	100	1539	22330	.103553	105592	.15324	1.44	102577	.14888	1.40
1Z	22	33	6	100	2035	22274	.103224	131644	.19102	1.81	116469	.16900	1.65
HM	22	33	6	100	1921	22760	.105422	135012	.19595	1.85	116289	.16876	1.65
B	22	33	6	100	8881	22200	.102901	71044	.10311	.97	84155	.12211	*1.00
HC	22	33	6	100	2221	22382	.103303	141400	.20526	1.94	121657	.17660	1.60
C	22	33	6	100	2286	22300	.103365	175388	.25454	2.40	139792	.20292	1.90
A	22	33	6	100	1466	22200	.102901	32455	.04711	.46	63569	.09227	.90
MARATHON OIL COMPANY													
2DP	15	22	8	11	4155	32885	.152151	243166	.35292	2.32	175955	.25553	1.68
2DI	13	22	8	11	8663	34407	.159481	479666	.69611	4.41	302088	.43844	2.78
2DE	26	22	8	11	9033	35000	.162111	497552	.72220	4.45	311606	.45222	2.79
3DP	26	22	8	11	4669	41000	.189984	269945	.39176	2.06	190223	.27607	1.45
MONSANTO CHEMICAL COMPANY													
1D	16	22	6	11	7655	29355	.135944	64955	.09433	.69	80904	.11744	*.86
1A	19	30	1	3	2741	31400	.145448	39177	.05688	.39	67415	.09784	.67

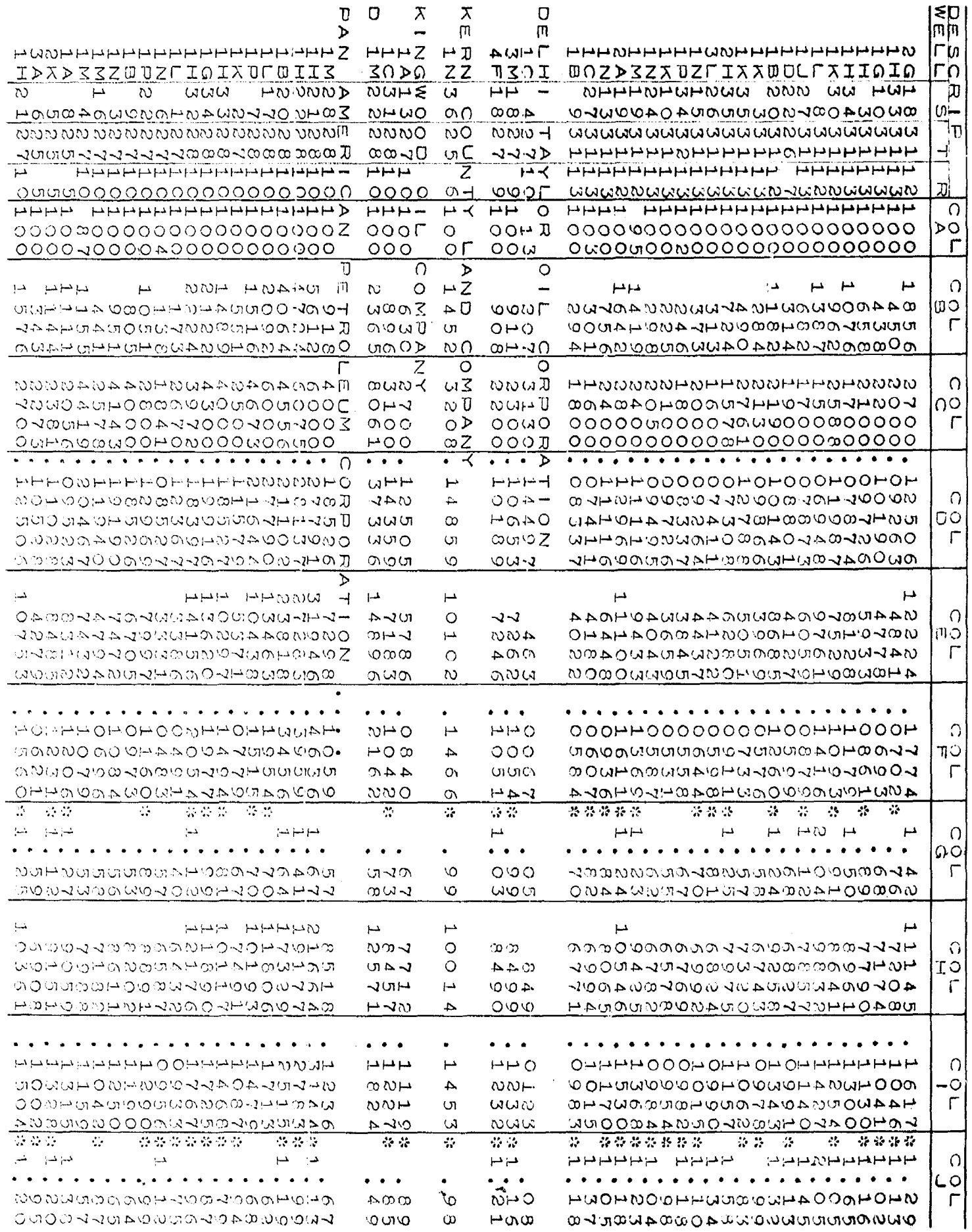
| DESCRIPTION | | |

DESCRIP WELL		S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
1	A	3	1	2	7	1	1	1 0 0	8 5 6	2 1 0 0	. 0 9 7 2 6	6 9 7 3	. 1 0 1 2	* 1 . 2 5
2	I	3	1	2	7	1	1	1 0 0 0	5 6 9 6	1 8 0 0 0	. 0 0 7 8 3 3 7	3 2 3 0 7 4	. 4 7 2 0 6	1 3 . 8 1
3	A			2	6	1	1	1 0 0 0 0	2 7 3 3 6 5 5	1 7 0 0 0	. 0 1 1 5 9 2 6 4 4	2 2 0 8 9 9	. 3 2 6 4 7	1 . . 9 9 7
4	A	2	3	3	7	2	2	1 0 0 0 0	2 2 0 0 5 6 6	1 7 2 5 0 0	. 0 1 1 5 9 7 9	2 2 4 6 6	. 1 0 9 8 7	1 . . 8 1 7
1	A		1	1	4	1	1	1 0 0 0 0	1 3 3 9 6 2 4	0 0 0 2 5 5 6	. 0 0 1 6 8 2 2	2 2 4 3 5	. 0 0 9 9 8	1 . . 9 6 7
1	B							1 0 0 0 0	2 2 5 5 8 8 9	0 0 3 3 6 8 2	. 0 0 1 2 1 6 5	2 2 2 2 5 5 5	. 0 1 7 8 1 3	1 . . 9 6 5
1	A					4	6	1 0 0 0 0	2 2 6 6 6 7 1 5	3 3 8 8 6 6 2	. 0 3 1 1 7 7 4	2 2 3 3 5 5 7	. 1 2 1 6 5 3	1 . . 3 6 0
2	G		1	2	8	9	4	1 0 0 0 0	2 1 7 0 1 8 3	1 0 1 6 8 2 5	. 1 0 0 6 1 1	1 4 2 2 0 5 7	. 6 1 6 2 2 3	1 . . 3 6 4
3	K					5	6	1 0 0 0 0	2 3 3 9 0 0 3 7	0 4 4 4 0 8 8	. 1 0 4 5 5 5 5	2 3 7 2 4 0 1	. 3 3 2 2 3 5	1 . . 5 5 0
4	D					2	3	1 0 0 0 0	3 5 5 0 0 2 4 4	0 0 0 3 7 2 8	. 0 0 1 0 7 9 4	2 3 9 9 7 6 4	. 2 2 3 2 1 5	1 . . 4 0 1
5	B					3	4	1 0 0 0 0	2 5 6 8 8 3 6	0 3 3 8 4 0 6	. 1 0 1 1 7 4 1	2 1 5 5 0 2 4	. 1 1 1 5 0 2	1 . . 4 8 2
6	B					4	5	1 0 0 0 0	2 6 8 9 9 7 7	0 3 8 8 9 7 7	. 1 0 1 1 3 3 0	2 2 7 3 3 1 1	. 1 1 1 1 1 1	1 . . 4 4 8
7	K					4	4	1 0 0 0 0	2 6 8 8 9 5 6	0 2 2 4 0 6 9	. 1 0 1 1 7 4 9	2 2 2 3 0 2 4	. 1 1 1 1 1 1	1 . . 8 7 8
8	C					6	6	1 0 0 0 0	2 4 9 0 3 1 7	1 0 1 0 7 0 2	. 1 0 1 1 3 0 2	2 4 4 1 6 5 6	. 1 1 1 6 0 1	1 . . 6 5 5
9	A					9	1	1 0 0 0 0	2 8 8 3 1 7 1	0 1 0 2 0 0 2	. 1 0 1 1 1 1 4	2 4 7 4 0 6 5	. 1 1 1 1 1 1	1 . . 6 5 9
1	A					1	2	1 0 0 0 0	2 9 7 0 8 3 3	1 1 0 0 1 1 2	. 1 0 1 1 1 1 4	2 6 9 3 3 9 4	. 1 1 1 1 1 1	1 . . 6 2 6
1	A					1	1	1 0 0 0 0	2 1 1 5 5 3 3	0 0 0 2 0 0 9	. 1 0 1 1 1 1 4	2 9 8 8 0 6 4	. 1 1 1 1 1 1	1 . . 4 3 2
1	A					1	1	1 0 0 0 0	2 1 9 7 2 0 8	0 0 0 2 0 0 9	. 1 0 1 1 1 1 4	2 8 8 0 6 4	. 1 1 1 1 1 1	1 . . 0 6 0
1	A					1	2	1 0 0 0 0	2 2 0 0 5 6 6	0 0 0 2 0 0 9	. 1 0 1 1 1 1 4	2 7 9 5 5 6 4	. 1 1 1 1 1 1	1 . . 9 3 6
1	A					1	1

DESCRIP WELL	S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
1P	25	29	11	100	2159	3600	.166744	138155	.200055	**1.220	119944	.174040	*1.004
1D	27	26	11	1000	2789	4192	.194166	171233	.248555	**1.228	137588	.199606	**1.003
1E	21	29	13	1000	1199	1900	.088800	31033	.045500	*1.051	62881	.091155	**1.004
1C	1 9	29	10	1000	1013	2263	.104882	77997	.113131	**1.088	87844	.112755	**1.022
1A	9	27	7	1000	747	2500	.115779	64003	.109299	**1.080	88039	.116757	*1.001
1C	25	29	11	1000	2214	2671	.112371	141033	.200477	*1.065	121488	.117633	*1.013
1D	33	29	11	1000	2146	2600	.112042	137466	.199955	*1.066	119577	.117355	1*1.044
D 1-	24	29	11	1000	1880	3832	.177491	123501	.179921	*1.011	112122	.116277	*.993
TEXACO - INC													
1F	12	30	12	100	191	3500	.162111	3481	.05055	.315	64822	.094161	.588
TEXAS EASTERN TRANSMISSION CORP ORATION													
1P	35	30	12	1000	767	2900	.134332	65055	.094447	*.700	80955	.117550	*.887
1M	20	30	12	1000	758	1800	.088337	64588	.093770	**1.120	80700	.117101	1*1.403
1M	21	30	12	1000	321	1742	.080684	41644	.060445	**.750	68466	.099442	*1.232
TIDEWATER OIL COMPANY													
1E	24	29	11	1100	2157	6141	.284433	138047	.200337	*.700	119888	.174000	.616
1F	18	29	11	1000	1047	6141	.284444	79766	.115777	*.411	88880	.128899	.455
1A	19	29	11	1000	1979	3663	.169666	128770	.186881	**1.100	114990	.166677	**.988
1J	11	29	11	1000	1 2293	2439	.112996	92677	.134559	**1.194	95688	.138999	**1.232
1H	13	29	11	1000	826	5000	.231599	68155	.098899	*.433	82611	.119999	.552
U. G. LENZ TURNER													
1	15	26	9	1000	570	1700	.078744	54711	.079944	*1.011	75444	.109551	1.396
12	15	26	9	1000	1562	1700	.078733	106801	.155500	*1.977	103232	.149881	1.990
13E	14	26	9	1000	969	1700	.078744	75566	.109882	*1.399	86611	.125577	1.600
14	14	26	9	1000	1197	1700	.078744	87663	.127922	*1.622	93000	.135500	1.710
11	17	22	9	1000	2317	4310	.199633	146444	.212955	**1.066	124366	.180555	*.923
10	8	22	9	1000	1010	6572	.304398	77811	.112999	*.377	87766	.127474	.402
2	7	22	9	1000	1185	2900	.134774	87002	.126338	**.944	92666	.134556	**1.003
1	4	22	9	1000	1410	3017	.139774	98822	.144334	**1.033	98966	.143666	**1.003
WESTERN NATURAL GAS CO.													
1M	32	28	11	1000	1175	3300	.152844	86488	.125558	*.822	92388	.134155	*.888
1C	1	27	11	1000	810	3414	.158813	67331	.097762	*.622	82168	.119255	**.755
2M	3	27	11	1000	1400	3000	.138955	98229	.142663	**1.033	98688	.143255	**1.033
WILSON OIL CO OF TEXAS													
1	17	25	9	1020	296	2400	.111166	41137	.059797	*.547	69122	.100355	*.900
2	12	25	9	1000	413	2000	.092663	46477	.067455	**.733	71048	.103155	**1.116
PAN AMERICAN GAS COMPANY PIPELINE SYSTEM													
PAN AMERICAN PETROLEUM CORPORATION													
9	1	22	9	1100	3227	5735	.266563	194223	.281955	**1.061	149855	.217455	*.822
10C	13	22	9	1100	8238	5700	.264001	68778	.099838	*.388	82944	.120455	*.467
10A	24	22	9	1100	2627	5700	.264001	162772	.236189	**.899	133044	.193155	**.733
10D	19	22	9	1100	9977	5700	.264001	77113	.111999	*.422	82740	.120155	*.488
10J	13	22	9	1100	1799	5800	.268664	119148	.172999	*.644	109800	.155933	*.599
9M	18	22	9	1100	3377	5735	.266562	42488	.061666	*.233	68911	.100055	*.388
9G	19	22	9	1100	2916	4900	.226696	177902	.255822	**1.144	141144	.204888	**.900
11K	20	22	9	1100	1956	3800	.176000	122749	.185050	**1.055	114325	.165888	**.944
PAN AMERICAN PETROLEUM CORP. PIPELINE SYSTEM													
PAN AMERICAN PETROLEUM CORPORATION													
1L	9	26	11	1100	4119	2700	.125066	24106	.034988	2.800	174833	.253755	2.003

DESCRIP WELL	S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
2N	10	26	11	100	247	3000	.13895	3775	.0548	.39	6639	.0963	.69
PLATEAU INCORPARTED GAS PIPELINE SYSTEM													
PAN AMERICAN PETROLEUM CORPORATION													
1	27	29	11	100	1858	3700	.17137	12234	.1775	*1.04	11151	.1618	* .94
SOUTHERN UNION GAS PIPELINE SYSTEM													
ASPEN CRUDE PURCHASING COMPANY													
1J	5	31	13	100	76	900	.04169	2877	.0418	*1.00	6160	.0894	2.14
ATLANTIC REFINING COMPANY													
1N	16	29	10	100	1109	1900	.08800	8301	.1205	1.37	9053	.1314	1.49
1G	36	29	11	100	1676	3700	.17137	11278	.1637	* .96	10641	.1544	* .90
AZTEC OIL AND GAS COMPANY													
7	14	28	11	1000	7183	4623	.21412	40195	.5833	2.72	26063	.3782	1.77
8	14	28	11	1000	3159	3990	.18064	19244	.2793	1.55	14889	.2161	*1.02
9	16	28	11	1000	4555	5257	.24349	26417	.3833	1.57	18715	.2716	*1.12
KM 10	15	28	11	1000	3655	5588	.22759	22168	.3147	* 1.14	16192	.2350	*1.85
11	15	28	11	1000	5201	6776	.31385	29778	.4323	* 1.38	20513	.2977	*1.85
AA 12	16	28	11	1000	3846	5800	.26863	22673	.3292	* 1.22	16718	.2426	*1.50
MM 15	11	29	11	1000	1428	1880	.08833	7781	.1141	* 1.09	7755	.1126	.56
16	33	30	11	1000	8445	1550	.06694	5809	.1048	* 1.09	6927	.1020	.77
BB 17	6	30	11	1000	9555	3668	.15559	7193	.1044	* .80	8274	.1201	*1.84
BX 18	6	30	11	1000	9620	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GL 19	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HA 20	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 21	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
NZ 22	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 23	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XI 24	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 25	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 26	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 27	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 28	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 29	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 30	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 31	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 32	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 33	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 34	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 35	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 36	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 37	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 38	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 39	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 40	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 41	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 42	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 43	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 44	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 45	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 46	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 47	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 48	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 49	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 50	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 51	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 52	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 53	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 54	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 55	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 56	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 57	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 58	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 59	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 60	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 61	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 62	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 63	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 64	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 65	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 66	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 67	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 68	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 69	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 70	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 71	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 72	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 73	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 74	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 75	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 76	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 77	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 78	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 79	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 80	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 81	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 82	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 83	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 84	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 85	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 86	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 87	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 88	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 89	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
IC 90	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
DU 91	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
KY 92	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
FN 93	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
AA 94	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
GQ 95	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
HC 96	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
MB 97	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
XM 98	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
ZN 99	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68
BB 100	6	30	11	1000	9955	4400	.18613	8842	.1283	* .80	9334	.1355	*1.68

DESCRIP WELL	S	T	R	COL A	COL B	COL C	COL D	COL E	COL F	COL G	COL H	COL I	COL J
1	2	29	12	100	738	3500	.16210	63553	09222	.557	8014	.11633	*.72
18	19	28	11	100	736	4440	.20556	22059	32206	.556	6410	.23813	*.16
6	11	28	11	100	919	3972	.18396	22559	18222	*.99	1133	.16413	**.89
1	3	28	11	100	1225	3700	.17137	14559	21181	*.1.	2453	.11386	*.06
18	18	28	10	100	1655	3000	.13896	11658	16221	*.1.	0538	.11703	.11
19	18	28	9	100	3224	4005	.11139	14609	13669	*.1.	9644	.11339	.12
20	19	28	9	94	3022	3304	.10671	73649	06969	*.1.	8276	.11228	.13
21	19	28	9	94	2809	2906	.13460	61994	23550	.75	2987	.11884	.14
22	2	28	9	100	8911	2004	.13022	77493	11228	.178	9113	.11332	.30
22	2	28	9	100	9551	8006	.13937	74983	10577	*.27	8632	.11225	.94
22	1	28	9	100	9155	1880	.10833	72983	08577	*.51	8513	.11712	.43
22	2	28	9	100	8844	2788	.12990	13422	11059	*.51	1778	.11223	.47
5	8	28	9	100	6377	1655	.07657	58223	08845	*.10	7731	.11223	.47
6	8	27	9	100	7387	1377	.06377	63553	09225	.45	8014	.11633	.82
7	9	27	9	100	3202	2074	.09357	41588	06043	.64	6844	.10933	.06
21	7	27	11	100	8983	3414	.15812	71993	10446	.66	8462	.11228	.82
1	2	29	12	100	979	3300	.15285	76193	11066	*.72	8689	.11261	*.82
THE	BR	IT	IS	H	AM	ERIC	AN	OIL	PRO	DUC	ING	COM	PANY
2	27	27	11	100	1516	2500	.11579	10438	.15151	1.31	1019	.14793	*.28
3	26	27	11	100	995	2700	.12550	77033	.11188	*.89	8734	.12674	**.01
5	15	27	11	100	347	2438	.11293	43005	.06244	.55	6919	.10044	**.89
9	23	27	11	100	1453	3000	.13895	10168	.14677	*1.06	1001	.14544	*1.05
CAUL	KI	NS	9	IL	COMPA	NY							
2	19	26	6	100	766	2900	.47660	11751	.17051	.36	1089	.15811	.33
4	14	26	6	100	1499	2570	.32225	13762	.19977	.63	1196	.17366	.54
1	13	26	6	100	7992	2502	.31958	11888	.17254	.54	1095	.15911	.50
5	13	26	6	100	5170	2700	.26178	51933	.07554	.39	7395	.10734	.41
8	33	26	6	100	9008	8827	.22819	72044	.10455	.37	8465	.12299	.44
4	33	27	6	100	8008	4373	.22022	67211	.09775	.48	8211	.11911	.59
8	34	27	6	100	7266	3924	.15881	62903	.09135	.50	7981	.11588	.64
3	21	26	6	100	3126	1400	.09514	18892	.02745	.54	1470	.21333	.42
6	22	26	6	100	1162	6000	.18527	85800	.12445	.67	9226	.13355	.72
11	23	26	6	100	1855	6000	.27790	87000	.12663	.45	9256	.13455	.48
16	28	26	6	100	7155	1159	.51685	62332	.09904	.17	7955	.11154	.22
23	33	26	6	100	824	2900	.47660	68052	.09887	.21	8255	.11198	.25
COM	PA	SS	EX	PL	OR	ATI	ON						
1	4	29	13	100	386	6480	.30013	45054	.06542	.22	7028	.10200	.34
1	25	30	13	100	1446	1600	.07411	10071	.14611	.97	9997	.14510	*.96
1	22	30	13	100	801	2657	.12330	66844	.09770	.79	8191	.11899	**.97
2	26	30	13	100	1086	1530	.07086	81866	.11688	.68	8992	.13052	*.84
SOUTH	EA	ST	UN	IT		DRO	CU	TIO	N	COMP	ANY		
4	35	29	11	100	2000	3300	.15285	12980	.18844	*1.23	1154	.16766	*1.10
CO	NS	OL	ID	AT	ED		SI	NCO	RPO	RAT	ED		
1	31	11	12	100	1410	2200	.13371	99880	.14334	*1.07	9896	.14365	*1.07
1	31	11	11	100	2234	2200	.10925	37707	.10553	*.58	6560	.10958	*1.03
1	31	11	11	100	5883	2200	.08942	55309	.08855	*.55	7560	.11017	*1.16
1	31	11	11	100	1856	2200	.09426	34249	.05479	*.54	6460	.10937	*1.01
1	31	11	11	100	2260	1800	.08330	35406	.05661	*.66	6552	.10947	*1.07
1	31	11	11	100	7092	2200	.09726	66220	.10593	*.33	7933	.11513	*1.13
1	31	11	11	100	6888	2200	.10166	56393	.09024	*.69	7633	.11108	*.94
2	33	11	11	100	6883	2200	.09926	66037	.10566	*.90	7855	.11422	*.76
1	33	11	11	100	4892	2200	.09426	53091	.08494	*.54	6433	.10937	*1.13



BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE No. 2504
Order No. R-2259-C

APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for reconsideration upon Applications of El Paso Natural Gas Company, Pan American Petroleum Corporation, Marathon Oil Company, Sunset International Petroleum Corporation, and Southwest Production Company for Rehearing in Case No. 2504, Order No. R-2259-B,

NOW, on this 1st day of August, 1963, the Oil Conservation Commission, a quorum being present, having considered the Applications for Rehearing,

FINDS:

(1) That the Applications for Rehearing do not allege that the applicants for rehearing have new or additional evidence to present in this case.

(2) That the Commission has carefully considered the evidence presented in this case and is fully advised in the premises.

(3) That Order No. R-2259-B is proper in all respects.

(4) That the Applications for Rehearing should be denied.

IT IS THEREFORE ORDERED:

That the Applications of El Paso Natural Gas Company, Pan American Petroleum Corporation, Marathon Oil Company, Sunset International Petroleum Corporation, and Southwest Production Company for Rehearing in Case No. 2504, Order No. R-2259-B, are hereby denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M Campbell
JACK M. CAMPBELL, Chairman

E. S. WALKER, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF PAN AMERICAN PETROLEUM CORPORATION, MARATHON OIL COMPANY, AND SUNSET INTERNATIONAL PETROLEUM CORPORATION FOR A REHEARING BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO TO RECONSIDER CASE NO. 2504, ORDER NO. R-2259-B OF SAID COMMISSION, BEING THE APPLICATION OF CONSOLIDATED OIL AND GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.	Case No. 2504

APPLICATION FOR REHEARING

Come now PAN AMERICAN PETROLEUM CORPORATION, a Delaware corporation, MARATHON OIL COMPANY (formerly THE OHIO OIL COMPANY), an Ohio corporation, and SUNSET INTERNATIONAL PETROLEUM CORPORATION, a Delaware corporation, all licensed to do business in the State of New Mexico, hereinafter collectively referred to as "Applicants," and apply to the New Mexico Oil Conservation Commission for rehearing in the above styled cause, and for grounds therefor state:

I.

Hearing was held on this case before the Commission on April 18 through April 21, 1962. By Order No. R-2259, dated June 7, 1962, the Commission denied the Application. Consolidated Oil and Gas, Inc. filed an application for rehearing which was heard by the Commission on February 14, 1963, and by Order No. R-2259-B dated July 3, 1963, and entered on July 9, 1963, the Commission granted the application changing the proration formula for the Basin-Dakota Gas Pool from 25 percent acreage plus 75 percent acreage times deliverability to 60 percent acreage plus 40 percent acreage times deliverability by amending the Special Rules and Regulations for the Basin-Dakota Gas Pool, as promulgated by Order No. R-1670-C.

Commission Order R-2259, dated June 7, 1962, did not affect applicants in that no part of that Order was believed by applicants to be erroneous; Applicants are affected by Order No. R-2259-B issued by the Commission as a result of the rehearing in that said Order is believed by applicants to be erroneous as hereinafter set forth.

II.

Finding No. 6 of Order No. R-2259-B, which adopts by reference certain figures as being the initial recoverable gas reserves underlying each non-marginal tract in the Basin-Dakota Gas Pool, is erroneous in that (a) these figures do not represent the best evidence or the most recent evidence available to the Commission and to the proponents of the change in the proration formula at the time of the rehearing; and (b) these figures were derived from evidence submitted by El Paso Natural Gas Company at the original hearing of this case, which evidence was suitable to show total pool reserves and for establishing the general relationship between well reserves and well deliverabilities in the pool but which was not designed for or accurate to determine the reserves underlying any particular tract.

III.

Inasmuch as the Commission has based Finding No. 6 upon erroneous data, all findings and conclusions, including Findings Nos. 7 and 10, which follow upon Finding No. 6, are necessarily erroneous also. No independent evidence exists in the record upon which Findings Nos. 7 and 10 can be based.

IV.

Inasmuch as the figures adopted by the Commission as the initial recoverable gas reserves for each individual tract are in error, the percentages of pool reserves attributable to each non-marginal tract and the tract acreage factors listed in Exhibit A are also in error; accordingly, said Order No. R-2259-B is unsupported by substantial evidence showing that the 60-40 formula, which it promulgates, will protect the correlative rights of operators in the Basin-Dakota Gas Pool.

V.

Findings Nos. 10, 12, 13 and 14 of said Order are not supported by substantial evidence in that the Commission has based said Findings upon a comparison of initial reserves with current, rather than initial, deliverabilities, such comparison being clearly discriminatory.

VI.

The Commission's order, which the statute requires be predicated upon the prevention of waste, is not based upon any evidence in the record that waste is occurring under the present 25-75 formula or that waste will be prevented by the 60-40 formula proposed by Consolidated and adopted by the Commission. The Commission's effort to predicate its Order upon waste in Finding No. 13 proceeds upon the erroneous theory, unsupported by evidence, that waste is being caused wherever a violation of correlative rights is found to exist. Finding No. 14 that waste will be prevented by the 60-40 formula is unsupported by any evidence in the record.

VII.

The Commission in its Order has failed to make a finding which under the law must be made in order to change an existing proration order, to wit: the portion of each tract's proportion of the total pool reserves which can be recovered without waste. The record contains no evidence upon which such a finding can be made.

VIII.

The rights acquired by the owners and operators of tracts in the Basin-Dakota Gas Pool who have developed their properties under the existing 25-75 formula are prejudiced and violated by the Commission's Order No. R-2259-B changing the basis of allocation without any evidence that waste is occurring under the existing formula or that waste will be prevented by the new formula.

IX.

Findings Nos. 15, 16 and 17 of said Order No. R-2259-B are erroneous in that they are not supported by substantial evidence and are based upon other findings which are without support in evidence as hereinbefore stated.

WHEREFORE, Applicants request that the Commission grant a rehearing in Case No. 2504 and that following such rehearing the Commission set aside its Order No. R-2259-B and in all respects deny the application of Consolidated Oil and Gas, Inc. to amend Order No. R-1670-C. Applicants further request that the Commission grant an opportunity for all interested parties to present oral argument upon this application for rehearing prior to taking action thereon.

ATWOOD & MALONE

By: Ross L. Malone
Ross L. Malone
Roswell, New Mexico
Attorneys for Pan American Petroleum Corporation

KENT B. HAMPTON
Division Attorney
Marathon Oil Company
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ATWOOD & MALONE

By: Ross L. Malone
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SETH, MONTGOMERY, FEDERICI & ANDREWS

By: Wm. R. Federici
Wm. R. Federici
Attorneys for Sunset International Petroleum Corporation

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 2504

APPLICATION OF CONSOLIDATED OIL & GAS, INC.
FOR AN AMENDMENT OF ORDER NO. R-1670-C,
CHANGING THE ALLOCATION FORMULA FOR THE
BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA
AND SANDOVAL COUNTIES, NEW MEXICO.

APPLICATION FOR REHEARING

Comes now Southwest Production Company, one of the protestants to the application of Consolidated Oil & Gas, Inc. for an amendment to Order R-1670-C of this Commission, and requests that a rehearing be granted in such cause and in support thereof would show to the Commission the following:

1. That this Commission has entered its Order No. R-2259-B wherein it granted the prayer of the application of Consolidated Oil & Gas, Inc. for an amendment to Order R-1670-C and thereby changed the proration formula for the Basin-Dakota Gas Pool.

2. That Order No. R-2259-B was improperly entered by the Commission contrary to the rules of the Commission and the law of the State of New Mexico.

3. That Order No. R-2259-B determines in Finding #10 that there is no direct correlation between acreage and reserves and yet such order, irrespective of such finding, bases the proration formula 60% upon acreage. That this manifestly demonstrates the invalidity of such order. That Finding #11 specifically determines that the formula in the order is merely a makeshift so that the average tract in the pool will receive an allowable relatively close to that to which it is entitled and thereby manifestly demonstrates that the order is invalid as to all tracts which do not happen to fit the average norm of the pool. That it is improper for the Commission to promulgate an order based on a determined improper factor and that a statement that the application of such improper factor will do justice in the average instance, does not lend validity to the order based on such admitted improper factors.

4. That Order No. R-2259-B was entered by the Commission without proper findings as required by law and that such order is not supported by evidence required to give the Commission power and authority to enter and promulgate such order.

5. That Order No. R-2259-B was entered by the Commission changing a previous proration order for the Basin-Dakota Pool without any showing that there was any change of condition between

the entry of Order No. R-1670-C and the entry of said Order No. R-2259-B, or any showing that would justify the Commission in changing a proration order previously entered by the Commission after application and hearing. That it is improper for the Commission to promulgate a proration order after due and proper notice to all parties and hearing upon the merits and then later set such order aside without any showing of change of condition or any other grounds to justify the Commission in changing an order previously entered.

6. That this Commission improperly conducted the rehearing upon which Order No. R-2259-B was founded, in that it admitted improper evidence and testimony over the objection of Protestant, all of which renders said order invalid and entitles this Protestant to a rehearing.

7. That Order No. R-2259-B promulgates a proration order which will result in waste being committed and which does not protect the correlative rights of all producers in the Pool but to the contrary, destroys correlative rights and interferes with and destroys the correlative rights of this Protestant.

8. That after considering the allegations herein contained, this Commission should withdraw and set aside Order No. R-2259-B, thereby once again giving effect to Order No. R-1670-C.

Respectfully submitted,

VERITY, BURR, COOLEY & JONES

By
Geo. L. Verity

Attorneys for Protestant,
Southwest Production Company

ATTACHMENT "A"

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Mr. Booker Kelly
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Bruce Anderson Oil and Gas Properties
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The Petroleum Club Building
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The Frontier Refining Company
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Kay Kimbell Oil Operator
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Fort Worth, Texas

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Mr. Bill Lorr
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Mr. Frank Gorham
Pubco Petroleum Corporation
First National Bank Building
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Continental Oil Company
P. O. Box 3312
Durango, Colorado
Attn: Mr. M. D. Haley

Beard Oil Company
466 Cameron Building
Oklahoma City, Oklahoma

KAY KIMBELL
OIL OPERATOR
BOX 1840
FORT WORTH, TEXAS

August 7, 1963

Land Department

State of New Mexico
Oil Conversation Commission
Sante Fe, New Mexico

Atten: Mr. A. L. Porter, Jr., Secretary

Gentlemen:

As one of the operators in the Basin-Dakota Gas Pool, we wish to commend the Commission for the action taken on Order No. R-2259-B dated July 3, 1963, by which order changed the proration formula to 60% acreage and 40% deliverability.

We feel that this action was necessary and will better serve the needs of the majority interested in the Basin.

Yours very truly,

Kay Kimbell

By:
Sam W. Sims, Jr.

SWS:me

AMERADA PETROLEUM CORPORATION
P. O. BOX 2040
TULSA 2, OKLAHOMA

LEGAL DEPARTMENT

August 1, 1963

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Basin-Dakota Proceedings
(Case No. 2504)

Gentlemen:

El Paso Natural Gas Company, Pan American Petroleum Corporation, Marathon Oil Company, and Sunset International Petroleum Corporation have filed applications for rehearing in the captioned matter.

These applications for rehearing neither claim the existence of new evidence, nor offer any arguments which were not made or could not have been made at the February hearing. They do make much of the fact that the Commission did not base its order on the "prevention of waste" as a matter wholly independent of the "protection of correlative rights." But applicants ignore the plain language of Section 65-3-13(c), New Mexico Statutes Annotated (1953). That section specifically provides that the total gas production from a pool may be restricted to prevent waste, but the allocation of the total pool allowable among the wells may be based on the protection of correlative rights (i. e., prevent uncompensated drainage between tracts). This the Commission has done.

Order No. R-2259-B in the captioned case is clearly supported by proper findings and substantial evidence. A rehearing would be no more than a rehash of what has already been done. We therefore respectfully submit that the above-described applications for rehearing be denied.

Very truly yours,

AMERADA PETROLEUM CORPORATION

By Thomas W. Lynch
Thomas W. Lynch, Attorney

TWL:ac

Memo

From
A. L. Porter, Jr.
Secretary-Director

July 25, 1963

To GOVERNOR CAMPBELL

Here is El Paso's application for rehearing in Case 2504.

Please note that they only attack our findings. They do not offer to present new or additional evidence.

What do you think of their request for oral arguments prior to our taking action on their ~~request~~ application?

Will follow our lawyers advice
Jack

VERITY, BURR, COOLEY & JONES
ATTORNEYS AND COUNSELORS AT LAW
SUITE 152 PETROLEUM CENTER BUILDING
FARMINGTON, NEW MEXICO

GEO. L. VERITY
JOEL B. BURR, JR.
WM. J. COOLEY
RAY B. JONES

TELEPHONE 325-1702

July 26, 1963

Certified
Air Mail

New Mexico Oil Conservation Commission
State Capitol Building
Santa Fe, New Mexico

In re: Case No. 2504
Consolidated Oil & Gas, Inc.

Gentlemen:

Enclosed herewith are original and two copies of Application for Rehearing in captioned matter.

Will you please file such application for rehearing.

Yours truly,

VERITY, BURR, COOLEY & JONES

By: Geo. L. Verity

GLV/ph
encl/3

cc: Southwest Production, Dallas
Mr. Ben R. Howell, El Paso
Mr. W. A. Keleher, Albuquerque
Seth, Montgomery, Federici & Andrews, Santa Fe
Kellahin & Fox, Santa Fe

A. K. MONTGOMERY
WM. FEDERICI
FRANK ANDREWS
FRED C. HANNAHS
GEORGE A. GRAHAM, JR.
RICHARD S. MORRIS

SETH, MONTGOMERY, FEDERICI & ANDREWS
ATTORNEYS AND COUNSELORS AT LAW
301 DON GASPAR AVENUE
SANTA FE, NEW MEXICO

J. O. SETH
COUNSEL

POST OFFICE BOX 828
TELEPHONE YU 3-7315

July 31, 1963

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Attention: Mr. Jim Durrett
General Counsel

Re: OCC Case #2504

Dear Jim:

Enclosed for filing are two Affidavits of Service in connection with the rehearings in Case 2504.

Very truly yours,

Dick

RSM:bd
Enclosures

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF EL PASO NATURAL GAS COMPANY FOR A REHEARING BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO TO RECONSIDER CASE NO. 2504, ORDER NO. R-2259-B OF SAID COMMISSION, BEING THE APPLICATION OF CONSOLIDATED OIL AND GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.	Case No. 2504

APPLICATION FOR REHEARING

Comes now EL PASO NATURAL GAS COMPANY, a Delaware Corporation, with license to do business in the State of New Mexico, hereinafter called "Applicant," and files this, its application for rehearing before the New Mexico Oil Conservation Commission, hereinafter called "Commission," in the above styled and numbered cause, and, for grounds therefor, would respectfully show:

I.

Hearing was held on this case before the Commission on April 18 through April 21, 1962. By Order No. R-2259, dated June 7, 1962, the Commission denied the Application. Consolidated Oil and Gas, Inc. filed an application for rehearing which was heard by the Commission on February 14, 1963, and by Order No. R-2259-B dated July 3, 1963, and entered on July 9, 1963, the Commission granted the application changing the proration formula for the Basin-Dakota Gas Pool from 25 percent acreage plus 75 percent acreage times deliverability to 60 percent acreage plus 40 percent acreage times deliverability by amending the Special Rules and Regulations for the Basin-Dakota Gas Pool, as promulgated by Order No. R-1670-C.

The Commission's Order No. R-2259 did not affect applicant in the sense of Rule 1222 of the Statewide Rules of the Commission (Rehearings) in that there was no part of that Order believed by applicant to be erroneous. Applicant is affected in the sense of Rule 1222 for the first time by Order No. R-2259-B issued by the Commission as a result of the rehearing in that said order is believed by applicant to be erroneous in many particulars hereinafter set forth.

II.

Finding 6 of said Order No. R-2259-B, which Finding is to the effect that the initial recoverable gas reserves underlying each non-marginal tract are the reserves shown in Column C of Exhibit A attached to said Order, is erroneous for the following reasons:

A. The evidence in the record does not support such Finding and the Commission's determinations of individual tract figures is apparently obtained from calculations made on rehearing by Consolidated Oil & Gas, Inc. which were based upon data as to average reserves obtained at the time of the original Hearing by Consolidated Oil and Gas, Inc. from estimates in the files of El Paso Natural Gas Company, which data is shown by the undisputed evidence to have been revised and replaced by different data as more information became available from drilling of additional wells, resulting in changing the estimates of average reserves. The parameters used in making estimates for entire townships were often based upon core data obtained from one well which data was shown by core data obtained from subsequent wells not to be representative of the entire area.

B. The conclusions offered by Consolidated Oil and Gas, Inc., which have been adopted as Findings by the Commission, were based upon estimates made by El Paso Natural Gas Company as a portion of a continuing reserve study of reserves underlying the entire Basin, which studies, as testified by the witness David H. Rainey, are the best

available for determining total pool reserves and for establishing the general relationship between well reserves and well deliverabilities for the pool but are not designed for or accurate to determine the reserves underlying any particular tract.

C. The determinations of fact are based solely upon the conclusions of Consolidated Oil & Gas, Inc.; are not supported by evidence in the record and such determinations are erroneously used by the Commission by reaching the further conclusions contained in Findings No. 7 and No. 10, thus basing one set of conclusions upon another set of conclusions without direct support in the record.

III.

Since the initial recoverable gas reserves for each individual tract are in error, the percentages of pool reserves attributable to each nonmarginal tract and the tract acreage factors listed in said Exhibit A are also in error; accordingly, said Order No. R-2259-B fails to afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the gas in the pool, insofar as this can be done without waste, and for such purpose to use his just and equitable share of the reservoir energy, and is therefore violative of correlative rights.

IV.

Findings Nos. 10, 12 and 13 of the Commission's Order are not supported by the evidence for the reason that the deliverabilities shown in Column B of Exhibit A of the Commission's Order are the most recent deliverabilities while the reserves shown in Column C of said Exhibit A are estimates of initial reserves and a comparison of the relationship between reserves and deliverability is discriminatory when the ratio of initial reserves to current deliverability of one tract which has produced over a period of several years is compared with the ratio of initial reserves to initial deliverability of

another tract. Since the Commission has obviously used initial reserves in comparison with current deliverabilities in making its Findings Nos. 10, 12 and 13, such Findings are clearly erroneous and are in conflict with undisputed evidence that such comparison is discriminatory.

V.

The Commission's Order, which the statute requires be predicated upon the prevention of waste, is not based upon any evidence in the record that waste is occurring under the present 25-75 formula or that waste will be prevented by the 60-40 formula proposed by Consolidated and adopted by the Commission. The Commission's effort to predicate its order upon waste in Finding No. 13 proceeds upon the erroneous theory, unsupported by evidence, that waste is being caused wherever a violation of correlative rights is found to exist. Finding No. 14 that waste will be prevented by the 60-40 formula is unsupported by any evidence in the record.

VI.

The Commission in its Order has failed to make a finding which under the law must be made in order to change an existing proration order, to wit: the portion of each tract's proportion of the total pool reserves which can be recovered without waste. The record contains no evidence upon which such finding can be made.

VII.

The record does not contain evidence upon which the findings required by the statute to be made before changing the existing proration order can be based, and the rights acquired by the owners of tracts who have developed their properties under an existing order have been prejudiced by changing the basis of allocation without evidence to support such changes. Specifically, there is no evidence to support the Commission's finding as to the reserves underlying each individual tract; there is no evidence to support a finding, and none was made,

of the portion of each tract's proportion of the total pool reserves which can be recovered without waste: there is no evidence to support the Commission's finding that the protection of correlative rights is a necessary adjunct to the prevention of waste and that waste will result unless the Commission acts to protect correlative rights; and there is no evidence in the record that waste is occurring or will occur under the existing allocation formula.

WHEREFORE, Applicant requests that, pursuant to Rule 1222 of the Rules and Regulations of the New Mexico Oil Conservation Commission and Section 65-3-22(a), New Mexico Statutes Annotated, 1953 Compilation, that the Commission grant a rehearing in Case No. 2504 and that, following such rehearing the Commission set aside its Order No. R-2259-B and in all respects deny the application of Consolidated Oil and Gas, Inc. to amend Order No. R-1670-C. Your Applicant further requests that the Commission grant an opportunity for interested parties to present oral argument upon this application for rehearing prior to taking action thereon.

/S/ Ben R. Howell
Ben R. Howell

/S/ Garrett C. Whitworth
Garrett C. Whitworth

SETH, MONTGOMERY, FEDERICI & ANDREWS

By /S/ Wm. Federici
Attorneys for El Paso Natural Gas Company

VERITY, BURR, COOLEY & JONES
ATTORNEYS AND COUNSELORS AT LAW
SUITE 152 PETROLEUM CENTER BUILDING
FARMINGTON, NEW MEXICO

GEO. L. VERITY
JOEL B. BURR, JR.
WM. J. COOLEY
RAY B. JONES

1963 MAR 7 AM 8

March 6, 1963

TELEPHONE 325-1702

New Mexico
Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Application of Consolidated Oil & Gas, Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico
Case No. 2504 - Rehearing
Our File No. 1320-L-19

Gentlemen:

Enclosed herewith is the original and two copies of Statement which we would appreciate your filing in behalf of Southwest Production Company in the captioned matter.

Very truly yours,

VERITY, BURR, COOLEY & JONES

By Geo. L. Verity
Geo. L. Verity

GLV/dh
Enclosures

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 2504
REHEARING

APPLICATION OF CONSOLIDATED OIL & GAS,
INC., FOR AN AMENDMENT OF ORDER NO.
R-1670-C, CHANGING THE ALLOCATION FORMULA
FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN
RIO ARRIBA, AND SANDOVAL COUNTIES, NEW MEXICO

STATEMENT OF SOUTHWEST
PRODUCTION COMPANY

This statement is submitted pursuant to the Commission's ruling at the hearing in the above styled and numbered cause held at Santa Fe, New Mexico on February 14, 1963.

Although there are many facets of this case that warrant comment, we have limited this statement to a rebuttal of the attack made by counsel for Applicant in closing argument against the legality of the Commission's existing proration order in the Basin Dakota Gas Pool.

First, we wish to point out that throughout the voluminous record of the many hearing and rehearings in this case, the Applicant has made no allegation whatsoever that the Commission's existing proration order in the Basin Dakota Gas Pool might be illegal or invalid. Not until the waning moments of final argument in the last hearing was this point raised.

Section 65-3-22, N.M.S.A., (1953 Comp.) requires that a person who makes application for rehearing on a Commission order set forth the respect in which such order is believed to be erroneous. The same statute goes on to provide that "the questions reviewed on appeal shall be only questions presented to the commission by the application for rehearing."

The application of Consolidated Oil and Gas Company for rehearing in this case makes no attack whatsoever on the sufficiency or legality of the Commission's findings in its existing proration order in the Basin Dakota Gas Pool and hence it must necessarily follow from the above referenced statutory language that it cannot, at this late date, be heard to complain of the validity of the order on this ground.

Counsel for Applicant would have the Commission believe that all its proration orders which do not strictly comply with the standards set out by the New Mexico Supreme Court in Continental Oil Company vs. Oil Conservation Commission, 70 NM 310, 378 P2d 809, are void ab initio. This is not the case. In paragraph 4 of that very decision the Court announced the rule that a Commission order will be assumed to be valid until it is successfully attacked, citing Hester v Sinclair Oil and Gas Company (Okl. 1960), 351 P2d 751. Certainly the Commission's existing proration order has not yet been successfully attacked thus far. The mere assertion of the order's invalidity by by counsel in closing argument cannot by any stretch of the

imagination be considered as a legally proper procedure by which to raise this issue.

This issue is not properly before the Commission and it should therefore be completely disregarded in the present proceeding.

Although it goes beyond the immediate question before the Commission, we wish to point out that there is a wealth of authority for the proposition that the Commission's presently existing proration order in the Basin Dakota Gas Pool, having long since become final, is not now subject to attack in any proceeding that applicant might hereafter see fit to institute in the Courts.

In nearly every jurisdiction where the question has arisen in recent years, the Courts have held that where an administrative agency acts constitutionally and has jurisdiction over the parties and the subject matter (which cannot be denied in this case) its final decisions cannot be subjected to collateral attack.[1] A collateral proceeding is defined as any proceeding outside the purview of the statute which provides for judicial review.[2]

The fact that the administrative agency's power to promulgate the order in question emanates from the legislative or executive branch of government has made the judiciary even more reluctant to permit a collateral attack than in the case where the order is wholly judicial in character.[3] In this context the term

"collateral attack" is analogous to the doctrine of res judicata and it is accorded the same degree of finality.

This point has not been ruled upon in New Mexico; however, we find nothing inconsistent with the foregoing contained in Continental Oil Company v Oil Conservation Commission, supra, since the Oil Commission's order was before the Court in that case on a direct appeal timely taken under Section 65-3-22, N.M.S.A., (1953 Comp.). In fact it might well be argued that the New Mexico Supreme Court tacitly approved the "no collateral attack doctrine" outlined above in the Continental case when it held that the former proration formula in the Jalmat Gas Pool would be assumed to be valid until it is "successfully attacked", despite the fact that it was clear from the record before the Court that the former order was subject to the same objections as was Order No. R-1092-A.

In summary we take the position that the Commission's existing proration order in the Basin Dakota Gas Pool is valid since it has not been successfully attacked and further that it cannot, at this late date, be collaterally attacked in the Courts.

Respectfully submitted,

SOUTHWEST PRODUCTION COMPANY

By _____
Geo. L. Verity
Its Attorney

For footnotes see page 5.

FOOTNOTES

1. Flemming v Nester, 363 US 603, 4 L ed 2d 1435, 80 S Ct. 1367; Andrew G. Nelson, Inc. v United States, 355 US 554, 2 L ed 2d 484, 78 S Ct 496, reh den 356 US 934, 2 L ed 2d 763, 78 S Ct. 770; Securities & Exch. Com. v Central-Illinois Secur. Corp. 338 US 96, 93 L ed 1836, 69 S Ct 1377; Adams v Nagle, 303 US 532, 82 L ed 1000, 58 S Ct 687; Davis Trust Co. v Hardee, 66 App DC 168, 85 F2d 571, 107 ALR 1425; De Groot v Sheffield (Fla) 95 So 2d 912; Martin v Wolfson, 218 Minn 557, 16 NW2d 884; Leeman v Vocelka, 149 Neb 702, 32 NW2d 274; Hardin v Jordan, 140 US 371, 35 L ed 428, 11 S Ct 808, 838; Sanford v Sanford, 139 US 642, 35 L ed 290, 11 S Ct 666; Davis v Wiebbold, 139 US 507, 35 L ed 238, 11 S Ct 628; Valier Coal Co. v Department of Revenue, 11 Ill 2d 402, 143 NE2d 35, 64 ALR2d 763; Foy v Schechter, 1 NY2d 604, 154 NYS2d 927, 136 NE2d 883; Ottinger v Arenal Realty Co. 257 NY 371, 178 NE 665; State Tax Commission v Katsis, 90 Utah 406, 62 P2d 120, 107 ALR 1477; Borax Consolidated v Los Angeles, 296 US 10, 80 L ed 9, 56 S Ct 23, reh den 296 US 664, 80 L ed 473, 56 S Ct 304.
Annotations: 14 ALR2d 89, §9; 41 ALR 922.

2. Albuquerque Nat. Bank v Perea, 147 US 87, 37 L ed 91, 13 S Ct 194; Palmer v McMahon, 133 US 660, 33 L ed 772, 10 S Ct 324; Miller v Railroad Commission, 9 Cal 2d 190, 70 P2d 164, 112 ALR 221; Harrington v Glidden, 179 Mass 486, 61 NE 54 affd 189 US 255, 47 L ed 798, 23 S Ct 574; Application of Hvidsten (ND) 72 NW2d 524; Alexander v Com. 137 Va 477, 120 SE 296; Craig v Leitensdorfer (Downs v Hubbard) 123 US 189, 31 L ed 114, 8 S Ct 85; Seaboard Air Line R. Co. v Daniel, 333 US 118, 92 L ed 580, 68 S Ct 426.

3. Thomas v Ramberg, 240 Minn 1, 60 NW2d 18; Pearson v Walling (CA8 Ark) 138 F 2d 655, cert den 321 US 775, 88 L ed 1069, 64 S Ct 616; White Way Pure Milk Co. v Alabama State Milk Control Board, 265 Ala 660, 93 So 2d 509; Foy v Schechter, 1 NY2d 604, 154 NYS2d 927, 136 NE2d 883.

1962 MAR 7 PM 3 51

A STATEMENT OF POSITION OF SUNRAY DX OIL COMPANY

SUNRAY DX OIL COMPANY, after reviewing the evidence and exhibits submitted at this hearing and at the April, 1962 hearing, feels that the basic issue that splits the companies represented in the hearing is whether acreage or deliverability most accurately reflects reserves. Both groups admit that with the proper data reasonably accurate estimates of reserves on a tract by tract basis can be made.

It is Sunray's position therefore, that the best estimate of reserves is not some other factor that is attempted to be equated with a given estimate, but the best estimate of reserves is simply the reserve estimate itself. Reserves should therefore be used to allocate gas production.

Sunray also feels that deliverability has been shown to be a completely unreliable guide to reserves on an individual tract basis, the only basis the Commission can use under the Jalmat Decision.

It is therefore, Sunray's position that since acreage and the thickness of the production zone more nearly reflects reserves than deliverability and since Consolidated Oil and Gas Company's formula relies more heavily on acreage than the present formula we would urge the Commission to adopt Consolidated's formula.

On behalf of Sunray DX Oil Company

1963 MAR 7 PM 3 51

STATEMENT OF TEXACO INC.

CASE NO. 2504

SANTA FE, NEW MEXICO

March 7, 1963

Texaco Inc. does not operate any producing wells in the Basin-Dakota Pool. However, Texaco owns six wells completed in the Basin-Dakota Pool, currently shut in. Texaco owns an interest in several producing wells in the Basin-Dakota Pool, and also owns considerable undeveloped acreage in the immediate area.

It is Texaco's opinion that deliverability does not have a direct correlation to revocable gas reserves in place under any particular tract, and therefore should not be used as a factor in the prorating of gas production. It is believed that to include deliverability as a factor increases the tendency to perforate longer intervals and stimulate with larger fracture treatments, which results not in an increase in reserves for a particular well but merely in an increase in the wells' deliverability. We believe such practices, in an effort to increase deliverability, cause both physical and economic waste. Texaco believes that to protect the correlative rights of all parties concerned, the most ideal proration formula would be one based on reserves in place. We also believe this type would be the most difficult to administer. With the great strides made within industry in the past, and those which will be made in the future, we believe that one day such proration will be possible. Until that time arrives, we recommend a proration formula where acreage is heavily weighted. Texaco recognizes the application of Consolidated Oil and Gas as a step in this direction and concurs with their application.

On behalf of Texaco, Inc.

MAIN OFFICE OCC
1963 MAR 6 PM 1:31

ATLANTIC REFINING COMPANY
P. O. BOX 2819
TULSA 2, OKLA.

LEGAL DEPARTMENT

March 4, 1963

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504; application of
Consolidated Oil and Gas, Inc.

Gentlemen:

The basic issue in this case is how much weight should be given to deliverability in a gas allocation formula. The answer should now be obvious.

If the evidence presented shows anything, it shows that there is no consistent or reliable relationship between the deliverability of a well and the recoverable gas reserves in place under the acreage assigned to the well. Nevertheless, and despite the experience of the Jalmat Case, this nonexistent relationship is resurrected and used to support a formula with a large deliverability factor.

The Supreme Court of New Mexico has clearly stated that this Commission "... must determine, insofar as practicable, (1) the amount of recoverable gas under each producer's tract; (2) the total amount of recoverable gas in the pool; (3) the proportion that (1) bears to (2); and (4) what portion of the arrived-at portion can be recovered without waste." Continental Oil Co. et al. v. Oil Conservation Commission et al., 373 P. 2d 809, 815 (1962).

An effort was made in this proceeding to link deliverability to reserves by using averages for groups of wells. But such an approach cannot stand close examination. For example, El Paso's Exhibit No. 2 shows that for groups of wells with different average reserves, the group having the highest average deliverability had an average deliverability of less than six times as great as the group with the lowest average deliverability. Yet, within each group, variations in deliverabilities of individual wells ranged from 10 to 100 times greater than the average variations between groups. An order based on this kind of meaningless statistical manipulation could hardly satisfy the mandate of the Supreme Court.

In order to follow the decision of the Court and in order to protect correlative rights, the Commission will have to make a finding that the formula it chooses

is related to the ratio which the recoverable gas under the acreage assigned to each well bears to the total recoverable gas in the pool. It is also necessary that the evidence support such a finding. Since there is no evidence to support a proper finding with respect to the existing allocation formula (75% of which consists of deliverability times acreage), we urge the Commission to set it aside.

It is Amerada's position that the smaller the deliverability factor, the closer a formula will come to the standard established by the Court in the Jalmat Case. We have already advocated a formula based solely upon acreage. If the Commission declines to adopt such a formula, we ask that the Commission adopt the formula proposed by Consolidated.

Very truly yours,

H. D. Bushnell
Thomas W. Lynch

Attorneys for
AMERADA PETROLEUM CORPORATION

By _____

TWL:hac

LAW OFFICES
OF
W. A. KELEHER
A. H. McLEOD
ATTORNEYS AND COUNSELLORS AT LAW
FIRST NATIONAL BANK BUILDING
ALBUQUERQUE, NEW MEXICO

W. A. KELEHER
A. H. McLEOD
T. B. KELEHER
JOHN B. TITTMANN
RUSSELL MOORE
WILLIAM B. KELEHER
MICHAEL L. KELEHER

OIL CONSERVATION COMMISSION
1963 MAR 1 AM 8 19

February 27, 1963

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

Enclosed please find original and three copies of Statement being filed on behalf of Pubco Petroleum Corp. in case No. 2504, the original and two copies being for members of the Commission and one copy for the staff.

Yours very truly,

WAK:cp
Enclosure

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 2504
REHEARING

APPLICATION OF CONSOLIDATED OIL & GAS,
INC., FOR AN AMENDMENT OF ORDER NO.
R-1670-C, CHANGING THE ALLOCATION FORMULA
FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN,
RIO ARRIBA, AND SANDOVAL COUNTIES, NEW MEXICO.

STATEMENT

At the conclusion of the rehearing in the above entitled case at Santa Fe on February 15, 1963, the Commission announced that permission would be granted to any interested parties to file, within twenty days thereafter, a statement for consideration by the Commission. Hence, this statement is now being filed on behalf of PUBCO PETROLEUM CORP.

On February 23, 1962, Consolidated Oil & Gas, Inc. filed its Application for an order establishing a special formula for the determination of allowables in the Basin-Dakota Gas Pool. The case was docketed as No. 2504. Briefly, the Applicant asked the Commission to abandon the formula for the gas pools of Northwestern New Mexico based on 75 X 25, and adopt a 40 X 60 formula. PUBCO PETROLEUM CORP. filed a response to the Application, objecting to the granting of the order prayed for, alleging that the granting of the order, in whole or in part, would seriously affect PUBCO in and about its operation, present and future, in the

Basin-Dakota gas field, alleging further that the proration formula presently in use was a just and workable formula and gave each well its fair share of the existing market commensurate with the ratio of recoverable gas reserves of the individual wells, as compared to the total recoverable reserves of the pool. PUBCO further alleged that if the Commission should consider any change in the proration formula, that such a change should be in favor of 100% deliverability. PUBCO further alleged, in its response, that changing the proration formula would be a violation of correlative rights; and directed the attention of the Commission to the fact that the Applicant had acquired the acreage complained of, and had drilled its wells with full knowledge of the then and now existing Commission orders governing the field.

Many pleadings were filed by oil companies, and others interested, and the case was tried before the Commission on April 18, 19, 20 and 21, 1962.

On June 7, 1962 the Commission entered its order denying the Application by Consolidated to amend Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool based on 40% acreage X deliverability plus 60% acreage. In paragraph 4 of the order of the Commission, it was stated on behalf of the Commission as follows:

> "(4) That the evidence presented at the hearing in this case concerning recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula."

Thereafter, and on June 27, 1962, Consolidated filed its petition for a rehearing upon the grounds therein stated, all of which will appear therein, reference thereto being had.

On July 7, 1962, the Commission acted upon the petition for rehearing, but provided as follows:

> "(2) That the scope of such hearing shall be limited to matters concerning recoverable gas reserves in the Basin-Dakota Gas Pool."

The action of the Commission in limiting the scope of the rehearing probably stemmed from a desire on the part of the Commission to take into consideration the decision of the Supreme Court in the so-called Jalmat case. In the third paragraph on page 6 of the Jalmat case, the court declared that the Commission had failed to make a finding as to the amounts of recoverable gas in the pool or under the various tracts, and as to the amount of gas that could be practicably obtained without waste. In addition, it was the opinion of the Supreme Court that the Commission should have made findings as to drainage, that correlative rights were not being protected under the old formula or at least being protected under the new formula to the extent, "insofar as practicable". It may be speculated upon that the Supreme Court would not have reversed the case had the Commission and proponents of deliverability specifically estimated the reserves in the wells in the Jalmat pool and compared its recoverable reserves to deliverability insofar as practicable.

At the outset it may be said that the burden of proof rested quarely on Consolidated to prove its case on rehearing, as well as the original hearing. Pubco contends that Consolidated failed to sustain the burden of proof. No new evidence was introduced to cause the Commission to reverse its decision of June 7, 1962. Consolidated failed to submit to the Commission any independent engineering or testimony of any

Petroleum engineer or geologist whose testimony was based on an independent investigation and study in the field. Instead, Consolidated submitted before the Commission several exhibits built up on graphs and the statistics introduced in evidence at the hearing on April 18, 1962 by El Paso Natural Gas Co., based on the number of wells in the field as of April, 1962.

Testimony was introduced before the Commission on February 14, 1963 to prove that since April 1, 1962 some 200 additional wells have been built in the pool. Consequently, any testimony offered by Consolidated, even based on El Paso Natural Gas Company's exhibits, introduced at the April, 1962 hearing, would be obsolete and of no probative value whatever to the Commission and its staff.

It is contended here that Consolidated failed to comply with the order of the commission granting a new hearing; that the exhibits introduced were not based on independent engineering or geology, but on hearsay entirely. Consolidated rested its entire case on exhibits numbered 3 and 4. Exhibit 4 was an I.B.M. calculation of 70 pages, containing 2,870 items, with thousands of figures, all based on an assumed state of facts and sets of figures prepared by El Paso Natural Gas Company for the April, 1962 hearing.

On February 14th and 15th, Pubco submitted extensive testimony by two expert witnesses: Dan Cleveland, a Petroleum Engineer, and Frank Gorham, a geologist, accompanied by carefully prepared maps and graphs, demonstrating that the present existing formula should be continued, but that if there should be any change in the formula now being used in the pool, it should be in the direction of deliverability, for the primary

reason that most of the 729 wells now in the pool have been drilled on 320-acre tracts.

It was pointed out by several witnesses before the Commission that a number of small operators in the pool have been financed by bankers and others on the assumption that there would be no change in the formula and that wells were being drilled and acres were being leased on that basis.

At the conclusion of the statement and testimony of February 15, the following statement was made on behalf of Pubco:

> "It is respectfully submitted to the Commission that we have produced here competent testimony to show and to determine the recoverable reserves on a tract basis for each well and tract in the field; we have also offered evidence before the Commission to show the recoverable reserves under the developed portion of the entire pool. Pubco's conclusion from the work done, exhibits and data submitted, have demonstrated, in our opinion, beyond a question of doubt, that if each well is to receive its fair share of the market in proportion to the reserves under the tract as related to the whole, that the existing formula should be left where it is, but if there is to be any change made, it should be 100% deliverability times acreage."

The testimony of Messrs. Cleveland and Gorham for Pubco and Mr. Ra[illegible]y for El Paso Natural Gas Co. furnished the Commission with all necessary data to make a determination in this case, such data being of invaluable assistance to the Commissi[illegible]and its staff. It is contended by Pubco that Consolidated failed utterly to carry out the promises implied in its petition for rehearing, and that in all justice, the Commission should enter its order confirming and reiterating its order of June 7, 1962. Any other course by the Commission

would inevitably lead to chaos in the Basin-Dakota Pool.

Respectfully submitted,

PUBCO PETROLEUM CORPORATION

By _____
ITS ATTORNEY
First National Bank Bldg.
Albuquerque, New Mexico

MAIN OFFICE OCC
1953 MAR 7 PM 3 51

BEFORE THE OIL CONSERVATION COMMISSION

OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL AND GAS, INC. For an Admendment of Order No. R-1670-C Changing the Allocation Formula in the Basin-Dakota Gas Pool

CASE 2504

WRITTEN STATEMENT OF EL PASO NATURAL GAS COMPANY

It is always proper to keep in mind the nature of the proceedings under consideration. This hearing grew out of an application by Consolidated Oil and Gas, Inc. (Consolidated) for a revision of Order No. R-1670-C, an order which went into effect without appeal. The burden of presenting evidence lies upon Consolidated. It goes without saying that the evidence must be clear and convincing to justify any change in property rights and relationships which have been entered in reliance upon the existing proration order.

Consolidated's attorney argues that the existing order is completely void. The great majority of operators in the Basin-Dakota Pools, do not agree with this position and here urge continuation of the present order. Consolidated relies upon the Jalmat Case as authority for this startling statement. The Commission is well aware that the original order in the Jalmat Case contained substantially the same findings as Order No. R-1670-C. The Supreme Court left intact

the original order, holding that the Commission must make certain specific findings to change that order. The original order in the Jalmat Case is in effect today just as Order No. R-1670-C will remain in effect until changed by the Commission. The Commission's acceptance of Consolidated's position on this issue would, in effect, condemn every proration order entered prior to Jalmat, none of which contained the specific findings. Other companies supporting the Commission's order are briefing this legal point and we do not wish to duplicate their work.

It is El Paso's position that the critics of Order No. R-1670-C have failed to produce evidence justifying or supporting any change in the existing order. In addition, we believe that the group supporting the existing order have produced evidence that compels the Commission to find that only acreage and deliverability are practicable factors to consider in making an allocation formula. The statute authorizes the Commission to give "equitable consideration to acreage, pressure, open flow, porosity, permeability, deliverability and quality of the gas and to such other pertinent factors as may from time to time exist, and so far as is practicable, shall prevent drainage between producing tracts in a pool which is not equalized by counter-draniage." A reading of the record in this case can lead only to the conclusion that there is not sufficient evidence of pressure, of open flow, of porosity, of permeability or quality of gas to make a practicable determination of recoverable gas reserves underlying each individual

tract or proration unit. No evidence supports the use of any factors other than "deliverability" and "acreage." No operator has introduced testimony to support use of any other factors.

The issue then boils down to the relative weight given to acreage and deliverability in making an equitable and practicable allocation formula. Many companies advocate use of straight acreage as a desirable formula because of the small-tract problem which exists in some areas. The San Juan Basin, and particularly the Basin-Dakota Gas Pool has substantially the same acreage dedicated to every well, with only five wells varying substantially from the 320 acre pattern. In many pools the acreage attributable to one well will vary from 320 acres to a fraction of one acre. Under conditions here existing acreage is merely a "per well" factor. To apply acreage here is in effect to use the "per well" factor which is so bitterly criticized in formulas combining an acreage allowance and a "per well" allowance. The use of 100% acreage in the Basin-Dakota Pool would in effect give every well the same allowable, disregarding undisputed evidence in the record as to great differences in thicknesses of net effective pay, porosity, water content, pressure, and (communication into the well bore). The use of a 25% acreage factor does provide a minimum to prevent premature abandonment of the poorer wells.

Continuing studies, as testified by D. H. Rainey, reveal that correction of the parameters used in estimating recoverable

reserves by additional data as new wells are drilled is bringing the estimate of recoverable gas reserves closer to the measured deliverability for the average well. While admittedly there are a few wells where the deliverability does not closely correlate with the current estimate of the new recoverable reserves, nevertheless for the great majority of wells, the use of deliverability is the best yardstick available to the Commission to estimate the recoverable reserves underlying each tract. The record is clear that "determinations of recoverable reserves" are but estimates, using the best data available, of the volumes of gas that will be produced from a tract prior to the operator abandoning the well located on the tract. The economic factors which compel abandonment are brought out in Pubco's studies. Corrections of reserve estimates, as additional data were obtained, demonstrates that deliverability may be a better indication of recoverable reserves than volumetric estimates obtained by averaging the available data upon a township-wide basis.

The proponents of an amended order have obtained core analysis and well log data from many of their opponents. The proponents did not see fit to introduce at the rehearing any testimony based upon such data. Proponents made no attempt to allocate reserves to each tract as a result of their own work. Proponents merely adopted El Paso's work presented at the April, 1962 hearing and urged the Commission to use this work as a basis

for finding the recoverable reserves under each tract. The testimony shows that El Paso regards its work as appropriate for determining the over-all reserves in the pool but as inadequate to furnish valid recoverable reserves underlying each tract except in averaging the data as was done in El Paso's exhibits. Futhermore, the uncontradicted testimony shows that as a result of new information and of El Paso's continuing study, the reserve estimates made in April, 1962 have been revised and were changed before Consolidated introduced its exhibits based on such estimates. It is crystal clear that a finding by the Commission of individual tract recoverable reserves based upon estimates, which the estimator says are out of date; would not withstand attack. But as to a number of wells El Paso did not have sufficient information even to estimate. Proponents attempted to cover this unexplored area by extrapolation of reserve contours. D. H. Rainey's testimony shows that this method of extrapolation can be used to determine pool-wide reserves but is inadequate as the method of determining gas reserves underlying any particular tract. A finding based upon out of date estimates and insufficient information could not survive a court's scrutiny.

The exhibits offered by Consolidated are subject to attack for many reasons. Their Exhibit 3 is based upon out of date estimates and uses extrapolation to fill in gaps. This unreliability is carried forward into Exhibit 4, which compounds inaccuracies by

comparing original reserve estimates against current deliverabilities. It is obvious that comparisions must be made at comparable times. The use of current deliverability against original reserves will give a distortion. The evidence shows that both reserves and deliverabilities decline as well produces. All of Consolidated's conclusions and their Exhibits 5, 6 and 7 depend upon the accuracy of Exhibit 4. When Exhibit 4 is shown to be inaccurate, then all the conclusions drawn and Consolidated's remaining exhibits also fall.

It is apparent when considering the averages that differences in recoverable reserves are best reflected by differences in deliverability. Any allocation formula must be based upon the practicable. If it is not practicable, for lack of core data and other information, to make a volumetric calculation of recoverable gas reserves under each tract then the only practical tool to use to reflect admitted differences is that of deliverability. In this pool the acreage under each well is practically identical. We contend that no specific findings are required to maintain validity of the original allocation order. If the Commission desires to make findings, then there is sufficient evidence from which the Commission can find that (1) the amount of recoverable gas under each producing tract can be estimated by using the deliverability of the well located on that tract; (2) the total amount of recoverable gas in the Basin-Dakota Pool is approximately 2.25 trillion cubic feet;

(3) the proportion that the recoverable gas under each tract bears to the total amount of recoverable gas in the pool is the proportion of the deliverability of the well located on that specific tract to the total deliverability of all wells in the pool; and (4) by using the formula prescribed by Order No. R-1670-C, the recoverable gas underlying each tract can be recovered without waste. There is also evidence to support a finding that under Order No. R-1670-C the drainage from one tract to another is equalized by counter drainage from the other tract.

Ben R. Howell

SETH, MONTGOMERY, FEDERICI & ANDREWS

By William R. Federici
William R. Federici
Attorneys for El Paso Natural
Gas Company

SETH, MONTGOMERY, FEDERICI & ANDREWS
ATTORNEYS AND COUNSELLORS AT LAW
P. O. BOX 828
SANTA FE, NEW MEXICO

MAIN OFFICE OCC

February 25, 1963

1963 FEB 25 AM 8 26

New Mexico Oil Conservation Commission
P. O. Box 871
State Land Office Building
Santa Fe, New Mexico

Subject: Statement of Sunset International Petroleum Corporation and Caulkins Oil Company Re Case 2504.

Gentlemen:

Sunset International Petroleum Corporation and Caulkins Oil Company again wish to state their opposition to any change of the allocation formula for the Basin-Dakota Gas Pool which would give more weight to acreage or less weight to deliverability.

The testimony and exhibits presented at the rehearing of Case 2504, and at previous hearings, prove conclusively that there is a direct relationship between deliverability and reserves in the Basin-Dakota Gas Pool, and that if deliverability is given at least 75 percent weight in the allocation formula, the protection of correlative rights will be achieved.

Even if the Commission should be of the belief that the formula should be changed to give less weight to deliverability, it is submitted that the record of Case 2504 does not contain sufficient evidence of a substantial nature upon which an order could be based. At the rehearing of this case, the proponents of the change in formula purported to supply information from which the Commission could make findings as required by the Jalmat decision (Continental Oil Company v. Oil Conservation Commission, 70 N.M. 310, 373 P.2d 809). As pointed out in the record, however, this evidence, and particularly the exhibit from which recoverable reserves were estimated, cannot be considered substantial because it is based on conjecture and surmise. That a Court or administrative body cannot base its findings upon conjecture or surmise is clearly settled by the decisions of the New Mexico Supreme Court (See, e.g., Stambaugh v. Hagey, 44 N.M. 443, 103 P.2d 640). Nor can an expert base his

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ATTORNEYS AND COUNSELLORS AT LAW
P. O. BOX 828
SANTA FE, NEW MEXICO

testimony on facts which do not afford a basis for a reasonably accurate conclusion. The rule is stated in 20 Am. Jur., Evidence, Sec. 795, as follows:

> ". . .the facts upon which the expert bases his opinion or conclusion /must/ permit reasonably accurate conclusions as distinguished from mere guess or conjecture. Expert opinion testimony should not be allowed to extend to the field of baseless conjecture concerning matters not susceptible of reasonably accurate conclusions."

To the same effect, see 32 C.J.S., Evidence, Sec. 522.

We submit that Consolidated Oil & Gas, Inc. failed to use good engineering practices in arriving at its estimates of recoverable reserves in the pool and that this evidence, and any testimony or exhibit based thereon, is without substantial basis.

In this case Consolidated Oil & Gas, Inc. and the other proponents of the change in formula have the burden of proving that the change is justified; the burden of proof is not on the opponents of a change to prove that the present formula is correct. The proponents have failed to meet this burden of proof.

In view of the foregoing, it is submitted that the applicants have made no case for a change in the allocation formula for the Basin-Dakota Gas Pool. Accordingly, the Commission should enter its order reaffirming Order No. R-2259, denying the application.

Respectfully submitted,

SETH, MONTGOMERY, FEDERICI & ANDREWS

By: Wm Federici
Attorneys for Sunset International Petroleum Corporation and Caulkins Oil Company.

RSM:t

COPY

SKELLY OIL COMPANY
P. O. Box 1650
TULSA 2, OKLAHOMA

PRODUCTION DEPARTMENT
C. L. BLACKSHER, VICE PRESIDENT
W. P. WHITMORE, MGR. PRODUCTION
W. D. CARSON, MGR. TECHNICAL SERVICES
ROBERT G. HILTZ, MGR. JOINT OPERATIONS
GEORGE W. SELINGER, MGR. CONSERVATION

OIL CONSERVATION COMM.
1963 FEB 25 AM 8 21

February 21, 1963

Re: Case No. 2504 - Re-Hearing
Order No. R-1670-C

Mr. A. L. Porter, Jr.
New Mexico Oil and Gas Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Porter:

In line with the announcement made by the Commission that they would accept statements or briefs within twenty days after the close of the hearing on February 15, 1963, we wish to file this statement on behalf of Skelly Oil Company having an interest in thirty-five wells in the Basin Dakota Gas Pool.

We believe that the granting of the application is a step in the right direction which is away from total or partial use of deliverability in the allocation of gas for proration purposes on the part of the State. Those familiar with the gas business understand that deliverability is generally the ability of a gas well to produce into a line for marketing purposes, and such deliverability tests usually involve three consecutive and continuous periods, such as pre-flow and conditioning, test flow, and shut-in pressure. It is evident that the line pressure of various purchasers or takers enter into the amount of gas producible of respective wells connected thereto, and such variation makes it impossible to have satisfaction in such formula. Additionally the continuous requirement of deliverability periodically finds a great many wells unable to comply with the periodic testing, and hence supervisory control on the part of the State is greatly handicapped. We believe that a formula simple in nature is most easily supervised by the State, and despite the continuous efforts by opponents in this Case, that as Pubco states "there is a relationship between deliverable and recoverable reserves," and as stated by El Paso "there exists a direct and constant relationship between deliverable and recoverable reserves in the Basin Dakota Pool," nevertheless the State Supreme Court has stated in the Jalmat Case that there is no relationship between the two, and therefore we believe this Commission

should follow this edict until otherwise changed.

The difficulties of the Oil Conservation Commission have greatly increased in the past few years due mainly to the proration of gas in the State both in Southeast and Northwest New Mexico. It is the writer's feeling that these great many difficulties in administration encountered by the Oil Conservation Commission are due to an effort to attempt to please the purchasers and transporters of gas, whereas in truth and fact the main and sole purpose of the Commission is to regulate the production. Deliverability as a factor in allocation is exclusively for the benefit of the purchaser or transporter, and for their convenience only. It is felt by this writer that the Commission should return to their main objective of regulating the production of gas from the wells in a reservoir, and if this is done we believe that the many burdensome problems encountered by the Commission would gradually be eliminated in the near future. By keeping the formula simple and restraining the supervisory control of the Commission over production, in line with the dominant duty of this Commission under the Act, we believe that the many problems now encountered would evaporate.

Respectfully submitted,

(Signed) GEORGE W. SELINGER

GWS:br

cc-Consolidated Oil & Gas, Inc.
4150 East Mexico Ave.
Denver 22, Colorado

Mr. Jason Kellahin
Santa Fe, New Mexico

Statement made on behalf of Sunray Mid-Continent - Re: New Mexico Oil Conservation Commission, Case 2504, Application Formula Basin-Dakota Gas Pool

Sunray Mid-Continent Oil Company believes that gas should be allocated on the basis of reserves. We do not believe that deliverability reflects reserves. We believe that acreage and the thickness of the production formation more nearly reflect reserves. Since acreage more nearly reflects reserves than deliverability and Consolidated Gas and Oil, Inc. formula contains a heavier factor of acreage than the present formula we would urge the Commission to adopt the Consolidated formula.

P. O. Box 2542
Amarillo, Texas

New Mexico Oil Conservation Commission
Santa Fe
New Mexico

Attention: Mr. A. L. Porter, Director

Gentlemen:

Pioneer Production Corporation presently operates twenty-two wells in the basin Dakota pool and has varying interests in twelve other wells in the same pool that are operated by others.

We do not believe that on the basis of the testimony presented at this hearing there is any justification for a change in the allocation formula from that provided by Rule 9(c) of Commission Order No. R-1670, dated May 20, 1960, as amended by order No. R-1670-c, dated November 4, 1960.

Accordingly, we recommend that the Commission deny the application of Consolidated Oil and Gas, Inc.

Yours very truly,

Pioneer Production Corporation

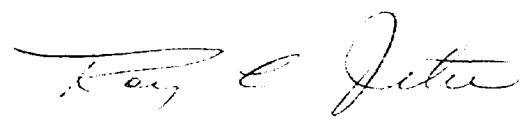
E. S. Morris,
Vice President

ESM:jt

For Commission Records: Basin-Dakota Hearing
Case #2504

Roy Jeter, Assistant Division Superintendent, on behalf of Western Natural Gas Company urges the Commission to retain the rules in the present form, believing that deliverability bears a reasonable relationship to recoverable gas reserves and that the present allocation formula furnishes a practical measuring device to permit each operator to produce his fair share of the reservoir.

WESTERN NATURAL GAS COMPANY



By: Roy C. Jeter

STATEMENT FOR CASE NO. 2504 - APPLICATION OF CONSOLIDATED OIL AND GAS INC. TO CHANGE THE BASIN DAKOTA ALLOCATION FORMULA

It is Texaco's opinion that deliverability does not have a direct correlation to the recoverable gas reserves in place under any particular tract and, therefore, should not be considered as a factor in the prorating of gas production. It is believed that to include deliverability as a factor increases the tendency to perforate longer intervals and fracture with larger treatments which results not in an increase in the reserves for any particular well but merely in an increase in the well's deliverability. We believe that such practices as this in an effort to increase deliverability can cause both physical and economic waste. Texaco believes that, to protect the correlative rights of all parties concerned, the most equitable proration formula for the Basin Dakota Gas Pool would be a formula based upon 100 per cent acreage.

Texaco will always strongly urge that both oil and gas proration formulas be based upon 100 per cent acreage; however, we are in favor of any change in the Basin Dakota allocation formula which tends to place more emphasis on acreage and would, therefore, recognize this as a step in the right direction.

At the present time Texaco does not operate any producing wells in the Basin Dakota Gas Pool, however, we are the operators of five wells completed in the Basin Dakota Reservoir but are currently shut-in. We do own an interest in several wells that are currently producing in the Basin Dakota Pool and we anticipate that our shut-in wells will be producing in the near future. Texaco also owns considerable undeveloped acreage in the immediate area of the Basin Dakota Pool. Therefore, Texaco Inc. as a very interested party recommends that the proration formula for the Basin Dakota Gas Pool be based upon 100 per cent acreage; however, we recognize the application of Consolidated Oil and Gas Inc. as a step in the right direction and, therefore, concur with their application.

Subpoenas Duces Tecum were served on the following:

Aztec Oil & Gas Company, L. M. Stevens in lieu of Joe Salmon.

British American Oil Producing Company, Frank Renard.

Southwest Production Company, Leon Wiederkehr in lieu of Carl Smith.

Pan American Petroleum Corporation, George Eaton

El Paso Natural Gas Company, David H. Rainey.

Pubco Petroleum Corporation, Frank D. Gorham

Joe Salmon was served on 9-11-62.
Frank Renard was served on 9-8-62.
Carl Smith was served on 9-8-62. Leon Wiederkehr was served 9-11-62.
George Eaton was served on 9-11-62.
David H. Rainey was served on 8-14-62.
Frank D. Gorham was served on 8-15-62.

Appearances in Case 2504 - April 18, 1962 hearing.

Mr. Ted Stockmar
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P. O. Box 10
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Mr. George Selinger
Skelly Oil Company
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Tulsa 2, Oklahoma

Mr. P. J. Farrelly
Compass Exploration Company
101 University Boulevard
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Mr. Roy C. Jeter
Western Natural Gas Company
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Mr. Hume Everett
Legal Department
The Ohio Oil Company
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Casper, Wyoming

Mr. Ben Howell
El Paso Natural Gas Co.
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El Paso, Texas

Mr. Kenneth Swanson
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920 Mercantile Securities
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Mr. Guy Buell
Pan American Petroleum Corp.
P. O. Box 1410
Fort Worth, Texas

Mr. W. A. Keleher, Attorney
Pubco Petroleum Corporation
First National Bank Bldg.
Albuquerque, N. Mex.

Mr. Bob Wynn
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Mr. George Eaton
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Mr. George E. Mills
The Atlantic Rfg. Co.
P. O. Box 379
Durango, Colorado

Mr. Booker Kelly
Gilbert, White & Gilbert
P. O. Box 787
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Mr. Phil McGrath
U. S. Geological Survey
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Appearances in Case No. 2504 - April 18, 1962 Regular Hearing

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1130 First National Bank Bldg.
Denver, Colorado

Mr. John S. Cameron, Jr.
Tidewater Oil Company
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Houston 1, Texas

Bruce Anderson Oil Operators
and Beard Oil Company
Suite 930
The Petroleum Club Building
Denver 2, Colorado

Mr. E. B. Granville
The Frontier Refining Company
4040 East Louisiana Avenue
Denver 22, Colorado

Mr. Sam Sims
Kay Kimbell Oil Operator
P. O. Box 1540
Fort Worth, Texas

Mr. E. S. Morris, Vice President
Pioneer Production Corporation
P. O. Box 2542
Amarillo, Texas

Mr. John J. Redfern
1203 Wilco Building
Midland, Texas

Mr. Carl W. Smith
Southwest Production Company
207 Petroleum Club Plaza
Farmington, New Mexico

Mr. Thomas M. Hogan
District Superintendent
The British-American
Oil Producing Company
P. O. Box 180
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Mr. Bob Black
Proration Department
Texaco Inc.
P. O. Box 3109
Midland, Texas

Mr. H. D. Bushnell, Attorney
Amerada Petroleum Corporation
P. O. Box 2040
Tulsa 2, Oklahoma

Mr. Paul Cooter
Atwood & Malone
Attorneys at Law
P. O. Drawer 700
Roswell, New Mexico

Extra copies of Exhibits
Received in Case #2504

1.	El Paso Natural Gas Co.	1	copy	of Exhibit	1
		1	"	" "	2
2.	Pubco	1	"	" "	2
		1	:	" "	7
		1	"	" "	6
		1	"	" "	1
3.	Southern Union	1	"	" "	1
		1	"	" "	2

Consolidated Cases

EXHIBITS RECEIVED IN CASE #2504

1.	Aztec	1 copy of Exhibit 1 1 copy of Exhibit 2
2.	Caulkins	2 copies of Exhibit 1
3.	Consolidated Oil Co.	1 copy of Exhibit 1 2 copies of Exhibit 2 2 " " " 3 3 " " " 4 1 copy of Exhibit 5 1 " " " 6 1 " " " 7 1 " " " 8
4.	El Paso Natural Co.	2 copies of Exhibit 1 2 " " " 2 1 " " " 3
5.	Pubco	3 " " " 5 3 " " " 3 3 " " " 4 3 " " " 2 3 " " " 7 2 " " " 6 2 " " " 1
6.	Southern Union Gas Co.	2 " " " 1 2 " " " 2
7.	Sunset International	1 copy of Exhibit 1 1 copy of Exhibit 2

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONSOLIDATED OIL & GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

CASE NO. 2504
(Rehearing)

To the following named attorneys and parties who have entered an appearance in the above entitled and numbered case and to the respective interests they represent:

Mr. Ted Stockmar
Mr. Jason Kellahin
Mr. J. J. Lacey
Mr. Howard Bratton
Mr. George Selinger
Mr. P. J. Farrelly
Mr. Roy C. Jeter
Mr. Oliver Seth
Mr. Hume Everett
Mr. Ben Howell
Mr. Kenneth Swanson
Mr. Guy Buell
Mr. W. A. Kelehey
Mr. Bob Wynn
Mr. George Eaton
Mr. George E. Mills
Mr. Booker Kelly
Mr. Phil McGrath
Mr. A. P. Holland
Mr. John S. Cameron, Jr.
Bruce Anderson Oil and Gas Properties
Mr. E. B. Granville
Mr. Sam Sims
Mr. E. S. Morris
Mr. John J. Redfern
Mr. Carl W. Smith
Mr. Thomas M. Hogan
Mr. C. R. Black
Mr. H. D. Bushnell
Mr. Paul Cooter
Mr. George L. Verity

N O T I C E

PLEASE TAKE NOTICE THAT THE ABOVE CASE HAS BEEN CONTINUED BY THE COMMISSION TO THE SEPTEMBER 13, 1962 REGULAR HEARING, AT 9 O'CLOCK A.M., MORGAN HALL, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO.

A. L. PORTER, Jr.
Secretary-Director

I hereby certify that I have mailed a copy of this Notice to the above-named attorneys and parties on this 24th day of July, 1962.

JAMES M. DURRETT, Jr.
General Counsel

No. 8-62

DOCKET: REGULAR HEARING - WEDNESDAY - MARCH 14, 1962

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

ALLOWABLE: (1) Consideration of the oil allowable for April, 1962.

(2) Consideration of the allowable production of gas for April, 1962, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for April, 1962.

CASE 2469: (Rehearing):
Application of El Paso Natural Gas Company for special rules and regulations for the Lusk-Strawn Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order establishing special rules and regulations for the Lusk-Strawn Pool, Lea County, New Mexico, including a provision for 160-acre oil proration units.

CASE 2504: Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9 (C) of Order No. R-1670. Applicant recommends an allocation formula based 60 percent on acreage and 40 percent on acreage times deliverability. The Commission also may consider the establishment of minimum and maximum allowables for the Basin-Dakota Gas Pool.

CASE 2505: Southeastern New Mexico nomenclature case calling for an order creating new pools, extending and abolishing certain existing pools in Eddy, Lea, Roosevelt and Chaves Counties, New Mexico.

(a) Create a new pool classified as an oil pool for Cisco production, designated as the Baish-Cisco Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM
Section 21: SE/4

(b) Create a new pool classified as an oil pool for San Andres production, designated as the Pecos-San Andres Pool, and described as:

TOWNSHIP 7 SOUTH, RANGE 26 EAST, NMPM
Section 32: NE/4
Section 33: NW/4

(c) Create a new pool classified as an oil pool for Pennsylvanian production, designated as the East Prairie-Pennsylvanian Pool, and described as:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 23: SW/4

(d) Create a new pool classified as an oil pool for Bone Springs production, designated as the Quahada Ridge-Bone Springs Pool, and described as:

TOWNSHIP 21 SOUTH, RANGE 29 EAST, NMPM
Section 27: SW/4

(e) Create a new pool classified as an oil pool for Bone Springs production, designated as the Scharb-Bone Springs Pool, and described as:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
Section 6: SW/4

(f) Create a new pool classified as an oil pool for Wolfcamp production, designated as the South Tulk-Wolfcamp Pool, and described as:

TOWNSHIP 15 SOUTH, RANGE 35 EAST, NMPM
Section 18: NW/4

(g) Abolish the Baish-Pennsylvanian Pool described as:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM
Section 21: SE/4

(h) Abolish the East Vacuum-Abo Pool described as:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 35: S/2 & NE/4
Section 36: SW/4 & S/2 NW/4

(i) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 37 EAST, NMPM
Section 33: SW/4

(j) Extend the Atoka-Pennsylvanian Gas Pool to include:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 28: SW/4

(k) Extend the Blinebry Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 30: SE/4

(l) Extend the Crosby-Devonian Gas Pool to include:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Section 3: NW/4

(m) Extend the North Hackberry-Yates Pool to include:

TOWNSHIP 19 SOUTH, RANGE 30 EAST, NMPM
Section 25: S/2 SE/4

(n) Extend the West Henshaw-Grayburg Pool to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
Section 2: W/2 SE/4

(o) Extend the Justis Tubb-Drinkard Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 14: NE/4 NE/4

(p) Extend the North Justis-Ellenburger Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: NE/4

(q) Extend the North Justis-Tubb-Drinkard Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 1: SW/4

(r) Extend the Maljamar-Strawn Pool to include:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM
Section 22: NW/4

(s) Extend the Paddock Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: E/2 SW/4

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 24: E/2
Section 25: N/2 NE/4

(t) Extend the Pearl-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
Section 31: SW/4

TOWNSHIP 20 SOUTH, RANGE 35 EAST, NMPM
Section 6: N/2 NW/4

(u) Extend the Sand Springs-Devonian Pool to include:

TOWNSHIP 11 SOUTH, RANGE 34 EAST, NMPM
Section 11: E/2 NE/4
Section 12: NW/4

(v) Extend the Shugart (Yates-Seven Rivers-Queen-Grayburg) Pool to include:

TOWNSHIP 18 SOUTH, RANGE 30 EAST, NMPM
Section 25: N/2 SE/4

(w) Extend the North Square Lake-Grayburg-San Andres Pool to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 4: SW/4
Section 8: NW/4
Section 11: NW/4

(x) Extend the Vacuum-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 34: S/2 N/2
Section 35: S/2 & NE/4
Section 36: SW/4 & S/2 NW/4

CASE 2506: Northwestern New Mexico nomenclature case calling for an order extending certain existing pools in Rio Arriba and San Juan Counties, New Mexico.

(a) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM
Section 25: NW/4
Section 26: NE/4

(b) Extend the Otero-Chacra Pool to include:

TOWNSHIP 25 NORTH, RANGE 6 WEST, NMPM
Section 13: NE/4

(c) Extend the Table Mesa-Dakota Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 17 WEST, NMPM
Section 34: S/2

iqg/

No. 12-62

DOCKET: REGULAR HEARING - WEDNESDAY - APRIL 18, 1962

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

ALLOWABLE (1) Consideration of the oil allowable for May, 1962.

(2) Consideration of the allowable production of gas for May, 1962 from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for May, 1962.

CASE 2504: (Continued)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9 (C) of Order No. R-1670.

Applicant recommends an allocation formula based 60 percent on acreage and 40 percent on acreage times deliverability. The Commission also may consider the establishment of minimum and maximum allowables for the Basin-Dakota Gas Pool.

CASE 2049: (Reopened)
Application of the Oil Conservation Commission on its own motion to reconsider the special rules and regulations for the Devils Fork-Gallup Pool, Rio Arriba County, New Mexico.

Case 2049 will be reopened pursuant to Order No. R-1670-B to permit interested parties to appear and present testimony relative to the effectiveness of the special rules and regulations for the Devils Fork-Gallup Pool.

CASE 1641: (Reopened)
Application of the Oil Conservation Commission on its own motion to reconsider the special rules and regulations for the Angels Peak-Gallup Oil Pool, San Juan County, New Mexico.

Case 1641 will be reopened pursuant to Order No. R-1410-C to permit interested parties to appear and present testimony relative to the effectiveness of the special rules and regulations for the Angels Peak-Gallup Oil Pool.

CASE 2530: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending, contracting and changing the vertical limits of certain existing pools in Eddy, Lea and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for Grayburg production, designated as the West Anderson Ranch-Grayburg Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 7: NW/4

(b) Create a new oil pool for Queen-Grayburg-San Andres production, designated as the Bear Draw Queen-Grayburg-San Andres Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 29 EAST, NMPM
Section 28: E/2

(c) Create a new oil pool for Delaware production, designated as the U. S. Delaware Pool, and described as:

TOWNSHIP 21 SOUTH, RANGE 29 EAST, NMPM
Section 27: SW/4

(d) Create a new oil pool for Abo production, designated as the Double A-Abo Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM
Section 20: NE/4

(e) Create a new oil pool for Delaware production, designated as the Salado Draw-Delaware Pool, and described as:

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 15: NW/4

(f) Create a new oil pool for Blinebry production, designated as the East Weir-Blinebry Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 11: NE/4

(g) Change the Vertical Limits of the Mescalero-Pennsylvanian Pool from Pennsylvanian to Permo-Pennsylvanian inasmuch as several wells are presently completed in both the Wolfcamp and Pennsylvanian formations.

(h) Contract the High Lonesome Pool by the deletion of the following described area:

TOWNSHIP 16 SOUTH, RANGE 29 EAST, NMPM
Section 20: NE/4
Section 21: All
Section 28: All

(i) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 9 SOUTH, RANGE 36 EAST, NMPM
Section 2: W/2 NW/4

(j) Extend the North Benson-Queen Pool to include therein; and extend the vertical limits to include the Grayburg formation as the result of a completion in the Grayburg formation.

TOWNSHIP 18 SOUTH, RANGE 30 EAST, NMPM
Section 27: S/2 S/2
Section 34: SW/4 NE/4 & E/2 NE/4
Section 35: NW/4

(k) Extend the Double X-Delaware Pool to include:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 22: SE/4

(l) Extend the Eumont Gas Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 8: NE/4
Section 16: SW/4

(m) Extend the South Eunice Pool to include:

TOWNSHIP 22 SOUTH, RANGE 36 EAST, NMPM
Section 24: SW/4

(n) Extend the Henshaw-Wolfcamp Pool to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
Section 13: SW/4

(o) Extend the Jackson-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM
Section 23: S/2

(p) Extend the North Justis-Blinebry Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 1: SW/4

(q) Extend the Lazy J (Pennsylvanian) Pool to include:

TOWNSHIP 13 SOUTH, RANGE 33 EAST, NMPM
Section 26: W/2 NE/4

(r) Extend the Maljamar Pool to include:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM
Section 32: SW/4

(s) Extend the Milnesand-San Andres Pool to include:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPM
Section 29: N/2 NW/4

(t) Extend the South Prairie-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 15: SW/4
Section 16: SE/4

(u) Extend the East Red Lake-Queen Pool to include:

TOWNSHIP 17 SOUTH, RANGE 28 East, NMPM
Section 12: SW/4

(v) Extend the Square Lake Pool to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 27: N/2 NW/4

CASE 2531: Northwestern New Mexico nomenclature case calling for an order extending existing pools in Rio Arriba and San Juan Counties.

(a) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 23 NORTH, RANGE 1 WEST, NMPM
Section 6: NW/4

(b) Extend the Flora Vista-Mesaverde Pool to include:

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM
Section 28: S/2

(c) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 WEST, NMPM
Section 23: W/2

(d) Extend the Cha Cha-Gallup Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 13 WEST, NMPM
Section 15: S/2 NW/4
Section 24: S/2 SE/4
Section 25: E/2 NE/4

(e) Extend the Puerto Chiquito-Gallup Oil Pool to include:

TOWNSHIP 27 NORTH, RANGE 1 EAST, NMPM
Section 29: N/2 SW/4 (partial)

(f) Extend the Totah-Gallup Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 12 WEST, NMPM
Section 18: N/2 NW/4

iqg/

NO. 24-62

DOCKET: REGULAR HEARING - WEDNESDAY - AUGUST 15, 1962

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

ALLOWABLE: (1) Consideration of the oil allowable for September, 1962.

(2) Consideration of the allowable production of gas for September, 1962, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for September, 1962.

CASE 2504: (REHEARING)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

NOTICE

CASE 2504 has been continued by the Commission to the September 13, 1962 regular hearing, at 9 o'clock a.m., Morgan Hall, State Land Office Building, Santa Fe, New Mexico. All parties who entered a formal appearance have been notified of the continuation by certified mail.

CASE 2561: (Continued)
In the matter of the hearing called on the motion of the Oil Conservation Commission to consider revising Rule 111, Deviation Tests and Whipstocking. The Commission will consider the report and recommended rule of the Industry Committee appointed by the Commission after the May, 1962 hearing. The proposed rule, as stated in the Committee Report, reads in its entirety as follows:

Rule 111. Deviation Tests and Directional Drilling

(a) Any well which is drilled or deepened with Rotary Tools shall be tested at reasonably frequent intervals not to exceed 500 feet or at the next subsequent bit change to determine the deviation from the vertical. A sworn notarized tabulation of all tests run shall be filed with Form C-105, Well Record. When such deviation averages more than five degrees in any 500 foot interval, the Commission may request that a directional survey be run to establish the location of the producing interval(s).

Rule 111. Deviation Tests and Directional Drilling (Cont.)

The Commission, at the request of an offset operator, may require any operator to make a directional survey of any well. Said directional survey and all associated costs shall be at the expense of the requesting party and shall be secured in advance by a $5,000 indemnity bond posted with and approved by the Commission. The requesting party may designate the well survey company, and said survey shall be witnessed by the Commission.

(b) No well shall be intentionally deviated in a predetermined direction without special permission from the Commission. Permission to deviate toward the vertical to straighten an excessively deviated well bore as defined in (a) above; or to sidetrack junk in the hole in an indeterminate direction or toward the vertical; or to drill a relief well to control a blow-out shall be obtained from the appropriate District Office of the Commission on Commission Form C-102 with copies of said Form C-102 being furnished to all offset operators. Permission to deviate a well in any other manner or for any other reason will be granted only after notice and hearing. Upon completion of any well that was deviated in a predetermined direction, except toward the vertical, a directional survey of the entire well bore must be run and filed with the Commission. In addition, all directional surveys run on any well that was intentionally deviated in any manner for any reason must be filed by the operator with the Commission upon completion of the well. Prior to the assignment of an allowable, operator shall submit a sworn notarized statement to the effect that all directional surveys run on the well have been filed.

CASE 2618: Application of El Paso Natural Gas Company for a revision of Rule 314. Applicant, in the above-styled cause, seeks the revision of Rule 314 pertaining to the gathering, transporting and sale of drip to provide for the redefinition of drip also to include condensate; to further regulate the transportation of drip, as redefined; and to require the reporting of such transportation on Forms C-110-A and C-110-B.

CASE 2503: Application of the Oil Conservation Commission, on its own motion, to consider the establishment of minimum gas allowables in the Blanco-Mesaverde, Aztec-Pictured Cliffs, Ballard-Pictured Cliffs, Fulcher Kutz-Pictured Cliffs, South Blanco-Pictured Cliffs, and West Kutz-Pictured Cliffs Gas Pools, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

CASE 2619: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending certain existing pools in Lea and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for Montoya production, designated as the North Justis-Montoya Pool, and described as:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 1: NW/4

(b) Create a new oil pool for Waddell production, designated as the North Justis-Waddell Pool, and described as:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
Section 35: SE/4

(c) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 25: NW/4

TOWNSHIP 9 SOUTH, RANGE 37 EAST, NMPM
Section 4: NW/4
Section 8: SW/4

(d) Extend the Blinebry Pool to include:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 5: N/2

(e) Extend the South Crossroads-Devonian Pool to include:

TOWNSHIP 10 SOUTH, RANGE 36 EAST, NMPM
Section 15: W/2

(f) Extend the Hobbs Pool to include:

TOWNSHIP 19 SOUTH, RANGE 38 EAST, NMPM
Section 22: N/2 NW/4

(g) Extend the Justis-Blinebry Pool to include:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Section 1: NE/4

(h) Extend the North Justis-Blinebry Pool to include:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
Section 35: SW/4

(i) Extend the North Justis-Ellenburger Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: SE/4

(j) Extend the North Justis-Fusselman Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: SE/4

(k) Extend the North Justis Tubb-Drinkard Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: SE/4

(l) Extend the Lea-Pennsylvanian Gas Pool to include:

TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM
Section 11: E/2
Section 12: All

(m) Extend the South Lane-Pennsylvanian Pool to include:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
Section 35: NW/4

(n) Extend the Medicine Rock-Devonian Pool to include:

TOWNSHIP 15 SOUTH, RANGE 38 EAST, NMPM
Section 23: NW/4

(o) Extend the Saunders Permo-Pennsylvanian Pool to include:

TOWNSHIP 14 SOUTH, RANGE 33 EAST, NMPM
Section 21: SW/4

(p) Extend the East Saunders Permo-Pennsylvanian Pool to include:

TOWNSHIP 14 SOUTH, RANGE 34 EAST, NMPM
Section 17: NW/4

(q) Extend the Sawyer-San Andres Gas Pool to include:

TOWNSHIP 10 SOUTH, RANGE 38 EAST, NMPM
Section 5: NE/4

(r) Extend the East Weir-Blinebry Pool to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 12: NW/4

iqg/

RULE 314: GATHERING, TRANSPORTING, AND SALE OF DRIP OR CONDENSATE
(As proposed by El Paso Natural Gas Company)

(a) For the purpose of this Rule, condensate is defined as any liquid hydrocarbon which is produced at the wellhead incidental to the production of gas well gas and separated from the gas by conventional separation methods; drip includes condensate, as defined above, or any liquid hydrocarbon incidentally accumulating in a gas gathering or transportation system, or any mixture of such hydrocarbons.

(b) The waste of drip is hereby prohibited when it is economically feasible to salvage same.

(c) Transportation and sale of drip is hereby authorized provided the provisions of this Rule are complied with and Commission Form C-110 has been completed and filed in compliance with the provisions of Statewide Rule 1109.

(d) Every person transporting drip within the State of New Mexico shall file Commission Form C-112 in compliance with the provisions of Statewide Rule 1111.

(e) The owner during transportation and all persons transporting drip by truck or other vehicle shall make report of such transportation on Commission Form C-110-A. When the owner is also the transporter, the owner shall complete Sections I and II of the Form, furnish one copy to the driver of the vehicle and, when the trip has been completed, file one completed copy with the Commission. When the owner is not the transporter, the owner shall complete Section I of Form C-110-A and deliver the Form to the transporter, who shall complete Section II of Form C-110-A and furnish the driver of the vehicle with one copy and, when the trip has been completed, file one completed copy with the Commission. The driver of the vehicle shall complete Section III of Form C-110-A. The person driving or operating a vehicle transporting drip shall have in his possession a copy of Form C-110-A signed by the owner and transporter, or an authorized agent, in the appropriate Section thereof, showing the name and address of the owner, the source and destination of the drip, the name and address of the owner of the vehicle, type of vehicle, license number of vehicle, name and address of driver of vehicle, quantity of drip transported, and date and time and places loaded.

(Over)

If the owner of said drip is not the producer thereof, each and every operator of such truck or other vehicle shall have in his possession, in addition to the above requirements, a completed copy of Commission Form C-110-B, signed and certified by the producer and the purchaser of said drip, or their agents, in the appropriate Section thereof, showing the name and address of the producer, the name and address of the purchaser, the source of the drip and the expiration date of the authority of the purchaser to transport drip from the producer's system or other facility. Commission Form C-110-B shall be prepared in sufficient number by the purchaser. One copy shall be retained by the producer, one copy by the purchaser, one copy shall be filed by the purchaser with the Commission, and one copy shall be given to each vehicle driver having need thereof.

(f) Every gas transporter in the State of New Mexico shall, on or before the first day of November of each year, file with the Commission maps of its entire gas gathering and transportation systems within the State of New Mexico, locating and identifying thereon each drip trap and/or tank in said systems, said maps to be accompanied by a report, on a form prescribed by the Commission, showing the disposition being made of the drip from each of such facilities.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
DRIP TRANSPORTATION REPORT

FORM C-110-A
(As proposed by El Paso Natural Gas Company)
TICKET NO._____

PRODUCER'S IDENTIFICATION NO. _____
(To Be Inserted by Owner of Drip)

SECTION I

1. NAME OF OWNER OF DRIP _____

a. PRODUCED BY OWNER [ ] PURCHASED FROM PRODUCER [ ]
(Check one. If b. is checked, attach copy of Form 110-B showing transfer of title)

2. ADDRESS OF OWNER _____

3. SOURCE OF DRIP _____

4. DESTINATION _____
(Name of Person and Physical Place to Which Delivery Authorized)

I hereby certify that on this _____ day of _____ 19____, I have authorized the below-named transporter to gather and transport to the above destination the quantity of drip specified below and that I have authority to sell the same.

_____
Signature of Owner or Agent

SECTION II

1. NAME AND ADDRESS OF OWNER OF VEHICLE _____

_____

2. TYPE OF VEHICLE _____ 3. LICENSE NO. OF VEHICLE _____

4. NAME OF OWNERS AGENT ORDERING TRIP _____

5. DATE ORDERED _____

6. FACILITIES TO BE SERVICED _____

The undersigned accepts drip for delivery in accordance with the above directions.

_____
Signature of Transporter or Agent

SECTION III

1. NAME AND ADDRESS OF DRIVER _____

Source	Gauge (Top)	Gauge (Bottom)	Barrels	Date and Hour
	Ft. ___ In. ___	Ft. ___ In. ___		
	Ft. ___ In. ___	Ft. ___ In. ___		
	Ft. ___ In. ___	Ft. ___ In. ___		
	Ft. ___ In. ___	Ft. ___ In. ___		
	Ft. ___ In. ___	Ft. ___ In. ___		
		Total		

I hereby certify that drip transported by me was obtained by me from the source described in Section I and loaded as described in Section III.

_____
Signature of Driver

FORM C-110-B

(As proposed by El Paso Natural Gas Company)

NEW MEXICO OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

DRIP SALE AND PURCHASE REPORT

I

NAME OF PRODUCER _____

ADDRESS OF PRODUCER _____

SOURCE OF DRIP _____

EXPIRATION DATE OF THIS AUTHORIZATION _____

I certify that I have transferred title to the drip from the above source or sources to the below-named purchaser and he is hereby authorized to obtain drip from such source or sources until the expiration of this authorization.

_____
Producer

II

NAME OF PURCHASER _____

ADDRESS OF PURCHASER _____

I certify that I am the purchaser and owner of the drip from the source or sources indicated above and am authorized to remove the same until the expiration date set out in Section I above.

_____
Purchaser

No. 27-62

DOCKET: REGULAR HEARING - THURSDAY - SEPTEMBER 13, 1962

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

ALLOWABLE: (1) Consideration of the oil allowable for October, 1962.

(2) Consideration of the allowable production of gas for October, 1962, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for October, 1962.

CASE 2636: In the matter of the application of the Oil Conservation Commission upon its own motion to change the time and place of certain hearings. The Commission proposes to change the date and place of the October regular hearing to 9:00 o'clock a.m., OCTOBER 18, 1962, at the FARMINGTON CITY HALL, 800 MUNICIPAL DRIVE, FARMINGTON, NEW MEXICO.
The Commission further proposes to change the date of the December regular hearing to 9:00 o'clock a.m., December 19, 1962, Morgan Hall, State Land Office Building, Santa Fe, New Mexico.

CASE 2049: (Reopened and Continued)
Application of the Oil Conservation Commission on its own motion to reconsider the special rules and regulations for the Devils Fork-Gallup Pool, Rio Arriba County, New Mexico. Case 2049 will be reopened pursuant to Order No. R-1670-B to permit interested parties to appear and present testimony relative to the effectiveness of the special rules and regulations for the Devils Fork-Gallup Pool.

CASE 2504: (Rehearing)
Application of Consolidated Oil & Gas Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico. Applicant seeks an amendment of Order No. R-1670-C to establish an allocation formula based 60% on acreage and 40% on acreage times deliverability. The Commission will hear opening statements and under the provisions of Rule 1214, and Rule 1215, may refer the presentation of evidence concerning recoverable reserves in the Basin-Dakota Gas Pool to Daniel S. Nutter, duly appointed examiner, or A. L. Porter, Jr., alternate examiner. The Commission would then hear all closing arguments.

Docket No. 27-62

CASE-2637: Southeastern New Mexico nomenclature case calling for an order creating, changing vertical limits, changing pool name and extending certain pools in Lea, Eddy, Chaves and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for Upper-Pennsylvanian production designated as the North Bagley Upper-Pennsylvanian Pool and described as:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 15: SE/4

Special Vertical Limits, Top pool at -4783 feet subsea, bottom of pool at -5727 feet subsea, as in Texas Pacific Coal and Oil Company's J. P. Collier Well No. 1, Unit F of Section 10, Township 11 South, Range 33 East, NMPM.

(b) Create a new pool classified as an oil pool for Lower-Pennsylvanian production, designated as the North Bagley Lower-Pennsylvanian Pool, and described as:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 10: W/2
Section 15: W/2
Section 16: S/2

Special Vertical Limits, top pool at -5727 feet subsea, bottom of pool at the base of the Pennsylvanian Formation, as in Texas Pacific Coal and Oil Company's J. P. Collier Well No. 1, Unit F of Section 10, Township 11 South, Range 33 East, NMPM.

(c) Create a new oil pool for Seven Rivers production, designated as the Car-Seven Rivers Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 29 EAST, NMPM
Section 21: NE/4

(d) Create a new oil pool for Paddock production, designated as the Fren-Paddock Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM
Section 21: NE/4

(e) Create a new oil pool for Queen production, designated as the West Hume-Queen Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 15: NE/4

(f) Create a new oil pool for San Andres production, designated as the Round Tank-San Andres Pool, and described as:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 30: NW/4

(g) Abolish the North Bagley-Pennsylvanian Pool, described as:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 10: W/2
Section 15: W/2
Section 16: S/2

(h) Abolish the North Double X-Delaware Pool, described as:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 11: SE/4

(i) Extend the vertical limits of the North Burton-Atoka Gas Pool to include the Pennsylvanian formation and change the Pool name to North Burton-Pennsylvanian Pool inasmuch as pool is producing from the Morrow and Pennsylvanian formations, and described as:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 32: NW/4

(j) Extend the Double X-Delaware Pool to include:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 11: SE/4
Section 14: N/2
Section 15: NE/4

(k) Extend the Drinkard Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 2: SE/4

(l) Extend the Empire-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 29 EAST, NMPM
Section 29: SE/4

(m) Extend the Grayburg-Jackson Pool to include:

TOWNSHIP 17 SOUTH, RANGE 29 EAST, NMPM
Section 30: SE/4

(n) Extend the North Hackberry-Yates Pool to include:

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM
Section 31: NW/4 NW/4

(o) Extend the Jackson-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 30 EAST, NMPM
Section 22: S/2 NE/4

(p) Extend the Lea-Devonian Pool to include:

TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM
Section 13: NE/4

(q) Extend the Medicine Rock-Devonian Pool to include:

TOWNSHIP 15 SOUTH, RANGE 38 EAST, NMPM
Section 14: SW/4
Section 15: SE/4
Section 22: NW/4

(r) Extend the Mescalero-San Andres Pool to include:

TOWNSHIP 10 SOUTH, RANGE 32 EAST, NMPM
Section 14: W/2
Section 23: W/2

(s) Extend the Milnesand-San Andres Pool to include:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPM
Section 18: SE/4

(t) Extend the Paduca-Delaware Pool to include:

TOWNSHIP 25 SOUTH, RANGE 32 EAST, NMPM
Section 10: SE/4

✓ (u) Extend the Salado Draw-Delaware Pool to include:

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 10: SE/4
Section 15: E/2

✓ (v) Extend the Vacuum-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 25: S/2
Section 26: S/2 NE/4

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 12: E/2 SE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 7: N/2 SW/4

CASE 2638: Northwestern New Mexico Nomenclature case calling for an order extending existing pools in Rio Arriba, Sandoval and San Juan Counties, New Mexico.

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(a) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 23 NORTH, RANGE 1 WEST, NMPM
Section 6: SW/4
Section 7: All
Section 18: All
Section 19: NW/4

TOWNSHIP 23 NORTH, RANGE 2 WEST, NMPM
Section 1: NE/4

TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Section 31: All
Section 33: S/2

(b) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 6: E/2
Section 7: NE/4

(c) Extend the Bisti-Lower Gallup Oil Pool to include:

TOWNSHIP 25 NORTH, RANGE 13 WEST, NMPM
Section 2: NE/4

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No. 33-62

DOCKET: REGULAR HEARING - WEDNESDAY - NOVEMBER 14, 1962

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

ALLOWABLE: (1) Consideration of the oil allowable for December, 1962.

(2) Consideration of the allowable production of gas for December, 1962, for ten prorated pools in Lea and Eddy Counties, New Mexico, and also presentation of purchaser's nominations for the six-month period beginning January 1, 1963 for that area. Consideration of the allowable production of gas for nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico for December, 1962.

CASE 2504: (Rehearing Continued)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on Motions to Quash Subpoenas Duces Tecum, the Commission will receive evidence concerning custody and/or control of core analysis, reports, and electric and radioactivity logs concerning wells that have cored in the Basin-Dakota Gas Pool. The case will then be continued to the regular hearing on December 19, 1962.

CASE 2623: (DE NOVO)

Application of Mrs. Alma Goodwin, Mrs. Nell M. De Forrest, and Mrs. Aulena M. Jennings for a hearing de novo of Case No. 2623, Order No. R-2317, application of W. K. Byrom for compulsory pooling, Lea County, New Mexico.

CASE 2696: Application of Texas Pacific Coal & Oil Company for 40-acre spacing, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order rescinding Commission Order No. R-69-D, which order provides for 80-acre spacing and proration units, Bagley Siluro-Devonian Pool, Lea County, New Mexico.

CASE 2697: Southeastern New Mexico nomenclature case calling for an order creating new pools, and extending certain existing pools in Eddy, Lea and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for San Andres production, designated as the Diablo-San Andres Pool, and described as:

TOWNSHIP 10 SOUTH, RANGE 27 EAST, NMPM
Section 16: SE/4

(b) Create a new oil pool for Abo production, designated as the Goodwin-Abo Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 37 EAST, NMPM
Section 30: SW/4

(c) Extend the Bronco-Wolfcamp Pool to include:

TOWNSHIP 13 SOUTH, RANGE 38 EAST, NMPM
Section 2: NE/4

(d) Extend the Elliott-Abo Pool to include:

TOWNSHIP 21 SOUTH, RANGE 38 EAST, NMPM
Section 9: NW/4

(e) Extend the North Hackberry-Yates Pool to include:

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM
Section 28: NW/4 NW/4

(f) Extend the Henshaw-Wolfcamp Pool to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
Section 23: NE/4

(g) Extend the Milnesand-San Andres Pool to include:

TOWNSHIP 8 SOUTH, RANGE 34 EAST, NMPM
Section 24: N/2 NE/4

(h) Extend the Monument-McKee Gas Pool to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 5: SW/4

(i) Extend the Pearl-Queen Pool to include:

TOWNSHIP 20 SOUTH, RANGE 35 EAST, NMPM
Section 3: E/2 SW/4

(j) Extend the Shugart Pool to include:

TOWNSHIP 18 SOUTH, RANGE 30 EAST, NMPM
Section 25: N/2 SW/4

(k) Extend the Vacuum-Queen Pool to include:

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 7: NE/4

(l) Extend the Vacuum-Grayburg San Andres Pool to include:

TOWNSHIP 18 SOUTH, RANGE 36 EAST, NMPM
Section 6: NE/4

CASE 2698: Northwestern New Mexico nomenclature case calling for an order extending certain existing pools in Rio Arriba, San Juan, and Sandoval Counties, New Mexico.

(a) Extend the Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 30 NORTH, RANGE 9 WEST, NMPM
Section 21: SW/4

(b) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 2 WEST, NMPM
Section 36: SW/4

(c) Extend the Bisti-Lower Gallup Oil Pool to include:

TOWNSHIP 24 NORTH, RANGE 9 WEST, NMPM
Section 15: S/2 NW/4

(d) Extend the Cha Cha-Gallup Oil Pool to include:

TOWNSHIP 29 NORTH, RANGE 14 WEST, NMPM
Section 18: S/2 SW/4 & SW/4 SE/4

TOWNSHIP 29 NORTH, RANGE 15 WEST, NMPM
Section 13: S/2 SE/4

(e) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 7: E/2 SE/4
Section 8: W/2 SW/4

(f) Extend the Verde-Gallup Oil Pool to include:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 22: SE/4 NW/4

(g) Extend the Rattlesnake-Pennsylvanian Oil Pool to include:

TOWNSHIP 29 NORTH, RANGE 18 WEST, NMPM
Section 18: SW/4 & S/2 NW/4
Section 19: N/2 NW/4 & W/2 NE/4

TOWNSHIP 29 NORTH, RANGE 19 WEST, NMPM
Section 2: E/2 SW/4
Section 11: NE/4 & E/2 NW/4
Section 12: NW/4, E/2 SW/4 & SE/4
Section 13: NE/4

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No. 37-62

DOCKET: REGULAR HEARING - WEDNESDAY - DECEMBER 19, 1962

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

ALLOWABLE: (1) Consideration of the oil allowable for January, 1963.

(2) Consideration of the allowable production of gas for January, 1963, for ten prorated pools in Lea and Eddy Counties, New Mexico. Consideration of the allowable production of gas for nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for January, 1963, and also presentation of purchaser's nominations for the six-month period beginning February 1, 1963, for that area.

CASE 2628: (De Novo)
Application of Marathon Oil Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Atoka-Pennsylvanian Gas Pool at a point 990 feet from the North line and 990 feet from the East line of Section 30, Township 18 South, Range 26 East, Eddy County, New Mexico. This case will be heard de novo under the provisions of Rule 1220.

CASE 2118:) Consolidated (Reopened)
2459:) Application of The Ohio Oil Company (now Marathon Oil Company), for 160-acre proration units in the Lea-Devonian Pool, Lea County, New Mexico.

CASE 2721: Application of Continental Oil Company for a triple completion Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete its State A-2 Well No. 2, located in Unit J of Section 2, Township 25 South, Range 37 East, Lea County, New Mexico, as a triple completion (tubingless) to produce oil from the North Justis Tubb-Drinkard Pool, an undesignated Abo Pool, and the North Justis-Devonian Pool through parallel strings of casing cemented in a common well bore.

CASE 2504: (Rehearing - Continued)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on motions to Quash Subpoenas

Duces Tecum, George Eaton, David H. Rainey, Frank Renard, and L. M. Stevens will be required to produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies, if they have not filed the same with the Commission prior to December 19, 1962. The Case will then be continued to the regular hearing on February 14, 1963.

CASE 2722: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending certain existing pools in Chaves, Eddy, Lea and Roosevelt Counties, New Mexico.

(a) Create a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production, designated as the Diablo-San Andres Pool, and described as:

TOWNSHIP 10 SOUTH, RANGE 27 EAST, NMPM
Section 16: SE/4

(b) Create a new oil pool for Wolfcamp production, designated as the South Anderson-Wolfcamp Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 23: NW/4

(c) Create a new gas pool for Wolfcamp production, designated as the Big Eddy-Wolfcamp Gas Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 31 EAST, NMPM
Section 3: SE/4

(d) Create a new oil pool, for San Andres production, designated as the South Prairie-San Andres Pool, and described as:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM
Section 16: SE/4

(e) Extend the Allison-Pennsylvanian Pool to include:

TOWNSHIP 8 SOUTH, RANGE 37 EAST, NMPM
Section 33: E/2 SE/4

(f) Extend the West Anderson Ranch-Grayburg Pool to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 5: SW/4
Section 6: S/2

(g) Extend the Arkansas Junction-Queen Gas Pool to include:

TOWNSHIP 18 SOUTH, RANGE 36 EAST, NMPM
Section 23: NE/4

(h) Extend the Blinebry Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: W/2 SW/4

(i) Extend the Brushy Draw-Delaware Pool to include:

TOWNSHIP 26 SOUTH, RANGE 29 EAST, NMPM
Section 14: E/2 SE/4

(j) Extend the Corbin-Abo Pool to include:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
Section 2: NE/4

(k) Extend the Double A-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM
Section 21: NW/4

(l) Extend the Double X-Delaware Pool to include:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 14: SW/4

(m) Extend the Drinkard Pool to include:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM
Section 24: E/2 SE/4

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 2: Lot 10
Section 19: W/2 SW/4

(n) Extend the West Hume-Queen Pool to include:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 15: SE/4

(o) Extend the South Lane-Pennsylvanian Pool to include:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
Section 23: S/2
Section 26: NW/4

(p) Extend the Loco Hills Pool to include:

TOWNSHIP 18 SOUTH, RANGE 29 EAST, NMPM
Section 19: N/2 SW/4

(q) Extend the Mesa-Queen Pool to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 16: NE/4

(r) Extend the East Millman-Seven Rivers Pool to include:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 22: W/2 SW/4

(s) Extend the Monument-Tubb Pool to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 22: NW/4

(t) Extend the Paddock Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: W/2 SW/4

(u) Extend the Round Tank-San Andres Pool to include:

TOWNSHIP 15 SOUTH, RANGE 28 EAST, NMPM
Section 25: E/2

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 19: SW/4

(v) Extend the Salado Draw-Delaware Pool to include:

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 10: NE/4

(w) Extend the East Turkey Track-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 29 EAST, NMPM
Section 1: SW/4

(x) Extend the Vacuum-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 26: NW/4 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 7: S/2 SW/4

CASE 2723: Northwestern New Mexico nomenclature case calling for an order extending certain existing pools in Rio Arriba, San Juan, and Sandoval Counties, New Mexico.

(a) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM
Section 14: NW/4

(b) Extend the Ballard-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 5: All
Section 6: All
Section 7: N/2
Section 8: N/2

TOWNSHIP 25 NORTH, RANGE 6 WEST, NMPM
Section 31: S/2

(c) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 7: E/2

(d) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 5: W/2

(e) Extend the Angels Peak-Gallup Oil Pool to include:

TOWNSHIP 26 NORTH, RANGE 9 WEST, NMPM
Section 4: W/2
Section 5: S/2
Section 6: SE/4

(f) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 West, NMPM
Section 14: W/2 NE/4, NW/4 SE/4
Section 23: W/2 E/2

(g) Extend the Cha Cha-Gallup Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 12 WEST, NMPM
Section 30: NW/4

TOWNSHIP 29 NORTH, RANGE 14 WEST, NMPM
Section 17: S/2 NW/4 & N/2 SW/4

(h) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 7: NE/4
Section 16: E/2 NW/4, W/2 NE/4 & W/2 SW/4

(i) Extend the Puerto Chiquito-Gallup Oil Pool to include:

TOWNSHIP 27 NORTH, RANGE 1 EAST, NMPM
Section 29: N/2 NW/4

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No. 6-63

DOCKET: REGULAR HEARING - THURSDAY - FEBRUARY 14, 1963

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

ALLOWABLE: (1) Consideration of the oil allowable for March, 1963.

(2) Consideration of the allowable production of gas for March, 1963, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for March, 1963.

CASE 2694: (De Novo)
Application of Southern Union Production Company for an amendment to the Northwest New Mexico Gas Proration Rules and Regulations. Applicant, in the above-styled cause, seeks an amendment to Order No. R-1670 as amended by Order No. R-2086, Rules and Regulations for prorated gas pools, San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico, to permit wells ordered shut-in for extended periods to make up accumulated overproduction to produce not more than 500 MCF each month during such shut-in. Upon application of Southern Union Production Company, this case will be heard de novo under the provisions of Rule 1220.

CASE 2504: (Rehearing - Continued from December 19, 1962)

Application of Consolidated Oil & Gas Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico. Applicant seeks an amendment of Order No. R-1670-C to establish an allocation formula based 60% on acreage and 40% on acreage times deliverability. The Commission will hear opening statements and under the provisions of Rule 1214, and Rule 1215, may refer the presentation of evidence concerning recoverable reserves in the Basin-Dakota Gas Pool to Daniel S. Nutter, duly appointed examiner, or A. L. Porter, Jr., alternate examiner. The Commission would then hear all closing arguments.

CASE 2753: Southeastern New Mexico nomenclature case calling for an order renaming, creating, abolishing and extending certain pools in Lea, Eddy, and Chaves Counties, New Mexico.

(a) Rename the Vacuum-Abo Pool, classified as an oil pool for Abo production, to the Vacuum-Abo Reef Pool with the vertical limits of said pool changed from the entire Abo formation to the Abo Reef formation and the horizontal limits the same. This change is necessary to correct for geologic nomenclature.

(b) Create a new oil pool for Bone Spring production, designated as the Greenwood-Bone Spring Pool, and described as:

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM
Section 12: NE/4

(c) Create a new oil pool for Strawn production, designated as the Greenwood-Strawn Pool, and described as:

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM
Section 12: NE/4

(d) Create a new oil pool for Glorieta production, designated as the Vacuum-Glorieta Pool, comprising the SE/4 of Section 26, Township 17 South, Range 34 East, with the vertical limits thereof described as being from the top of the Glorieta as depicted at 5840 feet on the log of Socony Mobil Oil Company's State Bridges Well No. 95, located in Unit P of said Section 26, to a point 275 feet above the Blinebry marker found at 6510 feet on said log.

(e) Create a new oil pool for Blinebry production, designated as the Vacuum-Blinebry Pool, comprising the SE/4 of Section 26, Township 17 South, Range 34 East, with the vertical limits thereof described as being from 275 feet above the Blinebry marker at 6510 feet on the above described log to the top of the Tubb formation at 7238 feet on said log.

(f) Create a new oil pool for Abo production, designated as the North Vacuum-Abo Pool, with vertical limits defined as the Abo formation, and described as:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 26: SE/4

(g) Create a new oil pool for Wolfcamp production, designated as the Vacuum-Wolfcamp Pool, with vertical limits defined as the Wolfcamp formation, and described as:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 26: SE/4

(h) Abolish the South Benson-Yates Pool, described as:

TOWNSHIP 19 SOUTH, RANGE 30 EAST, NMPM
Section 23: E/2
Section 24: SW/4, SW/4 NW/4 and W/2 SE/4

(i) Abolish the Hackberry-Yates Pool, described as:

TOWNSHIP 19 SOUTH, RANGE 30 EAST, NMPM
Section 36: SE/4 and S/2 NE/4

(j) Extend the Bishop Canyon-San Andres Pool, to include:

TOWNSHIP 18 SOUTH, RANGE 38 EAST, NMPM
Section 10: SW/4

(k) Extend the Corral Canyon-Delaware Pool, to include:

TOWNSHIP 25 SOUTH, RANGE 30 EAST, NMPM
Section 8: SE/4 and E/2 NE/4
Section 9: SW/4

(l) Extend the Double X-Delaware Pool, to include:

TOWNSHIP 24 SOUTH, RANGE 32 EAST, NMPM
Section 11: N/2

(m) Extend the Drinkard Pool to include:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 17: N/2 NW/4

(n) Extend the Fowler-Paddock Gas Pool, to include:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
Section 15: SW/4
Section 23: W/2

(o) Extend the North Hackberry-Yates Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 30 EAST, NMPM
Section 23: E/2
Section 24: W/2 and SE/4
Section 25: N/2 NE/4
Section 36: E/2

(p) Extend the North Justis-Waddell Pool, to include:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
Section 36: SW/4

(q) Extend the Lusk-Strawn Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM
Section 20: SE/4
Section 30: NE/4

(r) Extend the Monument-Tubb Pool, to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 16: NE/4

(s) Extend the Paddock Pool, to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 19: S/2 NW/4
Section 21: S/2 SE/4

(t) Extend the Pearl-Queen Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
Section 23: SE/4

(u) Extend the Red Lake Pool, to include:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 31: SE/4

(v) Extend the Round Tank-San Andres Pool, to include:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM
Section 30: NE/4 and SW/4

(w) Extend the South Tonto-Yates Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM
Section 24: SE/4 SE/4
Section 25: E/2 NE/4

(x) Extend the Weir-Blinebry Pool, to include:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 16: E/2 NE/4

CASE 2754: Northwestern New Mexico nomenclature case calling for an order extending existing pools in Rio Arriba, Sandoval, and San Juan Counties, New Mexico.

(a) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 23 NORTH, RANGE 2 WEST, NMPM
Section 1: W/2
Section 6: W/2
Section 7: NW/4
Section 13: W/2

TOWNSHIP 23 NORTH, RANGE 3 WEST, NMPM
Section 12: NE/4

TOWNSHIP 24 NORTH, RANGE 2 WEST, NMPM
Section 31: W/2

(b) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 5: SE/4

TOWNSHIP 26 NORTH, RANGE 4 WEST, NMPM
Section 17: NW/4
Section 18: NE/4

(c) Extend the Otero-Chacra Pool to include:

TOWNSHIP 25 NORTH, RANGE 5 WEST, NMPM
Section 5: All
Section 6: E/2
Section 8: All
Section 9: W/2
Section 10: SW/4
Section 14: SW/4
Section 15: SE/4
Section 22: NE/4
Section 23: NW/4

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 31: E/2

(d) Extend the Blanco-Mesaverde Pool to include:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM
Section 31: W/2

TOWNSHIP 27 NORTH, RANGE 9 WEST, NMPM
Section 14: S/2
Section 24: All

(e) Extend the Flora Vista-Mesaverde Pool to include:

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM
Section 21: W/2

(f) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 WEST, NMPM
Section 26: E/2 SW/4

(g) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 16: E/2 SW/4 & SE/4

(h) Extend the Escrito-Gallup Oil Pool to include:

TOWNSHIP 24 NORTH, RANGE 7 WEST, NMPM
Section 36: N/2 NW/4

(i) Extend the South Blanco-Tocito Oil Pool to include:

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM
Section 4: All

iqg/

(d) Extend the Blanco-Mesaverde Pool to include:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM
Section 31: W/2

TOWNSHIP 27 NORTH, RANGE 9 WEST, NMPM
Section 14: S/2
Section 24: All

(e) Extend the Flora Vista-Mesaverde Pool to include:

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM
Section 21: W/2

(f) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 WEST, NMPM
Section 26: E/2 SW/4

(g) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 16: E/2 SW/4 & SE/4

(h) Extend the Escrito-Gallup Oil Pool to include:

TOWNSHIP 24 NORTH, RANGE 7 WEST, NMPM
Section 36: N/2 NW/4

(i) Extend the South Blanco-Tocito Oil Pool to include:

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM
Section 4: All

iqg/

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 19, 1962

REGULAR HEARING

IN THE MATTER OF: (Rehearing-Continued)

Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on motions to Quash Subpoenas Duces Tecum, George Eaton, David H. Rainey, Frank Renard, and L. M. Stevens will be required to produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies, if they have not filed the same with the Commission prior to December 19, 1962. The Case will then be continued to the regular hearing on February 14, 1963. Case 2504

BEFORE: Honorable Thomas Bolack
Mr. A. L. "Pete" Porter
Mr. E. S. "Johnny" Walker

TRANSCRIPT OF HEARING

MR. PORTER: We are going to change the order of the docket and take up Case 2504.

MR. DURRETT: Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba,

and Sandoval Counties, New Mexico.

If the Commission please, I would like to state for the record that all of the parties subpoenaed by the Commission have now complied with the subpoenas and the Commission has on deposit with it all of the subpoenaed information.

MR. PORTER: That is in accordance with the order of the Commission issued as a result of our Farmington meeting?

MR. DURRETT: Yes, sir, that is in accordance with the ruling on the motions to Quash the Subpoenas Duces Tecum.

MR. PORTER: You'll notice attached to the docket a memorandum from the Director of the Commission which has stated that this case will be continued to the regular Commission hearing to be held on February 14, 1963. That case will be continued.

We will take a ten-minute recess.

(Whereupon, a recess was taken.)

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 8th day of January, 1963.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 14, 1962

REGULAR HEARING

IN THE MATTER OF: (Rehearing Continued)

Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on Motions to Quash Subpoenas Duces Tecum, the Commission will receive evidence concerning custody and/or control of core analysis, reports, and electric and radioactivity logs concerning wells that have cored in the Basin-Dakota Gas Pool. The case will then be continued to the regular hearing on December 19, 1962.

Case 2504

BEFORE: Honorable Edwin L. Mechem
Mr. A. L. "Pete" Porter
Mr. E. S. "Johnny" Walker

TRANSCRIPT OF HEARING

MR. PORTER: We will proceed to Case 2504.

MR. DURRETT: Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. In accordance with the Commission's Ruling of October 18, 1962, on Motions to Quash

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Subpoenas Duces Tecum, the Commission will receive evidence concerning custody and/or control of core analysis, reports, and electric and radioactivity logs concerning wells that have cored in the Basin-Dakota Gas Pool. The case will then be continued to the regular hearing on December 19, 1962.

May the Commission please, we have some correspondence in the file that I would like to read into the record at this time.

MR. PORTER: You may proceed to read the communications which we have received, Mr. Durrett.

MR. DURRETT: The Commission has in its official file a telegram received on November 13 reading as follows: "Re:Case 2504, this is to inform you that Mr. Frank Renard is authorized to furnish the data as ordered concerning Basin-Dakota wells that have been cored by British American Oil Producing Company. British American Oil Producing Company, Thomas M. Hogan."

We also have in our file a letter received October the 31st from Mr. Kenneth A. Swanson on behalf of Aztec Oil and Gas Company, and I would like to read that letter at this time. "Re; New Mexico Oil Conservation Commission Case 2504, Rehearing. Gentlemen: Receipt is acknowledged of the Commission's ruling with respect to the motions to Quash Subpoenas Duces Tecum. As required by Order in paragraph 2, Mr. L. M. Stevens will appear before the Commission at 9:00 A.M. on December 19, 1962 and

will there produce all core analyses reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Pool by Aztec Oil and Gas Company. Mr. Stevens has been given custody and control of such logs and reports for such purpose. Therefore, Aztec Oil and Gas Company does not plan to argue that some party other than Mr. Stevens actually has custody and control of this data at the November 14, 1962 hearing."

The Commission also has in its files a stipulation entered into by Jason W. Kellahin, attorney for Consolidated Oil and Gas, Inc. and William J. Cooley of the law firm of Verity, Burr and Cooley, attorneys for Southwest Production Company. I would like to ask the Commission to take administrative notice of this stipulation as it appears in full in the file rather than read the entire stipulation into the record.

The stipulation in general states that Consolidated waives objection to the non-appearance of Leon Wiederkehr at the hearing on December 19 as Southwest Production Company does not have any of the required information to be produced.

MR. PORTER: The Commission will take note of the stipulation as requested by counsel. I believe from the communications that you have just made part of the record that we have heard from Mr. Stevens, Mr. Wiederkehr and Mr. Frank Renard,

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representing Aztec and British American, Southwest Production Company.

MR. DURRETT: Yes, that is correct.

MR. PORTER: That leaves Mr. Eaton, Mr. Frank D. Gorham and Mr. David H. Rainey. Mr. Malone.

MR. MALONE: May it please the Commission, Charles Malone, Atwood, Malone, Roswell, counsel for George Eaton. I am also authorized to make a statement for Pan American Petroleum Corporation, Mr. Eaton's employer. Pan American feels that the Commission ruling and Order of October 18, 1962 is a very fair and appropriate disposition of the Subpoena Duces Tecum and Motions to Quash directed to those Subpoenas.

Pan American wishes to cooperate with the Commission in carrying out the ruling. To that end while the core analyses reports and electric and radioactivity logs specified by the Order are not in the custody or control of Mr. Eaton, who merely has access to them in the performance of his duties, Pan American will nevertheless furnish to the Commission all core analyses reports and all electric and radioactivity logs covering any and all wells in New Mexico in the Basin-Dakota Gas Pool which are owned and operated by Pan American.

Pan American will be prepared to produce these reports and logs at the Commission's hearing on December 19, 1962, or at such

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other time and place as the Commission may direct.

MR. PORTER: Thank you, Mr. Malone.

MR. FEDERICI: If the Commission please, Bill Federici of Seth, Montgomery, Federici and Andrews on behalf of El Paso Natural Gas Company, and Dave Rainey personally. I want to show an entry of appearance also for Mr. Garrett Whitworth, attorney, El Paso, Texas. With reference to the subpoena which was served on Dave Rainey and although Dave Rainey does not have the custody or control of the electric and radioactivity logs and the core analyses reports, El Paso Natural Gas Company will none the less make this information available to Mr. Dave Rainey to produce that information and that data at the hearing on December 19, 1962.

If the Commission please, my understanding of the order is that it requires Dave Rainey to produce the core analyses reports and the electric and radioactivity logs on wells owned and operated by El Paso Natural Gas Company which have been cored.

MR. PORTER: That is correct, Mr. Federici. Mr. Kelleher.

MR. KELLEHER: May it please the Commission, we also concur in the thought that the ruling of the Commission was fair on the question of Subpoenas Duces Tecum. I was in hopes that some lawyer would start another argument about the Subpoena Duces

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Tecum today, but apparently the Commission would like to have that dispensed with.

Everything that Pubco has belongs to Mr. Gorham personally, everything we have is a public record excepting the core analyses. We have an interest in thirteen wells in the Basin-Dakota, ten of which we operate. We have no wells that have been cored. However, Mr. Gorham will be here in person on December 19 and will obey the order of the Commission with reference to any testimony that he should give, but at this time we would like it clear that we do not have core analyses of our wells.

MR. PORTER: The Commission is happy, of course, that all of the people have indicated that they will comply with the ruling that the Commission made on October 18, I believe it was, that they will be here with the information desired and the case then, unless somebody else has something to offer at this time, the case will be heard on the 19th of December as scheduled. Mr. Kellahin.

MR. KELLAHIN: Just for the sake of the record, I think everybody has concurred that they will bring forth this evidence and the stipulation between Consolidated and Southwest Production was based upon an affidavit which was signed by the witness subpoenaed to the effect that they do not have this information, and for the sake of the record I wish to say that we concur

with the statement that has been made by Mr. Kelleher. If he says they don't have any cores, we accept it.

MR. PORTER: We will take the case up at the regular hearing on the 19th of December. Any questions anyone has concerning this matter? If not we'll proceed to the next case.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 27th day of November, 1962.

Notary Public-Court Reporter

My commission expires:

June 19, 1963.

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 14, 1962

REGULAR HEARING

IN THE MATTER OF:

Application of Consolidated Oil & Gas Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba, and Sandoval Counties, New Mexico. Applicant seeks an amendment of Order No. R-1670-C to establish an allocation formula based 60% on acreage and 40% on acreage times deliberability. The Commission will hear opening statements and under the provisions of Rule 1214, and Rule 1215, may refer the presentation of evidence concerning recoverable reserves in the Basin-Dakota Gas Pool to Daniel S. Nutter, duly appointed examiner, or A. L. Porter, Jr., alternate examiner. The Commission would then hear all closing arguments.

CASE 2504
(Rehearing)

BEFORE:
A. L. (Pete) Porter
E. S. (Johnny) Walker

TRANSCRIPT OF HEARING

MR. PORTER: The hearing will come to order, please. The case to be heard this morning is Case 2504.

MR. DURRETT: Case 2504: Application of Consolidated Oil & Gas Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

MR. KELLAHIN: If the Commission please, Jason Kellahin,

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Kellahin and Fox, Santa Fe, appearing in behalf of Applicant. I have associated with me Mr. Ted P. Stockmar, a member of the Colorado Bar. I would like at this time to also enter an appearance in behalf of Harry A. Trueblood and Associates, as owners of working and oil interests in the Pool involved.

MR. FEDERICI: May it please the Commission, William Federici of Seth, Montgomery, Federici and Andrews for El Paso Natural Gas Company, and associated with me Mr. Ben Howell, attorney, and Mr. Garrett Whitworth. Also making an appearance for Azted Oil and Gas Company, and also Mr. Ken Swanson for Aztec Oil and Gas Company. Also making an appearance for Calkins Oil Company and Sunset International, Mr. Tom Pope, also present.

MR. SANCHEZ: Manuel A. Sanchez, attorney at law, Santa Fe, New Mexico, appearing for Southern Union Gas Company. Associated with me is Mr. Oran Haseltine of Dallas, Texas.

MR. PORTER: Are there other appearances to be made in this case?

MR. VERITY: George L. Verity of Verity, Burr and Cooley for Southwest Production, and associated with me is Mr. Gordon Llewelyn of the Dallas, Texas, Bar.

MR. PORTER: Mr. Keleher.

MR. KELEHER: W. A. Keleher, Pubco Petroleum Corporation, Albuquerque.

MR. PORTER: Mr. Kelly.

MR. KELLY: Booker Kelly, Gilbert, White and Gilbert,

appearing for Sunray, DX, and Texaco.

MR. PORTER: Mr. Everett.

MR. EVERETT: W. Hume Everett for Ohio Oil Company.

MR. PORTER: Is that Marathon?

MR. EVERETT: If you please, that's what I was going to ask you, if the name would be changed in the record to Marathon Oil Company. Also I appear in the record as Division Attorney for the Ohio Oil Company. The same day they changed their name, two things happened, the name was changed and I was retired, and I am now in private practice and I would like the record to show me as an attorney in general practice, the address being Suite 504, Consolidated Royalty Building, Casper. I would also like at this time, first, to introduce to the Commission and to those present the new Division Attorney of Marathon Oil Company, Mr. Kent B. Hampton. Stand up, Kent, let them see what you look like -- and to ask that his appearance be entered in this case along with mine, and that of Atwood and Malone, who initially entered an appearance for all of us except Mr. Hampton herein.

MR. SELINGER: George W. Selinger for Skelly Oil Company.

MR. CAMERON: John Cameron for Tidewater Oil Company.

MR. WYNN: R. C. Wynn, Delhi Taylor Oil Corporation.

MR. MILES: George Miles for Atlantic Refining.

MR. PORTER: Anyone else desire to make an appearance? We have two motions before us this morning, one filed by Mr. Keleher for Pubco Petroleum Corporation. It's not a motion,

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it's objection to the Commission granting the rehearing. We have a motion filed by Mr. Hume Everett for Marathon Oil Company to vacate Order No. R-2259-A, which is the order granting the rehearing. Do you desire to argue the motion?

MR. KELEHER: May it please the Commission, I would like to state our position.

MR. PORTER: Mr. Keleher, at this time I just wanted to determine whether or not arguments are to be made, and I intend to set a time limit on the arguments.

MR. KELEHER: I would like to argue briefly.

MR. EVERETT: Yes, sir. I would like to argue my motion.

MR. PORTER: We are going to combine the objections and the motions for the purpose of argument. We will limit each side to twenty minutes. You can divide that time any way you see fit.

MR. KELEHER: I will take five minutes. Mr. Everett can have fifteen. May it please the Commission --

MR. PORTER: Mr. Keleher. Mr. Kellahin.

MR. KELLAHIN: We have not been served a copy of Mr. Keleher's motion. I ask if we could have a copy.

MR. KELEHER: I don't have an extra copy.

MR. PORTER: You can take a look at this one. The Commission recognizes Mr. Keleher at this time.

MR. KELEHER: If it please the Commission, our objections are as follows: That the Petitioner, Consolidated Oil and

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Gas, Inc., had ample opportunity to present its case at the time of the hearing. The preamble of this respectfully objects to the Order of Commission granting the rehearing in this above-entitled cause, and in support of this hereby says that Petitioner Consolidated had ample opportunity to present its case at the time of the hearing; that the matters and things that have been submitted to the Commission by all parties before the Commission have been decided, and that said cause was res adjudicata.

Our Motion to Quash Subpoena Duces Tecum, we move to quash the Subpoena Duces Tecum heretofore served upon Frank D. Gorham, and respectfully shows to the Commission: Number 1, That at the hearing in taking testimony in this cause, Consolidated, which requested the issuance of such subpoena --

MR. PORTER: Mr. Keleher, we intend to grant time for the argument on the Motion to Quash at a later time. Right now we would like to confine this to the Motion to Vacate Order, or your objection to granting the rehearing.

MR. KELEHER: Our objection is just that this case was tried before the Commission on the merits, and at that time the so-called Jalmat case had been decided by the Supreme Court, and all lawyers in New Mexico know that the Supreme Court never grants a motion for rehearing, so it might have been anticipated that the Supreme Court wouldn't do anything toward a rehearing in the Jalmat case; that at that time all parties before the Commission presented their case and tried it.

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Now the question now is going to be, are we going to try this case over again and take up the time of the Commission and of the companies and of the lawyers and everybody involved, or are we going to stand on the Order of the Commission? We believe that the rehearing was inadvertently granted without notice to counsel, and we object to it and don't believe that the Commission should retry this case.

MR. PORTER: Mr.Everett.

MR. EVERETT: May it please the Commission, W. Hume Everett, representing Marathon Oil Company. I will endeavor to meet the time limit set by the Chairman, but we feel that this is a very serious matter, so much so that after we read the petition for rehearing which I saw for the first time in the Commission files here day before yesterday, we recognized that we were in serious procedural trouble.

We would feel remiss if we did not call the Commission's attention to that situation which we feel the Commission may have gotten itself into inadvertently. So that what we have to say is not to be taken in any spirit of criticism, but we would like to be helpful if we can, to orderly procedure and orderly process.

I know the lawyers are all familiar with the Statute. I would refer to two Sections thereof, Section 65-3-20, and Section 65-3-22 of the New Mexico Statutes Annotated. Very briefly, 20 says that before any order shall be made under the provisions of this act, that a public hearing shall be held at such time, place

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and manner as prescribed by the Commission. It has an exception in that paragraph for emergency orders, which I think it's admitted this rehearing order is not. It provides notice in no case less than ten days, except in emergency, and that any person having an interest in the subject matter of the hearing shall be entitled to be heard.

Then we look at 65-3-22, which has two time elements in it, one twenty days after an order is entered by the Commission within which any interested party may file a petition for rehearing, and then it provides that in that petition they should set forth the respect in which the order or decision is believed to be erroneous and requires the Commission to grant or refuse that application in whole or part within ten days. It has no provision with reference to hearing.

After viewing this petition for the first time, I then prepared a Motion to Vacate the Order granting the rehearing, inasmuch as no one had any notice of the hearing, which is required by the Statute, and inasmuch as no one was afforded an opportunity to be heard, to voice any objection they might have with reference to the form of petition or with reference to the matter of re-hearing. This was the only procedure left to any of us who rejected rehearing which I could think of. As a matter of fact, it's the only way that I know of to present the matter.

Very briefly, the law with reference to such items, and I have not had an opportunity to brief this extensively, but I

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think it's very well summarized in 73 Corpus Juris Secundum, Paragraph 158 at Page 495, under Public Administrative Bodies and Procedure, C, where it is said, and I am quoting just a part that is applicable to this matter, as I view it: "Where an order is void for lack of due process, as where there was no hearing, the aggrieved party is entitled, if he has been prejudiced, to have the order set aside and the case reopened; and the agency has the power to do so."

Further, Paragraph 130, Page 453, "Where administrative action is taken in an adversary proceeding without affording adequate notice and opportunity to defend to interested parties, basic rights are invaded. The quality of the act rather than the character of the agency exercising the authority is determinative of the need for notice and hearing."

Then at Page 453, still quoting from 73 Corpus Juris Secundum, "The fact that the legislature may direct the doing of a certain act does not mean that an administrative body may be empowered without notice or hearing to direct the doing of such act."

Gentlemen, I submit that the order granting the rehearing in this case is void, and to proceed would be highly prejudicial to Marathon and other interested parties who are opposed to the application in this case. I have done my utmost to comply with the rule of the Commission with reference to service of copies of motions, and if there's any attorney or anyone else present to whom I have not already given a copy of the Motion, I wish they would

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please raise their hand and I'll see that they get one at this time. I have handed out about twenty of them to as many of the attorneys and parties I know who have entered appearances in this case. If there are any others, would you please raise your hand and I'll be delighted to give you a copy of the Motion at this time. It was impossible to get it to anyone by mail, having not seen the petition for rehearing until the day before yesterday, and having prepared my Motion which I filed yesterday afternoon. I see no hands raised, so I assume that everyone here in attendance, at least, has a copy of the Motion.

The Motion itself I would like to review very briefly. Then I wish to offer some correspondence and ask the Commission to take judicial notice of some items in its file in support of the Motion.

That Consolidated Oil and Gas, Inc. is the applicant herein, and I will refer to them in my argument and I also refer to them in the Motion as Consolidated. In October of 1960, Consolidated appeared in opposition to the allocation formula which was then adopted on November 4th, 1960, effective February 1, 1961. At that time they offered no evidence or testimony in support of this opposition to the formula.

Then herein, in this case, on February 23, 1962, they filed their application requesting the Commission to adopt a special formula "pertaining to the Basin Dakota gas pool," in which they did not object to acreage and deliverability as proper factors

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in the formula, but simply asked that the percentage of weight given to those two factors be changed. So after proper notice was given and this case was set, and as the Commission well remembers and the rest of us here, it started on April 18, 1962, and it was continued without interruption for several days and nights and was concluded on April 21, 1962. At that time Consolidated,and those joining with them in supporting their position,failed to prove the allegations of their application. They failed to discharge the burden of proof which was upon them, wanting to upset an order of this Commission. They were afforded every opportunity to make the best case they could make. Those parties who appeared in opposition to Consolidated's application offered evidence in support of Order No. R-1670-C which established the present formula, and opposed the application of Consolidated. At that time all of the witnesses, their exhibits, were available for complete cross examination by anyone at that hearing, including Consolidated and those supporting it, and they were thoroughly cross examined by Consolidated and those supporting it.

The Commission on July 7th, by its Order No. R-2259, found that the evidence presented at the hearing of the case concerning the recoverable gas reserves in the pool"is insufficient to justify any change in the present allocation formula", and then proceeded to deny Consolidated's application.

On June 27, 1962, Consolidated filed its petition for rehearing in this case, not specifying, as required by Section

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65-3-22, any error which might have been committed, but submitted that application to the Commission with a request for rehearing, and I'm quoting from the petition for hearing, "on any basis agreeable to the Commission." In that petition and in their subsequent action have sought to compel, as if they could, opposition witnesses and parties to furnish expert opinion evidence favorable to Consolidated's already denied application.

The Commission, prior to then, I think inadvertently, and prior to the time that Marathon had any opportunity or even knew about this petition, prior to the time we had any opportunity to object to it, and without any hearing whatever, entered its Order R-2259-A granting a rehearing in this case. I think that Consolidated's correspondence, its subpoenas duces tecum, prove beyond question they are not seeking a rehearing on any newly discovered evidence of anything which occurred prior to the close of the hearing on April 21, 1962. I don't think Consolidated, or any of those supporting them, can truthfully claim prejudice by reason of not having had a full and complete hearing on their application.

Consolidated has not alleged in its petition for rehearing nor has it proven that any competent evidence it now seeks in this so-called rehearing could not, with the exercise of reasonable diligence on its part, have been obtained prior to the close of the hearing on April 21,1962.

Consolidated has failed to take timely action in connection with Order No. R-1670-C and is guilty of laches as far as now

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attacking that order is concerned. They have failed to show in support of their application herein (1) the amount of recoverable gas under each producer's tract; (2) the total amount of recoverable gas in the pool; (3) the proportion that (1) bears to (2); and (4) what portion of the arrived at proportion can be recovered without waste; and (5) just how under such determinations the correlative rights of producers will be better protected than under the present formula.

They failed to sustain the burden of proof by failing to present sufficient evidence to justify this Commission in making a change in Order No. R-1670-C, and they have failed in their endeavor to discredit any opposition exhibit or witness, or to make their case therefrom.

No doubt Consolidated is disappointed with its failures and with the Commission Orders R-1670-C and 2259, but that is not either legally or equitably sufficient to warrant the granting of a rehearing or any further proceedings under the order which has been granted. We think that to permit Consolidated to proceed under this rehearing order and at great expense and inconvenience to those who are opposed to it, and to again rehash and rehash and rehash a valid order of this Commission which was entered after a full and complete hearing two years ago and after another full and complete hearing a few weeks ago would be unconscionable, inequitable, and highly irregular procedure and would tend to violate due process of law.

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Therefore we filed our Motion to Vacate. In support of that Motion to Vacate, I wish to ask the reporter to mark this as Marathon's Exhibit 1, these exhibits as Exhibits 1, 2, and 3.

(Whereupon, Marathon's Exhibits Nos. 1, 2 & 3 marked for identification.)

MR. EVERETT: I have here marked for identification -- I'm sorry I don't have copies of these, I will ask that the reporter make copies of these so I may have them in my file. Exhibit 1 is a letter dated July 6, 1962, which was received in the Casper Division, Office of the Division Manager, on July 9th, 1962, on the letterhead of Consolidated Oil and Gas, Inc., signed by Mr. J. B. Ladd. I would like to read very briefly from this letter, because to me it simply emphasizes the point which I have tried to make throughout this hearing, that Consolidated is not concerned with conservation, they are concerned with promotion; and they would have this Commission, in my opinion, act as a tool to aid them in that regard.

I want to read this letter to you. This is addressed: "Memorandum to Participants, In Re: --

MR. STOCKMAR: May we see the thing so we may decide if we want to object to it, so we can do so before you read it in evidence?

MR. EVERETT: If you don't count your reading time as my time.

MR. STOCKMAR: No objection.

MR. EVERETT: "Memorandum to Participants, In Re: Dakota Proration Formula, San Juan Basin. We have previously informed you of the New Mexico Oil & Gas Conservation Commission denial of our request for a change in the method by which Dakota gas withdrawals are allocated. Our hearing in April resulted in what is reported to be the longest Commission session in history - the hearing consumed four days."

"In essence, it is obvious that we won the battle but lost the war. The famous New Mexico Supreme Court Jalmat decision handed down recently said in principal that the Commission could not consider changing a proration formula unless detailed engineering reserve and performance data were included on each and every well in order that reservoir exploitation efficiency, and the always important issue of correlative rights, might be thoroughly and objectively defined."

"The impact of this on our proposal is indicated when one realizes that there are over 600 wells in the San Juan Basin Dakota reservoirs. We have now approached the Commission with the formal request that they require all operators to submit sufficient information regarding their particular wells such that the requirements of the Jalmat decision could be met. We are confident that a thorough engineering review, with objective conclusions based on all available data, would prove our proposed allocation formula more valid than the original formula which is now in effect. It is possible (and even quite probable) that while we may not be able

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to generate approval for our proposed new formula, we will succeed in invalidating the original formula. The net effect of this would be no proration at all. This would be good since we would then undeniably be governed by the unqualified intent of the contractual minimum-take guarantee; i.e., 50% of each well's ability rather than being limited to a lesser volume as suggested by the existing proration formula." This last part I certainly don't agree with, but it's part of the letter and it's going to be introduced in evidence.

"In any event, Consolidated Oil & Gas, Inc. is being heard from and we have gained respect in both our administrative and technological profiles."

I offer that in evidence in support of our Motion.

The second item is a letter addressed to Participants, dated July 17, 1962. It has been marked for identification as Marathon's Exhibit 2.

MR. STOCKMAR: No objection.

MR. EVERETT: This simply advised the Participants, whoever they are, that this letter is going to keep them up-to-date. It's on the letterhead of Consolidated again, and signed by Robert B. Tenison, to keep them up-to-date on changes in the data. It's dated July 17, 1962.

"We are preparing our own information and sincerely hope that all other interested companies will supply the necessary information for the reserve study required for a commission decision."

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I offer that in evidence in support of this Motion. The next item --

MR. STOCKMAR: No objection.

MR. EVERETT: -- is a letter and two attached sheets on the letterhead of Consolidated Gas and Oil, Inc. dated August 24, 1962, which shows it was received on August 24, 1962, Casper Division, Office of the Division Manager, marked Marathon Exhibit 3. It refers to and tells us that there has been a rehearing granted in this matter on September 13, 1962, and then with that they enclose a list of wells, they enclose a blank data sheet listing reservoir information needed for the determination of recoverable gas reserves. Then they respectfully request that as to the wells designated on the first list that we provide to them at our earliest convenience and prior to September 10th all the information suggested by the data sheet. "This should include, if you have made the calculations, your determinations of recoverable gas reserves. If you do not have any particular item of information, we would appreciate your furnishing all that you do have."

They want us to advise them whether we will attend the hearing or not. This last was unanswered.

I refer to the second page of it, which is the data sheet. There are eleven items listed on this sheet, and of the eleven, eight of them call for expert engineering interpretation and advice which, whether Marathon has it or not, it comes under the heading

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of none of their business, since it's confidential information which they could not get a Court to force anyone to disclose, and we think that this is entirely out of line; and further emphasize the point that they do not make a case and we do not propose to be beat over the back because we think no one can legally force us to present reserve determinations which were made in the course of our business and which were made at great expense to us and which are confidential information for the sole use of our management.

I offer this Exhibit 3 in support of our Motion.

MR. DURRETT: Deducting the time opposing counsel spent examining the evidence for objection, you have two minutes left.

MR. EVERETT: Thank you. I'll try and finish. I would ask the Commission to take judicial notice of a letter in its files, copy of a letter in its files, particularly the second paragraph, the letter dated September 7, 1962, addressed to Mr. Whitworth, Attorney for El Paso, by Mr. Stockmar, Attorney for Consolidated.

In that letter, in that paragraph, Mr. Stockmar expresses his willingness to cooperate "so long as the desired information is made available at the rehearing of Case 2504 as expert testimony." There again, we get in the realm of the very thing I'm talking about in this Exhibit 3, and that is expert opinion which the Ohio Oil Company or the Marathon Company, its successor, has obtained and has in its file. It's the same thing with every other operator in this room, and I think that Consolidated has failed miserably to make its case and wants to rehash and rehash.

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There has been no showing made whatever that they weren't afforded a full hearing and that they weren't given every opportunity to cross examine every expert and the basis of his decision. I would also ask the Commission to take judicial notice of the subpoenas duces tecum which were issued upon the request of Consolidated in this case. Items one and two of each of those reports call for evidence which was already presented to this Commission or was available to Consolidated upon cross examination prior to the conclusion of the hearing on April 21st; and I understand from the Chairman that there's going to be some arguments about those motions so I will not take further time talking about them, but if you will just take judicial notice of items one, two, and three in each of those, I think it becomes manifestly apparent that Consolidated does not want a rehearing, it wants a rehash; and it would like to endeavor, if it could get the strong arm of this Commission to help it, to get into the confidential files of each operator in hopes that it can make a case.

We think this is highly irregular procedure. They have had their day in Court, and as a matter of fact, in their own petition or in their own statements they have had four days in Court, and we don't think the matter should go any further, that it should stop here; and if Consolidated feels that it can make a case from its own evidence and testimony, let them file another application and we'll take off on another one, but let's not just go on and on and on in this case.

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We respectfully request that the order granting the rehearing be vacated. Thank you very kindly.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please, I would like to divide my time with Mr. Stockmar. On that basis, how much time do we have?

MR. PORTER: You have twenty minutes.

MR. KELLAHIN: Twenty minutes for our side?

MR. PORTER: Yes, sir.

MR. KELLAHIN: Of course, some of the matters presented by Mr. Everett actually pertain to the subpoenas which were issued by the Commission at the request of Consolidated. That will be fully discussed later, I am sure.

In Mr. Keleher's motion, he has based it on actually one thing. He says we have had full opportunity to present our case and it has been decided, and it is now res adjudicata. He further made the statement that the Jalmat case was available at the time. I would like to put the dates in the Commission's mind on that score. The hearings in the Consolidated application in the Basin Dakota Pool were April 18th to April 21st. The Jalmat decision of the State Supreme Court came down on May 16th. Certainly the reasoning the Court was going to follow was not available to us at the time hearings were held.

There has been some inference by Mr. Everett that we should have notified him forthwith when we filed our petition for

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rehearing, and he should have had a full hearing on that petition. Rule 1208 of the Commission's Rules and Regulations provides that: "When any party to a hearing files any pleading, plea or motion of any character (other than application for hearing) which is not by law or by these rules required to be served upon the adverse party or parties, he shall at the same time either deliver or mail to the adverse party or parties who have entered their appearance therein, or their respective attorneys of record, a copy of such pleading, plea or motion."

Now the Commission well knows that in many, many cases numerous appearances are made which are in effect just pro forma appearances for the purpose of making a statement or taking a nominal interest in the proceedings.

For that reason, they added this further provision: "For the purposes of these rules, an appearance of any interested party shall be made either by letter addressed to the Commission, or in person at any proceeding before the Commission or before an Examiner, with notice of such appearance to the parties from whom such pleadings, pleas, or motions are desired."

Consolidated received no notice from any party or parties that they desired pleadings from us. Had they given us that notice, they would certainly have been furnished with them. Now it is true that Section 65-3-20 of the New Mexico Statutes provides that orders of the Commission be entered after notice of hearing. It also says, however, "except as provided for herein." Now, the

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rehearing statute, 65-3-22, provides that: "Within twenty days after entry of any order or decision of the Commission, any person affected thereby may file with the Commission an application for rehearing." The Commission must either grant or deny it within ten days. That statute doesn't contemplate any hearing on the petition for rehearing. It's an administerial act on the part of the Commission. It's within their discretion as to whether they are going to grant a rehearing or not. The refusal of the rehearing has laid the foundation for an appeal to the Court.

In this instance, the Commission granted a rehearing. They did it by an order. It could have been done in the same manner as the original order was done, by application and advertising, notice that a rehearing be held. A notice is not necessary for this, and for that reason I couldn't conceive that 65-3-20 requires a hearing on a petition for rehearing. It's a little absurd to expect the Commission to do that all within ten days.

In regard to this question of res adjudicata, that is something which just has no application to the proceedings before this Commission. 2 American Jurisprudence 2d at 531 states: "The power of a court --" Now this is in the Public Administrative Law Section -- "The power of a court to open, modify, or vacate its own judgments exists despite the doctrine of res judicata, and a proceeding to open or modify a judgment of a court is generally regarded as a further proceeding in the original action. Accordingly, the doctrine may not properly be applied to restrict

the power of an administrative tribunal to reconsider or modify its own determinations, and in many cases the power of redetermination has been upheld against objections based on the res judicata doctrine." I think it is pretty clear that res judicata has no place in this hearing.

Now, Mr. Everett referred to the application for rehearing or the petition for rehearing, stating in effect that it set forth no grounds for the invalidity of the order. Without burdening the Commission by reading the whole matter, I would refer them to paragraphs 5, 6, 7, and 8 of the petition for rehearing, in which that was asserted at that time. We took issue with the Commission's finding, but in addition to that, available data can be provided, and we sought the Commission, if they saw fit, to present the further data. That is exactly what the Commission did in its order.

Now that asserts the grounds on which the order was invalid, the original order, and the Commission, fully within its jurisdiction, restricted this hearing to matters relating solely to reserves, basing it entirely upon the single finding of the order that there was insufficient information to enter an order on that basis.

Now the Motion filed in behalf of Marathon seems to assert that the Commission can grant a rehearing only on the basis of newly discovered evidence, that the Order 1670-C is a final order, and the Commission is without jurisdiction to review it or at this time receive additional evidence; and that rehearing violates the

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due process of law. I don't know what the reasoning on that is. It wasn't discussed in the argument, to my knowledge, so I don't really have an answer to due process of law. It should be borne in mind, when the Commission acts to prorate gas in the gas pool, it's excess gas, and that is the finding in the Jalmat case that will be discussed a little further by Mr. Stockmar.

Among the statutory powers of the Commission is the power to grant a rehearing, which we have already discussed, and the powers of this Section are relatively broad. The Commission may grant or refuse any application, either in whole or in part, and in the instant case, the Commission did grant the rehearing only in part.

2 American Jurisprudence 2d, 522, "Even apart from any statutory provision expressly authorizing modification," and New Mexico has such a statute, "administrative determinations are subject to reconsideration and change where they have not passed beyond the control of the administrative agency, as where the determinations are not final, but interlocutory, incomplete, provisional, or not yet effective, or where the powers and jurisdiction of the administrative agency are continuing in nature."

Section 526, The power to review has been received in the order in this instant case, and the reservation of such authority is effective. I refer to the order that was entered by the Commission at the conclusion of the original hearing. At the end of the order, the Commission said, Paragraph 2, that "jurisdiction of this cause is to be retained for such further order...." As

the American Jurisprudence 2d says, that's a valid reservation of authority.

In Section 537 of the same reference, same work, "A rehearing may be granted even though the evidence claimed as the basis for the application is not newly discovered and could, in the exercise of due diligence, have been offered at the original hearing." That is an answer to Mr. Everett and Mr. Keleher's contention that this evidence was available. Granted it was available, that does not affect the rehearing. "The discretion to grant or deny a rehearing may be exercised by granting a rehearing but by limiting the scope of the matters to be considered thereon." That's a quotation from the textbook. That is what the Commission has done here. We have no quarrel with their order. We may have wished a little broader hearing than has been granted us, but we're ready to go forward under the terms of the Commission's order.

MR. STOCKMAR: Gentlemen of the Commission.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: I would first like the record to show that Ohio's Exhibit 1 just entered does contain a notification that a formal petition for rehearing had been granted. That letter is dated July 6, 1962. I think Ohio's own exhibit again rebuts its statement that just now has it learned that there was a formal application filed, or just recently has it had an opportunity to see it, or something of that nature.

I will be very brief. I do want to state briefly what

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might be a philosophical view of my own, but I think it arises out of the law, and that is with respect to the nature of the power that this Commission has. As an administrative body, it has been delegated certain legislative powers by the New Mexico Legislature. Matters of prevention of waste for the benefit of the people, the protection of the correlative rights of interested operators is a matter which the Legislature can act upon and has acted upon in enacting the Oil Conservation Statute.

It could have, case by case, reviewed the matters which are presented to you each month, and could have legislated the solution for each one. It is not technically equipped to do this, and this power has been delegated to you.

Also among your powers are certain judicial-type functions. These together constitute what we call administrative power. There's a great difference between a legislative function and a judicial function. It relates to the question of jurisdiction.

Now a Court and any body exercising a strictly judicial function acquires jurisdiction in accordance with the law. It acts upon the matters in that case. After its decision and after the expiration of all appeal rights and so forth, its jurisdiction terminates and it can no longer review or revise that decision.

The legislative function, however, is entirely different, and this is the function which you exercise in preventing waste and protecting correlative rights. It is continuing jurisdiction, is never lost. If you have made an order, the following day or at

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least soon thereafter, pursuant to the reasonable requirements of notice and hearing, you may change that order. You may alter it; if an order is bad or invalid, you can recognize this and make a good order.

In this case, or in this State the so-called Jalmat decision states this principle very clearly, that the power that you have in these matters is a continuing legislative function. So without respect to the formalities for petitions for rehearing, for anything else, this body has the power at any time to hear and rehear, and in its discretion, permits it to hash and rehash these matters and to do its utmost to come up with valid orders.

I could easily drift into my opening statement, and I think that is all I need to say at this time.

MR. PORTER: Mr. Everett.

MR. EVERETT: If it please the Commission, very briefly I would call Mr. Kellahin's attention, he referred to 65-3-20, and would have the Commission think that the exception applies to everything in the Act. It applies to that paragraph. I noted the exception in my opening statement. I didn't burden the Commission by reading the entire statute, but I would call the Commission's attention to that. "Except as provided for herein, before any rule, regulation or order, including revocation, change, renewal or extension thereof, shall be made under the provisions of this act, a public hearing shall be held at such time, place and manner as may be prescribed by the Commission."

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MR. PORTER: May I have yours? The Commission considers this rebuttal argument. If each side wishes, they may have five minutes.

MR. EVERETT: I won't need that long. Thank you very kindly, though. In referring to 65-3-22, the rule that I cited to the Commission, whether it provides for notice or hearing or not, whether this is a legislative or judicial function, a legislative body is still governed by due process, and that means notice and hearing; and if Mr. Kellahin didn't know what I meant by it -- Suppose they tell you to grant a rehearing, it doesn't mean that you can do so without notice or hearing, but with due process.

I cite in support of that statement 73 Corpus Juris Secundum, page 453. Unfortunately, the time element being such as it was in this case, I didn't have an opportunity to exhaustively brief the law points involved, but if Mr. Kellahin had read a little further in 2 American Jurisprudence 2d, if he had gone on to page 337, he would have found a statement which I quote: "The primary purpose of a continuing jurisdiction is to give the tribunal power to change a decision or order to do justice in the light of newly discovered evidence or to meet changed conditions." Then it goes on with a discussion, a discussion of other items which he might cite to you as authority for going ahead with changing your order, whether newly discovered evidence or changed conditions or not, but that still does not get around due process of law, which any body sitting in a hearing must extend to those who might be

adversely affected by their action.

I again submit that our motion is the only way we could proceed to advise the Commission of something which we honestly and earnestly believe was inadvertent but which would put a very serious cloud upon everything that might be done from this minute on unless that order is vacated. That would not preclude your jurisdiction, but it would put it back in orderly procedure where if Consolidated is disappointed, it is in not having presented evidence. As the counsel told me this morning, "We didn't present evidence, we presented cartoons." They now want to file some exhibits. Let them file their application and follow through with notice of hearing. They have a right to file an application and come in and present their exhibits and testimony, and this is squarely upon them. I don't think they can meet it, but certainly it would be highly irregular to proceed further in this hearing.

MR. PORTER: Mr. Kellahin, do you desire your five minutes?

MR. KELLAHIN: I would just like to make this observation. The argument that has been presented is directed to the order granting the rehearing, and it's based on a lack of due process for the reason it was entered without a hearing on the petition for rehearing. Now that reaches the point of absurdity, to say that they don't have their day in court,because they are being heard on whether they will have a rehearing right now. Due process has been fully accorded.

MR. STOCKMAR: If the Commission please, it may be my last breakfast with Mr. Everett. I referred to a rather artistic

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drawing made by Mr. Trueblood. I think you recall the cube that received so much attention. In jest, I may have indicated that that was more likely a cartoon than an exhibit. I think if Mr. Everett will read the record, he will find that we did not dignify that explanatory thing by making it an exhibit. Thank you.

MR. EVERETT: If you please, you may strike any reference that I made to the cartoon business. I certainly didn't mean to be out of line. I enjoyed your remark very much indeed, because I thought it was so true. Just strike that from the record.

MR. PORTER: We'll take a ten minute recess at this time.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, please. The Commission has decided to deny the objections to granting of the order for rehearing and the Motion to Vacate, and we will take up next the Motions to Quash the Subpoenas. We have three Motions, one from El Paso, one from Pubco Petroleum Corporation, and one from George Eaton with Pan American. At this time I would like to ask if there is any objection to consolidating the arguments on these Motions to Quash?

MR. EVERETT: Before you reach that question, may the record show the exception of Marathon to your action in overruling or denying its Motion to Vacate?

MR. PORTER: Let the record show Marathon's exception.

MR. KELEHER: Pubco offers no objection to that procedure.

MR. VERITY: Southwest Production Company would object to

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consolidating our position, in that I feel quite sure our Motion to Quash the Subpoena will be on an entirely different basis than any others and should be heard separately.

MR. PORTER: Mr. Malone.

MR. MALONE: If the Commission please, George Eaton is in a somewhat different position than Pubco or El Paso. Pan American, by whom he was employed, was not an active participant in the previous case, has not entered an appearance in this case, and has not participated in this case. The subpoena that was served on him was served on him individually. We feel that under those circumstances, we are in a somewhat different position.

It may or may not develop in the course of the hearing that Consolidated, who issued the subpoena, will wish to insist on the production of the information called for by it. If they do not insist on it, why,there would be no occasion to deal with the questions that are presented by the subpoena served on Mr. Eaton.

On the other hand, if the Commission feels in the orderly handling of the matter that they would like to hear everyone on this issue at once, we would certainly present our position in whatever time the Commission directs.

MR. FEDERICI: We have no objection to the consolidation, but I would like to call the Commission's attention to the fact that there has been a Motion to Quash on behalf of Mr. Rainey, himself, personally.

MR. PORTER: Mr. Swanson.

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MR. SWANSON: I would like to move, on behalf of Aztec Oil and Gas, at whatever time is appropriate, to quash the subpoenas that have been served on two of its representatives. We feel that it could be properly consolidated for hearing. With respect to the first subpoena served, we would like the record to show that the second one will be in substitution of the original one, and that the counsel will agree that the Motion to Quash will be okay with him. For that reason, we would like for the first subpoena to be separated.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: Consolidated has no objection to hearing the argument on these Motions to Quash the Subpoenas. I might ask if Mr. Keleher has a copy of his Motion he could give us. I assume it's a written Motion; we were not furnished with one. The rest of them -- El Paso filed its Motion, of which we have copies, and Pan American filed one.

MR. MALONE: Mr. Eaton.

MR. KELLAHIN: Mr. Eaton. As to Aztec, we originally subpoenaed Joe Salmon. They requested that they be permitted to substitute L. M. Stevens, to which we agreed, on the assumption that he, if required to do so, is the right man to testify in this case.

MR. SWANSON: That's right.

MR. KELLAHIN: On that basis, we will not call for Mr. Salmon, although a return of service is in the file. For Southwest Production Company, we subpoenaed Mr. Smith. By telephone

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we were advised that Mr. Smith's wife was ill, and thereupon they asked to substitute Leon Wiedeikehr. We obtained service from Mr. Wiedeikehr, and a service is in the file on Mr. Wiedeikehr and Carl Smith. This again is on the assumption that, if required to do so, that Mr. Wiedeikehr is the proper man to testify.

MR. VERITY: That's correct.

MR. KELLAHIN: On that basis, then, we will not call for the appearance of Carl Smith. In addition, if the Commission please, we have no objection to the consolidation of the argument and response on these subpoenas; however, for the sake of the record, we would request that a separate ruling be made on each of the witnesses subpoenaed.

MR. PORTER: The Commission has decided to hear the arguments on the Motions separately. I would like to get your ideas as to how long it will take you to argue each Motion. How much time would you like?

MR. KELEHER: Pubco, five minutes.

MR. FEDERICI: El Paso Natural, it will take me twenty to twenty-five minutes.

MR. MALONE: I think for George W. Eaton I would request fifteen minutes.

MR. SWANSON: For Aztec Oil and Gas Company, approximately ten to fifteen minutes.

MR. VERITY: Since the appearance of Mr.Smith is not now required, Southwest will have no argument.

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MR. PORTER: The Commission has decided to allot fifteen minutes to each side on each Motion. We will consider the Motion by George Eaton first.

MR. MALONE: If the Commission please, we are perfectly prepared to proceed. In the discussions that we had had, it had been anticipated that El Paso Natural would proceed, and I think maybe we were going to try not to duplicate what we are saying. It might be more orderly if El Paso proceeded, unless the Commission prefers; we're glad to proceed for Mr. Eaton if you do.

MR. FEDERICI: That's satisfactory with us.

MR. PORTER: Then the Commission will proceed with hearing the argument from El Paso.

MR. MALONE: Thank you.

MR. FEDERICI: If the Commission please, the Commission allotted us two motions. The first one is directed to the subpoena which was served upon Dave Rainey personally. The other was the Motion on behalf of El Paso Natural Gas. If I do run a little overtime, it is because I have two Motions to argue.

MR. PORTER: The time will be granted, Mr. Federici.

MR. FEDERICI: With reference to the subpoena that was issued upon Dave Rainey, I represent Dave Rainey here personally and in his own personal capacity for the object of arguing this particular Motion. Now Consolidated Gas Company apparently requested of the Commission that it issue a subpoena duces tecum, or however you want to pronounce it, it's spelled the same. That means,

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of course, that the witness is directed not only to bring himself, but certain records, books, and papers with him. This subpoena was served upon Dave Rainey, who is an employee of El Paso Natural Gas Company in the capacity of Administrative Assistant. He is not an officer of the corporation, and the subpoena did not name El Paso Natural Gas Company. Rainey has filed with this Commission a notice to modify this subpoena insofar as paragraph 3 of the subpoena is concerned. There are three paragraphs in the subpoena in the request for production. The first two paragraphs relate to certain data which had been previously submitted in the hearing, and there has been no objection filed to those two paragraphs, but paragraph 3 is objected to.

That paragraph reads as follows: "To bring with him any reports, determinations, or tabulations of initial and subsequent reserve calculations made by,or in the possession of,El Paso Natural Gas Company concerning the recoverable gas reserves in the Basin Dakota Gas Pool not included in the eight data sheets subpoenaed above."

Well, that's just a shotgun request. It's a request to go on a fishing expedition, and in the first place, Dave Rainey is not an officer of the corporation, he does not have custody of these documents. He has no control over them. He has no possession over them, and he has no authority to deliver them if he wanted to. If the Commission please, these files which are requested, many of them contain confidential matters or privileged matters which Mr.

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Rainey would not be at liberty to produce if he could do so. I believe the answer to the question is fairly obvious, since he cannot produce them, since the records are not in his possession or control, he cannot possibly submit them at this time.

Let's take a brief look at the law just for a moment here. With reference to subpoena duces tecum, the rule is set forth in 97 C.J.S., Witnesses, Section 25, and is as follows: "The person who has the control of and the ability to produce the desired books or papers is the proper person to be subpoenaed."

Let's go to the Federal cases. You might ask, why do I go to the Federal cases? Sometimes you don't have a local State case applicable, and we go to the Federal cases because the Federal Rules of Procedure are quite applicable to the situation, because the State rules are quite similar or substantially the same as the Federal rules. In Moore's Federal Practice, Volume 5, at Section 45.05, the author states the rule as follows: "A subpoena duces tecum should be quashed and set aside where it has been served on a person not having possession and not being authorized to take possession of the documents, records, or things demanded."

Now if the Commission please, we do not contend that the Commission does not have the right to issue the subpoenas or subpoenas duces tecum. The Statute gives the Commission that right; but the exercise of that power by the Commission is governed by the general law applicable to subpoenas. There's one further practical matter that I think might be discussed at this time,

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although it relates to the Motion by El Paso Natural Gas Company.

Suppose that Rainey is ordered to bring these records; what do they consist of? You would have five filing cabinets weighing 500 pounds or more, with documents in each of the files, some of which may be confidential, some pertaining to third persons who are not party to this proceeding, and what would happen would be this, and this is the way the rule is set forth in the cases when this subject comes up. These documents would be brought up here and not delivered to the opposite parties. The Commission would have to go through documents to determine whether there are any confidential matters which the Commission will not let the other party see. The Commission would have to go through those files to determine whether the matters contained therein are material and whether they're relevant to the hearing, and this Commission would spend all of its time checking files instead of proceeding on with cases.

With reference to Mr. Rainey's subpoena, the main argument, of course, is that he doesn't have the custody and control and possession of the records; therefore, he just can't bring them with him.

If the Commission please, with reference to the Motion filed by El Paso Natural Gas Company, although El Paso is not named as a party, I think these matters should be brought to the attention of the Commission. Their reasons for objecting to the subpoena are set forth in their Motion to Quash, and I think I'll read

them because they are pertinent to this discussion.

Paragraph III states: "The reports, determinations and tabulations called for in said subpoena duces tecum have been accumulated over a period of several years and constitute records constantly used by El Paso comprising a bulk in excess of five hundred pounds."

"Transportation of these reports, determinations and tabulations from El Paso, Texas to Santa Fe, New Mexico and return would constitute an unnecessary and expensive interference with El Paso's business operations."

Paragraph IV: "Said reports, determinations and tabulations contain some items which are the property of other parties, are confidential in nature, relating to the properties of such other parties. To require production of all such material instead of specifying and identifying documents and papers which are easily distinguished and clearly described and which are shown to be relevant, is violative of the constitutional prohibition of unreasonable searches and seizures."

Paragraph V: "Said subpoena duces tecum is oppressive and unreasonable and should be quashed."

Paragraph VI: "In the event any subpoena issue to El Paso the party or parties on whose behalf it was issued should be required to specify and describe the particular reports, determinations or tabulations required."

That's what I was talking about a while ago. If the

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party does not specify with some certainty what they want out of those files, we would have to bring those files to this Commission, and this Commission would have to go through the files to determine, are certain portions of it confidential and therefore not subject to inspection, is the material in the first place, and then is it relevant to the hearing? Just how long that would take the Commission, I don't know, but as I say, there are five cabinets of files involved.

Now with reference to the law on the subject, insofar as what a party should specify and in general what is required with reference to subpoenas duces tecum, there are cases which support this, and I think this is true without too much doubt.

"Where the production of information demanded by a subpoena duces tecum is a burden in that a mass of documents is demanded without specifying and identifying the exact material sought, the subpoena duces tecum may be quashed as being unreasonable." citing U. S. v. Woerth, 130 F. Supp. 930, 231 F.2d 822. That case was affirmed in a Federal Second and also another citation, 2 American Jurisprudence 2d, Administrative Law, Section 264, page 95.

Now we go back again to Moore's Federal Practice. As I stated before, we do that because the rules are simpler, and this is a text written by a well-known professor, and it collects the cases and gives you the views expressed in those cases without going through the cases individually. Section 45.02, the author

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states the rule to be as follows: "A subpoena is unreasonable or oppressive if it is too broad and sweeping. It should normally be limited to a reasonable period of time and should designate the documents desired, or the subjects to which the documents relate with reasonable particularity..."

Now I was talking to the Commission about this procedure that follows if the subpoena is complied with and you bring the documents up. Here is a case that sets forth fairly well what's involved here, Hermann v. Civil Aeronautics Board, 237 F.2d 359. In the course of its decision the Court said: "In order to prevent their action from being arbitrary and oppressive, the Board should call the individuals and take testimony as to the existence and custody of the documents. Materiality and relevancy to the issues before the Board can be established in this method without the necessity of bringing truck loads of records to the hearing officer." What happens there is the burden is put on the Commission to go through these documents. The Commission doesn't have the time to do that.

There are other methods that the parties can use. They can ask for inspection of them, we can object to the inspection of them. There are methods by way of written interrogatories. They don't have to come in and give a shotgun request that would bring everything. They are not entitled to that. They are not entitled to go on a fishing expedition, and I don't think this Commission should give them a license to fish in our files.

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MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please, I would like to preface my remarks with some background on just why Consolidated took the route it did in connection with this case before getting into legal arguments which are involved here, because I feel that our position is material to the validity of our request for issuance of subpoenas duces tecum.

As the Commission well knows, subsequent to the original hearing, the Supreme Court of New Mexico issued its decision in the Jalmat case. On the basis of that decision, the Commission, accepting the ruling of the Supreme Court, held that there was insufficient evidence of reserve information in the record in Consolidated's case upon which to base a change in the proration formula. Basically, the information required under the ruling of the Jalmat case is the information set forth in the Statute, and that is, the Commission must determine, insofar as it may be practicably done, the reserves under the pool, the reserves under the individual tracts in the pool, the relation between the two, and the portion that can be produced without waste and with the protection of correlative rights; and the real basis of the Jalmat case on that particular point was that without knowing what the reserves were, the Commission was powerless to protect correlative rights.

For that reason, Consolidated has, insofar as it may practicably do so, prepared its information on reserves; but we felt

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it incumbent on us to go a step further and make every possible effort to get the reserve figures in the Basin Dakota Pool before this Commission.

Now the operators in the pool have reserve figures, admittedly. They are apparently extremely reluctant to produce them. If the Commission rules on their objection, they do not have to produce these reserve figures, I don't believe that they can later be heard to complain on the lack of reserve information in the record in this case.

Now El Paso's Motion to Quash, I don't have much quarrel with most of Mr. Federici's legal arguments. Basically, the Motion to Quash is directed to the discussion that the Commission, if the Commission finds that our subpoena duces tecum is burdensome, then under the law it shall be quashed; and so far as paragraph 3 is concerned, and apparently that is the only paragraph subject to attack, paragraph 3 calls for "Any reports, determinations or tabulations of initial and subsequent reserve calculations made by or in the possession of El Paso Natural Gas Company concerning recoverable gas reserves in the Basin-Dakota Gas Pool not included in the eight data sheets subpoenaed above," the eight data sheets being the eight data sheets which were utilized by Mr. Rainey as a witness for El Paso in the original hearing in this case. Apparently they do not object to reproducing the eight data sheets.

Now it has been asserted that in regard to the subpoena directed to Dave Rainey the reason that it should be quashed is that

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he has no control over the documents. That may well be, but it is strange indeed that he was able to obtain all this information from his company in the original hearing, and now says he cannot obtain it. Perhaps he doesn't have custody of the documents; they haven't told us who does. In any event, whoever does have custody, I assume is not present in this hearing room. If they are we would like to know it. We would indeed like to know it. I will ask that question, if that be the case.

MR. HOWELL: I'll answer that, that there is no one from the Reservoir Department of the company present in the hearing room today, and these are in the custody of the Reservoir Department.

MR. KELLAHIN: They are not officers of the corporation, either. They are, presumably, then, in El Paso within the State of Texas, which is beyond the subpoena power of this Commission. If we can't secure it by a subpoena within the State of New Mexico, then of course we can't obtain the data we need.

There's also the argument that the information contained in these files is confidential. They don't cite any law in support of withholding any information being confidential. I don't believe they have got any law on that.

This is from American Jurisprudence, Volume 58, Section 31, regarding the production of papers. "A party to an action may be compelled to produce books or papers in his possession or under his control to be inspected by the opposite party, and a witness or a party may be required to produce books or papers to be used

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as evidence on the trial, and this, notwithstanding the papers may be private. A corporation may be compelled to produce books and papers in like manner as if it were a natural person. Thus, the officers of a corporation cannot refuse to produce its books in court or before an officer authorized to take a deposition, in response to a subpoena, on the theory that the privacy with which its business is carried on is a trade secret which it is entitled to protect from the inspection of strangers."

Certainly there is no basis to say that this information is confidential and that is grounds upon which the subpoena should be quashed.

Now they accuse us of "shotgunning" in connection with this, and yet they can identify with great precision just what records we are calling for, and they say they weigh five hundred pounds. I think there's some confusion there, and I think they well know that our subpoena, in calling for reports, determinations or tabulations of initial and subsequent reserve calculations, does not include everything in five filing cabinets. Certainly they presented the same identical information at the previous case, and we are calling for the same thing as to the wells not covered in the previous case. It was no burden for them to go forward on it on their own. They cannot say that it is a burden to go forward with the same information on the wells not covered in the original hearing.

Mr. Federici said we had a right to inspect documents and

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identify these instruments that we want, and call for them in that fashion, and we can take interrogatories. I think Mr. Federici is under some illusion that the Oil Conservation Commission of New Mexico has adopted Rules of Civil Procedure, and the rule of practice before the Commission, that is not the case, but it is with other agencies within the State of New Mexico. I think that's the basis of his statement that we do have the right of inspection. I submit we do not have the right of inspection except by a witness brought before this Commission and placed on the witness stand.

Now they talk about the bulk of the exhibits that we have called for, and the fact that they are used in the daily operations of El Paso Natural Gas Company, and it's unduly burdensome to be called upon to produce these documents. 58 American Jurisprudence, Section 26, it says that "A person served with a subpoena duces tecum is bound to produce the document or documents called for unless he has a reasonable excuse for withholding it or them. The sufficiency of the excuse is a matter for determination by the court. A witness cannot excuse disobedience to the writ on the ground that the evidence called for is irrelevant, or, it has been held, that it would be inconvenient to produce the documents and compliance would entail great expense."

In other words, there's no basis for El Paso to refuse to produce these documents on the grounds they're confidential. There's no reason for El Paso to refuse to produce these documents

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on the ground that it is inconvenient and expensive; and those, basically, are the only two arguments they have advanced other than the fact that they say our subpoena duces tecum is so broad they don't know what to bring, all they know is that it's all in five filing cabinets.

It has just been called to my attention that Mr. Rainey has brought some material to this hearing. If the Commission sees fit to quash this subpoena, it should be only partial and as to paragraph 3 to which the Motions have been directed, and we certainly would expect a production of the other material. Any order quashing the subpoena in part should be limited in order to insure the production of the matters and the material which Mr. Rainey has brought to the hearing.

MR. PORTER: Mr. Federici.

MR. FEDERICI: Do I have some time left?

MR. PORTER: Yes.

MR. FEDERICI: I would like to answer Mr. Kellahin just briefly on the first last, and the last first.

Mr. Kellahin mentioned we didn't cite any authority on the matter of confidential documents and private papers. I'll be glad to accommodate you,however, at this point, Mr. Kellahin. Cases hold that the privacy of third persons should not be invaded by the use of subpoena duces tecum directed to a party having in his possession confidential material. Hermann v. Civil Aeronautics Board, 237 F.2d 359, Floriden Co. v. Attapulgus Clay Co.,

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26 F. Supp. 968. "And discretion should be exercised to avoid unnecessary disclosure of such material, particularly where the action is between competitors." 4 Moore's Federal Practice, Section 34.15.

Mr. Kellahin mentioned this Jalmat case. Well, the Jalmat case just put the burden directly on Consolidated Gas Company. They had it and they've still got it. They're still limited to the proper methods of obtaining this information. In other words, they still have to follow the rules which are applicable.

We haven't questioned too strongly what the reserves figures are so far as may be on certain data sheets here, but what we have objected to is they call for everything, "Bring all your reports, bring all your records, bring all your files and let us look through them." That's what we object to and that's why we have come to the Commission for some relief.

We might point out at this time that the company may file a motion in the event that, say, its Reservoir Department is served with a subpoena. I think that in all fairness we should be raising the issue now so at least the Commission can tell us, "Well, what can you ask for and what are we going to give you," if that happens. I didn't want to be caught here by surprise and have the Commission feel that I was going around the bushes now. The Commission might know it now, that we will object unless they follow the proper procedures there, also.

MR. PORTER: The Commission will not rule on any of the

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Motions until we have heard arguments on all Motions. At this time we will hear the arguments on Pubco's Motion.

MR. KELLAHIN: We still have not been furnished a copy of Mr. Keleher's Motion.

MR. KELEHER: I don't have one for you, Mr. Kellahin. I'm more or less doing the same thing inadvertently that Consolidated did to me. It was two weeks before I got a copy of the order granting a Motion for Rehearing in this case. I had to make a special request to get a copy of the Motion for Rehearing, but I will send you a copy. It's very brief and to the point, and we're deadly serious about it.

First I would like to comment very briefly on these Exhibits 1, 2, and 3 admitted by Mr. Hume Everett on behalf of Marathon. It seems a shocking thing, it's the first time in my experience in practicing before administrative boards, while litigation was in process and the Commission was considering these matters and things, that a memorandum has been distributed to participants in which it apparently discloses an entire lack of good faith on the part of Consolidated.

"We are confident," reading from one exhibit, "that a thorough engineering review, with objective conclusions based on all available data, would prove our proposed allocation formula more valid than the original formula which is now in effect. It is possible (and even quite probable) that while we may not be able to generate approval for our proposed new formula, we will

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succeed in invalidating the original formula. The net effect of this would be no proration at all. This would be good since we would then undeniably be governed by the unqualified intent of the contractual minimum-take guarantee; i.e., 50% of each well's ability rather than being limited to a lesser volume as suggested by the existing proration formula."

If that isn't playing fast and loose with this Commission, and overwhelming evidence that the Consolidated is not in good faith in connection with this matter, it is indeed strange.

The Commission will recall that day after day we sat here waiting for Consolidated to prove its case. How did it prove its case? It attempted to prove its case on cross examination of the witnesses produced by El Paso, by Pubco, by the other defendants in the case. That was the technique they used then. It was certainly an inexpensive and a very economical technique and procedure, but I was dismayed at that because it was contrary to every undertaking I had ever seen before any administrative body. Now they're using the same technique here. They come in here, and Mr. Kellahin let the cat out of the bag a minute ago by confessing to the Commission that they were confronted with a dilemma, "What are we going to do in the face of the decision of the Commission based," as he says, "on the Jalmat decision of the Supreme Court of New Mexico?" "What are we going to do?" "Are we going to the expense of hiring DeGaullier or Naughton or some other nationally known concern, which will cost us a great deal of money, which will make

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an examination of the Basin and bring in their returns and take it to the Commission, or are we going to ask the Commission to resort to its statutory power of issuing subpoenas duces tecum and get every oil company that we can to come in and lay the cards on the table and see everything that they have, and let's try to prove our case by that back door method?"

I'm only saying to this Commission that that isn't within the jurisdiction of this Commission. This Commission is not going to lend itself and be a party to that sort of a procedure. Based on that, we have filed very briefly here a Motion to Quash Subpoena Duces Tecum. When I dictated that to my stenographer, "What do you mean, 'quash'? Don't you think that word should be 'squash'?", and I think perhaps we should say "Motion to Squash."

We respectfully show to the Commission in our Motion:

"1. That at the hearing in taking testimony in this cause, Consolidated Oil & Gas, Inc., which requested the issuance of such subpoena, had ample opportunity to examine the reports placed in evidence by Pubco and to cross-examine the witnesses who identified such exhibits." That is correct. They had their day in court. They examined and they examined and they cross examined and re-cross examined and I thought the Commission was extraordinarily lenient in allowing and extending the scope of the examination and the cross examination so as to get all the facts before the Commission.

"2. That all reports have been filed with the Commission

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and are available and have been available to Consolidated since the time of filing." All of these exhibits, all those reports are here. All they need to do is to study them. We gave them copies of most of them.

"3. That the subpoena is general in terms and not specific, and in substance and effect is nothing more than a 'fishing expedition'." That's a trade mark of lawyers when they can't think of anything else to say, they say that a demur is like a Mother Hubbard, it covers everything and touches nothing, or that it is a fishing expedition. That's what this is. They are casting a line into the water to see if they can catch something, and if we will produce before them our confidential reports and all our data that we've gathered together at great cost and expense, and which is our property, we think it manifestly unfair that this Commission should say we should bring in everything. It's impossible for us to do it.

Now this very same question is up before a sub-committee of the United States Senate now, in which they are attempting to get the steel companies to produce their cost records. Well, manifestly that's an extraordinary request being made by that sub-committee. If the steel companies disclose their costs of making steel, producing steel in the United States, that will be telegraphed and telephoned and cabled all over the world. Our German competitors or English competitors, our competitors in Japan will know the cost of producing steel. So, rightly I think, the steel

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companies have said, "Gentlemen, that's hitting below the belt; you can't do it." We are in somewhat a similar situation. We have our own idea of estimates in the San Juan Basin on the wells in which we are interested, but supposing that some one of those well owners, with us joint owners, has got a sale on right now for the well or their interest in it, based on some idea of estimated reserves; and the deal is proceeding and we come before this Commission and say, "No, that isn't right, that guy is way off, here's what it really is, here is our estimate of it," we are in for a lawsuit. While I love to be employed by Pubco in lawsuits, I don't particularly fancy defending in that kind of a case.

"4. That the matters and things referred to in the item described in the subpoena have been fully submitted and presented to the Commission at the hearing, and the Commission should not now give Consolidated an opportunity to re-try its case in an attempt to cure any defects or omissions which could have been avoided by the exercise of reasonable diligence." If they had proven their case in the first instance, if they could prove it, they wouldn't be here today. What they're trying to do is to come within the decision in the Jalmat case and try to impress upon this Commission that they've done that job, and they want to do it at our expense, not at their own expense, and we don't think that the Commission will tolerate it.

MR. STOCKMAR: If the Commission please.

MR. PORTER: Mr. Stockmar.

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MR. STOCKMAR: I would like to make it clear that the letter Mr. Keleher referred to, which is Ohio Exhibit No. 1 in this rehearing, entitled Memorandum to Participants, was not directed as such to the participants at the prior hearing. The participants to whom this went are those who are participants in wells which Consolidated operates. I didn't want any confusion to arise there.

You will also recall the testimony of Mr. Trueblood, who repeated many times that the reason that Consolidated precipitated the prior hearing, and I started to say that again the reason is the same, was for the benefit of and the protection of these participants. It does not seem unusual to me, then, that they would be keeping these people advised, and I really don't know what Mr. Keleher meant by "flagrant thing", but it does not seem to me to be flagrant to send out a report to your partners that are helping you pay the cost of operation.

I also would like to note that the letter was written by Mr. Ladd of Consolidated, who is not a lawyer. If it should contain his construction of the Jalmat case, it certainly ought to be viewed as that, even among lawyers, there seems to be reasonable differences of opinion as to what the case may mean.

In his statement that"while we may not be able to generate approval for our proposed new formula, we will succeed in invalidating the original formula," I'm sure this arose out of discussions about the Jalmat case which casts -- well, it's not even serious

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doubt to me, the Jalmat case is clear that the existing proration order for the Basin Dakota Pool is subject to attack as being founded on improper findings, and that it can be attacked and can be set aside. This may be what Mr. Ladd meant.

When he said that the net effect of this would be no proration at all, and said that this would be good since we will then go under our contracts, I don't think it can be a construction on his part that this situation would last forever. I think we can all agree that legal and practical chaos would result if there was not a good and valid order issued by this Commission to allocate production in the field. The point is that if the existing order is invalidated and we have certainly attacked it in our petition for rehearing, and intend to attack it -- if it is invalidated or found void or if it is void, which it may be under one construction of the Jalmat case, with the eminent chaos of having no proration and no order, then this Commission will be compelled to find the right answer, the best answer.

I hate to bring up Goliath and David again here, but that situation still obtains. Our efforts made at the last hearing were not inexpensive to Consolidated. The efforts that we hope to make here are not inexpensive to it, and for its size relatively, they are quite expensive. We don't consider it a back door approach to try to present to you the best and most available data so that you have it and can make up your minds and produce the best order possible.

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Now as far as these particular subpoenas are concerned, we are not asking the Commission to do something unlawful, to bring a man forward illegally to capture documents and papers that you are not entitled to have. We are simply asking you, and we do so request and we hope your rulings on this, that insofar as it is lawful for these people to be brought here to testify, to bring reserve data and calculations, that that be done; and certainly to the extent that they have it here, that that be made available. I hope that if something is unlawful that it would also be under the law of New Mexico impracticable to obtain. That is the test that we are seeking to meet. If it can be lawfully brought forward, we are making lawful efforts to obtain it. If it's unlawful, then they need not be compelled to bring it forward. Thank you.

MR. PORTER: At this time we'll hear arguments on Aztec's Motion. Mr. Swanson.

MR. SWANSON: Assuming the Commission is satisfied with the agreement reached between Consolidated and Aztec as to the production of Mr. Joe Salmon at this time, we have no further comments on that subpoena.

Aztec's primary concern in this matter is that the subpoena served on L. M. Stevens was in three parts. It required the production of, in substance, all available information dealing with the reserves in the Dakota Basin Pool in Aztec's possession with respect to wells which it owned or operated. The second portion

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was a list of some thirty wells that they specifically wanted this information on. The third part was the shotgun category that's been discussed before.

We object primarily to the production of expert opinion as it relates to Aztec's reserve studies. This information has been gathered over a period of years at considerable expense. We have a trained staff that that's their primary purpose -- to develop reserves of the company. We feel it would be a serious handicap to us to have any party interested in an area where we have reserves be able to come before this body and compel us to produce those reserve studies. For one thing, they point to other adjoining areas of interest. It would be a good way to decide what your exploratory program might be in that area. We feel that this would be a real burden on us.

Rule 1212 of the Conservation Commission's Rules and Regulations provides that the rules of evidence to be followed in hearings before it shall essentially be those that prevail at the trial before a court without a jury. Of course, these rules can be relaxed at the Commission's discretion. These rules that apply in New Mexico are patterned after the Federal rules. There are several that are very important here. Rule 33 deals with the interrogatories, which of course are written questions propounded to an opponent for his answers. The case of Bugen v. Friedman holds that "Interrogatories as to opinions, conclusions, and legal contentions are improper."

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Rule 34 deals with the production of documents for an opposing party's examination in the hope that he can obtain information that he would use as his evidence in the trial of a case. Colonial Airlines v. Janas says: "Good cause for the production of an expert's report is not shown where the documents on which the report was based are available to the moving party." Rule 43 deals with evidence at the trial itself. Under this Rule, the case of Miller v. Sun Chemical Corporation holds that a party will not be required to compile information from his records.

Back again to Rule 33, dealing with interrogatories, the case of Zenith Radio Corporation v. Radio Corporation of America, 106 Federal Supplement 561, states that: "Interrogatories need not be answered where the information sought is otherwise available to interrogating party."

Attached to a letter Aztec received from Consolidated was the schedule that I believe Mr. Keleher referred to and that Mr. Everett also pointed out. I think we're all familiar, basically, with what it required. We examined that schedule; of course, that is the same schedule that was attached to their application for rehearing. All the matters that they asked for, with the exception of reserve calculations, are available to Consolidated from other easily accessible sources. Aztec has released its logs to the Well Reproducing Service, and it would be possible for Consolidated to order them if they desire to.

The information with regard to pressures and initial

deliverabilities, present deliverabilities, all the other items on that list are available from several sources. With respect to Federal wells, they are a part of the public record of the Geological Survey. I'm confident that most of that information is a part of the public record of the Commission itself.

There's possibly one category that's not covered. That's average permeability data. That's only available from an analysis of a core. If Consolidated should feel that their study essentially must include this information, I don't think Aztec would have any serious objection to furnishing the information they have with respect to the wells that have been cored.

In substance, it's our feeling that Consolidated rather has elected not to make an independent study of their own of the reserves in this area, and is hopeful of establishing it in evidence by requiring us to come forward. We resist very strenuously their attempt to have us testify as to what our reserve calculations are. With respect to some of our wells, we don't own them one hundred percent and we do not feel that we are at liberty to deliver any of this information without the permission of the parties who do own an interest.

One other case I would like to call the Commission's attention to, this was under Rule 33, and in my opinion it sums up this whole situation. This is the case of Drake v. Pycope, Inc., 96 Fed.Supp. 331. It says simply, "A party may not require his

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opponent to prepare his case for him."

MR. PORTER: Mr. McGrath.

MR. McGRATH: I just want to correct Mr. Swanson's statement. Our records are not public. They are confidential. Our well files and logs are confidential, they're not public.

MR. KELEHER: Are they subject to subpoena by this Commission?

MR. McGRATH: I don't know, I'm not a lawyer. You'll have to go to Washington.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please, much of what has been said by Mr. Swanson, I think the argument that we made in response to the other arguments covers it. We keep coming back to this confidential and private information. I would like to call the attention of the Commission further to 58 American Jurisprudence, Section 32, under the subject of Witnesses, where it says that: "It is a general rule that a witness possessing knowledge of facts material to the vindication of the rights of another may be compelled by judicial process to appear and give evidence in behalf of that other party, notwithstanding the evidence thus coerced may uncover the witness's private business."

We are talking about vindicating the rights of Consolidated under the contention that under the present formula our correlative rights are not being protected.

"This rule is also generally held applicable when the

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information sought is contained in books and papers. Accordingly, it has been held that it is no ground for the refusal of a witness to produce books and papers, when required by lawful authority, that they are private. The duty of witnesses to disclose the details of their private business for the benefit of third persons, when required in the administration of justice, is one devolving on them as members of a civilized community."

I think Mr. Stockmar stated that we are legally entitled to this information; we want it. If we are not legally entitled to it, that is the determination that must be made by the Commission. If we are not legally entitled to it, we don't need it. We are prepared to go forward with testimony in this case despite the observations that have been made that we're trying to get somebody else to build our case. It is our position that we must make every possible effort, every lawful effort to get before this Commission the reserve information upon which it must make its finding. If that information is not lawfully obtainable, then we have discharged our duty in attempting to bring everything to the attention of the Commission insofar as it may practicably be done, and it certainly is impractical to do it if it's unlawful.

Mr. Swanson seems to confuse the subpoena with the letters that were sent out by Consolidated asking for some voluntary information. The subpoena doesn't go into the question as to core analysis or any of that other information. They keep talking about what we asked for. We asked for reports, determinations or

tabulations of initial and subsequent reserve calculations. That doesn't include the well file. It doesn't include the core analysis, it doesn't include any of those things that they are talking about as being secret and confidential information. The only thing we asked for was their reserve calculations.

MR. SWANSON: Have I another moment?

MR. PORTER: Yes, you have, Mr. Swanson.

MR. SWANSON: Mr. Kellahin related that the list of information I referred to that was attached to the application for rehearing and the letter that Aztec got was not requested in their subpoena. I neglected to take a copy of our subpoena with us when I moved to that position.

Item 1 of the subpoena lists the specific items that are set in that schedule. I will read that into the record if that's necessary, I don't believe it is. Each of the headings are specifically asked for in item 1 of Aztec's subpoena. The only other comment I think appropriate is that Mr. Kellahin has suggested that we are inferring the big objection is that they expect us to prepare their case for them. The point there to be considered, I think, is that it's completely within their prerogative to advance whatever evidence they choose in this hearing. It may be necessary if they put into evidence figures with regard to Aztec's reserves, or any other party's, we'd feel compelled to rebut them with testimony of our own. We do not feel it is appropriate at this time for us to produce whatever testimony we might wish to make at a later

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date.

MR. PORTER: We have one more Motion to consider which we will immediately after the recess. The hearing is now recessed until 1:00 P.M.

(Whereupon, the hearing was recessed at 12:00 o'clock.)

AFTERNOON SESSION

(Whereupon, the hearing was resumed at 1:00 o'clock P.M.)

MR. PORTER: The hearing will come to order. At this time we will hear argument on the Motion on behalf of Mr. Eaton. Mr. Malone.

MR. MALONE: May it please the Commission, Ross Malone, Atwood and Malone, Post Office Box 700, Roswell, New Mexico, appearing on behalf of George Eaton, to whom a subpoena duces tecum was directed; and during the noon hour I was requested also to enter an appearance on behalf of Frank Renard of British American Oil Producing Company, who is an engineer in the Farmington Office of that company, to whom a subpoena duces tecum was likewise directed, and to say on his behalf that he adopts the Motion to Quash filed on behalf of George Eaton in support of his position.

If it please the Commission, there are two preliminary matters I would like to mention first. It's apparent from the argument we have heard already that there are a great many matters of fact which will enter into the Commission's determination which up to now and now, attorneys have been testifying to, not under oath. Should this question become of sufficient importance, it, of

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course, would be necessary for these facts that have been stated by counsel to appear in the record through a sworn witness. I assume, if we should ever reach that point, the Commission would afford us an opportunity to put a witness on the stand to substantiate the statements which I would make.

We would like to just know that that could be done if it should ever be necessary.

MR. PORTER: Mr.Malone, if there is any question of facts which the Commission feels it should consider, then we'll take sworn testimony.

MR. MALONE: I don't expect to make any further statements than the other counsel who have argued, but I do think we should have that in the record.

Secondly, I would request the Commission to modify my Motion to show that service was made on Mr. Eaton on September 11, which is disclosed by the return on file with the Commission, rather than September 10th which was the date on which I thought service was made at the time the Motion was filed.

Finally, I would say that Pan American and its employees, as well as British American and its employees, are in somewhat a different position here than the employees of the El Paso Natural and the Pubco and the other companies that actively participated in the prior hearing and presented evidence, and intend to present evidence in this case. Pan American entered an appearance solely for the purpose of making a statement at the conclusion of the last

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hearing and has entered no appearance in this rehearing. In other words, we are somewhat more in the position of an innocent bystander than the actual protagonists who were involved in the controversy actively and putting on testimony from their records.

As we view it, the question here is not, does the Commission have the power to reach the type of information these subpoenas duces tecum attempt to reach. As far as Pan American is concerned, we recognize that the Commission has that power. There is required for the exercise of it valid action on the part of the parties who seek to initiate the use of the Commission's power, and the questions before the Commission here, as we view it, are (1), has valid action been taken by Consolidated to exercise the power of the Commission in this respect, and (2), as agreed by counsel in its statement, shall the Commission exercise its discretion in this situation to require the production of this material.

Now the first ground stated in our Motion is directed to the fact that examination of the subpoena duces tecum served on these two men, and the file of the Commission, indicates that these subpoenas were issued by the Commission at the request of Consolidated in blank, that is to say, at the time they went out of the possession of the Commission, they were blank subpoenas, not directed to anybody and not specifying any material which was to be produced. Those portions of the subpoenas appear to have been and I believe were filled in by counsel for Consolidated after the subpoenas had left the possession of the Commission. We believe that under the

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law this does not constitute a valid exercise of the subpoena power of the Commission, and that for that reason the subpoenas are void.

The Statute, 65-3-7, which gives this Commission power to issue subpoenas, says: "The Commission, or any member thereof, is hereby empowered to subpoena witnesses, to require their attendance and giving of testimony before it, and to require the production of books, papers, and records in any proceeding before the Commission." The Commission, or any member, shall issue a subpoena to any person, but at the time these subpoenas were signed at the request of counsel and delivered out of the possession of the Commission, they were perfectly blank. They were not a subpoena directed to anybody, and the subsequent completion of them by counsel cannot, as we view it, make them a valid exercise of the authority of the Commission.

We rely for that proposition on the fact that there is a specific rule of the District Courts of New Mexico specifically authorizing the Clerk to issue a blank subpoena. Mr. Kellahin agreed in argument that those rules are not applicable to this Commission. The Federal Rules of Civil Procedure, Rule 81 (e), from which this rule is copied, has an express provision as follows:-- To what proceedings these rules are applicable, and the Federal Rules say in 81 (e), "These rules apply, (1), to proceedings to compel the giving of testimony or the production of documents in accordance with a subpoena issued by an officer or agency of the

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United States."

There is no provision in the New Mexico Statute saying these rules shall be applicable to action by any administrative agency of the State of New Mexico. The Legislature gave this power to the Commission. They did not give counsel the power to issue a subpoena duces tecum. At the time this subpoena left the Commission it was blank and void. The subsequent filling in of it by counsel does not constitute the issuance by the Commission of a subpoena. As we view it, for that reason the subpoena is void and should be quashed.

Secondly, we have alleged that the subpoena is unreasonable in that Mr. Eaton, and I believe I'm correct in saying Mr. Renard also were allowed forty-eight hours from the time the subpoena was served in Farmington within which to comply with the blanket shotgun provisions of this subpoena and to present themselves in Santa Fe to deliver the material. Now even if they had had it in their custody and been able to do it, which they did not, this would not have constituted a reasonable exercise of the subpoena power. The law in that connection at 97 C.J.S., page 369, is stated as follows: "However, a witness is not punishable for failure to attend in obedience to a subpoena where it is served so late that sufficient time to comply with it is not afforded him; and, in general, where the service of a subpoena is so delayed as not to give the witness reasonable time to prepare to attend the trial, his nonattendance will be excused on comparatively slight

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grounds, although the shortness of the notice is not per se an excuse."

We respectfully submit, with the Commission's knowledge of the material that was included in the shotgun subpoena that was served on the witnesses, that forty-eight hours in which to assemble and present that in Santa Fe is an unreasonable exercise of the subpoena power and runs afoul of the constitutional prohibition against unreasonable searches and seizure.

The third ground which we assert is that the subpoena itself does not meet the requirements of, the established legal requirements of a subpoena duces tecum. That exercise of the authority of a court or Commission is for the purpose of requiring the production of specific documents, it is required that there be a description of the documents to be produced in order that when the person comes in, it can be determined with certainty that he has or he has not complied with the subpoena.

I respectfully suggest that it's impossible to read these subpoenas and ever determine whether a man has complied with it, because of their broad shotgun character. Whether the subpoenas are reasonable or unreasonable in this respect is to be established in the light of some well-established standards to which I would like to refer briefly.

In 97 C.J.S. 377 this statement appears: "...the constitution requires that the forced production of documents by subpoena be not unreasonable, and the production of records may not

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be required under such circumstances as to contravene such constitutional provisions. In determining whether a subpoena duces tecum is invalid as unreasonable and oppressive, each case must be judged according to the peculiar facts arising from the subpoena itself and other proper sources."

At 381, "A subpoena duces tecum may be used to compel the production of any proper documentary evidence, such as books, papers, documents, accounts and the like, which is desired for the proof of an alleged fact relevant to the issue before the court or officer issuing the subpoena; but such subpoena may not be used for the purpose of discovery, either to ascertain the existence of documentary evidence or to pry into the case of the adverse party."

We respectfully submit that you cannot read the three paragraphs of this subpoena without determining that it does not specify any particular documents and is just a shotgun demand that you go out and collect up anything that might be in this general area and present it all to the Commission.

It says at page 382 of the same authority, "A subpoena duces tecum may not be used for the purposes of discovery....nor can it lawfully be employed for a mere fishing expedition, or general inquisitorial examination of books, papers, or records, with a view to ascertaining whether something of value may not show up therefrom...."

It seems pretty apparent that that's exactly what Consolidated is doing. They want all this material brought in here so they

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can look at it and see whether something of value may not show up therefrom.

Finally, a requirement which is recognized in all cases that I have read is that a subpoena duces tecum must be for a limited time. In other words, you can't just go in and say,"Well, produce everything you ever owned on a certain subject," because it is oppressive and unreasonable. It's impossible to determine whether the subpoena has been complied with. There's no limitation on the time of these subpoenas. These companies or these individuals, if they had it in their possession, are required to produce anything that they ever had dealing with these questions that are outlined on the subpoena.

On that subject, it has been said, "The limitation with respect to time in a subpoena duces tecum is sufficient if, where it specifies documents, a reasonable period of time is specified and it states with reasonable particularity the subjects to which the documents relate". I believe I gave you that citation, it is from 97 C.J.S. at page 396.

Referring to the East Sixty-fifth Street Corporation v. Ford Motor Company, 27 Fed. Supp. 37, "Some time limitation is usually required to prevent a subpoena duces tecum from being too broad in respect to the period covered."

I respectfully suggest to the Commission that this subpoena is fatally defective in that additional respect.

My time is almost up, and without reading additional

authorities which I have, I would like to point out only two additional things. The first is that I did not include in the return of Mr. Eaton, or in Mr. Renard's oral return the statement that these documents are not in his possession. I had assumed that would be a subject of testimony whenever the witness was called, but I will state and am prepared to prove that these documents specified are not and were not at the time the subpoena was served in the custody of either of these men, both of whom are engineers employed in the offices of their companies at Farmington. Each has access to these for the performance of his duties with the company. He does not have the custody of them or the responsibility for them.

Under the authorities read by Mr. Federici, the subpoena duces tecum must be directed to the person who has the responsibility for the records and the power to deliver them.

Finally, I would say that I'd like to suggest to the Commission that this is an extremely important decision that is to be made on these applications. I've heard some of the counsel in the case say, and I know it's true, that this is the first time the power of this Commission to issue a subpoena duces tecum has ever been exercised. Certainly it is the first time on the scale it is here sought to be used. The decision as to how that power is to be exercised is going to establish some precedents that are going to be awfully important to the industry and to the Commission.

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The Commission knows and every man that's employed by an oil company who is in this room, I believe, would get on the witness stand and testify that the stock in trade of an oil company, the most important information that they use, once discovery has been obtained, is the reserve calculations, because on those they determine whether to buy or sell properties, whether to develop or not to develop properties; they make the decisions which are crucial to the existence of the companies. Because of that, these reserve figures are the most highly confidential information that is in the possession of the Engineering and Production Departments of every oil company.

In the case of Pan American, that information cannot be disclosed to anyone other than an employ of the company requiring them for the performance of his duties without the consent of the Vice President in charge of the West Texas-New Mexico Division. That's how secret these reserve figures are.

For the Commission to here establish a precedent in a situation of this kind requiring the production of this information would invite every person who has any desire to enter into a financial transaction with an oil company on some acreage to file a motion on the proration formula to establish a new formula, and immediately issue a subpoena such as has been issued here, and get all the information that all the companies have in that area on that highly secret question.

Finally, that information, as has been pointed out by

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some of the other companies, is information that belongs not alone to us, but to us jointly with our partners in a great many wells. We are under strict limitation as to what we can do with it as far as our partners are concerned. They have not been subpoenaed in here to have a word in saying what should be done.

I would say to the Commission that power to issue the subpoena is not the important question here, but whether under all of the circumstances that I have suggested, the exercise of this power on a broad shotgun subpoena like this in circumstances like this constitutes a reasonable search and seizure, because certainly it is a search and a seizure if these subpoenas are enforced.

Thank the Commission very much.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please, it would seem that Pan American is in for one purpose and out for another, but I don't think that's material here. We're really not talking about Pan American's records but whether George Eaton has them and is willing to produce them.

The attack having been made on the subpoena power of the Commission, the section of the Statute referred to by counsel and quoted in that connection, this is substantially the same power to issue subpoenas which is vested in District Courts in the State of New Mexico to subpoena witnesses and compel their attendance and production of evidence; the same power that is

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vested in the other administrative agencies of the State and the lower courts as well. In the exercise of that power, there is a statute governing, I mean something more than just a rule of court governing the issuing of subpoenas in blank, which statute is called to the attention of the Commission and the Assistant Attorney General, who was present at the time before the subpoenas were issued.

Admittedly, two of the subpoenas bore the names and the information requested at the time they were executed by the Commission. The remainder were issued in blank, simply for the reason that there was no way of knowing on whom we could get service within the State of New Mexico; and for that reason we had to make inquiry and get them served.

Now this question of sufficient time in which to prepare the material required may or may not be a valid argument. It is, in fact, one of the arguments that Mr. Malone has advanced at this stage. I don't think it's necessary to inquire into it, but in regard to the defense and certainty of the subpoena itself, I think we should first remember that we're not dealing with lay persons in this field. Every person we have subpoenaed is an expert. He knows exactly the meaning of every item specified in the subpoena duces tecum. This is particularly true in the case of the subpoena served on George Eaton, in that in addition to the reports, data sheets, and other information that was required, all of which he knows and can identify, we also

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require any reports, determinations and tabulations on reserve calculations for specified wells. The reason for specifying those wells, as will come out later in the hearing, is to supplement evidence which is already in the record.

We have been accused of going on a fishing expedition constantly in the argument on these subpoenas. That is, of course, a normal argument on the subpoena duces tecum. What we have done here, what we have consistently tried to present to this Commission is, the subpoenas were issued for the sole purpose of getting before this Commission the information that New Mexico Statutes require the Commission to have in order to make a valid proration order prorating gas in the Basin Dakota Pool. That's the reason for the subpoenas and that's the basis for, the sole approach to this rehearing. We have taken this approach as a means of getting all of the valid information that we can get for the benefit of the Commission.

Now if the Commission is going to give way to the arguments that it will not require this information because of its secret and confidential nature, certainly that must be done on the basis that it is immaterial for the Commission to get this information before it for consideration in prorating gas in the pool.

MR. PORTER: That concludes the arguments on the Motions before the Commission. We are going to take a thirty-minute recess.

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(Whereupon,a recess was taken.)

MR. PORTER: The hearing will come to order, please. I hope you will excuse us for taking a little longer than thirty minutes. The Commission has been in session and present with our legal counsel. We realize the importance of the Motions that have been made here today, Motions that the Commission has never had an opportunity to consider prior to this time, at least since I have been a member. We would, therefore, like some time to make a ruling on the Motions to Quash, but we'd also like to have the full participation, that is, the participation of the full membership of the Commission in rendering a decision so we can make a ruling on it. So I have a statement to read, which is the Commission's ruling at this time.

The Commission has considered the arguments of counsel present concerning the Motions, and feels that the importance of its decision precludes a ruling at this time. The Commission feels that it therefore should take this matter under advisement and continue the case to the regular November hearing. The Commission will permit all interested parties to file Memorandum Briefs within the next fifteen days. A formal ruling on the Motion will be made by the Commission as soon hereafter as is possible, and a copy of the same will be mailed to all interested parties.

The briefs are to be filed within the next fifteen days from this date. If nothing else to come before the Commission, the hearing is adjourned.

(Whereupon, the hearing was adjourned.)

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me, and that the same is a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

WITNESS my Hand and Notarial Seal this 27th day of September, 1962, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley

NOTARY PUBLIC

My Commission Expires:

June 19, 1963.

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 15, 1962

IN THE MATTER OF:

(REHEARING)
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

Case 2504

NOTICE

CASE 2504 has been continued by the Commission to the September 13, 1962 regular hearing, at 9 o'clock a.m., Morgan Hall, State Land Office Building, Santa Fe, New Mexico. All parties who entered a formal appearance have been notified of the continuation by certified mail.

BEFORE: Honorable Edwin L. Mechem
Mr. A. L. "Pete" Porter
Mr. E. S. "Johnny" Walker

TRANSCRIPT OF HEARING

MR. PORTER: We will take up next Case 2504.

MR. PAYNE: Case 2504 has been continued until September 16, 1962 at the regular hearing to be held at Morgan Hall. All parties who entered a formal appearance have been notified of this continuance by certified mail.

MR. PORTER: In that case, we will move on to Case 2561.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 23rd day of August, 1962.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

March 14, 1962

REGULAR HEARING

IN THE MATTER OF:
Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9(C) of Order No. R-1670. Applicant recommends an allocation formula based 60 percent on acreage and 40 percent on acreage times deliverability. The Commission also may consider the establishment of minimum and maximum allowables for the Basin-Dakota Gas Pool. CASE NO. 2504

BEFORE: Edwin L. Mechem, Governor
E.S. "Johnny" Walker, Land Commissioner
A.L. "Pete" Porter, Secretary-Director of Commission

TRANSCRIPT OF HEARING

MR. PORTER: Case 2504.

MR. MORRIS: In the matter of application of Consolidated Oil & Gas, Inc., for an amendment of Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9(C) of Order No.

R-1670.

MR. KELLAHIN: If the Commission please, Jason Kellahin, Kellahin and Fox, appearing for the applicant. I have with me Mr. Ted Stockmar from the Colorado Bar who will present the case for Consolidated. I would like to also enter my appearance for Southern Union Gas Company and R. & G. Drilling Company; and could we ask that the Commission at this time call for other appearances in support of and in opposition to the application?

MR. PORTER: We'll call for appearances and they can state their position.

MR. KELLAHIN: Yes, sir.

MR. PORTER: Southern Union, you say?

MR. KELLAHIN: Yes, sir, and R.G. Drilling Company.

MR. PORTER: Mr. Everett.

MR. EVERETT: I would like the record to show that Atwood and Malone and Mr. Charles Atwood have entered an appearance for the Ohio Oil Company by letter dated March 12th, addressed to the Commission; and at that time Mr. Malone introduced me as a member of the Bar of Wyoming, also representing and being associated with him in the case and to handle it for the Ohio Oil Company. My name is W. Hume Everett, my address is Post Office Box 120, Casper, Wyoming.

MR. PORTER: Do you care to state your position in the case at this time?

MR. EVERETT: I don't know whether I could briefly or

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not, Mr. Porter. I would say we are opposed to the application.

MR. PORTER: Mr. Seth.

MR. SETH: Mr. Ben Howell, Garrett Whitworth, and Oliver Seth for the El Paso Natural Gas Company, and I'm appearing for Aztec also, and also for Sunset Production Company. All these parties are opposed to the application.

MR. COOTER: Paul Cooter of Atwood and Malone, Roswell, appearing for Pan American. Pan American is in favor of a continuation of the present allocation formula and is opposed to the application.

MR. PORTER: Mr. Kelly.

MR. KELLY: Booker Kelly of Gilbert, White and Gilbert, representing SunRay Midcontinent Oil Company. SunRay is basically in favor of the application.

MR. MILLS: I am George Mills, an operation engineer with Atlantic Refining out of Durango. We will wish to make a statement at the end of the hearing in favor.

MR. CAMERON: John Cameron, representing Tidewater. We concur in the application.

MR. BLACK: C.R. Black, representing Texaco Inc.. We wish to make a statement at the conclusion of the hearing concurring with the application.

MR. SETH: I have another appearance for Calkins Oil Company. We are opposed to the application.

MR. DUGAN: Tom Dugan, representing Pioneer Production

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Corporation, opposed to the application.

MR. PORTER: That was Pioneer?

MR. DUGAN: Pioneer Production Corporation.

MR. KELEHER: W.A. Keleher, Albuquerque.

MR. PORTER: Mr. Keleher.

MR. KELEHER: Keleher, K-e-l-e-h-e-r. I would like to make a brief statement if the Commission please, of our position in connection with Case 2504. The last sentence of the synopsis of the order, quote the following, "The Commission also may consider the establishment of minimum and maximum allowables for the Basin-Dakota Gas Pool." Now, we do not interpret the application to include that within the scope of the prior, and assume that that was added or injected into the order on the Commission's own motion.

Therefore, we would like to submit the following in opposition: It is the opinion of Pubco Petroleum Corporation that the current proration formula now in effect is a just and workble formula, and gives each well its fair share of the existing market commensurate with the recoverable gas reserves in the individual wells.

Two, any refinement or change in the existing formula should be in favor of deliverability and the reduction in the acreage factor, in that it is our belief that well deliverability more truly reflects recoverable reserves.

Three, an increase in the acreage factor at the expense

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of deliverability in our opinion would in effect violate the correlative rights and permit the weaker wells with less reserves to ultimately produce gas from the common source of supply in amounts in excess of their actual reserves.

Four, the current farming out presently provides a 25 percent acreage factor which in effect allocates a basic allowable to all wells regardless of their deliverabilities merely because they exist.

Five, we believe that it has been demonstrated that major changes occur within the Basin-Dakota Pool porosities, permeability, connate water, saturation and sand thickness, all of which are the major and important factors in determining the actual recoverable reserves within a given Dakota drilled section. We hope to propose to demonstrate direct relationship between deliverability and recoverable reserves.

Six, it is our contention before your honorable body that if any changes are to be made in the proration formula such a change should be in favor of one hundred per cent deliverability. Pubco's position is that it objects to the introduction of minimum or maximum allowables, their reduction would actually in effect substantially change the proration formula in favor of a straight acreage allocation of market and would be a violation of correlative rights.

MR. MORRIS: If the Commission please, Richard Morris appearing for the Commission Staff. We will have one witness to

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present testimony concerning the establishment of minimum allowables.

MR. PORTER: Are there any other appearances? Mr. Stockmar, if you are ready.

MR. STOCKMAR: Yes.

MR. HOWELL: If the Commission please, it appears from the number of appearances and the divergence of opinion that we are about to step forth on another of the hassles regarding proration in the Basin with which so many of us are familiar in the past; and in fairness to the proponents here, I think that I should tell them now that I would move for a continuance after their testimony is completed and ask that if possible, this case be set at a date other than the regular hearing date, because it looks very much as if we can run into two or three days. Now, unfortunately for a lot of us there is a hearing tomorrow in Texas that requires the presence of some people there; that is the hearing at which they want the executives to speak and many of the executives want none of their hands around there with them before they talk and we do run into somewhat of an embarrassing conflict. I think it's only fair that we tell you now that we will propose to make that motion for a continuance at the end of your testimony.

MR. STOCKMAR: Ted Stockmar, appearing for the applicant. Thank you for your candid statement, Mr. Howell. In immediate response to it, I would like the Commission to hear a

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little history in connection with this matter. Under date of January 19th, Consolidated, the applicant, invited all of the operators in the field whose names actually appeared as such in the proration schedules, to attend a meeting in Denver to discuss this very important problem. There was very substantial representation there which to me is evidence that there is a problem. Only one party absolutely declined to attend and that was Pubco who has just made a statement. I make this statement because as part of that invitation, and at that meeting, Consolidated made it very clear that as soon as possible it would seek this application which it has done. I feel that ample time in the five to six weeks that has passed since that time, ample time has been made available to parties to prepare themselves for this hearing. Consequently when the motion is made we will certainly resist any continuance of the matter.

We believe that the problem is a paramount one and it should be solved as soon as possible. I don't know that I need to restate too much the existing situation. As you know, under the existing order R-1670-C, the Basin-Dakota Gas Pool is spaced on three hundred and twenty acre spacing and the allowable is allocated on the basis of a formula which gives 25 per cent weight to acreage and 75 per cent weight to acreage times deliverability. Our application is to alter that substantially in favor of acreage and we are asking for a 60 per cent weight for acreage alone and a 40 per cent weight for acreage times deliverability.

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We believe in addition that the matters raised by the Commission on its own motion with respect to maximum and minimum allowables might be substantially solved if our proposal is adopted. There is a lot of history also behind this particular formula. I'm sure that members of this Commission will recall the many difficult hearings that were heard in 1954 and early in 1955 concerning spacing, in fact proration et al and the allowable formula, I would like to recall to your attention that at least in some of the fields involved there is a substantial problem created by a hundred and sixty acre spacing in certain areas and three hundred and twenty acre drilling in other areas. This also creates a very complicated allowable problem and it is, it has always been my view that this formula as it was initiated gave some weight to the disparity in acreage in drilling areas that then existed. I'm glad that Mr. Howell raised the question of Texas because this now gives me an opportunity to do the same.

I would like to call to the Commission's attention the February 19, 1962 issue of the Oil and Gas Journal. On Page 62 thereof, there is an analysis of the dramatic change that has taken place in Texas in the last eight months concerning the allocation of allowables in fields. Of the thirty-one gas fields they are spaced over 70 per cent, or twenty-two, where the allowables were allocated on the basis of one hundred per cent acreage; three of them were 75 per cent acreage; three of them were two-thirds acreage; one was fifty-fifty, one was twenty-five seventy-

five; and only two were on the basis of the Texas equivalent of deliverability. I think this dramatic change will be of interest to you; it shows that Texas at least is making some progress in the right direction here.

We recognize the difficulty of strict engineering proof with respect to the Basin-Dakota Pool in this early stage of its development. The volumetric reserve studies are very difficult. The pressure withdrawal history is very limited. None the less, it is clear to us that this Basin-Dakota Pool is substantially different from the Pictured Cliffs Reservoir or the Mesaverde, and it does seem obvious that this formula is a carry-over from those considerably different pools.

We also recognize that the deliverability concept as such is a difficult one. It certainly has a value in terms of measuring the relative capacities of the wells to produce into the pipeline, as you will see. We'll resist the impression that deliverability measures reserves. There are certain limitations inherent in the deliverability concept itself.

We recognize and applaud the work that Mr. Utz has done in determining deliverabilities with precision, but I feel sure that he would be the first to recognize that the same standards do not necessarily apply in all reservoirs; and we do have here inherent in the present system a use of a common back pressure curve which is admittedly different for the various horizons. We recognize these defects; the deliverability is still useful, no question of

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it. We do feel that overweighting or excessive weighting of the deliverability factor with its inherent defects serves to magnify and enlarge those defects.

There's also another thing that to me seems very important. We recognize that there was no surface weight existing under this present formula nor would it exist under any allocation formula if no gas was flared, but it is fair to state that the deliverability idea, if we had a hundred per cent deliverability formula, this would be the simple adoption of the rule of capture without surface waste. Now, the Commission is charged first with preventing waste. This it can accomplish with any formula. Its secondary responsibility is to protect correlative rights. This we submit has not been done, and experience to date has shown that the present formula does not do this. We have no quarrel with three hundred and twenty acre spacing. We believe this has been established, that it provides the right mechanism for getting ultimate recovery. We think it sets the appropriate economic atmosphere for the development of this pool, but we submit that the allocation formula must protect correlative rights and this is what we are here asking for.

I would like at this time to call a witness, Harry Trueblood.

MR. PORTER: I believe we have another statement.

MR. EVERETT: Having just come from Texas, I will not undertake at this point to answer [illegible] Stockman, but I would say that whatever is suggested in the Oil

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and Gas Journal merely may not be correct, but a lot of my friends are suffering under that very system down there, but what the Journal reports and what the fact is might be different. In all fairness to Mr. Stockmar and his client, I wanted to make a very brief statement before I join in the motion that is going to be made by Mr. Howell later on, as I understand it.

We were the one operator who was not notified of the Denver meeting, through no fault of Mr. Stockmar or his client, but we have about three per cent interest in the gas allocated in the Basin-Dakota Pool as does his client, so our interest there is about the same, percentagewise, of the total allowable. We read in Nancy Royal's report the latter part of February of this case, whereupon Mr. Spiekis of our company telephoned someone with consolidated in Denver and they very graciously sent to us some of the material which was presented to the operators at that meeting in Denver.

A day or two after that I called the Commission and we actually received a notice of this hearing on March 5th together with the copy of the application; and in all fairness to Mr. Stockmar, I wouldn't want him to proceed, and I thought it might be helpful both to him and his client and certainly so far as I'm concerned, my client. We just haven't had time to get ready to put on the kind of a defense we feel is lessened in this instance, so that we could join in the request for the continuance; but I wonder if Mr. Stockmar wanted us to go ahead with his testimony, exhibits and

witnesses at this time and then would recall those witnesses for a later hearing should the Commission be disposed to grant the motion. If they would do that, why, I think it might save some of us and save all of us a good deal of time to proceed in that fashion so that we in effect hear part of their case, recess, and then come back and put on our defense. Now that is not normal procedure except for the Federal Power Commission, and I don't want to imply I'm recommending anything to this Commission that might follow that one, but that is the effect of it and I just wonder what Mr. Stockman's view with reference to that procedure is, because you might prefer to wait and have us be prepared to cross examine at a later date. We are not prepared to do complete cross examination today. What are your views?

MR. STOCKMAN: Well, gentlemen of the Commission, we would, of course, much prefer to complete the entire hearing at this time. We are ready to proceed, others have had ample time. It would seem a waste of our time and yours at this time to present our case to find that it would largely have to be done again. If you are of a mind to continue the entire matter I think our position must be that if you elect to continue it that we will not proceed beyond this point.

MR. POWELL: Mr. Bennett, do you have something further?

MR. BENNETT: Well, I have tried to state our position. We are certainly not ready with our defense today although we are opposed to the motion. When our motion there can reasonably

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five hundred seventy-five wells in this field, and we are considering a rule that has been in effect by the Commission for a number of years statewide and for more than a year in this pool, I think we have to consider the whole pool and it's going to take our engineers some time to study all the wells and see the effect of this. I can go this far in my defense today, that the net effect of what the applicants seek here is to increase their income about $12,000.00 a month and decrease my client's income by $12,000.00 a month, so we take more than a passing interest in it. We think the economics are involved more than any correlative rights and maybe they are measured by dollars and if they are, they are measured by our dollars.

MR. STOCKMAR: I would like to correct one statement Mr. Hume Everett made, and that is that Consolidated is higher, has interest in wells exceeding 10 per cent of those drilled in the pool at this time, and then another implication at the last, said "our dollars." We are not trying to get Ohio's dollars, we are trying to get Consolidated's dollars.

MR. EVERETT: A point of view, Mr. Stockmar.

MR. HOWELL: Mr. Stockmar, might I ask one question? How long do you think it will take you to put your case in chief?

MR. STOCKMAR: Certainly less than one hour, Mr. Howell.

MR. KELLAHIN: Southern Union will also have a witness that would take approximately thirty minutes, I would estimate.

MR. PORTER: Sir?

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MR. KELLAHIN: I say Southern Union will also have a witness that will take twenty to thirty minutes.

MR. PORTER: Mr. Davis.

MR. DAVIS: Quilman Davis, representing Aztec Oil and Gas Company. I did not join in the discussion about a continuance motion that will be offered at a later time. I would be very happy for Consolidated to put on their case today and listen to them, but Aztec, it so happens, is in the same position. We did have notice of the meeting in Denver but we were not able to send anyone up there. We have not had the opportunity to prepare any witnesses for the opposition of this application and in view of the apparent motion to be made, I would like to move now that this case be continued to a date certain, either after the regular meeting, say in the next month or in between, to start off in the morning with this case because I personally think that it will take more than one day to finish this.

MR. PORTER: Mr. Davis, as I understand your motion, it's just a simple motion to continue with this case until a special date or the next regular hearing date or something that might be convenient by the Commission to be heard in its entirety, that is the case to be heard in full at that time.

MR. DAVIS: Well, I don't think--if I did go that far I didn't intend to. I always want to reserve the right to ask for any additional continuance if I was surprised.

MR. PORTER: After that time is what I had reference to.

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MR. DAVIS: Yes, but the idea is to continue this case over to either the regular meeting or as Mr. Howell suggested, maybe a separate date for it would be ideal.

MR. PORTER: Anyone care to comment?

MR. EVERETT: I would like to join in that motion and make this little statement. The reason I stated before and asked Mr. Stockmar what his view would be because I have always been under the impression, to try this case or a case of any sort, that both the applicant and those opposed to the application should go into the Courthouse prepared to fight it out; and that it's unfair to ask Mr. Stockmar to put on his testimony and witnesses today and let me have a month to go and dig it apart and work up cross examination and so forth, so I would join in the gentleman's motion to continue to a day certain. I would hope that we could have at least thirty days so that we could make an adequate study of the facts concerning this pool and this rule so as to formulate our defense and then we will not make our case on the failure of the applicant to make its case. We make our case on our own defense; so I join in your motion and ask the Commission to continue the matter for a complete hearing commencing sometime not less than thirty days from date.

MR. PORTER: Anyone else care to comment concerning the motion?

MR. STOCKMAR: I appreciate the attitude shown by Mr. Everett. It is because our geologist witness is very

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important to our presentation; and if the Commission determines not to proceed with the entire matter at this time, then we would prefer not to do it piecemeal and would like something less than thirty days because after the middle of April he will be very badly, already is very badly obligated for the rest of that month and through May. It would seem that sometime in the forepart of April would be adequate time for the others to prepare.

MR. PORTER: The Commission has decided to continue the case and will not hear any testimony today, but to continue the case to the regular hearing date, the 18th of April. It is hoped that we can get to the case fairly early that day and the Commission will be prepared or we hope we can be prepared to spend another day if necessary at that time.

The case will be continued to the regular April hearing, which is the allowable hearing day.

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STATE OF NEW MEXICO)
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COUNTY OF BERNALILLO)

I, MARIANNA MEIER, NOTARY PUBLIC in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached transcript of hearing was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

NOTARY PUBLIC

My Commission Expires:

April 8, 1964

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[redacted]

2501

Petition, Transcript,

Bill Exhibits, &c.

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 14, 1963

REGULAR HEARING

IN THE MATTER OF:

(Rehearing - Continued from December 19, 1962) Application of Consolidated Oil & Gas Inc., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico. Applicant seeks an amendment of Order No. R-1670-C to establish an allocation formula based 60% on acreage and 40% on acreage times deliverability. The Commission will hear opening statements and under the provisions of Rule 1214, and Rule 1215, may refer the presentation of evidence concerning recoverable reserves in the Basin-Dakota Gas Pool to Daniel S. Nutter, duly appointed examiner, or A. L. Porter, Jr., alternate examiner. The Commission would then hear all closing arguments.

CASE 2504

BEFORE: A. L. Porter, Jr.
E. S. (Johnny) Walker
Governor Jack Campbell

TRANSCRIPT OF HEARING

MR. PORTER: We're goim to take up Case 2504. The Governor has been delayed in his return to the Hearing Hall for a few minutes, but he will be back in a few minutes.

This is an application of Consolidated Oil and Gas Company for an amendment of Order R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

Most of you here, of course, are familiar with what

has transpired before. I believe it was last April that we had three and a half days of hearing and one night session, after which we entered an Order R-2259 denying the application, with the finding to the effect that the evidence presented at the hearing of this case concerning recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula. The Applicant applied for and was granted a rehearing, and certain information was subpoenaed from individuals and companies.

As you recall, we spent quite a bit of time hearing motions to quash the subpoenas. We issued an order modifying the subpoenas. The information which we subpoenaed has been delivered to the Commission and is available here at this time.

Now, when we advertised the case for rehearing, the Commission indicated that the taking of technical testimony might be referred to an Examiner. The Commission has decided to go ahead and hear the case instead of referring it to an Examiner; so at the beginning of the case, I would like to call for appearances.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, New Mexico, appearing in behalf of the Applicant. I have associated with me Mr. W. P. Stockmar, a member of the Colorado Bar, who will handle the presentation of the case on behalf of Consolidated. I would like to also enter an appearance for Southern Union Gas Company and a new participant in this proceeding,

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Benjamin K. Horton and Associates, in association with Mr. Benjamin K. Horton, who will appear in the case later today.

MR. PORTER: Mr. Federici.

MR. FEDERICI: Mr. Porter, Bill Federici of Seth, Montgomery, Federici and Andrews, on behalf of El Paso Natural Gas Company; and I have associated with me Mr. Ben Howell of El Paso, Texas, who will handle the case. On behalf of Aztec Oil and Gas Company, also, Seth, Montgomery, Federici and Andrews. Associated with me is Mr. Kenneth Swanson of the Dallas Bar, who will handle the case. I have also the following appearances for Seth, Montgomery, Federici and Andrews: Sunset International Petroleum Corporation and Calkins Oil Company.

MR. PORTER: Mr. Keleher.

MR. KELEHER: If the Commission please, W. A. Keleher, counsel for Pubco, Albuquerque.

MR. PORTER: Mr. Verity.

MR. VERITY: George L. Verity for Southwest Production Company.

MR. PORTER: Mr. Kelly.

MR. KELLY: Booker Kelly of Gilbert, White and Gilbert in Santa Fe, appearing on behalf of Skelly Oil Company; and I have Mr. George Selinger associated with me; and also appearing on behalf of DX Oil Company, and Mr. Loehr is associated with me; and also appearing on behalf of Texaco Oil Company.

MR. PORTER: Mr. Bratton.

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MR. BRATTON: Howard Bratton, Roswell, associated with Mr. Robert Wein of Dallas, on behalf of Delhi Taylor Oil Corporation. In addition, Humble Oil and Refining Company would like to enter a statement in the proceedings. I would like to ask the Commission at this time, to request that statements, written statements of position be heard or received by the Commission within a period of twenty days after the hearing is concluded.

MR. PORTER: Would there be any opposition to the period of time requested for filing statements?

MR. KELLAHIN: Is counsel referring to statements or briefs or just what does he contemplate?

MR. BRATTON: Just the normal statement of position.

MR. KELLAHIN: We certainly have no objection to that.

MR. PORTER: Then the Commission will grant a period of twenty days from the date of the closing of this hearing in which to file statements. Are there other appearances? Mr. Buell.

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell.

MR. PORTER: Mr. Hampton.

MR. HAMPTON: Ken Hampton, appearing on behalf of Marathon Oil Company.

MR. PORTER: The Commission will recognize Mr. Kellahin, the attorney for the Applicant.

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GOVERNOR CAMPBELL: May I, since I didn't participate in the original hearing and this is a re-hearing, as I understand it, have for the record an indication of whether there's any objection to my participating in the re-hearing proceedings, since I did not participate in the original hearing? I have no great desire to do it.

MR. KELLAHIN: We certainly have no objection and welcome your participation in the case. In that connection, am I correct that the record in the preceding hearings is a part of the record in this case today?

MR. PORTER: The record of the previous hearings will be made a part of this record.

MR. FEDERICI: Governor, we certainly have no objection to your hearing the case.

MR. KELEHER: Pubco has no objection, and let the record show that insofar as we are concerned, the Governor may read the transcript of the record in the prior proceeding, with the understanding that it will serve to the same extent as if he had been personally present.

MR. WALKER: Mr. Porter, the Land Commissioner has no objection to the Governor sitting in on this case.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: Mr. Stockman will proceed.

MR. PORTER: Is Mr. Stockman to make the opening statement?

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MR. KELLAHIN: Yes.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Gentlemen of the Commission, I first would like to thank Mr. Porter for summarizing what has transpired in the year past. It will shorten my statement somewhat.

This entire Case No. 2504 to date has been a little like a play in three acts. It started, the first act, with Order R-1670-C, Rule 9 of it, which was granted in November of 1960. At that time it was based on a limited amount of data relating to 160 wells, and that order established not only the present allowable allocation formula but it established the proration units.

Consolidated sought a hearing of that a year ago, based on additional experience, when it became convinced that the proper allocation formula should have a factor of no less than 60 percent acreage and no more than 40 percent deliverability. At the conclusion of that hearing, we felt and still feel that we had substantially borne the burden of proof necessary to cause a change, based on the ground rules as we all then understood them.

The second act I referred to is very short and sweet. Prior to the determination of our case, prior to the denial of our application, the Jalmar decision was handed down. This had a substantial impact on all of us, upon all of our understanding of proration matters. We cannot say, of course, that except for the Jalmat case we might have won the case or not. We do not

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know what was in the minds of the Commission. We do feel, however, that we had sufficiently borne the burden of proof, by a preponderance of the evidence had sustained our position that the time was ripe for a change; that we felt it appropriate to ask for this re-hearing.

Now part three of our little play has been the legal wrangling and what-not over subpoenas and what-not which has taken place since last May. This is what I hope to be act four and the final act. We hope that out of this hearing will arise a valid conservation order. I say this because it is my sincere conviction that under the holding of the Jalmat decision, the existing Rule 9 of Order 1670-C is void, and we are purporting to operate under what is a void order. You will recall that it was based solely on a finding, as was the order in the Jalmat decision, that there is some general correlation between deliverability and reserves.

In addition to it being void on a jurisdictional basis, we feel and have felt this since the decision, that it was subject to a direct attack in court on the basis of its invalidity; that any time we had chosen instead to make the court approach, as much as we might have had fun with the temporary chaos that would have existed with no order should we have prevailed, there would have been take or pay clauses that would have given rise to many problems -- we have chosen instead to come back on an administrative basis to bring forward to you what is

required by the Jalmat decision; that is, the reserves for each tract for the whole pool, and it is our hope that you will from this hearing create a valid order.

We feel that it will not be sufficient for you simply to deny our application; then we will still have a void order. I would like to talk about the existing order for a moment and relate it back to some of our prior testimony. The first is the effect of the order, and in our judgment it causes waste. There was testimony that because of the economics under which the parties operate because of the present order that only ten percent of the whole area which you have defined as the Basin-Dakota Pool has been developed to this time. It might be fair, after a review of all of the evidence, to say that within an area of economic production it is only thirty percent developed to this time. As we stated before, this is not, this lack of development is not because of the lack of producible reserves. It is because of the lack of economic incentive.

It was also testified that 58.3 percent of the then wells were uneconomic or economic failures, not because of the lack of reserves but because of this order that now exists. This situation has not changed. This lack of development as an economic thing is waste. If there is recoverable gas in these areas and the development of it is not encouraged by an appropriate order, this is waste.

This lack of development also impedes the opening of a

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market for this gas. We sincerely hope that Texas will not capture the Los Angeles market simply because we have not developed our known reserves. The opposition said that we were not intelligent to drill economic failures, under this rule that they shouldn't be drilled. We say that not to drill these wells that could be economic under a proper order is waste. It's waste caused by this presently invalid rule. It's avoidable waste.

We say that this is not the way to protect a valuable natural resource, to simply skim off the cream and pour the milk down the drain. We're really doing this in two ways. One is through this lack of development; the other is a matter of field management. I don't understand all the technicalities of this, but if we are simply popping off our easily recoverable reserves through high deliverability wells, we are destroying at least the flexibility of being able to serve them.

There is further waste that arises out of economics caused by the premature abandonment of wells. This is a fairly clear and easily understood thing. If these wells are not now economic successes, as time goes on they will become less so.

To also talk about the effect of the existing order on correlative rights, there are three definitions I would like to have you bear in mind. The first is our fairly clear statutory definition of what correlative rights is. To paraphrase it somewhat, it's an opportunity for each owner of property to be able to produce for himself without waste a just and equitable share

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of the total gas in the reservoir, and that which bears a proportion, the part that's under his land to that that's in the whole field. The Jalmat case certainly makes this clear.

There's another definition, also, and I would like to repeat what I stated a year ago. The right of a party to take and capture oil or gas under the rules of capture is perfectly clear. He has a right to take all that he can produce from his well, the full capacity of his well. Now deliverability also has this same definition. It is the capacity of the well to produce. Now to that extent a 100 percent deliverability allowable formula, even though it might be diluted some by restricting everybody, is still the rule of capture. That's all it's ever been. It does not protect correlative rights.

Now we've stated before that the methods of showing the correlation of deliverability to reserves is that mathematical device that cannot be supported. I think we demonstrated that convincingly at the last hearing. I hope we are past that. I hope we can now do what the statute says, what the Jalmat case says, and look at reserves and allocate the best way we can on that basis.

There's one other point and I would like to discuss this because I have a feeling that it's not always clearly understood. I have had the feeling that some people, some engineers feel that when a proration unit is established, that this somehow automatically is a legal and factual determination and from that

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time forward no gas can cross the boundary lines of that spacing unit. This is not true. People that have that feeling that there's some kind of a shield suddenly put around each tract, and that the allocation of allowables is simply that of allocating the market are losing sight of the fact that allocation must be carefully watched, may be changed from time to time so that the order which permits production permits the production of the equivalent of the gas that's under the 320-acre tract; it does not follow automatically because of proration. I'm sure this is clear to the Commission. I'm not so sure that it's generally understood.

As a last point, and this can't really be made part of testimony, in the most recent issue of the Oil and Gas Journal at page 96, there's the fourth of a series of articles entitled "Crises in Gas Proration." I certainly recommend this as reading for anyone interested in this problem, particularly because it shows what is hard for us to do here. It tells of the history of correlative rights versus gas proration. It tells of there being no problem in the beginning. The gas was being flared, and when it was taken, people were glad to get rid of it; and then there was a shortage and everybody was more or less satisfied by the market. Now in this day and age, as we temporarily, I hope, have an excess supply of gas for the first time, the correlative rights situation deserves great attention, for the first time, instead of allowing -- I'm not criticizing anybody,

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but instead of allowing the gas purchasers and the pipeline to determine how it should be done because this satisfies their needs and nobody else objected, we're years behind the protection of correlative rights, years behind that which we have learned to do for oil. It certainly is time now to do it properly for gas. Thank you.

MR. PORTER: The Commission will recess the hearing until 1:15.

(Whereupon, a noon recess was taken.)

MR. PORTER: The hearing will come to order. Mr. Stockmar, are you ready to call your first witness?

MR. STOCKMAR: Yes, I would like to call Mr. Harry A. Trueblood.

MR. PORTER: I would like to remind all of the interested parties of the order granting the re-hearing in which we limited the matters of testimony to discussions of recoverable gas reserves in the Basin-Dakota area. The Commission would like to move along with the hearing. We want a full and complete record, but we would like to ask you to refrain from being repetitious as much as you possibly can. You may proceed.

MR. STOCKMAR: We will endeavor to make it as short as we can.

(Witness sworn.)

HARRY A. TRUEBLOOD,

called as a witness, having been first duly sworn on oath, testified as follows:

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DIRECT EXAMINATION

BY MR. STOCKMAR:

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

A Harry A. Trueblood, Jr.

Q Are you the same Harry A. Trueblood, Jr., that appeared as a witness at the prior hearing in Case 2504 on April 18, 1962?

A I am.

MR. STOCKMAR: If the Commission please, is there any need to re-qualify this witness as an expert?

MR. PORTER: No, sir. His qualifications are a matter of record in the previous hearing.

MR. STOCKMAR: Thank you, sir.

Q (By Mr. Stockmar) Mr. Trueblood, I hand you two tabulations. Will you identify them, please, for the record?

A This first tabulation is a group of eight pages which is a photocopy of the 460 wells which El Paso Natural Gas handed us in the previous hearing and later produced to the Commission, and which we made a copy of subsequent to the issuance of the subpoenas.

The second tabulation is one of numerous pages which has put the wells,has identified the wells by township that had appeared previously only by deliverability and reserves under the original eight pages of information previously referred to. These were delivered to the Oil and Gas Conservation Commission in response to the subpoenas [illegible], and we then got a copy of them.

MR. STOCKMAR: I would like to ask that these documents be marked as Exhibits 1 and 2 for Consolidated and accepted in the record.

MR. PORTER: Will the reporter please identify them?

(Whereupon, Consolidated's Exhibits Nos. 1 & 2 marked for identification.)

Q (By Mr. Stockmar) Mr. Trueblood, I hand you Exhibit 2; will you please explain for the record what that exhibit purports to show?

A This exhibit is a breakdown of the wells which appeared in the El Paso Natural Gas review by township, with each well described and with the captions showing the initial deliverability of the wells, 1961 deliverability based on 1960 tests, the 1962 deliverabilities based on 1961 tests, the net feet of pay, the number of acres in the unit, the acre feet of sand, the township recovery factor, the initial reserves in place, the cumulative production through December 31st or to January 1, 1962, and the then current reserve as of January 1, 1962.

Q Thank you, Mr. Trueblood. Mr. Trueblood, have you made efforts to acquire or develop reserve information with respect to the producing tracts of land in the Basin-Dakota Field?

A Yes, sir, we have. Following the denial of our original application, and following the Jalmat decision, the Commission will recall that we made an attempt to get all of the operators to come forward with their own reserve figures and

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present them to the Commission for interpretation, and we were unsuccessful in this attempt. Our idea at the time was not to particularly act in some sort of folly, but we felt quite certain that if all the operators were to have to produce their reserves to the Commission, and the Commission was going to make a finding on a proper proration formula based on reserves, that undoubtedly everyone would come in and be somewhat high on their reserves, but at least they would be consistent and it would have been consistently high; so therefore, still in all, when you considered the tracts or a tract by tract interpretation of what should be a proper allowable, that at least it would be consistent as between tracts.

We met with absolutely zero success in this attempt, but we did ask and receive through the subpoenas a great deal of information; namely, core analyses and logs on 58 wells that had been cored in the reservoir. We compared the El Paso work on the 460 wells that appeared on Exhibit 2, Consolidated's Exhibit 2 in this case, with a certain amount of our work, and also with respect to the cored data which was available. We found that of the 58 wells that had been cored, that by comparing the reserves we calculated from the cored information that the average reserve that we computed without regard to cutoff points, which have previously been testified to as six percent, and log interpretations and what have you, we found that we ranged on the order of between 70 percent to a high of 130 percent, as

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compared to the El Paso numbers which were in this group of 460 wells. Quite frankly, with the amount of information and the lack of information from core data and what have you, we felt that the El Paso work had been remarkably accurate, that all of the engineers in this room all realize that there are several ways to go to arrive at reserves under a given tract, and any one of these several ways would be reasonable.

When we discovered that of the 58 wells that our computed reserves were 108 percent of the computed reserves for the identical wells available, we were satisfied that El Paso -- and I believe I testified in previous testimony that we were satisfied that El Paso had basically made a very honest appraisal of the reserves underlying the Basin-Dakota Field. Since we had been unable to compare all of the operators' own indication of the reserves as between tracts, there was only one other way in which we could at least be uniform in an approach to establish total reserves in the field, as required by the Jalmat case, reserves as between tracts. This would be to have an entire analysis made of the field as, say, it existed in December, as if El Paso's engineers, who had been very fair in their approach, had done the work.

Well, obviously, our own engineers and the people under my supervision could not possibly be El Paso's equivalent engineers, so therefore we had to make use of the common tool available to all engineers and geologists; namely, the contour map. This is

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our Exhibit No. 3.

(Whereupon, Consolidated's Exhibit No. 3 marked for identification.)

A Now Exhibit No. 3 is a map of the Basin-Dakota Field with a one billion reserve outer limit, that being the approximate reserve at which you arrive at a break-even point on your money for the expenditure, and beyond which no one would drill a well, if they did any previous economic thinking at all, to exploit reserves. So to that extent, this map has been prepared with a limiting one billion cubic foot reserve outer limit.

All of the 460 wells which El Paso had on our Exhibit 2 were then plotted throughout the Basin. The Commission will notice that there's a great deal of empty void space yet to be developed in the Field within the outline of this situation. However, we have for the most part mechanically contoured with an eye to the overall situation and an eye to the recovery factors that an engineer would normally expect to receive in this type of arrangement. From that point, we were able to construct or to pick reserves from this map as if the remaining missing wells in the December proration schedule had been done by El Paso engineers.

Well, now, that opens a general line of argument; well, this might not be exactly what El Paso gets, but keeping in mind the ground rules which El Paso laid down, and that is that they used a township recovery factor which in itself is a contouring device, it's an averaging device, in arriving at individual

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reserves that they calculated. Certainly the fact that we found in the interpretation of the core analysis data that within the accuracy of computation of reserves of from 30 percent low to 30 percent high on a given reserve, that this overall picture fell within a reasonable approach as to what numbers El Paso would have come up with for all wells in the Basin-Dakota Field as it appeared in the December proration schedule.

Now we have considered only 699 of the 743 wells since the balance of them are in this instance marginal and not subject to the proration formula at this time. The key to this map is this: We adopt El Paso's numbers and we adopt the numbers that we have developed as numbers for the Basin-Dakota Field as if we had prepared them, because we believe under our study and after all of this study that this is a fair and reasonable approach to the problem at hand; and that is, what is the total amount of recoverable reserves underlying the Basin-Dakota Field, and what is the recoverable reserve underlying each connected 320-acre tract which has a well thereon which had a deliverability factor in the December proration schedule.

Q Mr. Trueblood, is your adoption of the results of this work adoption by you as an expert petroleum engineer?

A That is correct. Now the results of this map show that as of the December proration schedule for 699 non-marginal wells which had deliverabilities, the average reserve per well was 3.03 billion cubic feet; that the total reserve for the 699 wells,

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exclusive of the marginal wells, was 2,159,000,000,000; that the total reserves underlying the field outline which had completed wells thereon was 2,255,000,000,000 cubic feet.

Furthermore, we found that the average deliverability for the 743 wells, which included the marginal wells, was 1340 MCFD, which is down slightly from where our position was in April, and that the 699 non-marginal wells had an average of 1410 MCFD. As I stated, we were able to determine a reserve for each individual tract, as required by the Jalmat decision, from this method, and these are our reserve numbers. We have these in the form of Exhibit 4.

(Whereupon, Consolidated's Exhibit No. 4 marked for identification.)

Q I think you were stating, Mr. Trueblood, that Exhibit 4 is a tabulation of the individual reserve data for each of certain wells. Would you explain the code that exists here and what other data this shows?

A If the Commission please, this is, because of the way an IBM machine works, this fairly could be considered complicated, but it really isn't. Basically, Exhibit 4 contains 699 wells located by township, range and location within each tract, under the Commission's use of letters for code, it contains the acreage factor for each of the 699 non-marginal wells. It contains a deliverability factor and it contains a reserve factor.

Q Are these the items "A", "D", and "R" in that order?

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A These are the items "A", "D", and "R" in the second column. Now the reserve number, I might point out, is either the direct calculated number of El Paso, or it has been picked from the contour map. The next column is percent, and that is, referring to the legend, percent of total reserves. That number is that percentage which the particular well bears to the total reserves under the 699 wells.

Now theoretically, the Commission could stop right here and come up with an allowable formula which is nothing more than a tract factor. Now this tract factor, however, would be changing every month as new wells were brought in. It would also be changing from a month to month basis as new information became available on reserves underlying specific tracts; and the Commission would probably be overwhelmed with every single operator appealing his reserves under his particular tract as set out by the Commission. However, we do propose that this is the only way to protect completely, without any question, correlative rights.

Now understanding that the Commission, through its experience in the years gone by, found that the use of a formula which includes acreage and deliverability is the most satisfactory tool from an administrative standpoint, we proceeded to develop certain other information for the Commission's use in connection with the use of deliverability factors in various percentages. Now this appears under "F" percent, which is the factor percent, which is column four and appears at 75 percent deliverability,

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100 percent, of 75 percent, of 50 percent, 40 percent; and if you'll move over to the next "F" column, because of the way the IBM machine had to tabulate this, it also includes 30 percent, 20 percent, 10 percent, and zero percent deliverability, which in effect is 100 percent acreage. Under "A.L.", "A.L." stands for the allowables and those are the allowables which the well in the instance of the 75 percent deliverability factor number was the actual allowable that any particular well received during the month of December. The allowable at 100 percent deliverability factor is that allowable which it would have received had the deliverability factor been 100 percent, and so on down to what the allowable would have been had it have been 100 percent.

Now I would like to point out at this particular time that the whole purpose of establishing the right allowable is that the allowable percentage that a well is granted be exactly that same percentage that it bears to the total reserves; hence the column percent allowable. That has to do with the percentage of the allowable which the well received, which may be compared with this percentage of the reserves. For example -- actually, in support of the present order, it's a very good one, and apropos, that the first particular one here shows that under 75 percent that the well was already getting more of its percent of allowable than it should have been getting. However, if you'll look at the third from the bottom --

Q Mr. Hinkle, would you make a further explanation of

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the column "A" over "R"?

A All right. Excuse me. The column "A" over "R" is the percentage of allowable that the well receives under the various deliverability factors as opposed to its percentage of reserve. Now if a formula could be constructed where in every instance this ratio were unity, then and in that event there would be absolutely no abuse of correlative rights.

Now pointing this out, you will see that in the instance of the first well that it's receiving more than its proper share of the allowable, and yet it is a low deliverability well; but if one looks at the third from the bottom one can -- 113, 113, you can see that the 25 percent deliverability would appear to be the closest and best factor. The next one right below it shows that 40 percent is the best, and so on.

Now if one will look on page 12, at the second well on page 12, one sees that this happens to be an average well, it has approximately an average deliverability and an average reserve for the field; and no matter what the acreage factor is or the deliverability factor is, it really never changes, and it basically gets its pro rata share and proper share of the allowable under the proper circumstance. I only throw those in for examples, because one might more easily, under a fairly complicated IBM setup -- as stated before, this was done to arrive at factors or ratios of percent allowable to percent of reserves for every single well in a non-marginal category in the different percentages of

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deliverability in the formula varying from 100 percent deliverability down to zero.

The results of the investigation of Exhibit 4 led us to Exhibit 5.

(Whereupon, Consolidated's Exhibit No. 5 marked for identification.)

Q Mr. Trueblood, will you proceed with your description of Exhibit 5?

A Exhibit No. 5 is nothing more than a count of the wells which fell into the various categories of percent of their proper allowable, assuming that 100 percent is the proper allowable that it should be receiving. This was done for each of the deliverability percentages in the proration formula, and a count was made thereof for each and every single well of the 699 wells. For example, under the current 75 percent deliverability in the proration formula, one may see that 418 of the 699 wells were receiving under 100 percent of their proper allowable, and that 281 wells were receiving in excess of their proper allowables.

Under the proposed 41 percent, one may see that unity of wells on both above and below 100 percent of proper allowable begins to become achieved.

Now Exhibit 5 demonstrated to our engineers and to me that a formula must be devised, if one insists on using deliverability and acreage in a formula, which would best group the maximum number of wells at unity and relieve the variation from

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unity. Hence we prepared a graphical presentation of four different percents of deliverability in the formula for our figure, Exhibit No. 6.

(Whereupon, Consolidated's Exhibit No. 6 marked for identification.)

Q Mr. Trueblood, before you proceed, only ten or so of Exhibit 6 have been colored. For the benefit of those in the audience that received uncolored ones, will you identify each of the lines?

A The lines on Exhibit 6, for those who have colored exhibits, the 100 percent line is colored red. This is the use of 100 percent in the deliverability formula and is a circular red dot. The dashed line with the circular black dot is the 75 percent number, which is the current deliverability in the formula. The 40 percent, as requested by Consolidated, is the triangular line with long dashes, the triangular points, and is colored green. The yellow or square boxes for the points is the 20 percent deliverability in the formula.

This presentation is made merely to show that as you increase acreage participation in the formula, all the curves begin to shift toward unity, and that somewhere in the range of 40 percent deliverability down to 20 percent deliverability in the formula, you have the maximum number of wells at unity and the narrowest type of curve. The best possible curve, of course, would be one in which all wells fall on the 100 percent of proper

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allowable line, or the next best thing within a reasonable tolerance on each side; and once again, referring to our 30 percent on either side of accuracy of computation of reserves, one in which all wells or practically all wells would fall within 70 percent to 130 percent of their proper percent of allowable, based on their rightful percentage of the total reserves.

One other exhibit arose from this interpretation, and it is our Exhibit No. 7.

(Whereupon, Consolidated's Exhibit No. 7 marked for identification.)

Q Due to the interruption, will you again explain your concept of the reasonable range of accuracy, the 70 to 130 percent that you were just speaking of?

A Yes. Based on our numbers for the reserves underlying each tract, and based on our thorough investigation of the wells which had been cored, and comparing same to the work we have presented, we found that in general we ranged between 70 percent and 130 percent of the numbers which we have deducted from this map, or were calculated originally by El Paso. This we interpret to be a reasonable interpretative range of reserves that engineers should be able to make from log calculations when compared with actual core data, and should be the range of accuracy wherein anything falling in that range, from a standpoint of reserves, of receiving percent of proper allowable, would not necessarily be an abuse of correlative rights.

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Due to the limitation of the accuracy of the actual prediction of the reserves themselves, however, any wells falling outside of that reasonable range of accuracy of prediction of reserves would tend to be an abuse of correlative rights. Hence our Exhibit No. 7, in which we have plotted the number of wells which fell outside of receiving at least 70 percent nor not more than 130 percent, or did receive more than 130 percent of their rightful allowable based on their share of the reserves. We have chosen, for obvious reasons, to entitle our graph "A Number of Abuses of Correlative Rights versus Percent of Deliverability in the Formula."

We then counted the wells falling outside of this reasonable range for each deliverability factor in the formula, and found that as the deliverability in the formula reduced to approximately 40 percent down to 20 percent, that the number of abuses were at a minimum.

Now to further investigate and not as an exhibit here, we also counted wells outside of reasonable limits of only 10 percent accuracy of reserves, 15 percent, 20 percent, 40 percent, and 50 percent. This we found produced very similar curves in every single instance, and all bottoming out in the 40 percent to 20 percent deliverability in the formula. Now the only thing that the range of accuracy does is to change the definition of what might be called an abuse of correlative rights. In essence, if one says that one may accurately determine reserves no better than

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50 percent of the actual reserves, the number of abuses necessarily lowers. As a matter of fact, the number of abuses under that particular definition dropped to 181 at 40 percent deliverability in the formula. However, we contend that even as we studied the various logs and the wells in the field and the accuracy of El Paso's determination of average recovery factors by township, that this number of 30 percent appears to be reasonable and appropriate; and therefore we utilized it in the preparation of Exhibit 7.

In summary, we have here produced for the Commission's review a way to arrive at a formula, if they continue to wish to utilize acreage and deliverability in a formula, which will cause the least harm to the most people. We feel that via the testimony in April, and we believe we thoroughly destroyed the correlation that there is a general correlation between deliverability and reserves; that if one averaged enough averages in different directions that he might come up with all sort of curves; and we further stated at that time that we could find no place where deliverability actually entered into the determination of reserves. Even the El Paso work itself was done on a volumetric basis, and we subscribed to it.

We therefore submit to the Commission that we have complied with every single portion of the Dalmat case for the Commission's review. We have individual reserves for each tract, we have a reserve for the field. We are convinced that this

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broad space out here that is presently under-developed will be a long time in being developed if the Commission allows a deliverability factor in the formula which makes 60 percent of the wells on a non-commercial basis which could be commercial if given the opportunity to be produced.

MR. HOWELL: I submit that this particular testimony is purely argumentative, is not directed to reserves, and El Paso objects to introduction in this testimony of rates of development of the area, the percentage of development of the area, and the witness' conclusions along those lines because that has no relationship to the issues of this case, which are now limited to reserves.

MR. STOCKMAR: These matters already appear in the prior transcript. I think we can drop that.

Q (By Mr. Stockmar) Do you have any further comments to make?

A Not at this time.

MR. STOCKMAR: I would like to ask that the Commission accept in evidence the exhibits offered.

MR. KELLAHIN: We object to the exhibits.

MR. STOCKMAR: I would like to have the remaining five exhibits numbered and marked for identification.

MR. PORTER: You have seven exhibits, and you are moving admission, that Consolidated Exhibits 1 through 7 be admitted into the record?

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MR. KELEHER: To which we object on the ground they are irrelevant, immaterial and incompetent. The witness testifies that they're based on exhibits in the former case tried here before the Commission April 18, 19, 20, 21; no evidence here of independent investigation. These exhibits are based entirely on hearsay, on what some other witnesses have testified.

MR. STOCKMAR: I think the witness clearly testified that he has examined every scrap of information available to him, that he has studied the reserve data forwards and backwards, every way that he can, and has arrived at this conclusion, which is his conclusion and he is bound by it. These are his numbers now. He testified that they were reasonable. They were constructed in a reasonable and uniform manner; that they were well done; that they were of the type that reasonable engineers could use. He has studied all other assocted data done by different people, non-uniform parameters, and he has made this his work.

MR. MORRIS: If the Commission please, on behalf of El Paso, we would also object to the introduction of the testimony, because all of the exhibits in turn are based upon the accuracy of reserve determinations made which appear in Exhibit 1. If Exhibit 1 should be inaccurate, if the reserves as set out in Exhibit 1 are inaccurate, then all of the other exhibits have no basis and the figures which are used there would not be applicable if the reserve figures are not correct. The witness has not seen fit to establish the data which he used, the manner in which he

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allocated reserves upon the 239 wells which appeared on the schedule which were not covered in the work that was done by El Paso.

Now the testimony of El Paso as to its 460 wells was very clear to the point that in order to determine the reserves applicable to any particular tract, it was necessary to take first the township parameters as used, the averages, which were the best information available; where something other than the average was available, we have used the exact, but the porosity, the water content, and the pressure and temperatures were then applied individually on the basis of logs. El Paso did not attempt to give any reserve data to any one well in which it did not ha[ve] both logs and deliverability.

There's no testimony in this record to support this exhibit as to the character of examination of logs, the methods that were used by th[e] witness in determining the net pay, what kind of logs he used, how he determined the net pay of these 239 wells that he has added now. His determinations as to reserves of those might not agree with ours. He said he used the same parameters, but he did not necessarily use the same factors that our work is based on in selecting the number of feet of net pay.

We submit that the Exhibit No. 1 is not supported by sufficient proof to establish the accuracy of his selections of net pay; and therefore, all of the exhibits could fall if that is not accurate.

Mr. [illegible], all of those questions, you know, may

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go to the reliability of the evidence and might be explored on cross examination, but there is no question that Mr. Trueblood has testified as an expert petroleum engineer that these are the reserves for this field. It is also quite clear that he testified as to the additional 239 wells that they were based on an appropriate contouring method. It's perfectly clear that each of the items going into the determination of reserves that Mr. Howell mentioned can be contoured, they can be contoured separately. There is certainly no problem about contouring them together. This is what he testified that he's done.

MR. KELLAHIN: I would like to point out in response to Mr. Howell's argument that he casts some doubt on the accuracy of Exhibit No. 1.

MR. HOWELL: It should have been Exhibit No. 3.

MR. KELLAHIN: You said No. 1, and that is your exhibit.

MR. HOWELL: No. 3 is what I referred to. I mis-named it.

MR. KELLAHIN: You do not quarrel with Exhibit No. 1?

MR. HOWELL: That is correct.

MR. KELLAHIN: You do not quarrel with Exhibit No. 2?

MR. HOWELL: I do not know, because that represents work done by other people other than ourselves.

MR. KELLAHIN: It is my opinion that the Exhibit No. 2 was furnished by El Paso under the subpoena.

MR. HOWELL: I would like to correct my motion, thinking

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the map was Exhibit No. 1. It is the exhibits from 3 on that we object to.

MR. PORTER: The record will show the objections by Mr. Howell, Mr. Keleher to the admission of these exhibits. The objections are overruled. The exhibits will be admitted to the record, and the Commission will determine, of course, the proper weight to be given to those exhibits; and, of course, the opposing counsel will have the opportunity to cross examine the witness now concerning any phase of his testimony or anything that appears in these exhibits.

(Whereupon, Consolidated's Exhibits Nos. 1 through 7 admitted in evidence.)

MR. STOCKMAR: I would like then to offer --

MR. KELEHER: May the record show an exception on the part of Pubco?

MR. PORTER: The record will show an exception on the part of Mr. Keleher for Pubco.

MR. STOCKMAR: I would then like to offer Mr. Trueblood for questioning by the Commission or the staff, for cross examination.

MR. PORTER: Does anyone have a question? Mr. Howell.

MR. HOWELL: Ben Howell, El Paso Natural Gas Company.

CROSS EXAMINATION

BY MR. HOWELL:

Q Mr. Trueblood, referring to your Exhibit No. 3, will

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you tell the basis that you used in placing the 239 wells that appeared on the December proration schedule upon which you have none of El Paso's work?

A Mr. Howell, if I understand your question, all of the wells that were in the December proration schedule were first plotted. Then the numbers for which we had El Paso data were placed opposite those wells which had been identified on Exhibit 2, and subsequent to that, I believe I testified that under my supervision the map was contoured with some interpolations put in where lack of general information was sufficient to cover a few of the areas.

Q Well, Mr. Trueblood, did you examine the logs on those 239 wells?

A No, Mr. Howell, I didn't.

Q Did you make in any way a determination of net pay on those 239 wells?

A No, we did not, Mr. Howell.

Q Did you make any revisions in the work which was at the time current in April of 1962, which was done by El Paso, which the record will show is a continuing process and which is constantly revised as additional logs are drilled and additional cores become available to cover the additional information that is now available on the [illegible] of those 239 wells having been --

A Mr. Howell, I believe I testified, if you'll recall,

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that we made a very thorough investigation of the 58 wells that were made available to us on core analysis; that from those 58 wells we compared the calculated numbers without using the same parameters that El Paso had used. We calculated the reserves and found that the 58 wells, some of which had been calculated previously by El Paso, some of which had to be taken from our contoured map, compared very favorably, in the range of from 70 percent to 130 percent of reserves which had been calculated by El Paso.

Now this additional data that was available to us served to confirm to us that El Paso's work was done in complete objectivity and done by very competent engineers. We felt no compulsion to try to improve upon it, and we could not duplicate their work since we are not El Paso's engineers.

Q Did any of the 58 cores that you examined cover the 239 wells?

A Yes, sir. I don't have the number with me, Mr. Howell, but several of them did.

Q Well, would you give just an estimate? Was it a half a dozen, five?

A I think it was eight or ten, something on that order. I don't recall.

Q Eight or ten. Now in determining the reserves, let's take one of the 239 wells that you don't have a core on, you don't have a log on the well, you put it on the map with contours; you do not have El Paso's estimates as to the reserves of that well.

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What was the method you used in giving reserves to that well?

A To pick it off of the contoured interval.

Q In other words, your contours are supposed to represent that everything within certain contours are arbitrarily or empirically, however you want to call it, given the same reserve calculation?

A This is exactly right. I believe that's exactly what I testified. I said, if you recall, that this percent is within the accuracy of the prediction of reserves, and we felt quite confident that there would be variance of 30 percent low to 30 percent high in individual instances, as we had found in the 460 well investigation on certain spot checks of it, and also on the 58 cored wells.

Q Now, assuming that cores or logs show that the reserve estimates which you assigned on the basis of contour lines are not accurate, is it not a fact that all of your calculations would come out with different curves and different results, if different reserves were used for the individual wells which appear on your exhibit?

A Would you ask that question again? I don't know what you asked.

Q You have done work which is based upon assigning reserves to each of 699 wells; that's correct, isn't it?

A That is correct.

Q And as to 239 of them, you didn't have any logs?

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A Well, that's not necessarily so. We had some of the logs, and as I believe I testified a moment ago, and before that, that in some instances we had core analyses for wells which El Paso had not had available or had not chosen to compute in the April hearing.

Q What did you do with those cases where you had a core analysis and the core analysis differed from El Paso's figures; which did you use?

A We used El Paso's figures throughout, because we felt that they were within the range of accuracy of prediction of reserves.

Q Even though you had before you a core which showed that the averages were not applicable to that particular tract?

A This doesn't disturb us particularly, because the average of the 58 wells -- and we have been averaging averages throughout this hearing, we found that we were only eight percent different on the overall average than El Paso's number for the core, and this is well within range of predictability of reserve.

Q Nevertheless, though, Mr. Truehlood, am I correct or am I incorrect in stating that if another engineer acting in the same good faith that you've acted should assign different reserves to these wells than these that you have, the resulting curves and the computations as to the amount of error would be changed by the use of different reserves?

A Well, if the engineer did on the 239 wells or 460 wells,

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originally, I'm sure that computations could be changed, but the method could still be used.

Q The point I'm getting at is, looking at this Exhibit No. -- which is this, Exhibit No. 4?

A 4.

Q Now there are a number of wells in here in which the bottom figure is a reserve which was assigned, but on the basis of a contour map?

A No question about it, that's right.

Q Now suppose -- let's look at this, let's take this very first one here. You have shown a reserve of 947. If another engineer in equal good faith would assign 1547 to that, it would then follow that all of your comparisons which you have made over the rest of the page would be different?

A One well would change that, Mr. Howell. Any one well out of 699.

Q I just asked you as to any particular well, a change in the reserves would result in a change in all your computations as to relationship?

A On all 698 other wells, one well change would.

Q Therefore, all of the other work is likewise dependent upon the reserves which you have assigned to the individual tract?

A That is correct.

Q Now, Mr. Trueblood, why did you exclude the marginal wells?

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A Because they don't figure in the proration formula.

Q Well --

A They get their --

Q If the allowable is low enough, wouldn't a marginal well figure into it? Wouldn't it cease to become a marginal well?

A Well, it could cease to become a marginal well. But now you are forecasting, and I'm just working off of December schedules.

Q Well, as a matter of fact, the direction is to determine the reserves under all the tracts; these wells are in the Basin-Dakota Pool, these marginal wells, are they not?

A That is correct. I believe I stated a reserve for them.

Q What is it?

A I believe I stated a reserve for them.

Q Are they listed anywhere in these --

A They're not listed in Exhibit 4 because we used Exhibit 4 for determining the proper proration formula for wells being prorated.

Q And these marginal wells in all instances are obviously low deliverability wells because they don't have the capacity to make the allowable that's been assigned to them?

A That is correct.

Q So that the exclusion of marginal wells, wells which by reason of their inability to make the allowable which was assigned to the application of the formula, by reason of exclusion

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of these marginal wells you have excluded a substantial block of low deliverability wells from your calculation?

A That is correct, and I believe under my testimony, I think you'll see that less than one percent of the reserves of the field are involved.

Q Mr. Trueblood, I believe that you have testified that the use of deliverability and acreage in a formula can, in your opinion, result in a reasonable proration allocation among the wells in the Basin-Dakota Pool?

A I believe that I testified that in the Commission's past history, that they had chosen to use acreage and deliverability, and I say that the only complete elimination of abuse of correlative rights is to assign tract factors and prorate on that basis.

Q You have, however, used in all of your studies both acreage and deliverability?

A Well, this is the subject of the application.

Q That's correct. The only quarrel that we have is as to the weight to be given the two factors?

A That's correct.

Q And I believe you will agree that with the difficulties inherent in actual reservoir determinations either on a volumetric basis or on a pressure decline basis, that some formula using acreage and deliverability can in a practical manner prorate the allowables in this field?

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A Well, it can from a practical standpoint, if that's what you are asking me; from an exact standpoint, no, it can't.

Q Would it be possible to make an exact standpoint without imposing upon the Commission a duty of making a reserve determination of every tract in the field?

A It would not.

Q So as a practical standpoint, you are willing to agree that an acreage and deliverability formula does accomplish the result; the only quarrel being as to the weight to be given the respective value of the two?

A I have to state again, Mr. Howell, I believe you recall what I stated before, that there's only one way to protect correlative rights in a complete manner, and that is to have it on a tract factor basis; and if the Commission chooses to reach a minimum abuse approach, then you could use acreage and deliverability and I believe that's what I've testified to and re-testified to.

Q That's right. But it is a practical matter of achieving something that would be extremely difficult to accomplish upon a tract by tract factor?

A But not impossible.

Q It would, however, involve a change every time another tract was brought into the producing area?

A Absolutely.

Q It would involve recomputation constantly as more information became available?

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A Absolutely.

MR. HOWELL: Thank you, Mr. Trueblood.

MR. PORTER: Does anyone else have a question?

MR. STOCKMAR: I would like to ask one or two questions on redirect.

REDIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, is it not true that all of the reserve data for individual wells that are in the marginal capacity can be determined from Exhibit 3, even though it does not appear in the schedule in Exhibit 4?

A Yes, they can.

Q In case you did not previously testify to the total reserve figure allocated to the marginal wells, would you do so?

A I'll have to do some subtraction. Approximately 96 billion cubic feet.

MR. UTZ: How many wells was that?

A 44. I have 699 in Exhibit 4, and I counted 743 in the proration schedule.

MR. PORTER: Is that 44 marginal wells?

A Right. Now there were additional wells in the proration schedule for which there were no deliverabilities, and hence we couldn't use them in the 699-well study.

Q (By Mr. Stockmar) Mr. Trueblood, did you by any chanc make a similar comparison using only the 460 wells which have bee

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calculated and try to arrive at some table showing the distribution of wells that are above and below 100 percent of their proper allowable?

A Yes, I did. We had the IBM machine also run off a count on the wells, which is identical to Exhibit 5. I believe, for just the 460 wells, as a further check to see how we compared at the end of 699 wells with the 460 wells. We found that under the 75 percent deliverability factor in the formula at this time, that 266 wells were receiving less than 100 percent of their proper allowable, and 161 wells were receiving in excess of their proper allowable; and this ratio of those receiving under their proper allowable was almost identical to the number of wells under the 699 schedule. So that we keep coming back to this 60-40, 65-35 range that has appeared throughout the original testimony and this testimony.

MR. STOCKMAR: We would like to offer a sheet showing this tabulation as Consolidated Exhibit 8. I ask that it be marked for identification.

(Whereupon, Consolidated's Exhibit No. 8 marked for identification.)

MR. PORTER: What is that tabulation?

A The 460 wells of El Paso distribution.

MR. STOCKMAR: I think Mr. Trueblood testified it is similar to our previous Exhibit 5, but limited to our wells on which calculations were made instead of contour.

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MR. PORTER: Any objections to the admission of this exhibit?

MR. KELEHER: I would like to enter an objection on behalf of Pubco for the same reasons stated previously.

MR. HOWELL: El Paso objects to the introduction of Exhibit No. 8 on the basis that there hasn't been sufficient predicate laid of the basic material, the manner in which the machine computation took place to establish the authenticity of the work.

MR. STOCKMAR: I have no further questions.

MR. PORTER: The objections will be noted and they will also be overruled and the exhibit will be admitted to the record for whatever weight the Commission may give it.

(Whereupon, Consolidated's Exhibit No. 3 admitted in evidence.)

MR. KELEHER: May the record show an exception.

MR. PORTER: May the record show that Pubco has asked for an exception to the ruling. Does anyone else have a question of Mr. Trueblood? He may be excused.

(Witness excused.)

MR. PORTER: Do you have another witness?

MR. STOCKMAR: We have no additional witness at this time. We may on rebuttal have additional testimony.

MR. PORTER: At this time we are going to take a ten-minute recess.

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MR. HOWELL: If it please the Commission, before we recess, may we ask if there will be any additional testimony offered by the proponents? I think that we have a group of several -- that is, the proponents of the change. We have a group of several companies that would necessarily need to confer, and if this constitutes the case that will be put on, we would like to ask for time to confer and make a determination as to whether we will put on any testimony or not.

MR. PORTER: Mr. Stockmar, do you plan to put on any additional testimony?

MR. STOCKMAR: On behalf of Consolidated, the only additional testimony might be in the nature of rebuttal. If we have any friends here, what they might be prepared to do, I don't know.

MR. PORTER: Any other of the proponents of the application plan to put on any testimony?

MR. KELLAHIN: In behalf of Southern Union and Benjamin K. Horton and Associates, we do not anticipate putting on any testimony unless it would be in rebuttal of testimony offered by the opposition.

MR. PORTER: Mr. Howell, it seems that there will be no further testimony unless it is in rebuttal to the testimony of the opposition.

MR. HOWELL: If it please the Commission, we would like to ask for a recess of 30 minutes in which the various interested

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parties may confer and make their determination.

MR. PORTER: The hearing is recessed for 30 minutes.

(Whereupon, a recess was taken.)

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MR. PORTER: The hearing will come to order. Mr. Howell, did your group come to a decision?

MR. HOWELL: I believe Mr. Keleher is ready to proceed with them.

MR. PORTER: Mr. Keleher.

MR. FEDERICI: May it please the Commission and Mr. Keleher, before your proceed, on behalf of Aztec Oil Company and Calkins Oil Company and Sunset International, I assume and understand that the objections made by Pubco and El Paso are concurred in, and that the record will show that these companies which I represent also make the same objection. If there is some objection by Mr. Kellahin, I'll make a motion at this time that Exhibits 1 through 8 be stricken on the grounds stated by Pubco and El Paso, and on the additional ground that there was no sufficient foundation laid.

MR. KELLAHIN: We have no objection to the companies represented by Mr. Federici. We certainly do object to his motion to strike the exhibits.

MR. PORTER: The record will show the objection as stated by Mr. Federici. They are also denied. Mr. Keleher.

MR. KELEHER: Mr. Chairman and Gentlemen of the Commission: The Commission has been very patient in hearing this case, and the petition was filed February, 1962, almost a year ago.

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This case was tried on its merits on April 19th, 20th and 21st, following which the Commission was asked to grant a rehearing, and an order granting that rehearing was entered on June the 7th, 1962.

I would like to direct the attention of the Commission to this fact, that the order granting the rehearing contained the following words, "that the scope of such rehearing shall be limited to matters concerning gas reserves in the Basin-Dakota Pool". In preparation for this hearing, Pubco has endeavored to comply with the recommendation and the order of the Commission as to limitation. For the past several months it has been work on the part of the entire staff, a large portion of the geological and engineering, evaluating the recoverable reserves to the Basin-Dakota Pool, and the recoverable reserves of each individual well within the entire pool, total.

After examining in detail all of the 769 total wells in the Basin-Dakota Pool, Pubco specifically computed the recoverable reserves on 382 wells where sufficient information was available to establish their recoverable reserves beyond reasonable doubt. The remaining wells either had insufficient information, or that pertinent information which was deemed necessary was unavailable to the Company. The number of wells specifically studied provides the necessary information for the calculation of the total recoverable reserves in the pool, as well as the individual well reserves within that pool.

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In addition, Pubco studied the deliverability of each well, the total deliverability in the pool, and prepared two maps which will be introduced before the Commission, and which in Pubco's opinion, graphically portray individual well recoverable reserves and individual well deliverability. Points of equal deliverability and points of equal reserves were connected to form iso lines, and graphically show insofar as practicable the direct relation between recoverable gas reserves in the Basin-Dakota Pool, and deliverability.

Further studies by our Petroleum Reservoir Engineer resulted in graphical studies to show the direct relationship between deliverability and recoverable reserves; graphs were also prepared and will be submitted here showing the ideal formula where an individual well will share in the existing market in direct proportion to its individual well recoverable reserves as related to the entire pool. These graphs, in our opinion, further demonstrate that any inclusion of acreage within the formula will create a serious inequity, since all wells are drilled on essentially 320-acre spacing units.

Any change in the current formula of 75 percent deliverability times acreage, should be in the direction of 100 percent deliverability, since acreage is consistent with each individual well in the area, and does not in any way reflect the market change in individual well reserves within the individual pool. The Commission is reminded, on the original establishment of the current

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formula, the acreage factor was introduced in order to create an artificial minimum allowable. An order of the Commission has now established minimum allowables in most of the various gas pools in the San Juan Basin, which should include the inclusion of acreage in the formula.

Our company has two witnesses, who will testify as to the methods and results obtained from this detailed study of the Basin-Dakota Pool. Our first witness, Dan Cleveland, Reservoir Engineer for Pubco, will undertake to explain the standard volumetric formula used by Pubco in determining reserves, and will show the results obtained by the company by a series of graphs which demonstrate the direct relationship between recoverable reserves and deliverability, the ideal formula, and the relationship thereto of the current formula, proposed formula, and the formula based entirely on acreage.

The second witness, Frank Gorham, Executive Vice-President of Pubco, will undertake to show the method of calculating individual well net pay thicknesses, individual well porosities, and individual well water saturations.

The comparatively recent decision of the Supreme Court of the State of New Mexico, relative to the well-known Jalmat case, indicate any proration formula utilized by the Commission in creating a gas pool in the State of New Mexico, should be that formula which, insofar as practicable, gives each individual well its fair share of the market, in direct relation to the individual wells

recoverable reserves as related to the recoverable reserves of the entire pool. Pubco's studies have positively shown such a formula would be 100 percent deliverability. And incorporation of acreage, except for those minor adjustments necessary for the few wells having less or more than 320-acres in their respective drill sites, would be in opposition to the Supreme Court decision; again, in our opinion.

At this time I would like to swear Mr. Cleveland and Mr. Gorham.

MR. PORTER: Will both witnesses stand and be sworn, please?

(Witnesses sworn.)

*****

D A N C L E V E L A N D, a Witness, called by Pubco Petroleum Corporation, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q Please state your name, with whom you are employed and your occupation.

A Dan Cleveland, Petroleum Reservoir Engineer with Pubco Petroleum Corporation.

Q Have you testified before this Commission as an expert Petroleum Reservoir Engineer before?

A Yes.

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Q Mr. Cleveland, you have previously testified before the Commission in this particular case, Number 2504, have you not?

A Yes, sir, I have.

Q Since the last hearing on this case, have you made additional studies of the Basin Dakota Gas Pool?

A Yes, sir.

Q To what extent have you made a study of the Basin Dakota Pool?

A Recoverable reserves were determined from the developed portions of the entire pool and the relationships of deliverability to recoverable reserves for initial and 1962 conditions were determined. Further determinations included the effects which the current formula and the proposed formula have on a well's share of the pool allowable in relation to its share of total pool recoverable reserves.

Q Will you define your meaning when referring to recoverable reserves?

A Yes, initial recoverable gas reserve is that volume of gas to be recovered over a period of time beginning when production is first initiated and ending at some future time corresponding to a minimum producing rate of income equivalent to operating costs.

Present recoverable reserve is that volume of gas that is defined as Initial Recoverable Gas Reserve less the volume of gas which has been produced to the present time.

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Q Do you have an exhibit setting forth these definitions of reserves and the method of computing the initial recoverable gas reserve?

A Yes, I do.

Q Directing your attention to what may be identified as Pubco's R-1, would you explain this exhibit to the Commission?

A On Exhibit R-1, which I have prepared, is a written definition of recoverable reserves as stated previously.

The method of calculating initial recoverable gas reserve is known as the Pore Volume, or volumetric method. Initial recoverable gas reserve was computed by equation One, as shown on Exhibit R-1. The initial recoverable gas reserve is equal to the original gas in place times a recovery efficiency factor.

The original gas in place is computed by equation Two. This is a standard volumetric formula. The original gas in place equals to area times pay thickness times rock porosity times the fraction of pore space occupied by the gas, expressed as 1 minus water saturation, to result in cubic feet of gas at original reservoir pressure and temperature. To express the reservoir gas in cubic feet at standard conditions, the gas volume at reservoir conditions is multiplied by the ratio of initial reservoir pressure to a base pressure of 15.025 psia times the ratio of base temperature of 60 degrees Fahrenheit or 520 degrees Rankin to reservoir temperature times the reciprocal of initial gas compressibility.

The recovery factor is computed by equation Three, which is

a simple gas law theory, which states that the difference between 100 percent of the original gas in place and the gas in place at final conditions is the percent of original gas that is to be recovered from the reservoir underlying the acreage for which the computation is made. The fraction of original gas remaining in the reservoir at abandonment is the ratio of abandonment pressure, corrected for gas compressibility at abandonment conditions to the initial pressure corrected for gas compressibility at initial conditions.

This recovery factor expresses the fraction of original gas in place to be recovered to abandonment when the producing rate of gas income is equivalent to operating costs.

Q Mr. Cleveland, is this a recognized method for computing gas reserves?

A Yes, sir, it is described in many reservoir engineering texts, one of which is Sylvain J Pirson Oil Reservoir Engineering, second edition 1958, pages 454 and 466; also in the Natural Gas Engineering handbook by Katz, and others.

MR. KELLAHIN: If the Commission please, I want to, on behalf of Southern Union Gas Company, interpose an objection to any testimony relating to gas reserves for individual wells, based upon this formula, for by its very definition shows that such testimony would be incompetent, in that it defines initial recoverable gas reserve as that volume of gas to be recovered over a period of time, beginning when production is first initiated and ending at

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some future time, corresponding to a minimum rate of producing income equivalent to operating cost. That has no bearing whatsoever on the statutory definition of the reserves which this Commission must determine in prorating gas in the Basin-Dakota Pool.

As it was stated in the Jalmat case, the basic findings which this Commission must make, must determine insofar as practicable the amount of recoverable gas under each producer's tract, and the relation of that amount of gas to the total amount of gas in the pool. Now, this definition on its face shows that it gives no consideration to the amount of gas under the tract dedicated to the well, but only to the amount of gas that that particular well would produce during its productive life, without regard to its source, or what particular tract or portion of the tract it came from.

MR. KELEHER: If the Commission please, later on we'll connect it up.

MR. PORTER: The Commission will reserve a ruling on the objection, and we'll determine whether or not the testimony is connected as Mr. Keleher suggested it will be.

Q (By Mr. Keleher) Now, Mr. Cleveland, will you briefly describe where and how you got the various pieces of data necessary to compute the reserves for the wells you studied using this method of computation?

A To compute the original gas in place the acres used for each well studied was determined by multiplying the Dakota gas

spacing unit of 320 acres by the acreage factor given in the January 1963 proration schedule.

Q Excuse me, but how many wells in this pool have acreage factors equivalent to a full 320 acre spacing unit?

A I found that there are 790 wells or about 90 percent out of a total of 767 wells shown on the January 1963 schedule which have acreage factors equivalent to 320 acres. Of those wells having acreage factors other than 320 acres, 47 wells or about 6.1 percent of the total wells had less than 320 acres, and 30 wells or about 3.9 percent of the wells were greater than 320 acres.

Q With 90 percent of the wells in the Basin Dakota having an acreage factor equivalent to an established spacing of one well per 320 acres, is it logical that acreage should have a significant relationship in this pool to the reserves under each well tract?

A No, sir. In my opinion, it is not logical in this case because acreage is nothing more than a constant factor characteristic of all wells except a few. If acreage varied for all wells, then it would be logical to give some weight to acreage in any proration formula wherein the intent is to allow a well to produce its fair share of the market corresponding to its share of reserves in the pool.

Since all wells in the Basin Dakota Gas Pool but a few have the same acreage factor, inequities in sharing the market and violation of correlative rights will persist increasingly as more

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weight is given acreage in a proration formula.

Q How did you determine the sand thickness, porosity, and gas saturation for the wells you studied?

A These values were furnished to me by our geological department who made a detailed study of each well using core and log information; and they plan to testify to this later on.

Q What is the basis for the pressure data used in your study?

A The initial surface pressure data was taken from data sheets as recorded with this Commission for each well. The gas compressibility was derived by standard procedures knowing the gas gravity and formation temperatures.

Q How about the pressure at abandonment conditions?

A The recovery factor as used in my study is a means of computing the volume of gas which is to be removed from the reservoir resulting in the reduction of original static pressure to some lower static pressure below which the reservoir is incapable of sustaining the delivery of enough gas to the well head to offset the expense of operating the well.

A study of Pubco's operating costs in the Basin Dakota indicated a yearly operating cost of $1130.00 per well, which is equivalent to the net income from 2/ MCF per day.

A study and projection of draw down characteristics in key wells across the field concluded that wells of higher deliverability had more favorable draw down characteristics than those wells having

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lower deliverabilities. That is to say that the higher deliverability well will have a lower static abandonment pressure at the economic flow rate of 27 MCF per day and an assumed flowing pressure, than a lower deliverability well will have at the same economic flow rate and flowing pressure.

Q Have you estimated the volume of present recoverable reserves from the developed portion of the entire pool?

A Yes, sir, I have estimated that the present recoverable reserves for the developed portion of the Basin Dakota Gas Pool represented by those wells shown in the January 1963 proration schedule to be about 2,791,638,000 million cubic feet.

Q How many wells did you compute the reserves on by the volumetric formula?

A Well, all wells were considered in our study, but the reserves were computed only on 382 wells, or about 50 percent of a total of 767 wells. The information required for computing the reserves on the other 385 wells was either not available, or was of unsatisfactory quality for computation of recoverable reserves.

Q Have you studied the relationship of deliverability to recoverable reserves?

A Yes, sir, I have. Mr. Kelehar, on one of your previous questions there, I might elaborate a little more on the determination of this total recoverable gas for the pool.

Q Go ahead.

A The reserves that were computed for the 382 wells, these

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reserves were plotted on a map. Iso lines were drawn through points of equal MCF per acre values. Now, from this map gridded values of MCF per acre were interpreted for those wells on which inadequate information was available. These values multiplied by the wells acreage factor times 320 acres resulted in the initial recoverable reserve by well. The total initial recoverable reserve less the production to November 1st, 1962, resulted in a present reserve estimate of 2,791,638,000 million cubic feet of gas for both marginal and non-marginal wells.

Q Have you studied the relationship of deliverability to recoverable reserves?

A Yes, sir, I have.

Q Do you have some exhibits which would demonstrate the relationship?

A Yes, sir, I do.

Q Can you number them?

A I have numbered them R-2 through R-8, and I will describe each exhibit as we go through them.

Q All right. Start in with 2, R-2.

A Exhibit R-2.

MR. KELLAHIN: I want to renew my objection, in that no sufficient foundation has been laid for any conclusions on the part of this witness, as to relationship between reserves and deliverability. In the first place, it's their definition for reserves, and not the Statute of the State of New Mexico; and in the second place,

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as pointed out in the Jalmat Case, the finding based on relationship between reserves and deliverability has no sufficient finding to support before this Commission.

MR. KELEHER: We can't get this witness to tell the whole story in one answer. As I promised the Commission, we will connect it up later on.

MR. PORTER: Mr. Kellahin, the Commission will defer ruling on this too, on the same basis.

MR. KELEHER: Mr. Kellahin has repeatedly referred to the Jalmat case, and it's our statement here that we are conforming exactly to the Jalmat case, and to the statutes.

MR. PORTER: You may proceed to examine your witness on the exhibits.

Q (By Mr. Keleher) Now, directing your attention to Exhibit 2, Mr. Cleveland, will you state what that exhibit may be?

A Yes, sir. I have Exhibit 2.

Q Will you state to the Commission what that is?

A Exhibit No. 2 is a plot of initial deliverability versus initial recoverable reserve, as previously defined, for 382 wells on which reserve values were computed. This plot represents an average relationship of deliverability to recoverable reserves. To facilitate the averaging process, wells were grouped according to reserve range of 0 to 1, 1 to 2, 2 to 3, billion cubic feet of initial recoverable reserve. Within a recoverable reserve range, each point represents an arithmetic average, deliverability

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per well versus an average recoverable reserve per well for those wells within a reserve range. The number of wells in each range is shown along the base of the graph.

Q Directing your attention to Exhibit 3, what does that purport to show?

A Exhibit Number R-3 was prepared on the basis of 1962 deliverability versus present recoverable reserve as of November 1st, 1962, for 357 wells having a non-marginal classification. The significance of Exhibits 2 and 3 is the fact that the two curves demonstrate a proportional relationship of deliverability to recoverable reserves. The more recent data bears out the evidence apparent from the initial data, and the proportionality of deliverability to recoverable reserve continues to hold true.

Q Do you have an Exhibit R-5?

A My next exhibit would be R-4.

Q R-4.

A Exhibit R-4 demonstrates that that similar average relationship holds true when using deliverability data as shown in the January 1963 proration schedule for the same wells. The deliverabilities in this case are primarily 1961 data with only 1962 data for those wells completed in 1962. Now, the purpose of this exhibit is to demonstrate again, the proportional relationship of deliverability to recoverable reserves and provide an additional foundation for supporting a study of the effects of various formulas on a wells share of the January 1963 market allowable,

compared to that wells share of the total pool's present reserve.

Q Can you present to the Commission, the results of the study to which you referred?

A Yes, sir. I have Exhibits 5, 6, 7, and 8.

Q Referring to Exhibit R-5, state what that is.

A Exhibit Number R-5 demonstrates a gas well's share of present pool allowable, compared to its share of the present developed recoverable pool reserves under the current formula of 75 percent acreage times deliverability, plus 25 percent acreage. On the vertical scale is the share of pool non-marginal allowable per well as the percent of total pool allowable. While on the horizontal scale is the share of pool reserves per well, as a percent of total developed pool reserves.

To protect correlative rights and prevent drainage between producing tracts, the ideal allowable reserve relationship would be the line as shown in red on this Exhibit R-5. For example, a well having a 4/10ths percent of the total developed pool reserves should have 4/10ths percent of the total allowable. Based on 356 wells, and the allowable for the same 356 wells as shown in the January, 1963, proration schedule, the effect of the current 75-25 formula is compared to the ideal line. Under the existing formula as well reserves increase they have a lesser share of the existing market as compared to what they should be getting under the ideal formula.

Now, Exhibit Number 6 was constructed similarly to the Exhibi

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Number 5. Again, the red ideal allowable reserve line is shown. Exhibit Number 6 was constructed similarly to Exhibit Number 5, and it compares the effects of the proposed 40-60 formula to the ideal relationship. Now, it should be noted under the 40-60 formula, as reserves increased those wells with higher reserves will receive even a lesser share of the market than they would have received under the ideal or current formula.

Exhibit Number R-7 demonstrates the effect of an allowable based on 100 percent acreage. It is apparent under 100 percent acreage that there is no change in the allowable per well, although there is a variation in reserves per well. Despite the fact that there is a marked difference in recoverable reserves per well, each well would receive the same allowable under a hundred percent acreage.

Now, Exhibit Number 8 is a summation value of these curves, and it demonstrates the effects on a well's share of the present pool allowable compared to its share of present developed pool reserves for the ideal allowable reserve relationship, which is this red line, the 75-25 formula, green line, the proposed 40-60 formula which is the orange line, and 100 percent acreage which is shown as the yellow line.

It is apparent that as more weight is given to acreage in a proration formula, the allowable per well progresses further from an ideal allowable, corresponding to the wells proportionate share of the pool reserves. The 75-25 formula more closely approximates

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the equitable allowable reserve relationship than does the proposed formula of 40-60.

Q Can you, at this time, Mr. Cleveland, briefly summarize your testimony?

A In so far as is practicable, reserves have been determined for the developed portion of the Basin Dakota Pool. It has been demonstrated that deliverability is proportional to recoverable reserves, and the same relationship has held true from the initial conditions to the present. Because deliverability is proportional to recoverable reserves, the most equitable formula for prorating the available market between wells is to incorporate maximum weight to deliverability. That is, the most equitable formula would be 100 percent deliverability. Any change in the current proration formula should be to increase the weight of the deliverability factor.

Now, most certainly the change requested by Consolidated, in my opinion, would be an unprecedented disturbance of long established equities in the field and a violent assault upon correlative rights.

MR. KELLAHIN: At this time, we would like to offer in evidence, our Pubco's exhibits K-1 through K-6.

MR. STOCKMAN: Excuse me, may I interrupt long enough to see if I do have a set of exhibits, and to find out which one is which.

A Mr. Stockman, the first exhibit, K-1 was the Definition

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and Volumetric Formula; R-2 was the Initial Deliverability Curve; R-3 was the 1962 Deliverability Curve; R-4 is the Deliverability for the January 1963 Proration Schedule; R-5 was the Gas Well's Share of Present Pool for 75-25; R-6 was the 40-60 Formula; and the next one was the Acreage Formula, and finally was the Summary.

MR. KELLAHIN: If the Commission please, I would like to renew my objection previously stated, and I would like to add to it, that it would be impossible for us to Cross-Examine this witness on the basis of his definition of reserves, since it has no bearing to the reserves that this Commission must consider before it makes any proration order. His entire testimony is based upon the assumption that the area of drainage of a well constitutes the reserves dedicated to that well, which is obviously wrong. It also assumes that deliverability is in direct proportion to reserves, which has not been established by this witness. And, particularly since we are talking about reserves which are defined without regard to the Statute, I feel we can't even Cross-Examine the witness.

We object to the witness' exhibits, and move that his testimony be stricken from the record.

MR. HOWELL: If it please the Commission, Ben Howell for El Paso. I would like to correct, if I may, Mr. Kellahin's statement there, with reference to both the Statute and the decision of the Court. It is the recoverable gas reserves which are to be found, they are necessary. As I understand this witness' testimony, he has attempted to determine the recoverable gas

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reserves, and I certainly heard nothing in his testimony to justify Mr. Kellahin's statement that the testimony that he's offered has been a determination of reserves based upon the amount that any one well would drain. I find nothing to that effect, and I certainly think that the objection does not state what the testimony actually was.

MR. KELLAHIN: May I point out, if the Commission please, that is inherent in his definition of reserves; it has no connection to the tract dedicated to the well, and that's what the Statute says, and that's what the Jalmat case says. We are in the same identical argument we were in the Jalmat case; we are talking about two different kinds of reserves. We are not talking about here in his testimony, the kind of reserves the Statute says the Commission was considering.

MR. KELLAHER: In the Jalmat case, if the Commission please, Page 6, third paragraph on page 6, the Court found that the Commission had failed to make a finding as to the amounts of recoverable gas in the pool, or under the various tracts, and the amount of gas that would be practicably obtained without waste. It was the opinion of the Supreme Court, the Commission should have returned findings that correlative rights were not being protected under the old formula or being better protected under the new formula, insofar as practicable.

As I see it, the Commission would not have been reversed had they estimated reserves on the wells in the Jalmat Pool, and

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related those recoverable reserves to deliverability, insofar as practicable. And that is exactly what this witness and petroleum engineer has endeavored to do.

It's unfortunate that Mr. Kellahin has reached the position where he is unable to Cross-Examine this witness. It's unfortunate that this witness has not testified to what they might like him to testify to. He's here, he's ready for Cross-Examination, and perhaps Mr. Kellahin can elicit from him the methods he used, what he means, and otherwise disect his testimony to the best of his ability. We contend this comes squarely in the ruling of the Jalmat case, and is exactly in accordance with the Statute.

MR. KELLAHIN: Mr. Keleher has seen fit to open the Jalmat case in part. I would like to read the entire quote from 375 Pacific Second. I'm quoting, starting at the bottom of page 814, it says:

"Therefore, the Commission by basingconclusions of fact, or what might be determined findings, must determine insofar as practicable, the amount of recoverable gas under each producer's tract, the total amount of recoverable gas in the pool, the proportion that 1 bears to 2, and what proportion of the arrived at proportion can be recovered without waste."

Now, without some testimony in the record as to what each tract's reserves are, we have no testimony before the Commission.

MR. STOCKMAR: Do I understand that the witness will be ready for Cross-examination after ruling on these exhibits?

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MR. KELEHER: Yes, sir.

MR. PORTER: That's my understanding.

MR. STOCKMAR: I would certainly like to strongly support Mr. Kellahin's statement. I find nothing in any of these exhibits which gives us the reserves for any particular tract, which gives us the reserves for the total pool, or which gives us any ratio of one to the other. Now, if they are being offered for this purpose, we do strenuously object.

MR. KELEHER: We offer them in evidence, and submit that the witness is ready for Cross-Examination.

Mr. Chairman, I would like to say this, that reference to Pubco's Exhibits 1 and 2 fully demonstrate the method and indicate that comes exactly within the Jalmat case, 1 and 2. In addition to that we have, by the next witness we will show the reserve map and reserves on our map, the exhibit which we have prepared, by Mr. Gorham.

MR. PORTER: The Commission will overrule the objection, and will consider the testimony, admit the exhibits, and give it whatever weight the Commission feels it is due.

MR. KELEHER: Exhibits R-1 through R-8 will be admitted subject to that condition?

MR. PORTER: They will be admitted in the record.

MR. KELEHER: You may have the witness for Cross-Examination.

MR. PORTER: Does anyone have a question of Mr. Cleveland?

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Mr. Stockmar.

CROSS-EXAMINATION

BY MR. STOCKMAR:

Q Mr. Cleveland, is there any place on any of Exhibits R-1 through R-8 where you have set forth the recoverable reserves under any specific 320-acre tract in the field, and if so, identify it.

A No, sir, I haven't.

Q Is there any place on any of these eight exhibits where you have set forth the recoverable reserves for the entire field?

A I have set forth on, starting with Exhibit R-5, the total developed pool reserves which correspond to reserves under the total non-marginal wells in the pool, as shown by the January 1963 proration schedule. And in this case, I'm working only with non-marginal reserves, and non-marginal deliverabilities. This was the basis on which I based my study.

Q Nowhere then is there set forth the total recoverable reserves on all the, on the entire pool, on these exhibits?

A No, not other than -- nowhere, except in my testimony, I--

Q No, I'm speaking only of the exhibits.

A Yes.

Q Is there any place on any of these eight exhibits where you have set forth the ratio between the recoverable reserves under any tract, and the recoverable reserves from the entire pool?

A No.

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Q No?

A No.

Q We may look at Exhibit R-2 for a moment; I was not able to hear how you had averaged these various wells. Would you tell me again how that was done?

A The wells were grouped according to reserve range, from zero to one billion, to two billion, and so forth, cubic feet; and after grouping the wells in this manner, then an arithmetic average of those wells reserves was determined, and correspondingly the arithmetic average deliverability was determined.

Q Is this the same procedure that you used last time, in April, when you referred to 33 wells?

A Yes, that is correct.

Q Is this the same procedure that the witness Rainey used with respect to his exhibits covering 460 wells?

A I understand that that would be correct.

Q Would you identify for me, this single well on Exhibit R-2 which shows a reserve of sixteen and one-half million MCF.

A I could identify it by digging back through my work sheets--

Q Do you have those with you?

A --which would take some time. Yes.

Q Please do, if you will.

A [illegible]

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Q Yes, sir.

A --which point were you asking for?

Q On your Exhibit R-1, you show a one well point which has a 16-plus million reserve.

A Okay.

Q I would like the identification of that well, please.

MR. PORTER: Is that Exhibit R-1?

MR. STOCKMAR: Excuse me. R-2, I'm sorry.

A Mr. Stockmar, that particular well is the Southern Union Production Company's Newlander Federal Number 1, located in Unit J, Section 31, Township 20, 11.

Q (By Mr. Stockmar) Thank you, Mr. Cleveland. Did I understand you to say, with respect to determination of reserves, that acreage is not a material factor in determining reserves?

A I said it's not a material factor insofar as making a distinction from well to well, in allocating the market between wells. Acreage is an important value in the determination of reserves, when calculating by the volumetric method, which I have demonstrated here. There happens to be only about ten percent of the wells in the pool that have acreage factors, either more or less than 320-acres per well.

Q In such determinations as you may have made, did you use the particular acreage factor in the formula, the particular acreage factor for that particular well?

A Well, in that case, the acreage factor was one, it was

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320-acres.

Q Did you always assume that the well would drain its 320 and no more and no less, is that correct?

A Well, that's correct, because the spacing distribution out here is on 320-acres.

MR. STOCKMAR: Thank you, Mr. Cleveland.

MR. PORTER: Anyone else have a question? Mr. Kellahin.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q Mr. Cleveland, your exhibits are based on initial deliverability and initial recoverable reserves, and present recoverable reserves and present deliverability, that is correct, is it not?

A Maybe you better run through that again.

Q Well, referring to your Exhibit Number 2, which you are talking about initial recoverable reserves.

A That is correct; initial recoverable reserves.

Q How do you calculate the initial recoverable reserves for the wells shown on this exhibit?

A I calculated those reserves by following this, or using this volumetric formula as demonstrated on Exhibit Number 1.

Q Now, that formula gives no consideration to the tract to which the well is dedicated, does it?

A Well, the tract designation would come in the acreage factor, or the amount of acreage that you use in the formula for

each tract.

Q But in your definition of initial recoverable reserves, you ignore that factor.

A No. I beg to disagree with you. In equation Number 2, you have--

Q But I'm talking about your definition under 1-A.

A Well, initial recoverable gas reserve can apply to the entire field, as well as one tract.

Q Is that what you are talking about in that definition, the entire field?

A I'm talking about that, regardless of whether it is a tract or the entire pool, which is initial recoverable gas reserve. Then the definition would apply to either a tract, pool, groups of wells, or any number of wells.

Q Well, if you are talking about tracts, you would have to put an acreage factor into it, of course?

A Well, the initial, the broad definition of initial recoverable gas reserve was made under the definition of reserves there on Exhibit Number 1. Then, I proceed in part two, to explain the volumetric formula for calculating initial recoverable gas reserve, and what the initial recoverable gas reserve is, and I proceed then with the formula. Now, in equation Number 2, I have included there, acres, that is included in that formula.

Q You treated that as being uniform throughout the pool, in this case?

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A No, I did not; for each well, depending upon its acreage factor.

Q You used the AD factor, is that correct?

A I used the acreage factor that was shown in the 1963 proration schedule. If the acreage factor was 1, then I used 320-acres; if it was less than 1, then I multiply that acreage factor times 320 acres, and that was the acreage I assigned as being in place, or the acreage under which I would compute the initial recoverable gas reserves.

Q Now, in your formula, you use a cubic feet per acre foot factor; that would have to relate to your 320-acres, wouldn't it?

A I beg your pardon?

Q Well, you use, do you use a cubic foot per acre factor in the formula?

A Well, yes. The 43,560, which is a constant of square feet per acre, times thickness, give you volume of cubic feet per acre.

Q How did you determine your thickness throughout this study?

A Well, the thickness was determined for all of these wells by our geological department, who furnished me these data.

Q On what did they base that study, do you know?

A Well, they will be coming on next, to give testimony to that, if you would like to wait. I'm aware of how they did do

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it, but I think they are more qualified to testify on it.

Q Now, as I understand you, you used 382 wells because you did not have the data on the rest of the wells, is that correct?

A We did not have what we would consider adequate data in order to calculate.

Q So, then you plotted them on an Iso map, similar to Exhibit Number 3 offered by--

A That's right.

Q --is that right. Now, did you make the determination that the information wasn't available, or did someone else make that determination?

A No, sir, someone else made that determination.

Q And that will be the witness who is going to be offered?

A That is correct. All logs and material like that, was available in our geological department; it was either available, or not available.

Q Now, referring to your Exhibit Number 2, for example, you have a point located here with 57 wells. What was the range of deliverabilities included in that point?

A Well, this would require my going back to my work sheets again.

Q If you would.

A Now, you are asking for the point that shows 57 wells?

Q You can take any one of those points, 63, 44, any of them along there, you can give me the range of deliverabilities.

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A Okay. Well, that second grouping there, if you please, of 59 wells--

Q Yes.

A --is that okay?

Q Yes, sir, that's fine.

A Mr. Kellahin, it would appear that that range would be from 204 to about 975, unless I have--

Q 204 to 975?

A Yes.

Q Is all of this based on work sheets that you have with you, Mr. Cleveland?

A All of what?

Q All of your work on the--

A Yes, all of my work, that is represented by these exhibits, is in work-sheet form.

Q Could you make those work-sheets available to us for comparison with your exhibits?

A Certainly may.

MR. KEIFER: I object to it, unless it's on a specific well basis. Why should we turn over all our sheets to them? They have got sheets of their own. If it please the Commission, we object to any fishing expedition like that, to using the same technique that was used in the original hearing, using our maps and our papers to build up their case.

MR. KELLAHIN: If the Commission please, I think we have

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a right to examine the underlying data on which these exhibits were based; the information has not been offered here. We can go through and ask him well by well, if the Commission sees fit.

MR. KELEHER: We prefer it that way, to ask him well by well; that will be fine.

MR. PORTER: Mr. Kellahin, to be clear on your request here, is it your request that he furnish you the work-sheets so that you can go through the work sheets to establish the facts concerning these wells on Exhibit 2, or his other exhibits, one by one?

MR. STOCKMAR: Mr. Kellahin and I have been conferring on this. What we would like to have is the identification of each of these 382 wells that appears on Exhibit R-2, the initial deliverability attributable to each, and the initial recoverable reserves attributable to each. Now, we are extremely reluctant to burden the Commission with this type of well by well situation; we are perfectly glad to do the work on our own time from these data sheets. But if we must have, to support, to get at the basic data underlying R-2, well, we are prepared to have Mr. Cleveland do it well by well.

MR. KELLAHIN: Well, we think the request is most unreasonable, but if they want to ask this witness well by well, to produce the core analyses on 382 wells, well, we can bring it all here tomorrow and it will take at least a week.

MR. STOCKMAR: No, I have not asked for that, as I am

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sure the Commission appreciates.

MR. KELLAHER: Well, we decline to do what they asked us to do before. We furnished them before, with all of our maps, all our computations, and overnight they came back here the next day with a set of figures, to say that we were all wrong. They did that same thing with El Paso's exhibits. Now, we object to that method of procedure. They have had months to prepare this case.

MR. STOCKMAN: So there is no difference of opinion, that is precisely why we are asking for it.

MR. KELLAHER: You want to build up a case?

MR. STOCKMAN: Same type of data, same matter, subject to the same defects, but we must have the underlying data to demonstrate the error.

MR. KELLAHER: We specifically ask the Commission not to grant that request. If they want to ask him in open court here, well by well, one by one, it will take at least a week, but that's all right. But to furnish our papers, they have no more right to ask us for our papers, than we have to ask them for their papers.

MR. PORTER: Mr. Kellahin--

MR. KELLAHIN: By our next witness, Mr. Gorham, we will submit two maps showing all of the 690 deliverabilities listed in the pool, and individual tract reserves under the 382 wells that this witness has testified to.

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MR. PORTER: Mr. Kellahin, do you think that your question might be resolved by the next witness--

MR. KELLAHIN: Very well could be, yes, sir.

MR. PORTER: -- if he does give the deliverabilities and the reserves, individually?

MR. KELLAHIN: Well, as I understand the exhibits, however, Mr. Porter, they are based on more than 382 wells.

MR. KELLAHIN: Three hundred and eighty-two.

MR. KELLAHIN: And they are proposing to offer the figures on 382 wells, whereas, their calculations are based on all the wells in the pool, or am I wrong?

A I beg your pardon there. The reserves were computed for 382 wells, as I stated previously. Now, to determine, or estimate the total reserves for the entire developed portion of the pool, the reserves for those 382 wells were placed on a map and iso lines were drawn through points of equal MCF per acre recoverable reserves, so that we had an iso MCF per acre map, and that map was gridded for those wells, or for those tracts that we did not make the exact computation. And reserve was determined from this iso map. The total of those wells reserves, plus the reserves from the 382 wells that we actually made the computation, gave me the total reserves for the entire developed portion of the pool.

MR. STOCKMAN: Well, is it clear, Mr. Cleveland, that the exhibit coming up will identify the location, the name of each

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well, or some means that could be located?

A It will identify the location.

MR. STOCKMAR: And the initial deliverability?

A The initial deliverability will be shown.

MR. STOCKMAR: And the initial reserves as calculated, or controvert?

A That is correct.

MR. STOCKMAR: I would like to suggest we proceed with the next witness, but reserve the right to Cross-Examine Mr. Cleveland further, after this evidence is made available to us.

If the Commission please, we are volunteering to do this kind of thing, so that we have this available, so that we can work on it, I would assume that we would be at least given this map so that we could look at it tonight, should we adjourn before it is introduced in evidence?

MR. KELLAHER: Oh, I don't think so. As I say, that's the same technique they used before. We haven't asked for any of their papers in advance, or anything of that sort.

MR. WALKER: Off the record.

(Discussion off the record.)

MR. PORTER: Does anyone else have a question of this particular witness?

MR. KELLAHIN: I haven't completed my Cross-Examination. If the Commission please, we got off on this when I asked him for these figures, when he testified to them. I would like to complete

my Cross-Examination.

MR. PORTER: In other words, if this information is available--

MR. KELLAHIN: No, I would like to go ahead now, with further questions, on other matters.

MR. PORTER: But you would also like to Cross-Examine this witness after the reserve picture by tracts is given?

MR. KELLAHIN: Perhaps, but I'm not taking any position on that at the moment. What I want to do is complete my Cross-Examination now.

MR. PORTER: Well, go ahead, Mr. Kellahin.

Q (By Mr. Kellahin) Now, Mr. Cleveland, referring again to your Exhibit Number 2, you have points at the lower range of initial, that related to initial deliverabilities, the larger number of wells in the pool are at the lower range of deliverability, that is correct, is it not?

A Well, the wells in which we had adequate information, we found to be grouped in the lower range.

Q And yet you give the same weight, insofar as your curve is concerned, to one well which you identify as a Southern Union Production Company well, Federal Number 1, I believe, Newlander Number 1, that is accorded the same weight as 57 wells, and 59 wells, and 44 wells, in the lower range of your curve?

A Well, of course, this is my opinion, if we had more wells, or had wells in which we had adequate information to

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calculate reserves, this well would probably represent an average well for that group, and this is why I plotted it on this graph.

Q Now, do you have any core information on that well?

A I wouldn't know offhand.

Q Well, did you calculate the reserves on that well?

A Yes.

Q How did you calculate those reserves?

A You want the factors used?

Q Yes, sir, on that particular well.

A All right. The acreage factor was 1 in this case, and equivalent to 320 acres. The average porosity, that was supplied to me, and I don't have it noted as to whether that is core porosity or sonic porosity or a log porosity, but the average porosity was ten and a half percent. The water saturation was computed as 16 percent. The net pay thickness, 87 feet. The initial reservoir pressure, 2,335 pounds. The abandonment pressure of 140 pounds. The reservoir temperature, 142 degrees Fahrenheit. Specific gravity of the gas, 7/10ths. And these factors were used in the volumetric formula on Exhibit Number 1, to compute initial recoverable reserve of 16,677,44[illegible] MCF.

Q Would you give me that last figure again, please?

A 16,677,44[illegible] MCF.

Q Now, you used an abandonment pressure of 140 pounds. How did you determine that? I believe you covered that in your testimony, but I would like to go back over it again.

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A Mr. Kellahin, I made a study of key wells over the field, made a study of their flow characteristics, and related these flow characteristics to an economic rate of flow. In other words, it would be a drawdown characteristic that could be correlated to the ability of the well to flow, and at the economic flow rate of 27 MCF per day. Then, at that point, assuming that the flowing pressure would be approximately 120 pounds, then I computed the abandonment pressure.

Q Was the abandonment pressure uniform?

A I beg your pardon?

Q Was the abandonment pressure thus calculated, uniform for the pool?

A Well, it seemed to be only uniform for those groups of wells that would fall into a high deliverability class, as compared to, and would be different from those wells that would fall into the low deliverability class. Now, most of the high deliverability wells would indicate that they would have this lower abandonment pressure, as compared to varying higher static abandonment pressures in the lower deliverability wells.

Q Now, what factors enter into the flow characteristics of a well?

A In this case, it was taking the surface pressures as reported on the deliverability sheets to this Commission by the operators, and plotting the static shut-in pressure squared, less the flowing pressure; or, P sub a squared on a log scale,

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versus flow rate from the well on a log scale. An extrapolation of points plotted in this manner was extrapolated to 27 MCF per day flow rate.

Q Now, that is based largely on the permeability of the zones in which this well is drilled, isn't it?

A That's right. This method would take into account indirectly, the permeability or the flow capacity of the formation from which this well is producing.

Q And that has no relation to the acreage dedicated to the well, does it?

A This has a relation to the ability of this formation to give up gas in economic flow rates.

Q I'm relating it to the 320 acres under the tract dedicated to the well, Mr. Cleveland. Does permeability have any relationship to that factor?

A The permeability, or the flow capacity of this formation into this well bore of this gas that is deposited under the 320 acres, this permeability does control the ability of this well to produce that gas in economic rates of flow, in economic amounts of gas.

Q Now, the same factor of permeability determines whether the well will drain 160 or 640 acres, does it not?

A That is correct; but in this field where you have approximately 90 percent of the wells that are completed, or developed on 320-acres, it's reasonable to understand that you have

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counter-drainage by offsetting wells, which are also developed on 320-acre spacing.

Q Well, now, Mr. Cleveland, are the permeabilities uniform throughout this pool?

A I would say that they vary all over the place.

Q And a well with high deliverability and good permeability, will drain a larger area than one with low permeability, would it not?

A Well, I would say that you could drain the gas attributable to that well under its 320-acres, more easily than you can for a well that has a lot lower deliverability.

Q That drainage is not going to stop at 320 necessarily, is it?

A Well, you are protected by counter-drainage by offset wells that are completed on 320-acres, so it should.

Q Doesn't your answer assume that the permeabilities of both wells are the same?

A Well, if a well, if a low deliverability well, which would indicate low permeability at the well bore, if it is unable to produce that gas through that well bore, another well offsetting it which might have a higher deliverability, has very little chance of draining that gas from that well.

Q That assumes that the permeability is uniform throughout the tract, doesn't it?

A No, this would assume that -- I'm saying that if the

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permeability under the low deliverability tract is smaller than the permeability under the tract having a higher deliverability.

Q Well, isn't the ability of the well to give up gas really a function of time, and not a matter relating to the reserves in place on the well?

A You could produce those wells indefinitely, and you could eventually reduce the pressure to the abandonment pressure of a high deliverability well. But, in my study I have defined what I mean by initial recoverable reserve, and to me this is what has some significance.

Q Well, your initial recoverable reserves is not the reserves under a 320-acre tract though, is it?

A Well, it's computed for a 320-acre tract, or whatever acreage--

Q Well--

A --is in the tract.

Q --to get back to your abandonment formula, what's the P sub a again, in that formula, how did you arrive at it?

A Well, I have already explained to you, Mr. Kellahin, the study that I made of the flow characteristics of the key wells across the field, by studying the flow characteristics of these wells and relating this to the ability of the well to flow, taking this in with an economic rate of flow.

Q Well, that only relates to the rate, doesn't it? Just the rate of flow, has nothing to do with the reserves, does it?

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A Well, this is the ability of the well to flow. And at this abandonment pressure, or this P sub a, as you referred to, it's at that point that well will have a static bottom-hole pressure, or a static pressure that below which this, the reservoir under this well is incapable of yielding economic flow rates of gas. And this economic rate is 27 MCF, as I defined before.

Q Now, we have already agreed, I believe, that this is a function of permeability, to a large extent; at least, permeability affects the rate of flow, of course.

A That is correct.

Q And is permeability a factor used in determining reserves in place?

A Well, for this volumetric method that I have used here, the permeability has been indirectly considered. I think it has to be considered in a volumetric estimate of recoverable gas, and it has been considered through the use of this abandonment pressure that was estimated to be equivalent to the reservoir condition at which time the reservoir cannot yield more than 27 MCF per day.

Q But, there again, do we come back to the point, Mr. Cleveland, that that relates directly to the area being drained by the well, and not to the tract dedicated to the well, insofar as the reserves are concerned?

A Well, there again, as I have stated before, Mr. Kellahin, you are protected by counter-drainage. With your field being developed on 320-acre spacing, and if the well across the lease

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line from you, from a high deliverability well, has poor drawdown characteristics, indicating a low permeability, and if you can't produce that gas through that well bore, the well offsetting it has very little chance of getting that gas.

Q Mr. Cleveland, you can produce it, given time enough, can't you?

A If you wanted to produce it out a thousand years, if you wanted to attempt to stay in business that long, you could get this--

Q We don't have to talk about a thousand years in this pool, do we? We can talk about another ten years, or fifteen, can't you?

A I don't know. I would suspect that it could be quite a bit longer, but I would have no way to make--

Q How many wells did you determine your characteristics on?

A I made a study of about 42 wells, that were scattered throughout the field.

Q And how many points did you have on each well?

A I set out to determine it, to make this determination on those wells that had at least three points.

Q At least three.

A In other words, anything below that was, oh, I didn't feel I could make a reliable prediction on.

MR. KELLAHIN: Thank you, Mr. Cleveland.

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MR. PORTER: The hearing will recess.

MR. KELEHER: May I ask the witness two questions, please, and I think we can excuse him.

MR. PORTER: Two questions, Mr. Keleher, all right.

MR. KELEHER: Thank you, Mr. Chairman.

REDIRECT EXAMINATION

BY MR. KELEHER:

Q Mr. Cleveland, going back to the "A, B, C" of this, without permeability, does any well have any recoverable reserves?

A No, sir. It would not. It's necessary for that well to have permeability before it can have recoverable reserves.

Q Therefore, permeability must be considered in estimating recoverable reserves?

A I feel that it has to be considered, Mr. Keleher.

MR. KELEHER: That's all. I kept my word.

MR. PORTER: Thank you. The hearing will recess until 8:30 in the morning. Remember, that's 8:30, instead of 9:00 o'clock.

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MORNING SESSION
FRIDAY, FEBRUARY 15, 1963 -- 8:30 A.M.

MR. PORTER: The hearing will come to order, please. Mr. Cleveland, will you take the stand, please?

Mr. Kellahin, were you through with your Cross-Examination?

MR. KELLAHIN: Yes, Mr. Porter, thank you.

MR. PORTER: Does anyone else have a question of this witness?

MR. HOWELL: Ben Howell, El Paso Natural Gas.

MR. PORTER: Mr. Howell.

CROSS-EXAMINATION

BY MR. HOWELL:

Q Mr. Cleveland, will you refer, please, to your Exhibits R-2, R-3, and R-4.

A R-2, R-3, and R-4?

Q Yes, Mr. Cleveland.

A All right.

Q Now, you have plotted on a graph, points which you have marked a number of wells represented by each point on R-2. I believe the first point says 44. There seems to be some confusion about the manner in which the reserves were calculated. Do I understand correctly that in determining the reserves, you allocated to each of those wells the acreage which is allocated to it under the State Rules?

A Yes, sir, that's absolutely correct; it's the tract

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acreage.

Q And as to each point that appears on this graph, you have, in determining the reserves for the well, limited those reserves to the acreage attributable to that well?

A That's correct.

Q So that possibly your exhibit might more accurately be entitled, the reserves for tracts attributable to 382 wells?

A That's correct.

Q And is the same thing true as to your Exhibit Number R-3?

A Yes, sir, it is.

Q And as to R-4?

A That's correct.

Q So my understanding is correct then, that each of these exhibits uses a reserve figure for the well that is actually the reserves for the tract upon which the well is located?

A That's correct, Mr. Howell.

Q I believe that may clear up some misunderstanding that seemed to exist here yesterday. Now, Mr. Cleveland, I notice that you have on your Exhibit R-2, you have plotted points, your second point, for example, is 59 wells; do I correctly understand that those, that the average as shown, the average reserve for the tract upon which the well is located for those 59 wells, is approximately three-quarters of a billion cubic feet?

A For the second point there, the average would be

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slightly less than one and a half.

Q One and a half. I beg your pardon. For the first point then, the 44 wells, the average is approximately a half billion, for the second point the average is approximately a billion and a half as to reserves, for the third point it's approximately two and a half billion, is that correct?

A Yes, sir, that's right.

Q Now, I believe that the testimony shows in this case, that estimating reserves is an estimate which is subject to error, and subject to constant corrections as more factors become known, more information becomes available, is that correct?

A That's right, Mr. Howell.

Q Now, would the possible errors, in just making estimates, in your opinion, exceed any error resulting from grouping in one group, say, these 57 wells whose reserves lie between two billion and three billion?

A Yes, sir, I think the possibility does exist; and the averaging method that we have used here, I would feel would tend to normalize the possible large area that you might have on an individual well basis, by grouping these and by taking an overall average of all wells, that you have a tendency to normalize this amount of error to a minimum.

Q And in your opinion, is this two and a half billion for these 57 wells, a reasonably good figure of reserves?

A I would think that it would represent a good reasonable

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average reserve.

Q And the error that any individual in calculating the reserves attributable to the tract upon which any one of these wells was situated, might be greater in magnitude than the difference between two and a half billion, which is the average point, and the estimate that was assigned to it?

A I would say that that is a good assumption.

MR. HOWELL: Thank you, Mr. Cleveland.

MR. PORTER: Mr. Stockmar.

CROSS-EXAMINATION

BY MR. STOCKMAR:

Q If the Commission please -- Mr. Cleveland, would the same thing be true as to deliverabilities as you have averaged for these wells?

A You have a variation in deliverabilities, and I would feel that the same thing would apply for the deliverabilities.

Q That is, that the average of all of the wells in the particular group is within the range of accuracy of measuring deliverabilities in the first place, is that what you are saying?

A Well, certainly over the field you have some wells in the measurement of the deliverability that perhaps you have a large margin of error. Now, I don't know what magnitude this might be, but I would suspect you would find this error to be on the anomalous wells in the field.

Q But if you take all the wells in any particular reserve

grouping as you have done, and average their deliverability, the variation between the measured deliverability and that average is within the range of accuracy of determining the deliverability, is that your statement?

A I would think so.

Q Do you still have your work sheets with you, Mr. Cleveland? I would like to know the ranges of deliverability for the first group of 44 wells.

Mr. Cleveland, I will also wish to know the range for the second group of 59, and the third group of 57, if that will aid in speeding up the hearing, as you go through here.

A You want a minimum and maximum, is that in your range, is that it?

Q Yes, sir.

A It would appear, Mr. Stockmar, that on the basis of my tabulation here, that the minimum and maximum, unless I have overlooked something here, from zero to one billion was for a well that had 29 MCF per day deliverability, up to about 900; and on the one billion to two billion, it was about 200 to a thousand; and on the two to three billion, it was 138 to 1400. Now, in the minimum ranges here, there were--

MR. UTZ: What was the last one, two to three billion? Isn't that a little different than the figure you gave us yesterday?

A Beg your pardon?

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MR. UTZ: Isn't that a little different than the figure you gave us yesterday?

A Well, it was 139 to 1400; I don't know, in looking through here yesterday--

MR. UTZ: That was from two to three?

A Two to three.

MR. STOCKMAR: I think that's all the questions I have.

MR. PORTER: Anyone else have a question? Mr. Utz.

CROSS-EXAMINATION

BY MR. UTZ:

Q Mr. Cleveland, I would like to clarify your method of determining your abandonment pressure. As I understood yesterday, you plotted the difference of squares between P sub a and P sub w, against the rate of flow, is that correct?

A That's correct.

Q And how did you establish the slope of that curve?

A Well, the slope of that curve, Mr. Utz, was established by those three points that I had.

Q You had three different pressure and flow points--

A That's correct.

Q --to plot. Then that established your slope, and you followed the slope down to 27 MCF per day, was it?

A That's correct.

Q And then calculated your abandonment pressure, or

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reservoir pressure at that particular point?

A That's correct.

Q Now, how did you arrive at your P sub w, at that point?

A Well, the P sub w at that point was assumed in all cases to be approximately 120 pounds.

Q You just used an arbitrary figure, 120 pounds?

A That's correct.

Q Now, that gave you considerable variances, did it not, in your abandonment pressure, as between tracts?

A It did. Well, I should say it did not for the larger wells, for the larger deliverability wells. For the lower deliverability wells, there was a considerable variation in abandonment pressure, static abandonment pressure that would result.

Q Do you have at hand there some of the ranges of abandonment pressures, that you could give us? In other words, let's take -- Well, what was the range of abandonment pressures for the 382 wells? Can you get that without too much trouble? When you find your minimum or maximum abandonment pressures, I would also be interested in the deliverability of the well.

A Mr. Utz, it would appear that the maximum abandonment pressure would be 1560 pounds of this group of 382 wells, and the deliverability was 27 MCF per day. The minimum pressure was about 140 pounds. It would appear that for most of the wells having

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deliverabilities above 2,000 MCF, approximately, well, then, the abandonment pressure would be about 140 pounds. One particular case here of 140 pounds for a well that had a deliverability of 4,937. Now, it would appear that the minimum deliverability would be for 140 pounds, abandonment pressure would be in the neighborhood of 2,000.

Q So that your abandonment pressures were substantially higher for your smaller wells?

A That's correct.

Q Which would tend, of course, to make the reserves much smaller on the smaller wells?

A Well, that's right. You can just only -- an operator can only take a well so far, and still operate at a profit. And although these pressures would represent static abandonment pressures, if you would allow the well to be shut-in long enough, it would achieve this abandonment pressure, but as soon as you open that well, then it would drop off immediately to such a level that the reservoir at the well bore would not yield an economic rate of flow.

Q So that on the smaller well, with an abandonment pressure of 1560 pounds, the initial pressure was something around 2,000, wasn't it? You only get about 25 percent of your reserves out of that well, reserves in place, that you would consider to be producible?

A Well, that's probably about right, yes.

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Q Referring to your Exhibit Number R-2, you gave some ranges of deliverabilities for about three groups. I believe your first group had 44 wells, the next group 59, the next group 57. I wonder if you could readily tell me what the range of reserves, calculated reserves was in those groups?

A In all three of those ranges?

Q Well, if it is not too much trouble, and not going to take too much time.

A Mr. Utz, I'm sorry it took so much time here, but for that first group, it would appear that the reserve range would be 300,000 MCF to about 742,000 MCF; for the second group, about one million MCF to 1,982,000 MCF; and then in the third group, 2,106,000 up to 2,778,000 MCF.

Q Then from that could we say that the range of reserves within each group was substantially less than the range of deliverabilities in each group?

A The percentage difference?

Q Yes.

A Yes.

Q Now, did you at any time during your study, turn this situation around a little bit and group your deliverabilities, your wells into deliverability groups, rather, and see how your reserves for those groups of wells fit a curve?

A Yes, sir. I looked at it briefly. Of course, the reason I didn't do that from the start is because it's only

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logical to me that the grouping would have to be on reserves. But I looked at that briefly, and compared the share of a well's participation of the allowable, compared to its percent of the total reserves, and compared this to the ideal line that was represented on Exhibit -- starting with Exhibit 5 and 6, and it would appear that the 75-25 formula would closely approximate that line for about 95 percent of the wells that I studied.

And out at the -- or up in the upper regions of the curve, you had about five percent of the wells that were scattered, that were probably defined as anomalous wells, which I realize there are anomalous wells in this study.

Q But you would agree, would you not, that there are other ways of analyzing the reserve deliverability ratio, other than the way you accomplished it here on Exhibit R-2?

A Well, Mr. Utz--

Q It could be a matter of judgment as to which is the best way to do it?

A I think that from one engineer to another, I think you do have differences in judgment, and it was my feeling right from the start that this was the correct way to do it.

Q Do you intend to offer the Commission any reserves by tracts on your 388 wells?

A That would be entirely up to counsel. I presume so, I don't know.

Mr. Utz, is that true?

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MR. GORHAM: We'll do it on the map.

MR. UTZ: Will you give us any individual tract reserves, will the map show the location--

MR. GORHAM: Yes.

MR. UTZ: --and the deliverability?

MR. GORHAM: Yes.

MR. UTZ: That's all I have.

MR. PORTER: Any further questions of this witness? You may be excused.

(Witness excused.)

MR. PORTER: Call your next witness.

MR. KELEHER: Mr. Gorham.

*****

F R A N K D. G O R H A M, J R., a Witness, called by Pubco Petroleum Corporation, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q State your name, please.

A Frank D. Gorham, Junior.

Q Mr. Gorham, what is your profession?

A I'm a petroleum geologist.

Q You have previously testified in this case, have you not?

A Yes, I have, sir.

Q And are qualified as a witness before the Commission in this and other cases?

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A Yes, sir.

Q What, if any, is your official position with the Pubco Petroleum?

A I'm executive vice-president of Pubco Corporation in Albuquerque, New Mexico.

Q This particular hearing, are you testifying as executive vice-president, or as a geologist?

A As a petroleum geologist, sir.

Q Mr. Gorham, you have heard the testimony of Mr. Trueblood, have you not--

A Yes, sir.

Q --testifying for Consolidated Oil and Gas, Inc. Were you present when he testified and the Commission allowed to be introduced what is known as Exhibit 4--

A Yes, sir.

Q --which related to a statistical study, involving acreage factors, deliverability, reserves, and other factors to which he testified?

A Yes, sir.

Q Directing your attention to that exhibit 4, which contains 70 pages, and in which there are 40 individual items on each page, or a total of 2,800 items, I'll ask you to discuss that exhibit 4, and give the Commission your opinion as to its validity and value to the Commission in this particular hearing.

A In my opinion, sir, the tabulation as presented, run

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through an I.B.M. machine, showing the various relationships of reserves, deliverability, proration factors, formulas, et cetera, is one that is entirely based on, I believe, what was called exhibit Number 3, and still posted on the bulletin board on my right, which was Consolidated's reserve evaluation of the Basin-Dakota Pool.

This reserve evaluation involved the calculations of El Paso Natural Gas Company at a previous hearing, and although there were some two to three hundred additional wells drilled where information to some large degree was available, this information was not utilized and they used the technique which is to some degree acceptable in the industry of extrapolating reserves over a broad area through control points, which specific information could have been obtained, and it was not obtained.

And, in my opinion, the reserve map as presented by Consolidated does not reflect the true picture of recoverable reserves in the pool. Therefore, in my opinion, Exhibit Number 4 can have no bearing in the case.

Q Mr. Gorham, Mr. Cleveland has testified that he had computed the recoverable reserves by volumetric means on some 382 wells in the Basin-Dakota Pool. My recollection is that he further stated that his recoverable reserves estimates were based on porosity determinations, water saturation determinations, and net pay determinations prepared by the Geological Department of Aztec.

Now, would you please summarize for the Commission briefly the methods of determination used?

A Yes, sir. We took two of our senior geologists off of their other duties, beginning some two months ago, and had them determine the basic factors of porosities, water saturation, and net pay thickness on all of the wells in the entire Basin-Dakota Pool.

Now, in addition to that, that information was turned over to our Reservoir Engineering Section, where it was further processed. And, following that, it was rechecked and computed by our Accounting Department insofar as the arithmetic was concerned. Of the total wells in the pool some -- in excess of 600 -- we found that some 382 wells either had sufficient number of logs or sufficient information as to core analyses that we could make what we believe to be a reasonable volumetric estimate of reserves.

Now, of that 382 wells, there are only approximately 300 which had the absolute criteria that we deem necessary for a reserve estimate, namely, the gamma ray log, the sonic log, and the induction log. Of the 382, all but 82 had that criteria. Some 82, approximate number of wells, had most of that information And based on adjacent wells, we were able to, in our opinion, establish the additional information necessary for reserve estimates.

Insofar as porosities are concerned, porosities were determined by the use of some 20 core analyses and by the use of the sonic logs which were available from the 382 wells studied. Now, we actually utilized a total of 60 core analyses made available to

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us by the industry, some of which were either cores in dry holes, some of which did not have sonic logs, and as a consequence only 29 of the cores were utilized for water saturations primarily; although, in the case of almost all of them, we used them for porosity determinations.

The calculations of porosity readings were made directly from a sonic log only as compared to the porosities as measured by the core analysis methods compared very favorably and on an over-all average differed by approximately 1 percent porosity, which, in our opinion, is well within probability error. When both a sonic log and a core analysis were available, core analysis porosity was used in preference to sonic calculation. For those wells for which core analyses were not available, porosity was determined by obtaining a direct reading from the sonic log, and in conjunction with the gamma ray log, which provided a shale correction were introduced into the Schlumberger porosity chart from which a reading was made of net effective porosity. This method and technique has been fully accepted by the industry.

I might also add at this point that Pubco used in its porosity determinations a minimum of four percent cut-off, or in other words, those porosities which fell below the four percent range were not included as effective net pay.

Water saturations were obtained from direct readings of induction logs and with the adjusted porosity previously determined and again using the gamma ray log, water saturations were again read

directly from the Schlumberger charts after correcting, in certain instances, for the difference in water salinities, known by specific samples taken.

I might say here that the industry is somewhat divided in coming to a determination of water saturation. Some will utilize the water saturation as given by core analyses. The core analysis provides total waters, which in our opinion reflects the invasion of drilling fluids, and in most cases your core analyses companies prefer not to give a true or connate water situation, unless they have had a large amount of experience in the area and have a correcting factor for total waters.

Finally, net pay was determined by including only (1) those apparently productive zones which were physically open to the well bore, and (2) those zones having four percent or greater porosity, and (3) those zones having 55 percent or less water saturation.

Q Mr. Gorham, was this work that you have described done by you or under your direction?

A Yes, sir.

Q And are you satisfied that it correctly reflects and represents the findings?

A Yes, sir.

Q Mr. Gorham, Pubco's studies are directly related, according to your testimony, to some 382 wells out of a total of 769 wells actually present in the field. Can you state, for the

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benefit of the Commission, the reason why not all 769 wells were completely evaluated?

A I believe I have already covered that, sir, but briefly, it was believed by Pubco, in order to make a reasonable estimate of recoverable reserves on an individual well basis that the requirements for the study would include gamma ray, sonic, and induction logs. Those wells which had core information are, for the most part, included in the number of wells studied, although even some of these wells were dry holes or lacked the additional logging tools to determine an accurate water saturation.

Q In connection with the work, have you prepared a map of the Basin-Dakota Pool, showing areas of equal reserves?

A Yes, I have, sir.

Q Will you please ask the Reporter to mark it for identification, Exhibit R-9, and then place it on the wall so that all may see it?

(Whereupon, Pubco's Exhibit No. R-9 marked for identification.)

Q Mr. Gorham, directing your attention to what has been identified as R-9 Exhibit, please state what that is, and what it purports to show?

A Yes, sir. This exhibit shows the initial recoverable reserves of the Dakota formation in the Basin-Dakota Gas Field Pool, located in San Juan Basin, New Mexico and Colorado. Iso lines have been drawn on 500 MMCF per acre reserve intervals through 20 MMCF.

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On the map, the Dakota gas wells are shown by the conventional gas well symbol, below which, in those wells where we believe to have an accurate, or a reasonable volumetric estimate of reserves, are the reserves in MMCF per acre.

We also used the conventional symbol for a Dakota gas well, which differs from a gas well in that it is filled in with the symbol, the Dakota well with a conventional symbol, the dry hole conventional symbol circled with four ticks; and in addition thereto, we have circled all of those wells, some 60 odd wells, I believe, that core information was available.

Each one of the wells, as previously stated, was computed by using the conventional volumetric formula where sufficient information was available. Those numbers were placed adjacent to the well, and Iso lines were drawn connecting those areas, or tracts of equal reserves.

In addition to those Iso lines, we colored those areas with initial recoverable reserves in MMCF per acre, from 5.0 to 10.0 in green; those areas from 10.0 to 15.0 MMCF per acre, in yellow; and those areas in red which were 15.0 MMCF per acre and up.

I would further like to call your attention to the fact that in doing this Iso line, or contour work, that we freely used dashed lines around certain of the areas, which obviously will be changed in the event new wells are drilled or where new wells provide sufficient information to justify that change.

In other words, although at first glance it would appear that each one of those smaller areas, or for that matter the larger areas, is fully developed or has been pinpointed, is certainly not the case. We also confined our Iso lines, generally speaking, to only those areas in which we believe there was sufficient development to make such an interpretation. We certainly did not believe that there was any justification for making any reserve estimates whatsoever out in these great white voids, where quite obviously other developments of reserves, thick sands, low water saturations, and high porosities will perhaps develop new economic areas.

Q Mr. Gorham, you also prepared a map purporting to show areas of equal deliverability in the Basin-Dakota Pool for the benefit of the Commission?

A Yes, sir, I have.

MR. KELEHER: I'll ask at this time that the Reporter mark that map, Pubco Exhibit R-10.

(Whereupon, Pubco's Exhibit No. R-10 marked for identification.)

Q (By Mr. Keleher) I'll ask that you place it alongside Exhibit R-9. Now, Mr. Gorham, please discuss for the Commission Exhibit R-10, what it purports to show, and other details?

A Yes, sir. To the left of the initial recoverable reserve map previously discussed, we have placed on the board the map showing the initial deliverability of all of the Basin-

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Dakota Gas field, or pool wells. In the same identical area, Iso lines were drawn on 500 MCF deliverability intervals through 2,500 MCF deliverability, and the map shows all wells drilled through the Dakota formation to December of 1962.

Again, the legend, or the symbols used on the map are comparable to the map previously described, with the exception that the number which appears below each individual well is the actual deliverability as reported to the Commission in MCF, in initial deliverability in MCF.

Also, on this map we drew the Iso lines which connected those areas which, in our opinion, had comparable deliverabilities. Again, as in the previous map, although there is the inference by the character and appearance of the map that different deliverabilities could or would not perhaps be obtained outside the area of studies, we certainly wish to point out at this time that in the area of white within the area of the Basin-Dakota Pool, that small and large deliverabilities may be obtained, but they have not been postulated in this study. We have only confined the deliverability Iso line area to those areas where deliverabilities were generally or approximately available.

I would like to call your attention to the fact that also on the map, we colored in green those areas of equal deliverability, which had deliverability ranges from 500 to 1,000 MCF; those areas in yellow with comparable deliverabilities from 1,000

to 1500 MCF; and those areas in red which were 1500 MCF or above.

I would like to call the Commission's attention to the similarity, or almost the exact replica in the two maps, which on a specific well basis, in our opinion, shows the direct relationship between calculated volumetric reserves in the San Juan Basin-Dakota Pool, and deliverability.

Q Have you prepared, Mr. Gorham, a transparent overlay of the areas of equal deliverabilities in the Basin-Dakota Pool which may be placed on the map showing areas of equal reserves so that a direct comparison can be made?

A Yes, I have.

MR. KELEHER: I would like to have that identified as Pubco's Exhibit R-11.

(Whereupon, Pubco's Exhibit R-11 marked for identification.)

A The third exhibit, which we are showing here is again the initial deliverability map, the same map previously discussed, only the contour lines are placed on a transparency; for the benefit of those who perhaps may not see the general correlation between the two areas, the deliverability and reserves, we have taken the deliverability study and placed it on a transparency.

We have, at this particular time, we are placing the transparency on the deliverability map previously shown, to show that the two maps are one and the same. We will now take this transparency, and superimpose the transparency on the volumetric estimate of recoverable reserves.

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Q On what exhibit, what number, on 9?

A On Exhibit Number R-9. I would like to point out to the Commission that in the primary areas of Dakota development, that there is an increasing, proportionate increase of deliverability in direct accordance with the increase in recoverable reserves. This holds true also in all of the outlying areas currently developed.

Now, using this technique, we obviously exposed ourselves to certain areas which we think are minor areas which do not show that specific direct relationship. I would like to call your attention to one such area in Section 24 of Township 26 North, Range 10 West. We are showing relatively high reserves with apparent relatively low deliverabilities. In our opinion, this particular anomaly is because it is our understanding that the well in the Northwest Quarter of Section 24 is an old well where they utilized nitroglycerine in order to complete the well. And, had that well been completed by modern means, the deliverability would probably be in line with the recoverable reserves.

I would like to also call your attention to the fact that there apparently is a slight misfit, to some degree at least, in the northern portion of Township 29 North, Ranges 10, 11 and 12 West. This area generally shows higher deliverabilities, I believe, versus lower reserves. In our opinion, this area represents an area that has probably different water salinities. Based on information that we have seen from one well, which if it were

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found to be true by additional information, we believe by correcting those water salinities to the proper salinities, that we would bring the deliverability and reserve again into line, which is certainly shown through the preponderance of the entire Basin-Dakota Pool.

Q At this time, I wonder, Mr. Cleveland, if you would straighten that overlay a little bit. It's a little out of gear there.

A I might make one further comment, that insofar as individual well deliverabilities are concerned or individual tract reserves are concerned, they are posted on these maps for ready reference for any specific interrogation of any particular area, which was one of the earlier questions, I believe.

MR. KELEHER: At this time, we would like to offer in evidence, Pubco's Exhibits R-9, R-10 and R-11.

MR. PORTER: R-11 is the overlay?

MR. KELEHER: Yes, sir.

MR. PORTER: Are there any objections to the admission?

MR. STOCKMAR: May we have just a moment to discuss that, if the Commission please?

If the Commission please, Consolidated would like to object to the admission of the Exhibit R-9, and just Exhibit R-9, on the basis that there has been no appropriate foundation whatsoever laid for the data which appears thereon. There has been no testimony whatsoever with respect to the individual reserves attribut-

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able to each tract. There's a simple statement that they appear on here. On reading the legend, it speaks of some per acre reserve that might exist at that point. There is nothing on it that shows the reserves for any tract. For these reasons, we would like to object to the admissibility.

MR. KELEHER: If the Commission please, we believe that a proper foundation has been laid by the witness, Dan Cleveland, and also by the testimony of this one, a hundred percent.

MR. STOCKMAR: Mr. Cleveland only testified with respect to one well, the one which is asserted to have 16 billion cubic feet of reserves. That is the only well as to which he was willing to give individual reserves, or did give.

MR. KELEHER: Well, that's the only well you asked him about.

MR. KELLAHIN: We submitted an objection to Mr. Cleveland's testimony, on the basis that no figures had been given on the reserves for the individual tracts, or for the field as a whole. We were assured that that would be tied up; I assume that this purports to tie it up. There are no figures on here for many, many of the tracts, and by the testimony of the witness, Mr. Gorham, they disregarded the productive areas in a large portion of the field, as he referred to the great white area, and yet Mr. Cleveland has given a reserve figure for the pool as a whole, and we have nothing by which we can test that figure.

MR. KELEHER: Well, it is unfortunate if you have nothing

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by which you can test it. By rebuttal, we believe we have established a proper foundation, both by the witness Cleveland and the witness Gorham, and that these are certainly admissible in evidence.

MR. PORTER: The objection will be overruled. The Commission will admit the exhibits, and the Commission will determine what value to place on the exhibits.

(Whereupon, Pubco's Exhibits R-9, R-10 and R-11 admitted in evidence.)

MR. KELLAHIN: At this time, I would like to renew my motion to strike the exhibits and testimony submitted by Mr. Cleveland.

MR. PORTER: Just a minute. I think he wants a ruling on his objection at this time, or his motion to strike the testimony and not to accept the exhibits.

Mr. Kellahin, the Commission denies your motion. Mr. Keleher, will you proceed?

Q (By Mr. Keleher) Mr. Gorham, at this time, will you briefly summarize for the benefit of the Commission your testimony and your view in regard to this?

A Yes, sir. In summary, Pubco believes that the proration formula for the Basin-Dakota Pool should be that formula which insofar as practicable gives each individual well its fair share of the market in direct relation to the individual well's recoverable reserves as related to the recoverable reserves of the entire pool. Pubco's studies have positively shown that such a formula should be 100 percent deliverability and should incorporate acreage

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only where necessary to make minor adjustments for the few wells having less or more than 320 acres in their respective drill sites.

MR. KELEHER: You may have the witness.

MR. PORTER: Any questions of the witness? Mr. Kellahin.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q Mr. Gorham, on your deliverability map, on the coloring there, as I understood your testimony, you cut off the coloring at the point of 1500 MCF, is that correct?

A I believe that's correct.

Q Now, how many wells are there in the pool with deliverabilities in excess of 1500?

A I haven't the slightest idea, sir.

Q How many in excess of 4,000?

A I don't know.

Q You didn't make any study of those wells at all?

A Yes, we did, yes, sir. Those wells with their higher deliverabilities which you are requesting are located on the map, and the contour lines go up to 2,000 MCF, I believe; and you'll also be able to determine on the map, if you wish to count them, all of the wells that have these various ranges. If you wish, I would be glad to try, if that is the request.

Q Had you, Mr. Gorham, colored your map to show the ranges between deliverabilities by per thousand, it would substantially have changed your approach, would it not?

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A I don't believe so.

Q Do you know, is it unreasonable to you to say there are 46 wells with deliverabilities in excess of 4,000?

A That may be so, I don't know whether that is true or not.

Q Is it your testimony that a well with deliverability in excess of 4,000 has four times the -- or two times the reserves of a well with 2,000 deliverability?

A I believe that is our testimony, yes.

Q You say it is a direct mathematical relationship?

A No, I don't believe that you can say that it's a direct mathematical relationship, or that certainly would have been employed. We do believe, however, that our studies have shown, whether that can be determined by mathematics or not, that such a relationship does exist.

Q What is the relationship?

A As we say, a direct relationship.

Q Well, it's not a direct mathematical relationship?

A It may be; I don't know what that formula would be, however.

Q You don't know what the relationship is in mathematical terms, is that correct?

A Well, on a mathematical basis, if you want to get into the details of that, the association we have here between deliver-

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ability and reserves is that in both deliverability and reserves, in order to have deliverability you have to have porosity; in order to have reserves, you have to have effective porosity. In order to have reserves, you have to have a porosity that is occupied by a certain portion of gas; in order to have a deliverability, you have got to have the same function. When you have a greater deliverability, and when you have greater reserves, you usually have a greater net pay thickness, so I would say that all of the functions incorporated in a deliverability, as well as in reserves, are present and are comparable.

Q Now, your maps, as I understand, are both based on initial deliverabilities and initial reserves?

A That is correct.

Q Would an annual change in deliverabilities, in your opinion, accurately reflect the changes in the remaining recoverable reserves?

A I believe so; in most part our studies have shown that as the field is depleted, and lower reserves remain to be recovered, that we are showing lower corresponding deliverability.

Q Now, in using the term "recoverable reserves", would you define that for me in the sense that you are using it?

A Yes. Recoverable reserves are those reserves which will be recovered, or a percentage of reserves which will be recovered from the calculated initial recoverable, or reserves in place.

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Q Now, in place where?

A Within the tract of 320 acres, which is the unit used throughout the entire Basin.

Q That is, your initial recoverable reserves is within the tract. Does deliverability have any relationship to reserves within the tract dedicated to the well?

A It certainly does.

Q What is that relationship?

A Well, as we said earlier, it's a direct relationship. Now, we have used individual well points in both our Iso line work for the deliverability map and the reserve map, as a matter of necessity, because those are the sources of our information. We have been able, therefore, to utilize wells outside of the tract to more accurately determine the reserves under the specific tract. The same thing has been done on our deliverability map.

Q Now, permeability is not confined to the boundaries of a 320-acre tract, is it?

A Rephrase that question.

Q Your permeability available through a well bore is not confined to a 320-acre tract necessarily, is it?

A I would say that neither is porosity, thickness, or any of the other parameters, since it is all a common reservoir.

MR. KELLAHIN: Thank you, sir. That's all I have.

MR. PORTER: Mr. Stockmar, do you have a question?

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BY MR. STOCKMAR:

Q Mr. Gorham, you have equated, at least by color, all of the points in space having in excess of 2500 MCF, have you not, on your Exhibit R-9? I'm speaking of the initial reserve map, which I believe to be R-9.

A You mean, as far as our contouring of those Iso reserve areas?

Q Yes. They have been given the same color, without respect to their size, as long as the point was in excess of 2500 MCF?

A I believe it's 15 MMCF; I believe that's correct.

Q All right, sir. Then without respect to the variation above that point, it will all show in red on your map, is that correct?

A That is correct.

Q And as to your Exhibit R-10, you have shown in red every well having a deliverability in excess of 2500 MCF, without respect to how close to, or far above that it is?

A In excess of 1500 MCF.

Q Yes, sir. May I direct your attention to several wells in the southwest corner of Township 29, and 11; do you find there a well with a, the number 52.7 after it? I believe that would be in Section 30.

A Which map are you referring to, sir?

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Q I'm speaking of your Exhibit R-9, the reserve map.

A Please refer to the well again.

Q I believe it to be in Section 30.

A 31.

Q Is that 31? And 29-11?

A Yes, sir.

Q And what is the number written beside it?

A 52.7.

Q And what does that mean?

A That is the recoverable reserves in MMCF per acre.

Q At that point?

A I don't believe you can say at that point. It's as calculated at that well, but as far as our Iso lines are concerned, it would generally include most of the South Half of Section 31, or the tract upon which it is located.

Q About a mile south of that is another well, with 16.1 written beside it.

A That is correct.

Q What does that mean?

A That shows that the recoverable reserves as estimated are 16.1 MMCF per acre.

Q Now, what color band do each of those fall in?

A They come in the color band of all of those wells that are red, in excess of 15.0 MMCF per acre.

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Q What is the actual ratio between the recoverable reserves at those points?

A Apparently about four to one, I believe; I'm not sure what you mean by ratio.

Q What is the average reserves for the wells in the field, according to your calculations, Mr. Gorham?

A I did not average the reserves in the field. These maps portray individual tract reserves.

Q Do you recall what Mr. Cleveland testified to as to the total reserves in the field?

A Yes, sir.

Q Do you recall how many wells there are in the field?

A I believe I testified earlier, something in the neighborhood of 769, is it? I have forgotten the exact number, but certainly in excess of 700. As I also explained earlier, we used something in the neighborhood of 382 wells for our calculations.

Q Based on the total reserves that you are submitting, and the number of wells that you are relating it to, could you give me an average figure per well?

A No, I don't believe I can. I'm not certain of the exact number of wells, and it would also depend upon what stage of reserve estimates you are interested in. For example, I have put on in the lower right-hand corner of Exhibit R-9, the total developed pool reserves minus the production attributable to the tracts as of November 1st, 1962, which is some 2,791,638,000 MCF.

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Q If we have approximately 700 wells, may we then divide seven into 28 and come out with about three and a half billion per well, as an average?

A I suppose we may.

Q Where would such an average well appear on your exhibit, according to your color scheme?

A Again referring to R-9?

Q Yes, sir.

A I believe that would probably be in the yellow area, which has the range from 10.0 to 15.0 MMCF per acre.

Q Mr. Gorham, how far does the minimum reserve per acre, which might appear in the red, vary from the average per well that we were just speaking of?

A Now, you are talking about the smallest reserve in what we have categorized as the higher reserve area?

Q Right.

A To what, again, sir?

Q To the average well.

A It would appear that the preponderance of these reserves are in the area of 25.0. However, as pointed out in the actual legend, the red area begins with a 15.0 and up, at the moment I don't see any 15.0's; I do see a well located in the Northwest Quarter of Section 3, 29 North, Range 12 West, that has a 15.7 MMCF per acre.

MR. STOCKMAN: I think that's all the questions I have.

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MR. PORTER: Anyone else have a question? Mr. Utz.

MR. KELLY: Mr. Porter, I would like to ask some questions on behalf of Sunray DX.

MR. PORTER: I have already recognized Mr. Utz. Mr. Kelly, you can go next.

BY MR. UTZ:

Q Mr. Gorham, the reserve figures and data that was on your Exhibit R-9 -- is it?

A Yes, sir.

Q --was calculated, those are posted in regard to the calculations that Mr. Cleveland made, are they not?

A Well, sir, they represent the final compilation of the volumetric reserve estimate, which includes the work of the Geological Department in establishing porosity, net pay thickness, and water saturations, which were then passed on to Mr. Cleveland's staff, who computed the exact reserves for the tracts, and those were pointed or superimposed on the map adjacent to the well from which the information was obtained.

Q So those represent the correct reserve figures that were calculated on the basis of abandonment pressure of 27 MCF per day, is that true?

A Yes, sir, they were.

Q Now--

MR. STOCKMAR: Pressure or volume?

Q (By Mr. Utz) Rate of flow of 27 MCF per day.

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A Rate of flow of 27 MCF per day.

Q So that that 27 MCF per day was arrived at on the basis of your low, your operating rate of $1130.00 a year, was that true?

A Yes, sir. We debated as to whether or not to carry this rate on down to zero rate per day, and we certainly concluded in a hurry that the difference in the amount of reserves that would be produced from 27 per day down to zero was so insignificant that we thought, as any prudent operator would do, that you would cut off the recoverable reserves at that lowest possible point which you could possibly produce the well and at a break-even basis relative to operating costs, with no overhead or anything applied.

Q Then, I think you anticipated my question. Then what you are saying is that if you had carried your abandonment pressure on down to a zero rate of flow, your reserve picture wouldn't have been any different, as I understand it?

A No, sir.

MR. [illegible]: That's all.

MR. PORTER: Anyone else have a question? Mr. Kelly.

BY MR. KELLY:

Q Mr. Gorham, excuse me for as ground covered, but I just want to get a couple of questions straight. Your Exhibit Number R-9, you have attempted to show the initial recoverable reserves, is that correct?

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A That is correct.

Q And you have arrived at the figures in the areas by various individual -- by using 382 wells where you had individual data on those wells, is that right? In other words, you had core analyses and you had sonic logs and other information that allowed you to evaluate the reserves on that particular well?

A Yes, that's substantially correct.

Q And then on the wells that you did not have information on, you used a process of extrapolating the information to these other wells?

A Only on a very, very limited basis. In most cases, not more than one drill site beyond good well control; and we certainly did not carry our Iso lines of equal reserve areas very far beyond actually developed wells either, because we do not believe that such reserve estimates could possibly be made at this time, in the absence of any information whatsoever.

Q But you do feel, in your expert opinion, that the information you were able to show on Exhibit 9 is a reasonably accurate estimate of reserves, initial reserves?

A We believe that it is reasonably accurate determination of recoverable reserves within the developed portion of the Basin-Dakota Pool. Now, the only area that was brought out by counsel that would possibly be argumentative in the deliverability and the recoverable reserve relationship, is in the area of permeability, and we believe that the development on the standard

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320-acre spacing basis has provided the counter-drainage to offset the permeability problem; and we also believe that as a result of some of our earlier studies in other horizons in Northwestern New Mexico and the San Juan Basin areas, for example, the Mesaverde and Pictured Cliffs producing zones which are also of cretaceous age and similarly deposited reservoirs, we have made the only other approach relative to this drainage-permeability problem in those sequences, the Mesaverde and Pictured Cliffs, and we found that by examining the shut-in pressures throughout the field in those horizons, that there was a general conformance of pressure gradient.

Relative to depth, as would be expected, there are certainly anomalous areas which we specifically investigated in regard to the high permeability and low permeability areas, and the high permeability or high deliverability areas, as some would look at it. We wound that the pressures were actually higher in those areas, indicating drainage from the high deliverability tract areas to the low deliverability tract areas.

Q Well, let me try once again. Does you exhibit -- I believe this one is Exhibit Number 9, is that correct?

A That's correct.

Q Does your Exhibit Number 9, in your opinion, reasonably accurately reflect the initial recoverable reserves in the Dakota formation?

A In the developed portion of the Basin-Dakota Pool,

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Q All right.

A Yes.

Q Now, you used the other attempt, I take it, to estimate reserves, and that was shown on Exhibit Number 10?

A That is not correct.

Q What are you trying to show by deliverability?

A We are showing a direct relationship between the volumetric method accepted by the industry of estimating initial recoverable reserves with the initial deliverability of the similar well or tract throughout the Basin-Dakota Pool.

Q But you stated, I believe, that deliverability has a direct relationship to reserves?

A We believe that is correct, yes, sir. And, if what you are saying is, that in this area, if we come up with a deliverability reading, or findings, would we possibly be able to estimate reserves? I feel this, we would have a very strong equation of those reserves, and I feel it would probably be directly proportional to the reserves as actually calculated by accepted means.

Q But the most accurate way to estimate reserves is the way you used on Exhibit Number 9, isn't that correct?

A That is correct.

Q Well, then, don't you feel that the best way to achieve correlative rights and prevent waste would be to assign your individual allowables on the basis of reserves in relationship to their total of the total pool estimate?

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A No, I do not, sir. And the reason for that is, in estimating reserves, you employ the use of the volumetric formula, a tool or a method which the industry feels is relatively inaccurate, and one which requires continuous adjustment, up or down, based on additional information as it is received.

On the other hand, the deliverabilities can be directly measured, and will facilitate, in our opinion, a proportionate share of the market between the pools, directly on the basis of reserves, as we see it today.

Q Well, I don't understand why you even bother with an estimate of reserves then.

A We estimated the reserves because that was the subject of the hearing. And we found that there was a direct relationship between reserves and deliverability.

MR. KELLY: Thank you.

MR. STOCKMAN: I have a few more questions, if you please.

MR. PORTER: I have one first. Mr. Gorham, in your statement there a moment ago, do you think the little wells are draining the big ones up here (indicating)?

A I'm not certain of that. There are some very peculiar pressure relationships, relative to establishing possibility of drainage; and the ones that we investigated particularly, there was just as many indications that the little fellow was draining the big fellow, as the converse.

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BY MR. [illegible]

Q Mr. Gor[illegible], what was the range of water saturations, [illegible] your Geological Department de[illegible]vered to Mr. Cleveland for [illegible] investigations?

I believe the [illegible], as stated, was 55 percent, above which we did not believe to be effective net pay.

Q 55 percent what, water saturation?

A Correct. The lowest water saturation, I would have to take a long look here. I believe the lowest is probably in the range of 12 percent, which is certainly very low.

Q Can you give me some idea of the average for all of the wells that you were able to determine this for?

A We found that the water saturations, as calculated by conventional means, were lower in those areas colored in red, as compared to the higher water saturations toward the periphery of the pool. I don't know that I could come up with an overall average. I would imagine the average, just for the sake of discussion, may be in the area of 20 to 30 percent water saturation.

Q Now, Mr. Gorham, would you do me a favor, and step up to your Exhibit [illegible]-9?

A Yes.

Q and would you simply designate a township which seems to have an artificial coloring of red and green and yellow?

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A (Witness indicates.)

Q Which Township was that?

A All right, we'll use 29 North, Range 11 West.

MR. STOCKMAR: Thank you. Excuse me, that's all the questions I had.

MR. PORTER: Mr. Howell.

MR. HOWELL: Ben Howell, El Paso Natural Gas.

BY MR. HOWELL:

Q Mr. Gorham, I have a little trouble. Some of these things, you can explain them to me, but you can't understand them for me, and so I might go back over one or two points to see if I understand your correctly.

In your testimony as to the studies that you have made, I assume that you have attempted to estimate the initial recoverable reserves in place?

A That is correct.

Q Is that always the same figure as the initial reserves in place?

A In place?

Q Yes.

A No, sir. It's usually less.

Q And if I understand your testimony, then, in your computations you have on an individual tract basis, as to the wells that you have studied, in effect determined for each tract the proportion of the initial reserves in place that can be produced before

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you abandoned the well because the well would no longer pay operating expenses, and have in that manner determined the initial recoverable reserves?

A That is correct, sir.

MR. HOWELL: Thank you.

MR. PORTER: Anyone else have a question of this witness? Mr. Utz.

BY MR. UTZ:

Q Mr. Gorham, would Pubco abandon the well with 1500 pounds pressure?

A We would, sir, if it wouldn't produce any gas.

Q You would no doubt give it some pretty heavy frac jobs before you abandoned it, wouldn't you?

A We certainly would. Now, that problem relative to abandonment pressure is very involved, but we have run into situations where in the early days over in the Twin Mounds area, located, I believe, in Township 30 North, Range 13 West, where we completed an early Dakota well, which had an abandonment pressure of some 800 pounds, which we re-fracked several times, as you suggested, and the only thing we could get was water, no more gas came out. That had a very high bottom-hole pressure, abandonment pressure.

Q That well probably had a serious fluid problem though, didn't it?

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A Yes, sir.

Q But in an area where you didn't have a fluid problem, you probably wouldn't have had that--

A I don't believe you are going to find an area without a fluid problem, when you lower your reservoir pressure down to the point you are speaking of.

Q If you did frac a well through some later work-over, and raised its rate of flow to where it was an economic rate of flow, then those reserves would then become recoverable reserves?

A We would then convert reserves in place to recoverable reserves, yes.

MR. UTZ: Thank you.

MR. PORTER: Any further questions of Mr. Gorham? The witness may be excused.

(Witness excused.)

MR. PORTER: Anyone else have testimony?

MR. KELLAHIN: We rest, as far as Pubco is concerned.

MR. PORTER: Mr. Howell of El Paso.

MR. HOWELL: El Paso will have one witness.

MR. PORTER: We'll have a 15-minute recess.

(Thereupon, a short recess was taken.)

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MR. PORTER: The hearing will come to order, please. Mr. Howell.

MR. HOWELL: Before we go on the record, I can give you an estimate of the testimony time. I notice Mr. Rainey has four pipes for his testimony.

MR. PORTER: Has a bunch of pipe cleaners, too.

MR. HOWELL: El Paso Natural Gas would waive any opening statement. We would like the privilege of making a closing statement after the testimony is all in.

(Witness sworn.)

DAVID H. RAINEY

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. HOWELL:

Q Please state your name for the record.

A David H. Rainey.

Q Are you the same David H. Rainey who testified in the original hearing of this case?

A Yes, sir, I am.

Q Mr. Rainey, have you made any study of Consolidated Exhibits 3 and 4 since they were introduced into evidence?

A Yes, sir, we made a rather hurried study last night as to the validity of some of the figures on those exhibits, in light of El Paso's current reserve estimates of the Basin-Dakota

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Pool.

Q Now referring to Consolidated Exhibit No. 4, what is the factor which Consolidated used for reserves? Is that the initial estimate of recoverable reserves in place?

A Yes, sir, that's my understanding, based on figures that have been furnished to them from studies that El Paso had made as of April of 1962.

Q And those were the initial recoverable reserves?

A That's correct. That's my understanding.

Q What deliverabilities were used by Consolidated?

A As near as we can determine, they've used current deliverabilities in every case.

Q Would that have the effect of using the current deliverability of a well that has been producing for three or four years against its initial recoverable reserves in place?

A Yes, sir, that's true, and it would relate initial reserves of wells that were completed eight or ten years ago to initial reserves of wells that were completed last year.

Q But using the deliverability as of 1962?

A Yes, sir, that's correct.

Q Is that a reasonable method of determining the relationship of deliverability to recoverable reserves?

A No, sir, I don't believe so. It's sort of like mixing apples and oranges, I think. In attempting to establish a relationship between recoverable reserves and deliverability, we should

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either use initial recoverable reserves and initial deliverability or determine current recoverable reserves to use against current deliverability.

Q What effect would using the current deliverabilities against initial reserves, such as Consolidated's Exhibits 4 through 7 or 8, I believe it is, have with reference to discrepancies as to wells with lower deliverabilities?

A It would tend to increase those discrepancies in that you are relating the current allowables, based on current reserves, as a percentage factor of initial --

Q Let me correct you.

A Excuse me, current deliverability. Current allowables based on current deliverabilities as a percentage relationship to initial reserves. Those wells with small deliverabilities which in many instances, which may be wells that have been drilled and producing for a number of years, would not bear the same percentage relationship if current reserves were used.

Q Passing to your study of Consolidated Exhibit No. 3, I believe that the testimony showed that this exhibit was constructed by Consolidated by posting on a plat El Paso's estimates as they were in April of 1962, of the initial reserves in place on certain wells, is that correct?

A It's initial recoverable reserves, Mr. Howell; yes, sir, that's correct.

Q How many wells was that, 460 wells?

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A I think the exact figure was 457 wells at that time, which was on our exhibit as of the April hearing.

Q Then as to the 237 or '39, '40, some figure in that vicinity, approximately 240 wells that have been drilled since then, the recoverable reserves as determined on Consolidated's Exhibit 3 were determined by them as the result of extrapolating isopacous contours?

A Well, iso-reserve contours, yes, sir. That's my understanding of Mr. Trueblood's testimony.

Q Have you available some of the volumetric initial recoverable reserve calculations which we have made on those recently drilled wells?

A Yes, sir. We've studied a few last night to illustrate the differences between the current estimate of reserves as El Paso is looking at them, and the estimate which was furnished to Consolidated. At this point, I might add that those figures were given to Consolidated not in response to the subpoena but as I understood it, the subpoena duces tecum required only the furnishing of certain core analyses. We gave those figures to Consolidated to use as they saw fit, with the specific understanding at the time that we gave them to them, which was in about September or October of 1962, that they had been superseded and that to the best of my knowledge, no reserves shown on those lists were identical to the reserves as El Paso was contemplating them at the present time.

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Q Before we get to the variances between the figures on Exhibit 3 as compared with the reserve estimates which we had in 1962, let's look at some of the comparisons that you made between the reserves allocated to certain tracts by Consolidated on Exhibit 3 where they used this iso-reserve map, and the volumetric estimates which we have made on some of the same wells.

A If we may refer to Consolidated Exhibit No. 4, which is the tabulation of the reserves as picked off of the map, as I understand it, we picked a number of wells off of, which were in the so-called 240 or 239 classification, in other words, wells that we had not specifically given Consolidated figures for, even though those figures had been changed, and on the basis of the contour lines drawn on that map they had extrapolated a reserve for the wells that they did not have specific data from El Paso on. We picked about ten or twelve of those wells. In the interest of time, I'll just pick out three or four right now to show the deviation from the figure that Consolidated is showing on Exhibit 4 and Exhibit 3, and the calculations of those reserves as El Paso presently looks at them.

We'll turn to page 5 of the Consolidated Exhibit 4, look at the seventh well on that page which is labeled Consolidated Oil and Gas 1-N, I presume that's a Well No. 1 and Location "N" of Section 2 of 32, 12. The reserves shown there by Consolidated is 1,800,000,000 cubic feet. El Paso's current determination, and I think Consolidated may be happy to hear this, is 3,057,000,000

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cubic feet on that particular well. This changes the relationship, of course, as to the percentage relationship of allowables and reserves. Unless the Commission desires that I read all those figures, it merely shows that the percentage relationship to reserves of allowable on Point Number One, their 100 percent deliverability line changes from .33 to .19. The second one was 75-25 formula, changes it from .68 to .40. It's pretty obvious tnat we didn't pick this to prove that 75-25 was the most valid formula on this particular well; because skipping down to the 10 percent deliverability factor in the formula, we still only have a .94 relationship, and only when we get to a straight acreage does that well get a percentage allowable in relationship to its total percentage reserve within the pool.

I might add at this point that even though we changed some of these reserves fairly substantially to arrive at these percentages, we still used the 2,159,000,000,000 cubic foot total reserve that Consolidated used. We didn't attempt to re-add and subtract all the wells we had worked on. If we may turn to page 8 now, the third well on the page, Consolidated reserve is 2,900,000,000 cubic feet. El Paso's current calculation on the reserves is 5,055,000,000 cubic feet. That percentage relationship then arrived at in the same manner that Consolidated did it shows that even on 100 percent deliverability formula that well only has a .93 relationship of allowables to reserves; in other words, that well could be granted an allowable commensurate with its

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reserve as a percentage of the total pool reserve, should get something in excess of 100 percent deliverability in its allowable.

One more well on that same page, the 8 well, which is the third well from the bottom, the reserve picked by Consolidated from their map shows 3 billion cubic feet of reserves on that well. El Paso's current reserve calculations are 1,903,000,000 cubic feet, which changes the percentage relationships as shown by Consolidated at 100 percent deliverability. Based on the new reserve, the relationship between percentage of allowable to percentage of reserve will be .93 at 100 percent deliverability; and on the 75-25 formula would be 1.10 as a percentage relationship.

We made those calculations now on, as I say, about 12 or 13 wells, and if it's desired, I can go through the whole group that we picked, but we merely used this to show the fact that, as I testified to at some length in the original hearing in this case, the determination of reserves in the Dakota Pool, as far as El Paso is concerned, is a continuing and continuous thing; and as new information becomes available through new logs, new cores, new wells, our township factors which we have discussed before are changed. The Reservoir Department advises me at this time that they have about 10 or 15 cores that only came in to the Department last week that are not included in our present studies; and it's quite probable that a number of the township factors which

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I may testify to today will be changed within the next month or so when the Reservoir Department gets around to revising figures, based on new information.

Q Now, Mr. Rainey, do you conclude from that that any attempt to use volumetric calculations as an exact proportion of the total pool's recoverable reserves as applied to the individual tracts is a matter that by necessity is full of error and subject to constant change?

A Yes, sir. I think Mr. Trueblood testified to that specific point yesterday, that in attempting to use a tract factor, as he called it, every time a new well came into the pool and new reserves were proven up, those factors would have to be changed and revised.

In addition, I think it was pointed out quite clearly, and El Paso is of the same opinion, in Pubco's testimony, that because of the lack of specific detailed information on a great number of individualwells, it's extremely difficult to calculate accurately, for purposes of allocating allowables. individual well reserves.

Q By individual well reserves, do you mean the recoverable reserves underlying the tract which is applicable to that well?

A Yes, sir.

Q There was some discussion about the accuracy or errors in the deliverability tests?

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A Yes, sir.

Q I don't believe there is in the record any statement at the present time generally covering the manner of deliverability tests and the validity of the deliverability tests as applicable to the Basin-Dakota Pool under the rules of this Commission. Would you please comment on those tests?

A Yes, sir. There is established in the entire San Juan Basin a procedure for taking deliverability tests, which was established, as I recall, in 1954. At a hearing just a few months ago that specific procedure was revised in the light of approximately nine years experience in testing wells for deliverability in the San Juan Basin area. It's my opinion that the deliverability testswhich we're now obtaining in the San Juan Basin are reasonably accurate, I'll put it. There are individual well cases where it is difficult to obtain a deliverability test, but in general, the deliverabilities are accurate and as will be shown later, is an accurate reflection of the recoverable reserves of that well.

In our experience in re-evaluating and re-examining the reserves in the light of new information and new data as it becomes available, I am of the opinion that if there is a discrepancy between reserves and deliverability as a direct relationship, that the deliverability test is a more accurate reflection of the actual recoverable reserves than the volumetric calculations which may be made on the basis of, many times, inadequate

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data.

Q By your use of reserves in your testimony, am I correct in assuming that in each instance you mean the recoverable reserves underlying any particular tract attributable to a well?

A I am always referring to the recoverable reserves underlying the tract.

Q Before we leave the deliverability formula, does the deliverability formula work better in areas where the pressures, the reservoir pressures are high or in areas of lower reservoir pressures?

A As a general thing, I would say that probably the mechanism used by the New Mexico Commission in determining deliverability values is probably more accurate in reservoirs like the Dakota and in possibly reservoirs such as the Pictured Cliffs or even the Mesaverde, where there may be considerable amount of liquid problems involved with the wells, and consequently some doubt on occasion in specific individual cases as to the validity of shutin pressures. I think probably the deliverability tests in the Dakota are as accurate as tests can be made.

Q You testified at some length on the original hearing as to the method which El Paso used in estimating recoverable reserves in the Basin-Dakota Pool. Would you please briefly summarize, without going into great detail, the work that El Paso performs as a continuous and continuing study?

A Yes, sir. Our Reservoir Department obtains whatever

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information can be obtained in an effort to analyze individual well characteristics. It has been testified to at some length here, in many instances that information is not available. We take what information is available, and by averaging on a township basis the most accurate information which can be obtained as to porosity, interstitial water, pressures, net pay -- we don't average net pay, excuse me -- as to any other factors which may be pertinent to the calculation of reserves, we then arrive at a factor which we term a township factor, which is the MCF per acre foot recoverable reserve for that township. We then take logs and analyze them and sometimes in the light of new information, old logs may be re-analyzed to determine net pay thickness for an individual well, which we feel represents as near as can be determined to any fashion the net pay thickness of the tract upon which that well is drilled. We then determine the individual reserves for those wells.

Now admittedly, many times in the averaging method that is used by El Paso, our reserve calculations as to specific wells may not be the ultimate actual recoverable reserves of that well, because of the averaging factor. As a practical matter, I think the method that Mr. Cleveland used for Kubco in extrapolating the productivity of the well down to an economic limit will give more accurate individual well reserves than the method that El Paso uses.

Q What pressure do we use as an abandonment point?

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A We use a constant abandonment pressure of 600 pounds bottom hole pressure, which is approximately 500 pounds wellhead pressure. It's a constant abandonment for every well. Recognizing the fact that many wells with high deliverabilities will be produced to pressures considerably lower than 500 pounds wellhead, and, conversely, many wells of low deliverability -- and there are a number of them in the pool that probably under strict economics should be plugged at the present time -- will have to be abandoned at much higher pressures.

Q Have we at the current time made estimates on additional wells since the last hearing?

A Yes, sir. At the April hearing we had made reserve determinations on 457 wells. At the present time on our present Exhibit 1, we have made reserve determinations based on this average means on 729 wells. It's my recollection that I testified at the time of the April hearing that there were 673 wells completed in the Basin-Dakota Pool as of January 1st, 1962. With the best estimate we have today, there were an additional 268 wells drilled in the year 1962, which means that at the present time there are completed -- now these are drilled wells that are completed, some of them may be dry holes that were, of 268 wells, which brings us to a total, if my mental arithmetic is correct, of 941 wells which have been completed in the Basin-Dakota Pool.

Q But our studies are limited to 729?

A 729, of the wells that we had both sufficient data that

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we thought we could calculate even on the averaging basis the individual well reserves, and upon which we had deliverabilities. Now I think there are a number of wells actually connected to the pipeline at the present time upon which we did not have deliverabilities, but our study is solely based on the wells that we both calculated the reserves and obtained the deliverability. Our reserve determination and our deliverability determination as shown on our Exhibit 1 are both for initial conditions.

Q Before we leave our method, am I correct in understanding that the purpose of our study is to try to determine the best figures for the pool and not necessarily the best figures for each individual tract?

A Yes, sir, that's correct. I was going to get into that in a little more detail in discussing Exhibit 1; but our method of determining reserves for our Reservoir Department for our purposes is overall pool dedicated reserves. We do not feel that as to an individual well, a particular individual well, our method may be the best method that has been generally used by the industry. But our purpose is a little bit different than that used for many companies, in that our reserves are concerned more with the entire pool reserves rather than specific well reserves.

Q Would you please point to an exhibit and mark it Exhibit A-1?

(Whereupon, El Paso's Exhibit No. A-1 marked for identification.)

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A It has been marked Exhibit R-1. It's this exhibit right here. This exhibit is done in exactly the same fashion as all the previous exhibits that have been presented by El Paso in this category in attempting to establish a relationship between deliverability and reserves in the Basin-Dakota Pool. We have averaged by reserve groups all the wells which fell into that group according to El Paso's current volumetric reserve determinations, based on these average township factors. We have tabulated opposite the reserves of each of those wells the deliverabilities, the initial deliverabilities of each of those wells, and have arithmetically averaged those.

This first point here represents 22 wells in the range between zero and one billion cubic feet of reserves. The average reserve is 770 million cubic feet, and the average deliverability is 477 MCF per day. The second point represents 209 wells; the average reserve is 1,500,000,000 cubic feet. The average deliverability is 977 MCF per day. The third point represents 201 wells, the average reserve is 2,457,000,000 cubic feet, and the average deliverability is 1,344 MCF per day. The fourth point falls below the line and represents 166 wells; the average recoverable reserves of 3,438,000,000 cubic feet, the average deliverability is 1,461 MCF per day. The fifth point represents 78 wells with an average reserve, recoverable reserve of 4,462,000,000 cubic feet and an average deliverability of 1,952 MCF per day. The sixth point represents 33 wells with an average recoverable reserve

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of 5,505,000,000 cubic feet, and average deliverability of 2,606 MCF per day. This last point over here at the end represents 20 wells and includes all of those wells upon which El Paso calculated recoverable reserves in excess of six billion cubic feet; in other words, we lumped all the big wells into one because the point was relatively insignificant in the overall picture.

The average recoverable reserves of those 20 wells is 7,066,000,000 cubic feet, and the average deliverability is 1,725 MCF per day.

This line represents the average line, which can be drawn through those points. Coincidentally, and by actual calculation, that line is the 100 percent deliverability line, which means that any well which falls on that line has exactly the same percentage reserves of the total reserves as it has percentage deliverability of the total deliverability. Incidentally, the average recoverable reserves calculated by El Paso, based on these 729 wells, is 2,848,000,000 cubic feet, and the average deliverability is 1,372 MCF, and that point lies on that line.

MR. PORTER: Give me that average reserve figure again.

A Yes, sir, 2,848,000,000. To my way of thinking, this exhibit indicates conclusively that there is a direct and constant relationship between deliverability and recoverable reserves in the Basin-Dakota Pool. Now admittedly, if we plotted all 729 points on that graph, there would be a shotgun effect shown, which is recognized I think by anybody that would attempt to do it. El

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Paso's feeling is that the average effect cumulatively of using average township factors and average recoverable reserves and deliverabilities for all of those wells in the magnitude of the number of wells that we have on that curve at the present time tends to reduce any errors which may crop in as to individual well calculations.

Consequently, we believe that this curve as shown here on 272 more wells than we had for the previous hearing in April conclusively proves that there is a direct relationship between the deliverability and recoverable reserves.

Q (By Mr. Howell) Mr. Rainey, as we correct our estimates of recoverable reserves, do we find that the corrected figures fall more nearly in line with the deliverability curve, the 100 percent deliverability curve, than the figures that we started with on initial estimates?

A Yes, sir, that's correct.

Q Mr. Rainey, will you please tell the Commission what you show on Exhibit ?-R and discuss that exhibit?

(Whereupon, El Paso's Exhibit No. A-2 marked for identification.)

A Yes, sir. At the outset, I would like to make it thoroughly understood that I had nothing to do with the picking of the colors on that exhibit. This exhibit is designed to show the relationship of the percentage allocation formula which allocates allowables in the Basin-Dakota pool in relation to the reserves underlying the tracts, recoverable reserves underlying

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the tracts, and the other formulae that have been discussed here and the current formula which is in use in the pool. We took an average well in each of the reserve groups which are shown on Exhibit 1. Using the average reserves and average deliverabilities we calculated the allowables which would be assigned under various types of formulae. Purely as an arbitrary means of arriving at this, we established a market of 10 billion cubic feet for a month, which is roughly what nominations have been running in the Basin-Dakota Pool for the last two or three months. Again, as I testified in a previous case, I don't want to commit the purchasers to take that much gas out of the pool every month, but we used that figure in arriving at this exhibit.

Another thing, 10 billion made it easy to figure the percentages and so forth. We then calculated, on the basis of the average reserve, the allowable which would be assigned to wells in the pool on the basis of 100 percent reserves. That's shown by the red bar.

The allowables actually calculated for that, if you want the figures, the first group was 3,727 M squared CF per month. It's 3 million MCF per month, so it's 3,727 MCF squared per month. The second bar is 7,464, 7 million per month. The third one is 11,831 MCF. I'll go to that. It's easier to read the figures. Am I confusing everybody by changing over?

The fourth bar is 16,554 MCF per month. The fifth one is 21,487 MCF per month.

Q Now, Mr. Rainey, before you go any farther, let's stop and let's identify again the bars in that group.

A The bar that I'm talking about at the present time is the red bar. I'm giving the figures that represent each of the bars individually. The red bar is the reserve allowable that would be assigned to a well based on the average reserve for a well in each of the groups as shown in Exhibit 1.

Q That is the red bar which you've used in all of those -

A All the figures that I have given are figures that represent the red bar.

Q Are figures that you have given.

A In the sixth group, the figure is 26,515 MCF per month. The last one, based on the last reserve group, the allowable would be 34,050 MCF per month.

Now the second bar -- but before I go to that, we then drew a red line through the center of the end of each of the red bars, which represents a line of the percentage formula, if you could actually allocate allowables in direct relationship to the recoverable reserves underlying the tract for each well.

The second column, the orange column is the allowable which would be assigned on the basis of 100 percent deliverability, again using the average deliverability derived from each of the points on Exhibit 1. The figures for the first bar, first orange bar are 4,773 MCF per month. The second group, the bar is 9,770 MCF per month. The third group, the figure is 13,438 MCF per

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month. The fourth group, the figure is 14,768 MCF per month. The next group, the figure is 19,513 MCF per month. That's the fifth group. The sixth group, the figure is 26,061 MCF per month; and in the last group, the highest reserve group, the figure is 17,250 MCF per month.

We did not draw a line through the ends of that bar because in looking at it, it's pretty difficult in the first place to draw a line through bars this wide rather than through points. In the second place, we couldn't find any better line than the 100 percent reserve line to draw through the ends of those orange bars. Some of them fall above, some of them fall below; and any line drawn for 100 percent deliverability would be so close to the 100 percent reserve line, in our opinion, that we couldn't determine any other relationship for it.

The third bar, the purple bar, represents the allowable which would be assigned a well of the average deliverability in each of the groups on Exhibit 1 under the present allocation formula of 75 percent acreage times deliverability plus 25 percent acreage. For the purposes of this exhibit, we assume that each of the average wells had a 320-acre unit on it. In the calculation of the individual well reserves on Exhibit 1, we took the actual acreage assigned to that tract to determine that reserve.

The figures for the purple bar, the third one, in the first group is 7,006 MCF per month. The second group is 10,756 MCF per month. The third group, the figure is 13,508 MCF per

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month; and the fourth group, the figure is 14,386 MCF per month. The fifth group, the figure is 18,068 MCF per month. The sixth group, the figure is 22,973 MCF per month; and the last group, the figure is 16,366 MCF per month.

It can readily be seen in drawing a line, admittedly an approximate line, it could deviate a little bit one way or the other, the allowables which are assigned to wells of lower reserves are in excess of that allowable which would be assigned to them on 100 percent reserve allocation, and the allowables to wells of higher reserves are considerably less than the allowables which should be assigned to them on the basis of 100 percent reserves.

The next bar, the kind of brownish-orange bar is a bar which represents the allowable which would be assigned to a well in each of the reserve groups with the average deliverability in that group on the basis of the formula advocated by Consolidated, which is 40 percent acreage times deliverability plus 60 percent straight acreage. The figures for the bar in the first group are 10,138 MCF per month; the second group, 12,138 MCF per month; and the third group, 13,606 MCF per month. In the fourth group, the figure is 14,074 MCF per month; and the fifth group, the figure is 16,038 MCF per month. In the sixth group, the figure is 18,653 MCF per month; and the last group, the figure is 15,130 MCF per month.

Now as an illustration and comparison, we also drew a line as near as we could approximate it through the bars representing the allowable which would be assigned to wells on the basis

of the so-called 40-60 formula; and as can be seen, the lower reserve wells depart further even from the percentage reserve allocation line on the high side, and the higher reserve wells are even further from the percentage allocation line on the low side.

The last group is the green bar, which is the allocation which would be assigned a well on the basis of 100 percent acreage; and Consolidated has indicated they feel that the further we go toward acreage, the better we are allocating the allowables in this pool. It's readily apparent that even with great discrepancies in reserves within the pool, the straight acreage allocation would give the same allowable to every well in the pool every month, irrespective of the net thickness, porosity, or what you have underlying the tract. The figure for the straight acreage is the same in every case, and it's 13,717 MCF per month.

Q Before you leave Exhibit R-2, Mr. Rainey, would you comment on why those lines don't intersect at a common point on there?

A Yes, sir. Theoretically, there should be an average well somewhere in the pool that it would make no difference whatsoever what allocation formula was assigned to it. It would get the same allowable under any allocation formula. That point would lie somewhere approximately within this third group, because that's about where the average well in the pool would lie.

In attempting to put these lines on here as closely as

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we could in relationship to the length of the bars, it was a little bit difficult to hit one common point there, but thecretically there is one common point for a particular well where no formula would make any difference whatsoever on the allocation assigned to that well.

Q Had you used, instead of a bar a quarter of an inch width or greater, just a straight line, would it have been easier to have connected those points?

A Mr. Howell, it's possible that it wouldn't actually have intersected at a common point on the figures that we have used here, anyway, in that in the third group we have used the averages for the third group which differ somewhat from the average well in the pool. Had we used a group of bars or a group of lines for an average well in the entire pool, those lines would all have intersected at the point representing that one well.

Q Mr. Rainey, what conclusion have you drawn from the studies which you've made and which are reflected by El Paso's Exhibits R-1 and R-2, as to the possibilities of an allowable formula which permits the Commission to, insofar as practical, allocate to each tract in the pool its fair share of gas that can be produced without waste?

A Mr. Howell, I think it's pretty conclusive from our exhibits and from the other testimony that has been put in by Pubco in this case that there is a direct relationship between deliverabilities and recoverable reserves underlying the individual

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tracts. There has also been considerable testimony as to the inaccuracies of the determination of individual well reserves in some instances. That's not to say that there are not wells in the pool that we can calculate very accurately the recoverable reserves. Because of the inaccuracy of the specified individual well calculations in some instances, it's particularly impractical for the Commission to attempt to allocate allowables or to allocate market demand on the relationship of reserves. Consequently, with the direct relationship which has been demonstrated between deliverabilities and recoverable reserves, I feel that insofar as practicable, the Commission can allocate the market demand in this pool to the wells in relationship to their deliverabilities and be fulfilling the statutory requirement in regard to allocating them in relationship to their reserves.

It has further been demonstrated both on El Paso's exhibits and Pubco's exhibits the magnitude of deliverability in that formula would begin to approach 100 percent rather than to depart from 100 percent. It's recognized that there are wells in the pool who have very low deliverabilities; and in conformance with the Commission's directions in the statutes to prevent the premature abandonment of wells, El Paso feels that the 25 percent acreage portion of the formula as it's presently constituted is an eminently fair means of preventing premature abandonment of the poorer wells in the pool, most of which are going to be marginal wells anyway.

Q Have you made any studies to determine the effect which the adoption of the 60-40 formula might have on a specific group of wells in the same way that you've looked at the average well as shown on Exhibit No. 2?

A Yes, sir. I think on the average it can be seen very readily that the 60-40 or 40-60 formula as advocated by Consolidated tends to depart more and more from the percentage allocation formula which would be on 100 percent reserves. As a quick check to see what would happen, we ran some figures on a specific group of wells which are operated by Consolidated, and found that under the 60-40 formula as proposed, in comparison to the 75-25 formula, for the month of January, 1963 and for the month of February, 1963, Consolidated would have derived approximately $12,000 per month additional revenue on the wells operated by them, which are the low reserve-low deliverability wells in this pool -- some of them, I mean.

Q Would that amount of money, that 10 or 12 thousand dollars, come from the other operators in the pool with better reserves?

MR. STOCKMAN: I would like to object to this line of interrogation here, speaking of some wells only and attributing great values to Consolidated by changing its allowables for that well, without considering other wells that might be reduced. It does not seem to me to be an appropriate approach, if it's material at all, which I really doubt that this is, to the

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determination of reserves in each tract.

MR. HOWELL: If the Commission please, might I clarify one point here that I think the objection created a little confusion.

Q (By Mr. Howell) Did you take all of the wells in which Consolidated was the operator and calculate them as a group?

A Yes, sir.

Q So that that calculation was based upon all of the wells which they operate, and not a particular group of their wells, excluding others of their wells?

MR. PORTER: Objection sustained.

MR. HOWELL: If the Commission please, may I ask a question? If Counsel wishes to object, he may do so before we answer.

Q (By Mr. Howell) Could you testify as to the volumes of gas that would be transferred as a result of such a change, as to all of the wells which are operated by Consolidated?

MR. STOCKMAR: Does the witness know which wells Consolidated has an interest in?

MR. HOWELL: That was not the question. The question was as to the wells which Consolidated is operating.

MR. PORTER: As I understand it, that would consist of the wells that are listed in the Commission's records with Consolidated as the operator?

MR. HOWELL: With Consolidated as the operator.

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MR. STOCKMAN: We have no objection to the witness answering that question.

MR. PORTER: You may proceed to answer the question.

A Consolidated would have received under the 60-40 formula, in addition to the volumes they're entitled to under the 75-25 formula which is currently in effect, in the month of January, 95,138,000 cubic feet, and in February, 87,625,000 cubic feet of additional allowable which must, of necessity, in the absence of a change in the market for the pool in that month, have come from some other operator.

Q (By Mr. Howell) Were these Exhibits R-1 and R-2 prepared under your general supervision?

A Yes, sir, except the coloring kind of got out of hand.

Q Do they correctly reflect the matters which you have testified to?

A Yes, sir.

MR. HOWELL: El Paso offers its Exhibits R-1 and R-2.

MR. PORTER: Are there any objections to the admission?

MR. STOCKMAN: Consolidated would like to object to the admission of both exhibits on the basis that nowhere on either of them is any indication of the recoverable reserves under any given tract in the field, or any indication of the recoverable reserves in the entire pool, or any indication of the ratio of the first to the second. This was the purpose of the hearing. We've tried to be rather quiet and allow some latitude as to this

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discussion, but except for the three wells to which Mr. Rainey did testify, there has been no evidence presented that's responsive to the Commission's limitation on what should come here.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: Southern Union joins in that objection.

MR. PORTER: The Commission will overrule the objection. The exhibits will be admitted. The Commission will determine what value to place on the exhibits.

(Whereupon, El Paso's Exhibits R-1 and R-2 admitted in evidence.)

MR. STOCKMAR: Are we still operating under the same ground rules, that we have an automatic exception to the overruling of our objection?

MR. PORTER: You can register an exception if you would like to.

MR. STOCKMAR: I would like to register an exception to this and every other time that Consolidated may have been overruled.

MR. PORTER: The record may so show.

MR. HOWELL: That concludes our direct testimony.

MR. PORTER: That concludes your direct examination. Any questions of Mr. Rainey? Mr. Stockmar.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Rainey, you have testified that deliverabilities can be measured quite accurately?

A Yes, sir.

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Q You have testified that reserves can be measured but not quite so accurately; is that what I infer from your testimony?

A I think in many instances reserves can be measured with reasonable degrees of accuracy. There are a number of cored wells in this pool. It's my understanding in talking to the Reservoir Department that there's something like 120 core analyses --

Q As between the two, looking at the entire pool, which factor can be measured more accurately?

A On the pool as a whole, it's my opinion that deliverability can be measured more accurately on an individual well basis.

Q On your curve, you have averaged by reserve groups, you've averaged deliverabilities and reserves by reserve groupings once again as you did last year, have you not?

A Yes, sir.

Q If deliverabilities are more accurately measured for large groups such as the 220, 209 groups that you have there, would it not have been more valid to average by deliverability groups and thus plot your points and draw a curve?

A No, sir. I disagree with you completely there. We are attemping here not to prorate deliverabilities but to prorate reserves. Consequently, we have averaged them within reserve groups in an effort to establish the relationship of reserves to deliverabilities.

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Q Are you not, by drawing the line, simply trying to show that there is an apparent relationship between deliverabilities and reserves?

A I think it's considerably more than an apparent relationship. I think it's a direct relationship.

Q Would you derive that from the line?

A Yes, sir, and from the general relationship of individual well reserves and deliverabilities throughout the pool.

Q You do not deny that we could average the same data by deliverability groups and draw another line on the chart, do you?

A You can draw another line, but I don't think it would be anywhere near as valid as a line broken down by reserve groups.

Q Is it from this study that you draw the conclusion that there is a relationship between the deliverability and reserves?

A Yes, sir.

Q It's an age-old type of arguing that if you assume a premise, then you are able to argue from that and prove your premise. Does this thing have any validity whatsoever if the premise is not correct to begin with?

A Mr. Stockmar, we didn't start with a premise, we started with an investigation a number of years ago in an attempt to determine whether or not there was a relationship between deliverability and reserves in the Basin-Dakota Pool and in some of the

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other pools in the San Juan Basin area. Based on the statistical facts we derived the premise there was a direct relationship between deliverability and reserves.

Q And these are those facts?

A Yes, sir.

MR. STOCKMAR: That's all the questions I have at the moment.

MR. PORTER: Mr. Kellahin.

BY MR. KELLAHIN:

Q If you did average your well groupings by deliverabilities, and since there is a direct relationship between deliverability and reserve, the end result would be a straight line if your premise is correct?

A Mr. Kellahin, we went into this in great detail in the previous hearing, as you recall.

Q Yes, sir.

A We have investigated that particular point on a number of occasions. There are wells which tend to throw the curve out of line. For approximately 90 percent of the wells, your statement is exactly correct; if you average them by deliverability groupings for about 90 percent of the wells, you'll derive a straight line.

Q But you didn't do that?

A No, sir. I didn't do it for the purposes of an exhibit. We have run some rough calculations. I don't have them

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with me.

Q You gave some figures on the volume of gas to be gained by Consolidated to the wells operated by Consolidated if the order before the Commission is adopted?

A Yes, sir.

Q Have you made a calculation on the volume of gas that would be gained or lost by Southern Union Gas Company?

A No, sir. It's my recollection just offhand, and I have not checked these figures, that Southern Union has some of the higher deliverability wells in the pool, and it's quite possible that they would derive a loss from the establishment of the formula.

Q How about Aztec Oil and Gas Company?

A No, sir. I have made no specific studies other than the one quick look at the Consolidated wells.

Q In other words, all you were concerned with is what would happen to Consolidated, and not where the gas might come from?

A Yes, but it obviously came from somebody else.

Q That's one reason we are here, Mr. Rainey.

A I'm glad we have got it out on the table, then.

Q Taking your groupings in Exhibit No. 1-A, give me the ranges of deliverabilities in each group.

A Yes, sir. In group one consisting of 22 wells, the deliverabilities ranged from two to 1477, bearing in mind that

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these are initial deliverabilities. That two deliverability well, I am sure, has since been plugged and abandoned. The over-all range is extreme. However, there are only about four or five wells out of the entire 22 that are in the extreme ranges.

Q Go on to group two.

A All right, sir. The deliverabilities in group two, which consists of 209 wells, I believe, range from -- well, offhand, Mr. Kellahin, the lowest one I see is 25; the highest one would range up to around 4,000 MCF per day. Again there are extremes, but they're in the minority.

Q I want to know the extremes.

A That's 25 and 4,000, approximately.

Q Would you give me group three now?

A Yes, sir. Group three, in just eyeballing it, runs from approximately 84 -- let me retract that, it's not approximately 84, it's 84. The highest one is, offhand, is 4,235.

Q Group four, please.

A Group four is the range between 3 billion and 3,999,000,000, consisting of 166 wells. The lowest deliverability is, offhand, is 194 MCF per day, and the highest one is 8,663 MCF per day. Again, those extremes are in the minority.

The next group, 78 wells between 4 billion and 4,999,000,000 reserves. The lowest deliverability I see is 119 MCF per day, and the highest is 7,378 MCF per day. Again those extremes are in the minority.

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In the range between 5 billion and 5,999,000,000 reserves, consisting of 33 wells, the lowest deliverability I see is 183 MCF per day; and the highest, 12,063 MCF per day. The next highest is 8,000 MCF per day. And the last grouping, which consists of 20 wells with reserves in excess of 6 billion cubic feet of reserves, the lowest deliverability is 216 MCF per day and the highest is 4,202, I believe, MCF per day.

Q Now it's your testimony that the well with 183,000 MCF per day for the purposes of your exhibit has the same reserves as the well with the 12,063,000?

A No, sir.

Q You grouped it in the same reserve group?

A Bearing in mind -- yes, sir, they are in the same group, but our reserve calculations are based on a constant abandonment. I have no idea of what the pressure of the 300 well is. I would venture to say it's in the neighborhood of 1500 to 2,000 pounds of pressure. That well will probably be abandoned sometime in the next year or two unless that deliverability levels out pretty abruptly. That 12,000 per day deliverability well will probably produce for a great number of years. The recoverable reserves on an individual well basis may differ markedly from the individual well calculations that we have used, but by averaging them as we have, we felt that the relationship that we have established on Exhibit 1 is a valid relationship.

Q Then you are averaging 119 against 3,338 MCF

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and saying there is a direct relationship?

A Yes, sir.

Q What is that relationship; between those two wells, for example?

A Well, the 119 MCF per day well is probably going to be abandoned next year, and its recoverable reserve is substantially less than we have calculated on the basis of a fixed abandonment pressure.

Q You have them in the same reserve bracket?

A That is correct.

Q Your calculation is that they have the same recoverable reserves?

A For the purposes of our study and the basis that we calculated the reserves.

Q But you admit they do not have the same recoverable reserves?

A That's right, as a practical matter, and as was demonstrated by Mr. Cleveland of Pubco.

MR. KELLAHIN: That's all. Thank you.

MR. STOCKMAR: I have two more questions, please.

MR. PORTER: Mr. Stockmar.

BY MR. STOCKMAR:

Q Can I assume that you have before you certain data sheets that describe these wells and show the reserve calculations for each well?

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A You may assume that if you want to.

Q Is the answer yes?

A Yes, sir, I do.

Q Are you willing and do you intend to put these into evidence as exhibits?

A I'll have to have a ruling from my Counsel and a subsequent ruling from the Commission.

MR. HOWELL: If the Commission please, we do not intend to put them into evidence. We do not intend to clutter the record with that individual data.

MR. STOCKMAR: Those are my two questions. Thank you.

MR. PORTER: The hearing will recess until 1:15.

(Whereupon, the hearing was recessed until 1:15 o'clock P.M.)

AFTERNOON SESSION

MR. PORTER: The hearing will come to order, please. Are there any more questions of Mr. Rainey? Anyone have any more questions of Mr. Rainey? He may be excused.

(Witness excused.)

MR. HOWELL: That concludes the testimony to be presented by El Paso.

MR. PORTER: Anyone else desire to present testimony? Mr. Swanson.

MR. SWANSON: Yes, sir. Aztec has one witness.

(Whereupon, Aztec's Exhibit No. 1 marked for identification.)

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MR. DURRETT: Will you stand to be sworn, please?

(Witness sworn.)

L. M. STEVENS

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. SWANSON:

Q Would you state your full name, please?

A L. M. Stevens.

Q Are you the same L. M. Stevens who has testified at this Commission at a previous hearing after having been qualified as an expert witness?

A Yes, I am.

Q Mr. Stevens, have you made a study of the effect on correlative rights in the Basin-Dakota Pool of various proration formulas, including the existing formula and that proposed by Consolidated?

A Yes, sir.

Q What was your conclusion as to the best manner in which such a comparison could be made?

A Well, it was my conclusion that the best manner in which this comparison could be made was by considering the effect of the various formulas on average deliverability and reserve data developed from a study of all or practically all of the wells in the pool. I knew that El Paso had such a study which

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was more nearly complete in this regard than any other study that I know of. I know how El Paso determined their reserve values and I agree in principle with their techniques. I also know how they have grouped their wells, how they arrived at the different averages within the groups, and I agree with this method.

A check of their reserve values showed that they compare favorably with reserves developed by Aztec for wells which we operate and others in which we have an interest. I knew that El Paso had kept their reserve study up to date, and I requested that they supply me with average reserve values with their corresponding deliverability values as developed by their latest study on 729 wells. This they did, and I made the comparison by using their values developed by this study, which to my knowledge is the most nearly complete and up to date study that there is for the Basin-Dakota.

Q Have you prepared an exhibit from this data demonstrating the effect on correlative rights of various participation formulas?

A Yes, sir, I have.

Q Would you refer to it, please? Mr. Stevens, would you explain your exhibit, please?

A Yes, sir. This exhibit was prepared from the use of the data supplied me by El Paso. There are seven different reserve groups with averages including 729 wells. The effect on

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correlative rights by prorating on a 40-60 formula and on the current 75-25 formula, and on 100 percent "A" times "D" formula can be determined from this exhibit. The blue line illustrates yearly allowables which would be granted the average well by prorating on a 40-60 formula; the red line shows the same thing for the current formula; and the green line shows it for the 100 percent "A" times "D" formula.

The number next on each point indicates the number of wells in that reserve group, and the number in parentheses indicates the range of reserves in each group.

The yearly allowable for the average of each of these groups was determined through the use of factors which were taken from the 1962 proration schedules. Each point shows this yearly allowable for the average of that point, and this allowable is expressed as a percentage of the average reserve for that well. This allowable so expressed is plotted against the average deliverability of each group.

Now the red point at the extreme right of the exhibit shows that the high reserve wells would be granted annual allowables equal to about four percent of their reserve under the present formula. At this rate it would, of course, take them about 25 years to deplete their allowable, and during this time the low reserve wells would be granted allowables equal to about 10 percent of their reserves and could deplete this reserve in about 10 years.

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Adopting a 40-60 formula would cut the high reserve well allowables from four percent to a little less than three and a half percent, as indicated by the blue point, and would increase the low reserve well allowables from 10 percent to about 14 percent. Now under this formula, the low reserve wells could now deplete their reserves in about seven years, after which time they would recover reserves in excess of the reserves properly attributable to the tracts where they produce. In doing this, correlative rights would of course be violated.

Now the position of the blue line as related to the position of the red line here would indicate that considering acreage in the allocation formula would tend to cause violation of correlative lights, and the degree of that violation would vary directly with the weight given acreage in the formula.

The green line shows that a 100 percent "A" times "D" formula would be desirable if there were no need for an automatic minimum allowable as provided for by the present formula. The green line shows that under this formula the 100 percent "A" times "D" allowables would vary only by slightly over two percent between high and low reserve wells. The low reserve wells as indicated would still be favored slightly even under this formula. The relative position of this green line would indicate that any change in the formula should be in the direction of giving deliverability more weight in the formula.

Now the points in the rectangle below all three lines

and located between the three to four billion and the four to five billion reserve groups are for 21 wells in a six billion or better reserve group. These 21 wells represent about three percent of the total wells studied, and the points in that rectangle indicate that changes in the formula wouldn't affect their allowable too much. Therefore, since this is true, they weren't considered in this comparison.

Q Mr. Stevens, in summary, what conclusion would you draw from this exhibit?

A I would conclude that deliverability should be emphasized in the proration formula.

Q It would appear that a straight deliverability formula would be the most equitable of the three illustrated here?

A It would appear so, yes.

Q To your knowledge, would Aztec object to the continuation of the existing formula even in spite of that?

A No, sir, we would not.

Q Mr. Stevens, was this exhibit prepared by you or under your supervision?

A Yes, it was.

MR. SWANSON: At this time we would like to introduce Aztec's Exhibit No. 1 in evidence.

MR. PORTER: Is there any objection to the admission of the exhibit?

MR. STOCKMAR: Consolidated would like to object to the

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admission of the exhibit on the grounds that it does not in and of itself contain any reserve figures for any given tract. It does not contain reserve figures for the entire pool. It does not contain any ratio of one to two, and is not responsive to the hearing as called.

MR. KELLAHIN: Southern Union joins in that objection.

MR. SWANSON: The exhibit is designed to make certain conclusions with regard to data that has been entered into this hearing and data that was available to him and that he has checked to the best of his information as to its accuracy, and it is.

MR. STOCKMAR: It is my recollection that just before lunch I asked if this data was going to be made available, made indirectly. The answer was no.

MR. HOWELL: The question was if we were going to introduce it in evidence, and the answer was no, we were not going to introduce it in evidence.

MR. STOCKMAR: Mr. Swanson has just stated that the data was available to us, and it was not available to us.

MR. SWANSON: I think the data is also on El Paso's Exhibit No. 1 and 2, which are in public view at the moment.

MR. PORTER: Mr. Stockmar, you were referring to reserves on an individual tract basis and total reserves in the pool and the ratio of the proportion of one to two. The objections are overruled. The Commission will permit the exhibit and determine what weight to be given to it, and the record will show

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exception, if you would like, Mr. Stockmar.

(Whereupon, Aztec's Exhibit No. 1 admitted in evidence.)

MR. STOCKMAR: Thank you.

MR. PORTER: Does anyone have a question of Mr. Stevens?

MR. SWANSON: I'm not quite through with my direct examination.

MR. PORTER: Oh, I see.

Q (By Mr. Swanson) Mr. Stevens, in arriving at the best possible proration formula for this pool, in your opinion would one big objective be to limit the number of wells receiving allocations in excess of the ideal allocations for those wells? By ideal, I mean that allocation which directly relates its share of the allowable to its share of the recoverable pool reserves.

A Yes, I believe that would be true.

Q Why would you think this would be important?

A Well any well which is consistently granted an allowable that is greater than its proper or ideal allowable will sooner or later be allowed to produce somebody else's gas, and this obviously would violate correlative rights.

Q For a moment, if you will, assume that you are in complete agreement with the reserve data that has been presented to the Commission by Consolidated, with the manner in which the data was fed into the IBM machine, and the calculations that machine was required to make. From the data that Consolidated has presented, in your opinion, is it possible to tell what weighting

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of deliverability would be most desirable in determining a formula which will limit the number of wells receiving allocations in excess of the ideal allocations?

A Yes, sir, that would be possible. We refer to their Consolidated Exhibit No. 5. They show under the 100 percent weighting and deliverability weighting and opposite the 100 and to 109 percent of proper allowable, 35 wells are shown. Now the number of wells getting exactly 100 percent of their proper allowable is not indicated, but we can assume that all of these 35 wells would receive exactly 100 percent of their proper allowable. Now at the bottom of this column, it's indicated that 247 wells received 100 percent or better of their proper allowable or ideal allowable. Then, subtracting the 35 wells which we assume received 100 percent of their proper allowable leaves 212 wells that produce in excess of, or that are granted allowables in excess of their proper or ideal allowable under the 100 percent deliverability formula.

Going through the same procedure with the 75 percent deliverability formula, we find that this would be increased to 245 wells that would be granted allowables in excess of their proper or ideal allowable.

Under the 50 percent deliverability weighting, there would be 284 wells in this category. Under the 40 percent weighting, 316 wells. This would increase to 338 wells under the 30 percent; 347 wells under the 20 percent; 365 wells under the 10

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percent; and 361 wells under straight acreage prorationing would be granted allowables in excess of their proper or ideal allowable.

Now the range of wells in this category, those that would be granted allowables in excess of their proper allowable, ranges from a low of 212 wells to a high of 365 wells. It's apparent from this exhibit that as the weight of deliverability in the formula is decreased, as the weight of deliverability is decreased it increases the number of wells which would receive allowables greater than their ideal or proper allowable.

Q Mr. Stevens, these wells which you've testified to that would be producing in excess of the ideal rate for each well are the minimum number of wells that would be in that category, would they not?

A Yes, sir.

Q Not being able to determine how many wells from this data are producing at their exact ideal rate, you have assumed that all producing in the range of 100 percent to 109 percent of that rate are producing at their exact ideal rate?

A Yes, sir, so this would be the minimum number of wells in those certain categories. This exhibit supports our conclusion that to better protect correlative rights, deliverability should be given heavy emphasis in the proration formula.

Q Would you refer to Consolidated's Exhibit 6? This apparently is a plot of the number of wells receiving the various

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percentages of proper allowables under four different proration formulas. These include the 100 percent, the 65 percent, 40 percent, and 20 percent of the deliverability values. Which formula according to this data would most effectively limit the wells receiving in excess of their fair share?

A The 100 percent deliverability formula represented by the curve constructed through the open dots, the wide dots. Under this formula, in all ranges above the ideal or the 100 percent line here, there are fewer wells which receive allowables in excess of their fair share under the 100 percent deliverability proration.

Q In this regard, what would be the next most desirable formula that's illustrated on that exhibit?

A The next most desirable would be the 75-25 as indicated by the black dots on this next curve. This formula would tend to restrict the number of wells receiving allowables above the ideal, very nearly to the same degree that the 100 percent deliverability formula tends to restrict. It certainly is nearer to the 100 percent deliverability formula than the other two formulas are. This exhibit will demonstrate again that giving deliverability maximum consideration in the allocation formula will give better protection of correlative rights.

Q Would you refer to Consolidated Exhibit No. 7?

As I recall, this is designed to illustrate the number of abuses of correlative rights caused by various deliverability

values in the formula. These abuses are limited to those falling outside the 70 percent to 130 percent range in reserve estimates. According to the data on this exhibit, how many abuses of correlative rights would occur should the Commission adopt the 40-60 percent formula requested by Consolidated?

A About 350 abuses.

Q Do you know how many wells are included in Consolidated's data?

A I think there were 699, say 700.

Q Of that 700, 350 abuses of correlative rights would occur?

A Yes, sir, about 50 percent of the wells.

Q Of these 350 abuses, can you tell from their data how many are caused by wells receiving allowables in excess of their ideal allowables?

A It can be determined from the Exhibit No. 5 again that 204 wells would receive more than 130 percent of their ideal allowable.

Q Using the same 70 to 130 percent allowance, can you determine how many of the 350 abuses due to 100 percent deliverability formula are caused by wells receiving in excess of their ideal allowable?

A Yes, sir, that can be determined in the same manner from the same exhibit. We have determined it to be 172 wells which would receive more than 130 percent of their ideal allowable

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under the 100 percent formula. This compares with 204 wells in this category under the 40-60 formula.

Q Does Exhibit 7 tend to mask the number of excessive allowable wells?

A Yes, sir, it would, more or less, because it would mask actually the actual number of excess allowables because it's indicated on this exhibit that it disregards wells falling in the 100 to 130 percent of ideal allowable range. Actually, according to this data, under the 40-60 formula at least 316 wells would receive more allowable than their ideal, as compared to 212 wells in this category under the 100 percent deliverability formula.

Q In your opinion, which is a greater impairment of correlative rights, allowing a well to produce at an excessive rate, that is, at a rate in excess of its ideal rate, or restricting a well's production at a rate below its ideal rate?

A When you first think about these things, they are both pretty serious impairments of correlative rights. However, when you think about it further, it's obvious that a well which consistently receives more than its fair share of the allowable will sooner or later produce somebody else's reserve. After this reserve is produced and sold, the rightful owner of that reserve has no second chance, so to speak, to produce that reserve himself because it's already gone. It's sold.

But restricting a well's allowable to less than its fair share, it might not completely destroy its correlative rights

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because this allowable could remain in the reservoir to be produced by the well later, depending on certain circumstances. Circumstances favorable to this type of thing would exist for a well located in a relatively isolated area, or a well surrounded by other wells which have their allowable restricted in the same way, or a well which would have drainage barriers which would be locally around its lease. Under such circumstances, the true effect may be just a prolonging of the time for the well to produce its share of the pool reserve.

Q Mr. Stevens, would you summarize the conclusions you have drawn from Consolidated's exhibits?

A Yes, sir. Again, under the assumption that their data is correct, all three of their exhibits, Nos. 5, 6, and 7, demonstrate that as deliverability receives less weight in the formula there would be an increase in the number of wells receiving allowables in excess of their fair share of these pool allowables. This is, of course, an impairment of correlative rights; and for this reason, deliverability should be emphasized in the proration formula.

Q Forgetting now the assumption that you are in complete agreement with Consolidated's data and methods, have you any comments you would like to make with respect to their data and the procedures they followed?

A Yes, sir. I would make this comment. They started with reserves on 457 wells, which by now is outdated and have been

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revised. Any errors that were inherent in these 457 wells will be carried to other wells by their extrapolation. I don't believe that they have determined as closely as has become possible their reserves since early 1962, the development of additional data which is generally available. Any change in reserves would change the relationships as indicated by their exhibits, because their exhibits are based upon their reserves. I think their reserves need to be refined, and I do not believe that their reserves are the best estimates now available to the Commission.

Even so, even with this, their exhibits still support our conclusion that deliverability should be emphasized in the proration formula. In my opinion, the number of wells receiving a greater or less than their ideal allowable as indicated by these exhibits, it might be decreased, this number of wells which are in this category might be decreased if their study had been based on their reserve data comparable to that developed by El Paso Natural Gas and Pubco, if their reserve study would have been as intensive and as detailed as these reserve studies have been.

MR. SWANSON: I have no further questions.

MR. PORTER: Does anyone have a question of the witness Mr. Stockmar.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Stevens, I didn't object to the line of interrogation while it was going on, but you made repeated references to

Consolidated's Exhibits 5, 6, and 7, and were drawing certain conclusions therefrom. Do I understand that it was those exhibits as modified by you, after arbitrarily eliminating certain categories of wells from it?

A No, sir. That wasn't the case at all. My conclusions drawn from these exhibits were taken from your own data that you submitted to this Commission.

Q You said something about there being one category under which 204 wells would be in excess of 100 percent, or something like that. I don't find the number 204 on here.

A That's a calculated number. I can tell you how I got it if you would like me to go through it.

Q What's this about your crossing out all the wells in the 100 to 109 percent category?

A Well, I didn't cross them out, actually I just subtracted them from the total in that particular group because I wanted to arrive at the number of wells which were receiving allowables in excess of their percent of proper allowable as you have shown here. I wanted to arrive at the number of wells that were receiving allowables in excess of their proper allowable.

Q Well, isn't a well which is receiving 101 percent of its proper allowable receiving in excess of it?

A That is correct, but I think I made the statement that the wells receiving exactly 100 percent are not indicated on this exhibit. The wells from 100 percent to 109 percent are lumped

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together and under the 100 percent formula there are 35 wells in that range.

Q So you subtracted everything in that line to arrive at a new set of data?

A I subtracted it from the data that you have here on your exhibit.

Q So as to one formula, you subtracted 35; to another, you subtracted 71. All your work is a different total of wells, is it?

A It is under a different total, but it's still under the 100 to 109 percent range.

Q Why did you knock out the 90 to 99 percent?

A Because I was trying to arrive at the number of wells which were receiving an allowable in excess of their proper allowable. The 90 to 99 percent range would obviously be knocking out a well that was receiving less.

Q Why didn't you knock all the wells over a hundred out, then, the whole bottom half of the exhibit?

A That would have left me with zero wells producing over their excess allowable, and obviously that isn't true. There are 212.

Q Isn't it correct that all of your testimony and your conclusions are based upon your calculations as you have remodeled our exhibits?

A Well, basically, I suppose that's true.

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MR. PORTER: Any further questions? The witness may be excused.

(Witness excused.)

MR. PORTER: Does anyone else have testimony to present in the case?

MR. STOCKMAR: I would like to present Consolidated Exhibit 6 as so marked.

MR. KELLAHIN: If the proponents are through, we do have some rebuttal testimony.

MR. FEDERICI: If the Commission please, I have a statement for one of the parties.

MR. KELLAHIN: You want to make it now?

MR. FEDERICI: I think I will make it at this point.

MR. PORTER: Mr. Federici.

MR. FEDERICI: For Calkins Oil Company. We agree with the conclusions stated and proven by the witnesses and the exhibits presented by El Paso Natural Gas Company, by Pubco, and by Aztec; and we affirm and support those views.

The Commission will recall that in April, Calkins presented evidence that deliverability should be the predominant factor in the allowable formula. The evidence introduced by other operators at this hearing further clearly supports this position. It is, therefore, our recommendation to the Commission that the present 75-25 formula be continued for the Basin-Dakota Pool. If the Commission please, that will be all at the present

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time.

MR. PORTER: Mr. Kellahin, you say Consolidated has one rebuttal witness; is that what you said?

MR. KELLAHIN: Southern Union does and Consolidated does, also. I think it would be rather brief, however.

MR. PORTER: Which one do you want to call first?

MR. KELLAHIN: I would like to call Mr. Oren Haseltine, for Southern Union.

(Witness sworn.)

OREN HASELTINE

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Oren Haseltine.

Q By whom are you employed and in what position?

A Southern Union Gas Company, Executive Assistant.

Q Are you the same Mr. Haseltine who testified in the case before the Commission at the April hearing?

A Yes, sir.

Q Are your qualifications as a petroleum engineer a matter of record before this Commission?

A They are.

MR. KELLAHIN: We submit the witness as a qualified

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engineer.

MR. PORTER: His qualifications are accepted.

Q (By Mr. Kellahin) Mr. Haseltine, in connection with some of the testimony that has been presented before the Commission today, there has been some statements made that deliverability is a more certain figure, in fact, a relatively certain figure in testing wells in the Basin-Dakota Pool; do you recall that testimony?

A Yes, sir, I believe that's been affirmed a few times, that deliverability is a very determinable thing and subject to practically no error; that it is a parameter easily measured, and therefore has a very good reliability and good use in any kind of a proration formula.

Q Have you had any experience in the taking of deliverability tests in the Basin-Dakota Pool?

A Yes, sir, I have run a few myself, and as an employee of one of the pipeline companies in the area we have a great deal of interest in the deliverability tests and the manner in which they're taken.

Q Do you find that any wide variations occur in deliverabilities on any given well?

A We find that, first of all, deliverabilities -- and this has been testified to I believe by Mr. Gorham -- deliverabilities will increase and can be made to increase in the case of a number of wells through the use of modern or improved completion or

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stimulation techniques. It is a well known fact, and we need to recognize that when we speak of an initial deliverability that at some future time that well may have a higher deliverability. If we subscribe to the testimony or to the concept that deliverability is directly related to reserves, we have to say that those wells so stimulated have shown a corresponding increase in reserves.

Q Now do you believe that to be true?

A No, sir.

Q Other than the factor of time, would an increase in deliverability increase the recoverable reserves under a given tract of land, in your opinion?

A Pardon me?

Q Other than the factor of time --

A Right.

Q -- does the increase in deliverability increase the recoverable reserves under that tract?

A The increase in deliverability may serve to extend the economic life of a well. Now then, we have seen evidence offered that recoverable reserves is created by certain rock parameters, none of which include deliverability or permeability. This is a good volumetric formula and I'm sure that the staff of the Commission recognizes what I'm getting at, that a volumetric formula is one thing but it does not recognize, does not include any parameters that you can arbitrarily enlarge when the stimulation

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is successful and results in an increase in deliverability. Therefore, any imagined correlation or direct relation between this volumetric calculation falls down when you are successful in stimulating a well and getting an increase in deliverability; there's no factor in that volumetric formula which you can increase. You can't increase "H", you can't increase fee; you can't increase gas saturation; you can't increase any of those parameters, so it's, the imagined relation between volumetric reserves and deliverability simply isn't there, once a well has been stimulated.

Q Are there factors which would affect the accuracy of the deliverability test in the Basin-Dakota Pool?

A Yes, there are. The seven-day shut-in pressure which is required by statute is subject to a great deal of mis-observance and maybe some boiler housing. Let me put it this way. We have one operator who is connected to our system and he has turned in deliverability tests which have been accepted by the Commission, and he shows a seven-day static shut-in approximately half his original reservoir pressure. This is on the initial deliverability test turned in on these wells. Now the fact that he can turn in a seven-day shut-in approximately 50 percent of his original static serves to increase his deliverability approximately 60 percent. This is just arithmetic.

Q Do fluids in the well bore have any bearing on it?

A Right. I wouldn't want to infer that this operator

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is boiler housing this data, he probably has fluid in the hole.

Q That would be the answer to that particular situation?

A I think that is probably right. The Dakota is going to be characterized by that kind of situation in more cases than not.

Q Does the manner in which the well has been produced prior to the taking of deliverability tests have any effect on the deliverability test?

A It has a very great effect. I think probably most of the engineers here will admit that deliverability tests are in some measure rate sensitive. That is to say that if one well has been shut in for four or five months or even seven or eight months prior to its deliverability test, it will show a higher deliverability than it would have shown had it made its monthly allowable each month prior to that test. That's just an observed fact in the Basin-Dakota Pool.

Q Now you heard the testimony submitted by Pubco Petroleum Company to the effect that they calculated some of their wells down to an abandonment pressure of 140 pounds. Do you agree that they can be produced to that point?

A No, sir, I don't think that any Dakota well is ever going to produce to 140 pounds. In the first place, that infers that the gathering system would be run at probably 50 pounds and it also infers that there is no fluid in the hole to drown out that pressure. Actually, two barrels of fluid in two-inch tubing would kill a 140-pound well.

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Q Would that be a possibility in the Basin-Dakota Pool?

A I think it would be a probability.

Q Now you were present this morning and heard the testimony of Mr. Cleveland and saw the graphs which he submitted to this Commission?

A Yes, sir.

Q Have you examined those graphs?

A Yes, sir, I have.

Q Do you have any comments to make in connection with them?

A The graphs that Mr. Cleveland produced show several points through which he has drawn a straight line, and to the appearance of the eye they fit the points very well. However, we need to recognize that some of those points represent 50 or 60 wells, and some of the points which have equal amount of bearing on the position of that line represent only one well. In addition, I don't have a copy of that curve in front of me but I believe above the 3 million reserve range he had 61 wells represented above the line and 29 below. This is referring to Pubco's Exhibit R-2. Above the 6 billion foot recoverable reserve range, he had some, oh, if I remember my addition correctly, there were about 60 wells above the line represented by four points; and some 29 or 30 wells below the line represented by four points. The position of his line gives somewhat more weight to those 20 or 30 wells below the line, one of which, one point of which represents

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only one well, than it gives to the 60 or 70 wells above the line.

Now here again, I feel confident that the staff is aware of things that can be done with graphs of groups and graphs of averages. That has been apparent through some of the questions that have been asked, but I feel that this thing can't go unchallenged by Southern Union, since we have an interest in this case that's before the Commission; and it's simply a matter of arithmetic and analytical geometry that you can average in almost any direction you want to go. You can group wells in almost any direction you want to go. The point, the extreme point on this Exhibit R-2 by Pubco shows a deliverability of some 4600 plus MCF per day. I believe, if I'm not mistaken, there are 40 or more wells in the Basin-Dakota Pool that have deliverabilities higher than that point, and yet they are not even in appearance on the graph, unless they have been averaged into these lower reserve groups.

So the point I'm making is that we've got to recognize the fallacy in plotting one well and giving it equal weight with 59, as has occurred here on this graph.

Q Do you recall the two exhibits of Pubco, R-9 and R-10, being the iso-reserve map and the initial deliverability map?

A Yes, sir.

Q Do you have any comments in connection with that?

A Well, here again, it's a case of art work taking predominance in our eye over the facts of the case. I direct your

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attention to a well in which I have particular interest and to which Mr. Cleveland testified, we got 16 billion feet of reserves. This well on Exhibit R-9 is located in fractional Section 8 -- no, it's in Section 17, 28 North, 11 West. No,-- I'll get it right here. It's the one north of that. It's in Section 31, 29, 11. This well, according to the exhibit by Pubco, has approximately 53 million feet per acre of recoverable gas. The well directly south there with a figure on it of 16.1 million, then, has a recoverable reserve less than a third. In other words, the ratio there is about three to one between the reserves of this well to the south and our Newlander No. 1, ratio about three to one in the reserves.

Now on the other map, he has shown the deliverabilities of those wells, on the one hand it's 4600, the other one it's 2900. The ratio there is about 30 percent greater, about 30 to 40 percent greater deliverability in a well that has almost four times the reserves, according to his calculations. Now I recognize that this is an anomaly. Nevertheless, the red paint makes all these anomalies. They are all grouped together in a big red blotch.

Q Are there other anomalies of the same type in the red area that you referred to?

A I'm sure there are a lot of them. The only other one I looked at was the Angel Peak 23-A Well of ours, which has a recoverable figure there of 28.1 million feet per acre. 28.1 is

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nearly twice the lower limit at which they begin to color the map red, 15 point omitted. In other words, here's a well that has twice the value represented by the contour between the red and the yellow areas, and yet it's painted over red. The effect of this is just like the effect of averaging this other data. It serves to mask what is probably pretty valid work in determining reserves.

I wouldn't take any issue at this time with the figures that they have put on their map. The issue that I take is the fact that the picture presented, due to a wide area of red paint, does not represent the anomalous situations that exist throughout the Basin, so we get a distorted picture of what's actually the case.

Q Mr. Haseltine, where you have a deliverability ranging from 183 to 12,063, grouped in the same reserve group, would you call that a valid grouping by reserves, assuming that there is a direct relationship between the reserves and deliverability?

A Well, if the reserve calculations are correct, it's a valid group by reserves, but it certainly shows no relationship whatsoever between the deliverability applicable to those wells to which the reserves have been attributed.

Q Would that indicate that there was a direct relationship between reserves and deliverability?

A I never have thought so, and I don't think so now and no one has shown us that such a thing exists.

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Q In the event the proposal of Consolidated is adopted by the Commission would, in your opinion, Southern Union stand to gain or lose gas production?

A This is a point that we didn't figure bringing up, but since the other people brought it up, all right, let me get this into the record. Southern Union wells, either the ones we operate or the ones in which we own an interest, all are above average in deliverability, and we would sustain a marked reduction in current income if the proposal which we are supporting is adopted.

Q In your opinion, will you sustain a marked reduction in ultimate recovery?

A No, sir, I don't think so.

Q Do you have anything else to add to your testimony?

A I believe that's all I have.

MR. KELLAHIN: That's all the questions I have of the witness.

MR. PORTER: Does anyone have a question of the witness? Mr. Keleher.

CROSS EXAMINATION

BY MR. KELEHER:

Q Mr. Haseltine, you say you are an Executive Assistant with Southern Union Gas Company?

A Yes, sir, that's correct.

Q You stated in your testimony that Southern Union had an interest in the case before the Commission?

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A That is right.

Q Would you state to the Commission what that interest may be?

A I'll be glad to. In order to serve a market with gas, you need two things. You have to have reserves and you have to have deliverability. We feel that we have got the reserves, but we feel it's entirely possible that that deliverability will be gutted before we get those reserves out of the ground and we will be serving Albuquerque with Texas gas.

Q Well, then, it's purely a selfish interest, is it not?

A If you wish to term it selfish, it is; we are all in the business to make money.

Q You stated that if the Commission did not adopt the formula -- or if the Commission did adopt the formula petitioned here by Consolidated, that Southern Union would lose money?

A I said we'd lose current income, yes, sir.

Q I understand that, my recollection is that you said that you would sustain a loss.

A I believe that the record will show --

Q You now want to correct it to say that you would sustain current income loss?

A If you like, we can check back, but I think I said current income.

Q Now the Southern Union isn't a particularly philanthropic interest?

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A None of us are.

Q You are here looking out for the interest of Southern Union Gas Company?

A Right; yes, sir.

Q You mentioned that you had some association or some employment with one of the pipeline companies?

A Yes.

Q What's the name of that company?

A Southern Union Gas Company.

Q Southern Union Gas Company is also a pipeline company?

A Yes, sir.

Q Do you have any affiliate or subsidiary corporation operating in the San Juan Basin?

A We have two affiliated companies.

Q What are their names?

A Southern Union Production Company and Southern Union Gathering Company.

Q Why do you not operate as a unit in the name of the Southern Union Gas Company? Why do you have three corporations operating?

MR. KELLAHIN: I submit this cross examination is immaterial. It has nothing to do with the direct testimony of this witness.

MR. KELEHER: The witness said he has an interest, and we want to disclose the interest if we can.

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A The three corporations were set up before I ever heard of Southern Union, and as an Executive Assistant in the Gas Supply Department, I don't know why they have three corporations.

MR. PORTER: The Commission sustains the objection.

MR. KELEHER: Let the record show an exception.

MR. PORTER: The record will show an exception.

Q (By Mr. Keleher) Now while Southern Union might sustain a loss of current income, you are looking down the road, that's what you testified to?

A I beg your pardon?

Q While Southern Union may sustain a temporary loss, you are looking down the road for eventual income, is that right?

A That is right.

Q And you don't want any Texas gas brought into New Mexico?

A We don't mind selling Texas gas. In fact, we peak out with it right now, but I believe every one of us who operate in the San Juan Basin would prefer to sell San Juan gas to Albuquerque and Santa Fe.

Q You own an interest in some wells, do you not?

A Yes, sir.

Q You have others that you operate?

A Yes.

Q How will those people fair, assuming that your petition or theory is adopted by the Commission?

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A Cur participants?

Q Yes.

A I don't really know. As a matter of fact, most of our wells are 100 percent working interest owned by Southern Union.

Q But as to those in which you do not own a hundred percent working interest, how will they fair? Have you considered them?

A No, I don't really know how the splinter interests will shape up.

Q You have no consideration for them and it's immaterial to you what happens to them, is that right?

A Why, no, we expect them to make money.

Q You mentioned fracturing; by the use of hydraulic fracturing is it possible to open up to the well bore reserves under the tract which prior to fracturing were not opened to the well bore and would never be recovered?

A Yes, it is.

Q You admit that?

A I certainly do.

MR. KELEHER: That's all.

MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Stockman, do you have any further

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testimony?

MR. STOCKMAR: I would like to call Mr. Harry Trueblood for rebuttal testimony.

HARRY TRUEBLOOD, JR.

called as a witness, having been previously duly sworn, testified further as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, you are the same Mr. Trueblood that previously testified here?

A I am.

Q Have you been present in this hearing during the testimony of all the witnesses that followed you?

A Throughout.

Q Do you have any comments in the nature of rebuttal testimony that you care to make concerning the evidence presented by others?

A If the Commission please, first of all, in response to Mr. Rainey's testimony concerning the fact that his Exhibit No. R-1, if it were presented, would look like somebody shot it with some buckshot; so it just so happens that we have got our Exhibit No. 9 that purports to show the buckshot.

MR. HOWELL: If the Commission please, Ben Howell on behalf of El Paso. Before this witness testifies, I would like to inquire as to the basis with which he grouped his wells within

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reserve groups. How did you determine that you put a particular well between the three billion and four billion?

A Mr. Howell, this is a plot of every single well, 460 wells which we had information and access to, of El Paso. This is an actual plot.

MR. HOWELL: Is it based upon the data which was furnished to you in April?

A It's based upon the data on your Exhibit No. 2, which I believe listed all the wells by township, the wells, the initial reserves, the initial deliverability; and this is a plot of initial deliverability and initial reserves for the 460 wells.

MR. HOWELL: Based upon that April reserve study?

A Yes, I presume that is correct.

MR. HOWELL: Then El Paso moves to exclude this testimony because it is based upon evidence which the people who did the work, namely, El Paso, say is out of date, has been revised, and has been replaced by other and new estimates as to the reserves for the particular wells shown on there. We move to exclude testimony relating to such an exhibit.

MR. STOCKMAR: It is not being offered to show what a shotgun blast today might look like. It's being offered to show what a shotgun blast appearance might look like. It has nothing to do with the present situation. It's demonstrative of what has been for years concealed in those eight or nine points that appear on the deliverability versus reserve curves.

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MR. PORTER: The Commission will overrule the objection. It will determine the weight to be given to the testimony and the exhibit.

A If the Commission please, this is an exact replica, and for some reason there seems to be a discrepancy between 457 and 460 wells, and the data that we got in response that was listed by township, we wound up with 460. They may not have meant to give us the other three, but these are the 460 dots which represent the original reserve calculated by the El Paso Natural Gas presented in the April testimony, and the original deliverability.

The Commission will recall that what was termed "high jinks" or otherwise by our opposition, that we turned the curve around by grouping these reserve groups together, averaging reserves within the deliverability groups. Now this is, if we had the April line here on this graph, this, what they drew their line from, there is a simple mathematical relationship as to why they keep coming up with this straight line, and it was the answer when they started and it's the answer when they end. This could just as well read apples versus oranges. This is a plot of "X" and "Y" in which the slope of that line or that line or that line or any other line or groups of lines originating from a point can be measured, where "Y" is equal to "AX", where "A" is the slope of the line, or "BX" or "DX" or "CX"; and every time you have a point here, you can draw that many lines.

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Now for any given one single point, a line, let's take this one since I haven't already marked it, a line drawn from the center to that point, to that well, is a defined slope which can be measured; and all it says is that the only relation that that slope really has is time. If you had one well in the reservoir and it had a certain deliverability and it had a certain reserve, that under a given length of time it would be reduced to zero. That's what it says. Well, that's fine for one well. And that is the relationship between deliverability and reserves.

Assuming that a pressure decline versus cumulative production were a straight line, and in all cases we have all found that it comes down in a fairly straight line and then begins to tail off through the later stages of the life of a well, because the theoretical decline of pressure versus cumulative production, theoretically, this is why this is true. Now similarly, any other point on that line will reduce its reserves in an equal amount of time, and as long as you stay on that line and you only had wells on that line, you would be reduced to zero and correlative rights would all be protected on that line. Everything would come out at the same time, which is what is encumbent upon the Commission.

However, when you take series of lines, 560 possible lines, or maybe some of the wells fall on the same line and begin to push them altogether and group them into one, you are saying

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that when they come out with a line which is similar to this one, that everything over on this side of the line is getting its reserves out in the same length of time that everything on this side of the line is.

Now obviously, when you get out to the points of low deliverability with low reserves, it's impossible. It's even impossible in the average range. So what happens when you assign an allowable formula, which allowable is nothing but time, it's the length of time you are going to allow or require a well to produce its reserves, when you start assigning an allowable based on a premise that starts out in this direction, nothing can happen but that all wells in this lower range have got to go over to that range, that the reserves have got to go over to the higher deliverability side, and it's drained.

What we're saying is that all of the testimony that's come before this Commission since time one on this concept that there is a general correlation between deliverability and reserves is based first upon the false premise that every single well in the San Juan Basin falls on a given line. If it doesn't, then you don't protect correlative rights. So much for the scatter shot graph. This is the mechanical part of it.

Now frankly, I can average this group of wells in a deliverability range and then I can switch it to averaging all the deliverabilities in another range, and I imagine I would get a sign curve of some type. I could go the other direction and average

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all the reserves in a given deliverability range. The last time in the previous hearing we came up with this type of thing. Now quite frankly, going back to -- forgetting deliverability versus reserves and saying "X" and "Y", if you put certain restrictions on the preparation of a graph from scatter points, you can come out with a circle or a duck or anything else, if you put the proper restrictions going in. It has to do with mathematics and has nothing to do with the problem at hand, the problem at hand before this Commission, what are the total reserves in the field, what are the reserves under each tract, what are the reserves as between tracts and the comparison thereof; and that's what Consolidated attempted to present in its original testimony. We presented an Exhibit 4 --

MR. HOWELL: If the Commission please, I object to the witness arguing.This is not rebuttal testimony. There's nothing of rebuttal in here. It's purely argument that the witness is making at this time. I object to the witness arguing his case during the time that he's supposed to be submitting rebuttal testimony. All the rebuttal that he's submitted so far has been rebuttal directed to the original case that probably would have been rebuttal possibly at the end of that case; and certainly was available to him if he desired to make rebuttal to the exhibit in the original case. He should have made it as a part of his direct testimony. We object to this line of testimony which is nothing but argument and is not a rebuttal of facts in the case.

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MR. STOCKMAR: As to the last sentence that Mr. Trueblood gave, I join in the objection because I was planning to make that myself.

Q (By Mr. Stockmar) However, Mr. Trueblood, so you don't leave me without anything to say, will you confine yourself a little more closely to rebuttal?

A Attempting to stay with rebuttal, and referring to my Exhibit 4, which I believe that El Paso, Pubco, and Aztec have each attacked as stating that we have shown original reserves versus current deliverability, we did this purposely, not in an attempt to in any way falsify the rightful percentage of reserves appearing under the percent "R" because deliverability had nothing to do with their rightful percentage of reserves under the whole.

You recall that I said we could stop right there. However, to show what is happening in the Basin today as a result of the use of the present formula, we use current deliverabilities. Now if they had preferred, and we could do it and present it to the Commission, we could redo it on an original reserve with an original deliverability and re-present it and it would come out substantially the same, in my opinion. We could redo it by taking the percentage drop in deliverability that it has from original deliverability to now, and whatever that percentage drop, multiply that percentage times the original reserves and take that off; since deliverability apparently in their testimony is directly proportional to reserves, we could have subtracted that as we could

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subtract the actual production to date, which has been relatively insignificant throughout the field on a whole from the produced reserves and presented on that basis.

Just as well, if we had El Paso's 723 wells that they have now studied, we could have run it through the machine in the same way, using, as they used, original reserves and original deliverability.

Now there is one other thing which we could have done with this, but it's immaterial at this time, apparently would not be rebuttal so I can't get into that; but I would point out that with respect to our Exhibit 3, that El Paso under their study found that the average reserve in the field now is 2.84 billion, which compares very favorably, that was on 723 wells and that compares very favorably with my previous testimony of 3.03. There's been less than a five percent change on 743 wells from their original work. From this I would assume there would only be a five percent change in our work if it were redone.

With respect to the Pubco reserves themselves, I wish to point out to the Commission that there are three factors in determining recoverable reserves under a 320-acre tract, any one of which is substantially altered, or if substantially different from the average would change recoverable reserves underlying that tract. One would be the abandonment pressure which Pubco showed as from 140 pounds to 1560 pounds. The second and of equal weight, approximately, not exact but almost, approximately, it's a little

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variation, but would be the water saturation variance. The third thing would be the porosity pick itself.

Now I believe it was testified by Mr. Gorham that they had water saturations as low as 16 percent. He further testified in anticipation of problems of interpretation of core analyses that core analyses in general tend to show higher total water saturations than actual interstitial water. This is generally true in areas and in sandstones of high permeability. It's very difficult for me to anticipate very much invasion, if any, in a core that has less than one-tenth of one percent -- excuse me, less than one-tenth of a millidarcy permeability to air; and furthermore, when the expansion of gas within the core is allowed by coming from the bottom of the hole to the top of the ground, it's generally a fact that probably water will be spilled from the core itself. Therefore, it's interesting to note that the ranges of the core analyses which Consolidated was able to get its hands on were in the order of 35 to 65 percent, and that the average was on the order of 40 to 50 percent, which happens to be in the same range that El Paso had previously testified as to how they arrived at their reserve figures and that we subscribe to.

It is our opinion that the water saturations are on the order of 40 to 50 percent in the productive zones of the Dakota formation in the Basin-Dakota Field. It's easy to see that a change of water saturation of 15 or 20 percent could make

it an extreme change in reserves or in recoverable reserves.

MR. KELEHER: I would like to object. The witness is again arguing. I understand rebuttal, this is not rebuttal. I object to it. If they want to ask something specific in answer to questions that have been asked on the witness stand by witnesses or something of that sort, or in regard to a particular exhibit, that is something. To have this witness go on interminably arguing his theory of the case, that's up to his attorney to argue.

MR. STOCKMAR: I could draw the proceedings out a little by interrogating the witness. He is simply describing what he believes to be an error by Pubco people in using water saturation in arriving at their reserves.

MR. KELEHER: Well, he's free-wheeling and arguing as he goes along, and we object to it.

MR. PORTER: Mr. Stockmar, would you ask the witness specific questions so that he may give you a simple and direct answer to the questions that you ask?

Q (By Mr. Stockmar) Mr. Trueblood, is it your opinion as an expert petroleum engineer that the range of water saturations from 12 percent minimum to 55 percent maximum that Mr. Gorham said had been used is correct for use in determining reserves in this field?

A It is not.

Q What do you believe to be an appropriate range of percentages to be used?

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A From a minimum of 35 to a maximum of 65.

Q Did you hear Mr. Gorham say that his average of the information his department submitted to Mr. Cleveland was 20 to 30 percent?

A I did hear that.

Q Is it your testimony that this will cause a substantial difference in the reserve calculations if these different figures are used?

A It would in any instance as from well to well or the field as a whole.

Q Would the particular deliverability of a well enter into the accuracy of the reserve determination on a particular water saturation?

A Ask that again.

Q Let me come back to that when I'm better organized here. You stated that abandonment pressure was also a major factor in the determination of reserves. Do you believe that the abandonment pressure as high as 1560 pounds is a reasonable point at which to cut off reserves in certain wells in this field?

A For all wells above complete marginal status at this time, I think it's completely unrealistic.

Q Is this an economic function?

A This is an economic function, and to allow abandonment at 1560 pounds would cause waste.

Q Would some improvement in the allowable awarded to low

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deliverability wells improve this situation?

A It certainly would. It would allow them to utilize their pressure underlying their tract to a maximum during the overall period of withdrawal of gas from the total field as a whole.

Q Do you believe that larger weighting of acreage in the allocation formula would accomplish this; that is, driving down the abandonment pressure for low deliverability wells?

A It wouldn't be the final answer, but it would certainly be a step in the right direction.

Q Would this then prevent waste in your judgment?

MR. HOWELL: Is this rebuttal or is this just going over the same position that these people have taken all along, that they want more acreage in the formula? If they will direct the rebuttal testimony to some testimony that was put on at this hearing, we'll sit here and be quiet, but if the witness and his counsel are going to merely restate and take all of our time to re-argue the position and the testimony, by the greatest stretch of the imagination it cannot be called rebuttal; and we are going to have to object to it and we do object to it as being not in the nature of rebuttal but being part of the direct case,having been covered by this witness in the direct case and not being directed in rebuttal to any specific testimony.

MR. STOCKMAR: I'm trying to do the best I can to ask questions. We are definitely attempting to rebut witness Cleveland's testimony that 1560 pounds is an appropriate abandonment pressure.

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I don't know how better to get at it except one way, which is to turn my witness loose again.

MR. HOWELL: Maybe you and the witness had better have a conference.

MR. STOCKMAR: Well, I will do that. Thank you for the rather unusual privilege.

MR. HOWELL: I have a better one, Counsel. I just suggest that you change places.

MR. STOCKMAR: I would like for the record to show that I was not telling him what to say. I was asking him what to ask.

MR. PORTER: I want to overrule. The Commission will overrule this objection because we think this question was pertinent. Be sure and confine your rebuttal to something that has been previously testified to in this case.

MR. STOCKMAR: Yes, sir.

Q (By Mr. Stockmar) Mr. Trueblood, do you have any further rebuttal with respect to the abandonment pressure testimony that the opposition presented?

A We concur wholeheartedly with the El Paso abandonment pressure of 600 pounds as being one realistic which will aid and help in unloading the fluids which would undoubtedly climb up as the pressure is withdrawn from the reservoir. We think that 140 pound abandonment pressure is completely unrealistic. Furthermore we think that 27 MCFDA deliverability is completely unrealistic as being unable to carry the liquids out of the well bore, having

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insufficient velocity at that kind of pressure.

Q Mr. Trueblood, do you recall Aztec's Exhibit No. 1?

A Yes, sir, I do.

Q Do you have any comments to make in the way of rebuttal with respect to the testimony relating to it?

A Aztec's Exhibit No. 1 was again based on the average concept of reserve groups, disregarding the reserves within deliverability groups, and had it have been drawn on exactly the opposite basis within ranges of deliverability which could actually have been measured, it would have shown the opposite results.

Q Do you have any further statements which are clearly rebuttal?

A One other with respect to Aztec and their comments on our Exhibit 5. I would like to point out to the Commission that they did eliminate the 100 to 109 wells in their comments; and within the confines of Exhibit 4, had they have taken the time they could have found the exact number of wells in each deliverability range which were one, and to arbitrarily take out all wells in that group, they could take out all wells in all groups and I think the Commission would find, as we found, that practically no wells under any deliverability formula, any formula which included deliverability, hit exactly one; and that our original testimony was that the only way to accomplish one throughout would be on a tract factor basis, assuming you can arrive at proper reserves underlying the tracts.

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MR. STOCKMAN: Thank you, Mr. Trueblood. I would like to offer in evidence Consolidated Exhibit No. 9.

MR. HOWELL: If the Commission please, in addition to the former objection, El Paso Natural Gas Company objects to admission at this time in rebuttal testimony of Consolidated Exhibit No. 9, for the reason that it is not in rebuttal to any testimony offered at this rehearing, but is directed entirely to testimony that was offered at the original hearing; and if offered in rebuttal should have been offered in rebuttal at that time.

MR. STOCKMAN: I think it is clear that the thing was offered as demonstrative of what does happen in this reservoir. The witness clearly testified that the same thing would be true if we were to use all of the present information that El Paso has. I think this connects it up very adequately.

MR. PORTER: The record will show your objection, Mr. Howell, but we ruled that we would accept the testimony and the exhibits and would assign them whatever value the Commission wants.

(Whereupon, Consolidated Exhibit No. 9 admitted in evidence.)

MR. HOWELL: Note our exception.

MR. PORTER: Your exception will be noted. Does anyone have a question of Mr. Trueblood? He may be excused.

MR. FEDERICI: Could we have a few moments and ask the witness to stay? Bill Federici for Calkins Oil.

CROSS EXAMINATION

BY MR. FEDERICI:

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Q Why didn't you plot reserves against acreage? You show this plot up here but you don't show a plot of reserves versus acreage.

A I don't understand your question, Mr. Federici. Why didn't I do something?

Q You don't show a plot up there of reserves versus acreage. You just show the deliverability versus acreage.

A In answer to your question, Mr. Federici, this is a plot of the 460 wells that were presented of deliverability versus acreage of El Paso.

Q If you showed acreage versus reserves, could you state what kind of a plot you'd show there?

A I plotted --

Q If you plotted acreage as against reserves --

A Under what parameters; what recoverable reserves?

Q Recoverable reserves against those particular wells.

A If I plotted acreage against it?

Q Yes.

A Plotted it out in a square around this thing?

Q Showing the same type of a shotgun pattern or whatever pattern you would get if you plotted acreage against reserves.

A Since practically all the wells have 320 acres, I presume I would plot 320 acres over here and reserves over here and everything would fall along the line, wherever it fell.

Q It would fall along a straight line?

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A Right, whichever direction I put the acreage on.

Q What bearing does acreage have as far as reserves is concerned?

A I believe it's been testified all the way through by everyone, inclusive of myself, that acreage is a part of a volumetric formula for recoverable reserves. 320 acres has been assigned by the Commission. It is in the formula and it's there. I mean deliverability isn't, but it's in the formula.

MR. FEDERICI: That's all.

MR. PORTER: Any further questions of the witness? He may be excused.

(Witness excused.)

MR. PORTER: Are there any other witnesses to be offered? At this time we'll have a 15-minute recess, after which we will hear the closing statements.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, and the Commission will hear closing statements.

MR. STOCKMAN: May I commence?

MR. PORTER: Mr. Stockman.

MR. STOCKMAN: I will be very brief. I do wish to reiterate and urge most strongly now that the Commission recall our position that the present order governing allocation in this field is void; that whatever your judgment may be, we hope that it is based on such findings as will produce a valid order.

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Now insofar as practicable, we have brought before you valid evidence of the reserves in each tract in the field, and in the total field we have shown you the proportion that each tract should have. We have shown you that our formula can be adopted without waste. We have shown you a way to prove to yourself at any time through the same IBM mechanisms that we have used what the proper relationship between reserves and deliverability in the formula should be. It may be that from time to time it should be changed as more and better reserve data is brought before you.

Our figures show that there is some utility in having some deliverability in the formula. We are not afraid of facts and we've brought them here and we have made vigorous efforts to get them for you. As reserve facts, I do not now wish to include Pubco's reserve figures. We state that they are incomplete and I think that they have been discredited by Mr. Haseltine and Mr. Teuebleod on the basis of very important factors of abandonment pressuce, water saturation, and so on. Enough of that.

I would like to refresh your recollection on one small point. In my opening statement in April I said that we had combed the journals and textbooks and treatises for authoritative and impartial statements as to whether or not there was a relationship between deliverability and reserves. At that time we found none. I'm happy to state now that we have found one, and I ask that you take administrative notice of it. It's an article in

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the January, 1963, Journal of Petroleum Technology, pages 41 to 46, published by the AIME; and I did jump up and anticipate Mr. Guy Buell a minute ago because I thought it fair to him to tell him that two of the authors of this are employed by Pan American.

It clearly states that there is no relationship between deliverability and reserves. I mention this now because I want to get back to something that I was talking to Mr. Rainey about. It is not proper to prove something if part of your proof assumes the proof itself; and if that assumption is not valid, then the proof derived from it is not valid.

If there is, in fact, no relationship between deliverability and reserves, then the apparent statistical relationship they purport to show is not valid.

Beyond that, there was some testimony with respect to the economics; Consolidated might stand to gain a substantial amount of money each month if our order is granted. I hope you will recognize that if it is $12,000 a month, that almost $150,000 has been lost to Consolidated of its rightful share of this reservoir since this hearing began.

But enough. We have carried the burden of proof, I feel sure we have gone beyond showing that 60-40 is the right formula. We've shown that it should have been 75 acreage - 25 percent deliverability. In truth, 60-40 would be a compromise.

MR. PORTER: Mr. Kelehor.

MR. KELEHER: May it please the Commission, I'm sure I

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speak on behalf of everyone here in expressing appreciation of your patience, fortitude, and endurance displayed by the Commission in hearing this case. The Commission will probably recall that the case was tried originally April 18, 19, 20, and 21, with voluminous testimony, many maps, much expert testimony; and after six weeks or so the Commission entered its order on June 7, 1962, paragraph four of which said that "The evidence presented at the hearing of this case concerning the recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula."

The Commission, upon petition of Consolidated, granted a rehearing, and in granting that rehearing the Commission said specifically that the scope of such rehearing shall be limited to matters concerning gas reserves in the Basin-Dakota Gas Pool. The Commission will probably recall that at the April 18th hearing, Mr. Trueblood, toward the conclusion of his testimony, told the Commission under oath, "We want to get our piece of pie in the Basin-Dakota. We can't do it under the existing formula which in advance declares uneconomic any drilling operations."

The Commission is well aware of and will take judicial notice of the fact that since April, 1962, some 200 wells have been drilled in the Basin-Dakota, indicating that statement made by Mr. Trueblood that it would be uneconomical to drill in the Basin had no basis in fact.

We promised at the outset in our opening statement to

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undertake to adhere to the ruling made by the Commission limiting the scope of the testimony, and our case was prepared and submitted on that basis. We tell this Commission in all sincerity that we believe that we have produced here evidence by competent witnesses and by appropriate exhibits to determine the recoverable reserves on a tract basis for each well and tract in the field.

We also offered evidence to show the recoverable reserves under the developed portion of the entire field. Our conclusions from the work done, exhibits and data submitted, demonstrated in our opinion beyond a question of doubt that if each well is to receive its fair share of the market in proportion to the reserves under the tract as related to the whole, that such formula should be left where it is; and if any change is made, it would be in the direction of 100 percent deliverability times acreage.

We would like to submit to the Commission that the burden of proof in this case rests upon Consolidated. In our opinion, that burden of proof has not been sustained, has not been carried forward. No new evidence was introduced before the Commission, in our opinion, to cause it to reverse its June 7th decision. Consolidated brought before this Commission on the rehearing no independent engineering or geology, no evidence of reseearch, but brought before this Commission what I call a hodgepodge of exhibits including Exhibits 3 and 4 made up in part on an IBM machine, casting upon this Commission and on its staff the

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burden of trying to ferret out to determine the meaning of such exhibits. It's our position here that such exhibits and the testimony presented by Consolidated have no probative value; that the applicant failed to comply with the order of this Commission.

It is practically admitted by the witnesses for Consolidated that they have not done any new work excepting to rearrange and rescramble some figures which, it developed under cross examination, were obsolete, based on El Paso Natural Gas Company's figures and exhibits presented in April, 1962, overlooking entirely the many new wells and the conditions that have changed in the Basin since that time.

Is it fair to the Commission, to the staff, to assume the burden which Consolidated should rightly assume, and attempt to ferret out and to grant their petition based on such evidence? We think not. We respectfully submit to the Commission that Pubco demonstrated by two witnesses, Dan Cleveland, a petroleum engineer, and Frank Gotham, geologist, by convincing testimony that the existing formula is fair and just. We procured maps, we furnished engineering data, all at a cost of many thousands of dollars in money, hundreds of man hours in the field and in our offices.

We have contended here that deliverability should be emphasized, we have demonstrated the reasons why the existing formula should be accepted. The Commission has heard the testimony, the staff has heard the testimony. We have sincerely done our best to comply with the order of the Commission. We have

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introduced evidence by competent witnesses which survived grilling cross examination. We have submitted plats and graphs and charts honestly and capably made, which we believe will be of aid to the Commission in reaching a fair and just determination of the issues in this case, and we submit it to you respectfully. Thank you.

MR. PORTER: Mr. Buell.

MR. BUELL: May it please the Commission, for Pan American Petroleum Corporation. First I would like to remark on the article that Mr. Stockmar mentioned, and I would like to assure him that his mentioning of that article did not embarrass me in the least. I have read the article, I think it's an excellent article and I would recommend to everyone in the room that they read it. I would go further and freely admit that we have engineers with Pan American other than the two gentlemen who were the co-authors of that paper who would also say if you asked them academically, they would say there is no relationship between deliverability and reserves. We also have other engineers who would tell you, based on a specific study they have made of a gas pool, that in some gas pools there is a direct relationship between deliverability and reserves. An engineer, to come to work for Pan American, he does not have to sign a pro-deliverability affidavit or an anti-deliverability affidavit. Our management actually encourages differences of opinion among its engineers and technical people. It's only in that way that we can ever make progress. If we had no differences of engineering opinion, all of

us here today would still be reciting the old dogma, "More wells, more oil; more wells, more gas." That has been discredited. It has been discredited by people who made specific studies to prove the people who were perpetuating that were wrong.

Actually, Pan American is in a very unique position here. We are probably one of the few operators of any consequence in the Basin-Dakota Pool whose position is such that there is very little the Commission can do with regard to an allocation formula that will hurt us or help us. Actually, the majority of our wells would fall in group three or group four on the technicolored El Paso exhibit, and you can see by that exhibit that allocation and reserves, 100 percent acreage, 75-25, or Consolidated's formula, would make very little if any difference in our current income.

For that reason we feel that possibly in this case we can be extremely objective in that our current income is not affected. We are also unique, as Mr. Stockmar referred to in that article, we are not a pro-deliverability company. As this Commission knows, in the Jalmat case we opposed a change to deliverability. We opposed the change there because the current formula, in our opinion, was doing an excellent job of equitably distributing the reserves in the pool.

We feel here in the Basin-Dakota that this current formula is doing a good job of equitably distributing the reserves in the Basin-Dakota Pool. For that reason, we support this formula and oppose any change. It's, I suppose, in the American tradition

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to always feel sorry for the unfortunate. Actually, I have some sympathy for Consolidated. I wish that they had more allowable than they have, but I would recommend to this Commission that in seeing that Consolidated gets additional allowable they do not do violence to correlative rights of the other operators in the pool; and it is my firm conviction that if you adopt their proposed amendment you would do violence to the correlative rights of other operators. Also my sympathy for Consolidated is tempered, to a great extent, by my knowledge of the fact that a lot of the wells that Consolidated is operating with low allowables, they knew when they were drilling those wells and completing those wells that they were drilling in an area that was marginal both from a standpoint of Dakota reserves and Dakota deliverability.

Actually, we have farmed out some tracts to Consolidated and they have developed in those tracts which were below our standards both as to reserves and deliverability.

I have also critically looked at the New Mexico statutes. I have read the Jalmat case very carefully, and I find nothing in the statutes, nothing in the Jalmat case decision, and nothing in the Commission rules that says the Commission can play Robin Hood and take from large reserve tracts and give to small reserve tracts; and that's exactly what Consolidated is requesting.

MR. PORTER: Mr. Verity.

MR. VERITY: May it please the Commission, I'm a little bit surprised at this point to hear counsel for Consolidated speak

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about the fact that the present rules are void. It's my understanding about the present rule with regard to Basin-Dakota gas that it was established by this Commission after such time as they had a hearing upon the matter, after an order was promulgated and when no appeal was taken. Certainly any attack upon the validity of that order at this time would be a collateral attack which could not be countenanced in the law.

Counsel might argue that possibly there wasn't as wide an evidence base in arriving at that order as could have been had; nonetheless, it was properly arrived at upon proper judicial determination. We do not think it can be attacked collaterally. We have a valid order that was properly arrived at.

Counsel for Consolidated at this juncture would like to have it changed. It strikes me as somewhat peculiar that the formula they suggested should be used in changing the one that we have got. I believe that everyone has admitted that acreage bears no relation to reserves, and a pure acreage formula would assume that every acre under every well in the entire pool had exactly the same reserve.

Now there is a difference of opinion as to whether or not deliverability does or does not bear a relationship to reserves, but Southwest Production Company feels that there's been some very fine proof that it does bear a very direct relationship to reserves and that in this pool it's the only factor that we have that can be used as a relationship to reserves in establishing an allowable,

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and I think that this fact and this truth is borne out in testimony by Consolidated in this case, when although they come forth and say that deliverability is not a proper factor of relation to reserves, they say "We still want to use it. The only thing," they say, "is that we don't want to use 75 percent, we want to use 60 percent of something that everyone admits has no relation whatsoever to reserves,"and I think that this is single testimony to the fact that the present formula is correct and that we must keep a deliverability factor here so that we do have a relationship to reserve in proper fashion.

I want to point this out to the Commission, and then I am through. My client has spent millions of dollars in developing portions of the Basin-Dakota Gas Pool. At the present time they have plans to continue these expenditures and to spend many millions more in development there. They are not doing this with all their own money. This is done with financial institution money, and if this formula of proration is to be changed every time someone sits down and realizes that the wells they've drilled are not giving them the return that they would like, then financing of development of the Basin-Dakota Pool is going to be hazardous indeed; and the development program that my client and other clients have is going to be seriously questioned by their financial institutions.

We think that there has been no demonstration here that this formula should be changed. We think that there is evidence

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that it does bear a proper relationship to reserves and that the proponents for changing it tacitly admit this when they don't come forth with anything that they say does make a proper relationship to it. We feel it would do grave injustice to the development of the Basin-Dakota Gas Pool and to the proper allocation of allowables to change this formula.

MR. PORTER: Mr. Howell.

MR. HOWELL: May it please the Commission, the use of acreage in proration formulas, I believe, historically, grew up as a result of small tract drilling, and I think there are a good many people who say, "Oh, yes, acreage has got to be considered; it's the most important factor in reserves." That might be valid, but considering a pool here which had been developed with some wells on 320 acres, some wells on 80 acres, some wells on 40 acres, and a great spread of acreage attributable to the well, obviously, where there are those variances of significant amount in acreage, then acreage does bear a great effect upon the reserves. However, in the Basin-Dakota Pool, the testimony shows that substantially all of the wells are drilled on the same acreage, that the 320-acre spacing extends to approximately 98 percent of the wells; and with exception probably of one well, all of the other wells have a very small plus or minus acreage resulting from irregular survey tracts. So that when we analyze it, the use of acreage in this formula as applied to the Basin-Dakota Field is nothing but the per well allowable which has been so bitterly

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and consistently opposed and I think wish some reason opposed in areas in which small tract drilling has, by reason of contributing to a per well allowable, has permitted small tracts to drain a large tract. We don't have that here.

If we went to 100 percent acreage in this field, what you would have would be a per well allowable, for all practical purposes. Now that has some terribly bad features. I think we all realize that the testimony clearly shows great variation in sand thicknesses, great variations in the reserves that underlie these tracts which in this case are practically the same for every well in the field, so that to avoid the impact and the injustice of a per well allowable, it is necessary to move away from the straight acreage concept and try to find some factor which bears a greater relationship to reserves than acreage does, which in this pool is a constant, for all practical purposes, of one.

Now there isn't any testimony as to any other possible formula except a combination of acreage and deliverability. There isn't any testimony as to any other basis upon which an order could be reached.

Now we have the two advocates of change. I shan't comment, I sympathize with Consolidated's situation where the areas that were farmed out to them turned out to have poor reserves and poor deliverability. Insofar as Southern Union's testimony, I want to call attention to the testimony of Mr.

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Wiederkehr, to whom I believe Mr. Haseltine is Administrative Assistant, which appeared in the original hearing, in which Mr. Wiederkehr frankly said that as far as Southern Union was concerned, they would just like to leave the gas in the ground. They would like to use it as a storage area there. It may be that their commitments with purchasers are such that they prefer and are willing to take less income from their wells to save themselves on their other obligations that they may have.

I do know that the testimony in this case shows that in order to maintain the balance, that Southern Union depends upon El Paso Natural to take large volumes of gas that are produced from wells to which Southern Union has connections, in order to keep those wells from accumulating a great deal of underproduction. When you have that situation, obviously you want a formula which keeps the gas in the ground.

We're trying to look at this from the standpoint of the operator. One formula or another may be better for the pipeline, but the testimony in this case is directed to producing the reserves from the various tracts.

I think that there's testimony from which an estimate can be made of the total pool reserves. I don't believe there's any credible testimony from which reserves to all of the tracts in the pool could possibly be determined. I'm sure that Consolidated and Southern Union are going to argue that their Exhibit No. 4 constitutes a basis upon which the Commission might

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rely. You know, it sure would be fun to get in the Courthouse and have someone whose reserves were shown as two billion feet for the tract, according to the estimates which were made in 1962, and whose proration formula was based upon that allocation, and have available the witnesses who prepared that formula, who have here in this hearing testified that revision of data has resulted in as much magnitude of change as doubling or cutting in half reserves for various tracts as compared with the data which appears on Consolidated Exhibit No. 4.

I think we've shown that Consolidated Exhibit No. 4 cannot be a reliable index; first, because the data upon which they based it is admittedly replaced by more accurate data; second, by a poor method of extrapolation without any consideration of the same factors which El Paso considered in making its reserve estimates, some 200 wells were given a value and a reserve allocated merely by the method of extrapolation. That method of extrapolation and contour lines, the testimony shows, is fairly valid for a broad area in general, in averages, but for particular tracts it just doesn't fit what it's supposed to do.

Now I was a little surprised, and I think everybody that is supporting the present formula was a little surprised when Consolidated closed their testimony, closed their presentation without presenting one bit of data which they had derived from the cores, from the well logs which were dragged in here under subpoenas and about which we had quite a legal hassle, as you

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recall.

There isn't a bit of work that's in this record right now other than some calculations made on an erroneous basis that wasn't in the record when the case was closed last April. It seems to me that Consolidated's case in this presentation of their testimony is like setting up a row of dominoes. Exhibits 4, 5, 6, and 7 depend upon calculations which they made in Exhibit 3. Exhibit 5 depends on calculations made in Exhibit 4. Exhibit 6 depends on calculations made in Exhibit 4. Exhibit 7 depends on calculations made in Exhibit 4.

It's been shown that those relationships which were used for those calculations between the reserves and the deliverabilities are not valid; first, for the reason that they used current deliverabilities as against original reserves; second, that they put a block of some 200 wells in on extrapolated data; and, third, that the reserve basis which they used has generally been changed as a result of new studies.

I submit that if you push over Exhibit 3 and Exhibit 4, that all of the other exhibits and their probative force falls just as flat as the row of dominoes.

We believe that the testimony conclusively shows that, while the over-all pool reserves remain somewhat the same, as new data comes in, as wells are drilled, as new sand thicknesses are determined, as new cores become available, as better information is received and evaluated, while it is true that it does not

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change the over-all field greatly, it does make changes of great magnitude in the individual well tracts.

I call the Commission's attention to the difficulty that would exist in supporting any formula that was based upon allocation to an individual well tract of a reserve determined from the Exhibit No. 4 in this case, based not upon original work of Consolidated, but based upon taking some studies that were current in April of 1960, extrapolating from them, abusing certain relationships which may or may not exist and coming up with an attempt to specify reserves for each tract. We just believe that the testimony and the proof doesn't show it.

The testimony clearly shows that of all of the known factors, the one which can as far as practicable be determined and be used by the Commission in allocating to the various tracts in the pool the opportunity to produce their fair share of the recoverable reserves is more nearly related to deliverability than to any other single tool which is available for use.

We submit that the proof justifies this, that an order based upon such a finding is adequately and amply supported by the evidence and that the use of the deliverability factor is based upon reasoned testimony. We submit that Consolidated has utterly failed to meet the burden of providing any new credible or competent testimony after the close of the preceding hearing.

MR. PORTER: Mr. Federici.

MR. FEDERICI: May the Commission please, Bill Federici

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for Calkins Oil and Sunset International. Mr. Keleher and Mr. Howell and the others who have already spoken have covered most of the points that I was going to talk about, at least in part. At this time, however, I want to briefly discuss this burden of proof. I want to state what I have urged and what I have stated throughout all of these many hearings.

The burden of proof is on Consolidated; it is not upon us. They have not met that burden of proof. The evidence presented in this hearing, if the Commission please, by Consolidated, has in fact been no different in any material respect from that which was submitted in the April, 1962 period. It's evident that most of the evidence in this hearing is negative evidence.

Consolidated is asking this Commission to find facts based on what we call speculation and surmise. This Consolidated ought not to ask the Commission, and this the Commission should decline to do.

We have been talking about equities in the case, and Calkins and Sunset International are smaller operators in the field. Any change in the formula will certainly do violence to their rights. The evidence submitted by El Paso and Pubco and Aztec and Calkins and Sunset International in the original hearing and in this rehearing makes it crystal clear to me, and I hope to the Commission, that deliverability is the predominant factor in the allowable formula, and that the present 75-25 formula should remain in effect.

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MR. PORTER: Mr. Hampton.

MR. HAMPTON: Ken Hampton, Marathon Oil Company. Marathon Oil Company supports the present allocation formula of 25 percent acreage and 75 percent deliverability. We believe and we think that testimony of Pubco, Aztec, and El Paso have confirmed that such a formula best affords each owner under a proration unit the opportunity to recover his just and equitable share of the pool.

We also believe that there is insufficient data to make an accurate estimate of the reserves under each proration unit. However, where we do have evidence, where there is sufficient data in order to calculate reserves under a proration unit, we think it's been shown that there is, at least in this particular case, that there is a definite relationship between the deliverability of the wells on those units and the estimated reserves from such wells on those units. Therefore, it seems only practical to us, in remembering that both the statute and the Jalmat give heed to the mandate "insofar as is practical," it seems only practical to us that under such circumstances giving a weight of 75 percent deliverability will afford in this instance each owner of a proration unit his just and equitable share of the pool.

Mr. Verity has already brought out that Consolidated itself recognizes that there must be some relationship to deliverability since they themselves have given credit to deliverability to the tune of 40 percent. We subscribe to the present formula.

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We think it's reasonable, that it will afford each owner of a proration unit the opportunity to recover his just and equitable share.

MR. PORTER: Mr. Swanson.

MR. SWANSON: Aztec concurs with the views that have already been expressed by those aligning themselves on the defense of the present allowable formula in the Basin-Dakota Pool. There are a few points we feel could be emphasized.

What has Consolidated done to support his assertion that there is a more desirable allocation formula for this pool? They have introduced in evidence a map based on well reserve data that has been shown to be out of date. They have extended that information into areas giving values to wells in spite of independent information they might have which would show that information was not correct. They have developed a series of reserve figures for the various wells. These were fed into an IBM machine with varying deliverability values to, I suppose, develop some relationship between the proper weight that should be given to deliverability in the formula.

They then presented exhibits which I suppose had the purpose of demonstrating what that correct formula was. It was very vague to me how they showed their conclusions from those exhibits. In my opinion, if you will make the assumption that their premise is correct, that their well data is accurate enough to demonstrate these relationships, in examining their data it is

still obvious that any decrease in deliverability in the allowable formula would not serve to protect correlative rights.

Now, the question is, is there a direct correlation between deliverability and recoverable reserves in this gas pool? Witnesses Cleveland, Gorham, Rainey, and Stevens all testified that this relationship did exist. It was demonstrated quite graphically in Pubco's Exhibits R-9 through R-11. It was also shown in El Paso's Exhibit No. 1. This conclusion can be reached from their second exhibit and also it can be reached from Aztec's first exhibit. This testimony and these exhibits are all based on a more detailed, more up to date, in my opinion more accurate approach to what the reserves are in this gas pool.

The Commission is charged under the statute with determining insofar as practicable the recoverable reserves under each developed tract in this pool and under the tract as a whole. Now Consolidated has made a determination of these reserve values and apparently they have made that determination which, insofar as is practicable, they feel should be made. It's been demonstrated, I believe, that there are better studies available from which the Commission can reach a decision in this case. The standard of "insofar as practicable" that Consolidated has applied to this endeavor is not a sufficient standard to meet that which the Commission is required to meet.

Finally, in my opinion, all of the data and exhibits that have been presented either by the proponents of the existing

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formula or those who have requested a change show that any change in deliverability weight occurring in a proration formula should be to increase this consideration rather than to reduce it.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please, I will attempt to be as brief as possible. Mr. Keleher in his closing statement injected a new issue into the hearing in asking the Commission to take notice of the fact that some 200 new wells had been drilled. The Commission can also take notice of the fact that wells are drilled for many, many reasons, including offset obligations and dual completions, and on account of certain tax considerations which affect an individual company.

Now, the proponents don't seem to be in agreement on whether or not figures have been submitted on a tract basis. Mr. Keleher said that his company had submitted reserve figures for the pool as a whole and reserve facts for each individual tract in the pool. None of the others who have spoken so far seem to agree with that statement and say there aren't any tract figures before the Commission at this time, other than those submitted by Consolidated with which they disagree. We are inclined to agree that Pubco did not submit any figures reflecting reserves for each tract in the pool. Several witnesses gave reserve estimates for the pool as a whole, and Consolidated gave reserve estimates for the pool as a whole; but only Consolidated then divided those estimates to the individual tracts within the pool and showed the

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relationship of the reserves under each tract to the reserves under the pool as a whole, and then went one step further and showed the Commission how those reserves and their proportion of the total reserves compared under each proration formula that has been considered.

Now, time and time again it's been stated that Consolidated's work was based on figures which are now obsolete. Witnesses stated it on the witness stand but declined to produce the new figures. We asked for them and they were refused.

MR. HOWELL: If the Commission please, they did not ask for them. They asked if we intended to introduce them and we said we would not. There was no request made that they be given to them.

MR. KELLAHIN: The figures were not offered to this Commission, and on that basis the opponents of Consolidated, Southern Union, and those seeking the change in this proration formula have come forward with the figures that are required by the New Mexico statute.

Now it's rather startling to me, having sat through the Jalmat case when some of the others were here, to see practically the same argument come up again, and Mr. Howell and the others would ask this Commission to make the same error it made in the Jalmat case and prorate the Basin-Dakota Pool on the basis of the relationship between deliverability and reserves, when the Supreme Court of New Mexico clearly stated that that is not

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an equivalent of the findings required by the statute. Now the findings required by the statute are clearly stated, and they were discussed and interpreted in the Jalmat case. That is that this Commission must determine insofar as it may be practicably done the reserves in the pool, the reserves under each tract in the pool, the relationship of one to the other; and on that basis see that each operator in the pool gets his fair share of the reserves underlying his tract. He must have the opportunity to produce his share of the allowable based on that computation.

Now in order to show the relationship between deliverability and reserves, both Pubco and El Paso and Aztec have taken figures and grouped wells by reserve computations, the basis of which were not presented to the Commission. They have then placed, on the basis of that computation, a single point on a graph and drawn a straight line. As was shown by Mr. Haseltine, they gave no weight to the fact that there were more wells included in one group than in another, but drew a straight line as if all the groups had equal weight. It's strange to me that they can say a group containing deliverabilities from 25 to 4,000 all have the same reserves for the purpose of their exhibit, and yet admit from the witness stand that the well with 25 deliverability does not have the reserves of the 4000.

They made no effort to group their wells by deliverability figures, and had they done so, they would have reversed their curve as was done by Mr. Trueblood in the hearing in

April.

The Commission full well knows that acreage is a very important factor in the computation of reserves. As stated here in this case, it has no position because all the acreage is the same. That presupposes that there is a direct correlation between reserves and deliverability, if you have twice the reserves, you have twice the deliverability, and yet from the witness stand they admit that isn't true, and then you have to make a net pay computation of your reservoir and acreage comes into play, and it will vary from one well to the next simply because your net pay is going to be different from one well to the next, from one drilling tract to the next; so certainly acreage is an important factor that must be considered by this Commission in prorating the gas in the Basin-Dakota Pool.

Mr. Verity expressed some surprise that we say that the present proration order is invalid and void. We have alleged that before the Commission in the previous hearing. We raised the question in the petition for rehearing, and we assert now that unless the Commission makes the finding required by the statute, then we have no valid proration order. Whether they agree with our presentation or not, an order must come out of this Commission which makes the basic findings required by law; and Consolidated and Southern Union have given the Commission the only information on which such an order can be based.

The Supreme Court clearly stated that a finding of

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the general correlation between deliverability and reserves is not the equivalent of the finding required by the statute, and held that Jalmat order void, not voidable but void; and we assert that is the situation here.

We respectfully submit that the Commission must make a new order regardless of what its decision may be as to the proration formula to be entered in this case; and if they do, that new order must contain findings as to the total reserves in the pool, the reserves under each tract in the pool and the relationship of one to the other, and a finding that the formula will then give each person in the pool an opportunity to produce his just and equitable share, that being the reserves under his tract.

MR. PORTER: Mr. Popp.

MR. POPP: Mr. Don Popp, Sunset International. It is the opinion of Sunset International that the Basin-Dakota proration formula as it is now is a valid means of allocating to each well its fair share of recoverable reserves in relation to the present market.

The evidence as presented indicates to us that if any change is to be made in this formula, that change should be made in the direction of more weight given to deliverability. It is our observation that no engineering data has been presented to support a change as proposed by the applicant.

We would like to point out that we have made an investment in fourteen wells in the Basin-Dakota Gas Pool on the basis

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of the present formula giving 75 percent weight to the deliverability. In making this investment, we have attempted to drill our wells at such locations and to complete in such a manner as to avail ourselves of this 75 percent deliverability factor. We believe that in doing so we have acted according to best engineering practices and also as a prudent operator. Our investment in these wells was made on the basis of the existing formula. We feel that to change this formula to give less weight to deliverability at this time would be very unfair to us and would be unwarranted in view of the evidence presented at this hearing, which shows the present formula to be a proper one.

I might add that the 95,000 MCF for January and the 87,000 MCF for February that Mr. Rainey pointed out that Consolidated would gain if the formula were changed and what Sunset would lose if the formula were changed, compared to some of the other operators we are relatively small, but for this very reason we would suffer most for each dollar if the formula were changed.

MR. STOCKMAN: Is the applicant entitled to a rebuttal?

MR. PORTER: Does anyone else desire to take a position or make a statement in the case?

MR. KELLAHIN: I would like an opportunity to reply to Mr. Kellahin's recommendations to the Commission as to what their duties are. I didn't know that Mr. Kellahin was still counsel for the Commission, but I would like to say this. This is a motion for a rehearing, a rehearing. The order of June 7, 1962,

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said they had not carried the burden, had not proved their case; and it was dismissed. They filed a motion for rehearing; it was given. They came up here and we've had the rehearing. In my humble opinion, all that's necessary for this Commission to do is to say that no testimony has been submitted before the Commission sufficient to change its opinion of June 7, 1962, and it is therefore reaffirmed and confirmed.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Mr. Trueblood has asked me to state that while we would welcome $12,000 additional a month from any source, his records indicate that the average deliverability and the average reserves of the 64 wells in which Consolidated has an interest are very near the average of all the wells in the pool. He doubts that his company's gain, if any, will approach $1,000 a month if our order is approved. He wishes me to reiterate that one of the primary reasons he is here is because this balanced situation is not true of his many participants, and he wishes to aid those who have been put into a 12 or 13 or 15 year payout.

Secondly, I would like to again talk about what the Jalmat case shows. If it says one thing clearly, it says that this is not a Court and that your functions are not judicial, but that you are an arm of the Legislature and that your functions are legislative; and as such, any legislative act can be changed at any time as the Legislature does, notwithstanding periods of

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time within which an appeal might be taken from some types of orders. When an order is void from the beginning, based on a jurisdictional deficiency, it can be sawed off just as you'd saw off the limb of a tree if it was dead. In terms of the burden of proof, we say that we have presented the best evidence. There may be more; there may be better evidence, there may be better evidence in Dave Rainey's briefcase. It is not in the record, however. Our evidence is, and we did ask for it in September.

MR. PORTER: I would like to remind at this time of a ruling that the Commission made at the outset of the case, and that is that any interested party will be permitted to file a statement within 20 days. Counsel for the Commission has some correspondence which he will call our attention to at the present time. I don't think it will be necessary to read all of the correspondence, but merely to state the position they take.

MR. DURRETT: If the Commission please, we have received a letter from Pioneer Production Corporation. This letter was received by the Commission on February the 12th, and it states that Pioneer Production Corporation wishes to go on record as opposing any change in the method of allocating production from the wells in this field.

We have received a letter from Continental Oil Company. This letter was received on February 7th, and for the record, I would like to state that Continental Oil Company in this letter states that they desire to be on record supporting the application of

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Consolidated Oil and Gas Company. That's all we have.

MR. HOWELL: May I ask one question? Does the permission to file written statements apply to those of us who have offered statements to revise and extend our remarks as is permitted in the Congressional Record?

MR. PORTER: This ruling applies to any interested party. If there is nothing further to be offered in the case, we will take it under advisement and take up Case 2754.

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

WE, ADA DEARNLEY and MARIANNA MEIER, Notaries Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by us; and that the same is a true and correct record of the said proceedings to the best of our knowledge, skill and ability.

WITNESS our Hands and Seals this 28th day of February, 1963.

NOTARY PUBLIC

My Commission Expires:

June 19, 1963.

NOTARY PUBLIC

My Commission Expires:

April 8, 1964.

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NUMBER	MARKED FOR IDENTIFICATION	OFFERED	ADMITTED
Consolidated's #1	15	29	33
Consolidated's #2	15	29	33
Consolidated's #3	18	29	33
Consolidated's #4	20	29	33
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Pubco's #R-3	61	64	68
Pubco's #R-4	61	64	68
Pubco's #R-5	62	64	68
Pubco's #R-6	62	64	68
Pubco's #R-7	63	64	68
Pubco's #R-8	63	64	68
Pubco's #R-9	106	112	114
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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 18, 1962

REGULAR HEARING

IN THE MATTER OF: (Continued)

Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C to establish an allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9 (C) of Order No. R-1670.

Applicant recommends an allocation formula based 60 percent on acreage and 40 percent on acreage times deliverability. The Commission also may consider the establishment of minimum and maximum allowables for the Basin-Dakota Gas Pool.

Case 2504

BEFORE: Honorable Edwin L. Mechem
A. L. "Pete" Porter
E. S. "Johnny" Walker

TRANSCRIPT OF HEARING

MR. PORTER: We will take up Case 2504.

MR. MORRIS: Application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C to establish an allocation

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formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9 (C) of Order No. R-1670.

MR. PORTER: This case was continued from the regular hearing last month, and when we called the case last month, we called for appearances. At this time I am going to ask the attorney for the Commission to read those appearances, and when he has finished, then we would like to call for any additional appearances which may be made this morning.

MR. MORRIS: Appearances at the March hearing were entered by attorneys on behalf of Consolidated Oil and Gas Company, Southern Union Gas Company, R & G Drilling Company, Sunray Midcontinent Oil Company, The Ohio Oil Company, El Paso Natural Gas Company, Aztec Oil and Gas Company, Sunset International Oil Company, Pan American Petroleum Corporation, Caulkins Oil Company and Pubco Petroleum Company.

Appearances were also entered by company representatives for Atlantic Refining Company, Tidewater Oil, Texaco Inc., and Pioneer Production Company.

The Commission has also received letters and correspondence stating positions on behalf of the Beard Oil Company, Bruce Anderson, Frontier Refining Company, Amerada Petroleum Corporation,

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Kay Kimbell, and British-American Producing Company.

MR. PORTER: Is there anyone here this morning who hasn't entered an appearance in the case?

MR. BRATTON: Howard Bratton for Humble Oil and Refining Company.

MR. WENDELL: R. C. Wendell, Delhi-Taylor Oil Corporation.

MR. FARLEY: P. J. Farley, Compass Exploration.

MR. LACEY: J. J. Lacey, attorney for Tenneco Oil Company.

MR. SELINGER: George W. Selinger, Skelly Oil Company.

MR. JETER: R. C. Jeter for Western Natural.

MR. PORTER: I would like to get some indication how many are going to put on testimony. First, I would like to call on those who intend to put on testimony favoring the application. I assume first would be Consolidated?

MR. STOCKMAR: Yes, sir.

MR. KELLAHIN: We have one witness at the present on behalf of Southern Union Gas Company, and, if the Commission please, we are expecting Mr. Al Wiedekehr to arrive later and we would like to put him on when he does arrive. We will renew that motion after we complete our witness, however,

MR. PORTER: Does anyone else intend to put on

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testimony favoring the application? I'll now ask for those who intend to put on testimony opposing the application.

MR. KELEHER: If the Commission please, Pubco Petroleum Corporation has two witnesses and some exhibits.

MR. HOWELL: If the Commission please, El Paso Natural Gas Company. We will have one witness.

MR. SWANSON: Aztec Oil and Gas Company will have one witness.

MR. SETH: Sunset International will have a witness.

MR. HOLLAND: Caulkins Oil Company will have a witness.

MR. PORTER: Mr. Kellahin, how many witnesses did you say you would have for Consolidated?

MR. KELLAHIN: Southern Union there will be two; Consolidated there will be one. I have associated with me Mr. Ted Stockmar, a member of the Colorado Bar, who will present the case for Consolidated.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Gentlemen, I would like to ask leave to again make a few opening remarks. The remarks last time seem to have been diverted into a discussion over the continuation, and I would like to set the stage a little for our testimony here. The existing Order, Rule 9 (C) of No. R-1670-C provides for an allocation of allowables from the Basin-Dakota Gas Pool on the

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basis of 25% acreage and 75% deliverability. The applicant's proposed formula would amend this rule for this Basin-Dakota Pool only so that the acreage weight would be 60% and the deliverability weight, 40%.

In deciding upon this very important issue, we feel that there are two major points that the Commission should keep in mind, and toward which we will direct our testimony. These are, first, that it is our sincere conviction that the existing order is detrimental to the development of the Basin-Dakota Gas Pool, and as such it is detrimental to the State of New Mexico and detrimental to its people. Secondly, we are convinced that the existing order deprives some of the operators of the protection of their correlative rights and of the right to produce their own gas, their own reserves, all for the benefit of certain other operators.

We hardly need state that on either count the time is right for a review and a change. Let us first examine my statement that the existing order is detrimental to the development of the pool. We submit that the record will show that in terms of what this Commission has found to be the Basin-Dakota Pool, the common source of supply, that the existing development of spacing units involves a development of approximately 10% of the reservoir.

We submit that the record will also show that the rate of

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drilling of new wells in the reservoir has slowed down almost to a walk. It is our position, and we believe that we can show that almost 60% of those existing wells are, under this order, economic failures.

Now, the time has come to find out why this situation can exist. Is it the lack of producible reserves in place? We submit that the answer is no. Is it the lack of the capacity of the wells to produce enough to yield an economic return? We submit that the answer is no. Is it the lack of a market? We all agree that an even larger market would be beneficial to the operators and to the State, but even under the existing market it is not the small market that creates this problem. Lastly, is it the economic results of operations under the existing order? We submit that the answer to that is yes, and that it should be amended.

It gives me considerable pause, and no doubt it does you also, to consider the awesome power that you gentlemen have in this situation and the awesome response in connection with it. Consider that by a simple amendment of this existing order that you can convert hundreds of existing wells from economic failures to economic successes. In matters of this kind it's always helpful to me to walk around on the other side of it and get a different perspective. What we have here to look at is a relatively new

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field. Even though it is overlain by Pictured Cliffs, Mesaverde production, it is a separate and distinct reservoir, just as distinct as if it had been discovered in the southwest corner of the state somewhere.

With the new pool we do have a new order, but there certainly is a great element in that order of a carryover from the shallower orders even though they are distinct and separate things. We have limited experience with the field. Considering all these things, it seems only fair that the existing order should be regarded as a temporary one to gain experience to observe its impact, and that when the time is ripe it should be changed.

Many months ago, eighteen months I think, you considered this problem to give this what I choose to regard as an interim order. At that time there was diverse evidence and testimony and you could have, with propriety, at that time granted an order the same as the applicant is now seeking, 60% acreage, 40% deliverability. Had you done it and had at this time El Paso Natural Gas and others come before you here asking for a change of that order to 75% deliverability, 25% acreage, you would then have had to consider that in granting such an order you would immediately convert hundreds of economic successes into economic failures.

I query whether you would have or should do such a thing, and yet here today we have the exact equivalent of that situation,

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a continuance of the existing order is the same thing.

Now, a word or two about the second point, the abuse of correlative rights. We submit that the evidence will show, we certainly will attempt to show it, that this reservoir is more uniform than not, that it's a blanket sand, having more or less uniform characteristics throughout with some variations, but that no tract varies substantially from its neighbors and from other tracts in the field.

There is one characteristic where there is substantial variation. This is with respect to the permeability encountered in that well. This we believe to be due to the accidental penetration of a so-called tight spot, or maybe of a loose spot, if that's the appropriate term for high permeability, which high permeability may be due to the particular characteristics of the sand at that point or the penetration of some long-range fracture system. Either way, that well was rated as a high deliverability well, even though no one believes that the particular permeability of the sand has any bearing on the gas reserves in place in that land.

As we stated last time we were here, we have no quarrel with deliverability as a device for measuring relatively the capacity of the wells to produce under given situations. We disagree violently with the concept that deliverability measures

the reserves that can be produced from the spacing unit on which that well is located. We submit that there is no mathematical relationship between deliverability and reserves under a specific tract.

In preparation for this hearing we've studied this matter as best we can. We have looked in the text books, we have talked with engineers; we have done independent study; we can find no mathematical relationship between deliverability and reserves under a given tract, under a spacing unit, for example. It may be, and you have seen, and you no doubt will see again today, graphs and charts which show an apparent relationship between the deliverability and reserves. These may have some bearing with respect to deliverability versus the reserves under some drainage area. We submit that that drainage area is not, is never fully the same as the spacing unit. Everyone knows that a well will not drain a precise 320-acre rectangle. There must be variations from that.

We submit that these comparisons of reserves versus deliverabilities that you have seen in the past and will see again today are no more than statistical gymnastics. It's easy to make comparisons between many things to show an apparent relationship even though none exists. A good statistician could show a good correlation between the annual production of oranges and the

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annual production of apples, and yet there is no dependent relationship between those two. There may be a common cause, it may be the appetite of the people, but there is no relationship between those two.

Maybe a better analogy, or another one, a good statistician could show a good comparison between the consumption of beef every year and the production of cattle, if you will. You say, "oh, but there is relationship there." I say, "All right, let's look at the great nation of India where cattle are sacred. They are raised but they are not eaten." What happens to the statistician's theory then, it's out the window.

The point of this is that the apparent comparison depends entirely on the rules of the game. In India it's against the rules of the game to eat cattle. In our case the rules of the game are the orders of this Commission. Anyone working with figures which arise out of an order, which in itself relates deliverability and allowable production, it's a simple thing to show a relationship, it's there. Change the order, there's another relationship.

We urge that this Commission not be beguiled by these mathematical manipulations. It's much easier to show, and I think we can do it, that there is a clearcut relationship between surface acreage and reserves. At least, they have one major

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common factor, that's area.

Go back once more, we say that deliverability is not a measure of the reserves under a given spacing unit. If deliverability measures reserves in any way it can only measure the reserves in the drainage area contributing to that particular well. It does not measure the reserves that this Commission is charged with allocating fairly to the parties involved.

In this light, I think the comparison you can make between new surface acreage and reserves seems to me to be more accurate when we're speaking of reserves under a given tract than to speak of deliverability under some unknown drainage area. With these two comparisons in mind, how can it be argued that our proposal of 60% acreage and 40% deliverability is anything but, anything more than a conservative minimum weighting of acreage?

At the last hearing I think the position of the opposition was summarized by Pubco in its opening statement they basically want 100% deliverability. We submit that a 100% deliverability formula is nothing more than a chocolate-covered form of the rule of capture, the very thing that the New Mexico Conservation Act was enacted to prevent, the very thing which you gentlemen are charged with preventing. If there's a single title you can give this case, Perry Mason might, it's the rule of capture versus the protection of correlative rights.

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With that statement I would like to call Mr. Harry Trueblood as our first witness.

MR. KELEHER: In view of the fact that counsel for the applicant has stated his position and anticipated mathematical manipulations on the part of those objecting, may I repeat what was said briefly into the record?

MR. PORTER: You may proceed.

MR. KELEHER: I would like to state Pubco's position. We represent Pubco and object to the granting of the order prayed for on a number of grounds, including the following: The granting of the order in whole or in part will seriously affect Pubco in its operation, present and future, in the Basin-Dakota Gas Pool and will result in Pubco's abandonment in whole or in part of the drilling of scheduled wells for 1962. That Pubco respectfully objects and excepts to consideration by the Commission of any contemplated establishment of minimum and maximum allowables for such pool. That the proration formula presently in effect is a just and workable formula and gives each well its fair share of the existing market commensurate with the recoverable gas reserves of the individual wells.

That any refinement or change in the existing formula should be in favor of deliverability and a reduction in the acreage factor in that it is Pubco's position that well deliverability

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more truly reflects recoverable reserves.

That it is Pubco's position that an increase in the acreage factor at the expense of deliverability would in effect violate correlative rights and permit the weaker wells with less reserves to ultimately produce gas from the common source of supply in amounts in excess of their actual reserves.

That the existing formula provides a 25% acreage factor, which in effect allocates a basic allowable to all wells regardless of their deliverabilities merely because of their existence.

That it has been demonstrated that major changes occur within the Basin-Dakota Pool in porosity, permeability, connate water saturation, and sand thickness, all of which are the major and important factors in determining the actual recoverable reserves within a given Dakota drillsite. Pubco proposes to undertake to demonstrate the direct relationship between deliverability and recoverable reserves.

Pubco contends that if the Commission should consider any change in the proration formula, that such a change should be in favor of 100% deliverability.

Pubco objects to the introduction of minimum or maximum allowables in the field because such introduction would result in substantially changing the proration formula in favor of a straight acreage allocation of market and would be a violation of

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correlative rights.

That the applicant acquired the acreage complained of, and has drilled its wells with full knowledge of then and now existing Commission orders governing the field.

MR. PORTER: Mr. Stockmar, would you call your witness, please?

MR. STOCKMAR: Mr. Harry Trueblood. May I have all the witnesses sworn?

MR. PORTER: Just a minute, please. The attorney would like to swear all of the witnesses at the same time, or at least swear all of those who are present.

(Witnesses sworn.)

MR. STOCKMAR: May I proceed?

MR. PORTER: Yes.

HARRY A. TRUEBLOOD, JR.

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, would you please state your full name and position for the record?

A My name is Harry A. Trueblood, Jr., I'm president of Consolidated Oil & Gas, Denver, Colorado.

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Q Would you state generally your qualifications as a petroleum engineering expert?

A I have a B. S. in petroleum engineering, University of Texas, 1948. I have at various times worked as an engineer for a major oil company in the capacity of production engineer, reservoir engineer and drilling engineer. I have acted as a chief engineer for an independent operator in the Rocky Mountain area, in the job as a consultant and supervising the drilling and completion of wells for a period of two years prior to the formation of the present company. I have supervised the actual drilling, equipping, completing of some of the first Basin-Dakota Field wells in the San Juan Basin prior to any order, incidentally, by the Commission. I have subsequently supervised personnel working under me in the actual drilling, development and producing operations of the Basin-Dakota Field, and at this time Consolidated Oil & Gas owns an interest in and/or operates approximately 10% of the wells in the Basin-Dakota Field.

MR. STOCKMAN: I ask that the witness's qualifications as an expert be accepted by the Commission.

MR. PORTER: They will be accepted, yes, sir.

Q (By Mr. Stockman) Mr. Trueblood, first, in your capacity as a member of management or as an executive, would you refer to my statement that the existing order is detrimental

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to the development of the field and give us your opinion in that connection?

A Gentlemen, it will be said to the contrary, I'm sure, in a few moments, but our primary concern at this hearing is one concerning the future development of the Basin-Dakota Field. We're already where we are. If the formula is allowed to continue as it now exists where it causes wells having less than a million cubic feet deliverability to be declared economically unsound, there is no other way for any management, I submit, to go from an economical standpoint but away from the development or further development of the Basin-Dakota Field.

Now, the number of a million cubic feet a day deliverability being uneconomic may come as a shock, but we intend to show this is the case. Certainly in looking forward past today we're already hung with what we have and, once again, as opposed to what the counsel for Pubco stated, most of our wells were drilled in the early stages and most of our wells in the earlier stages represented a tremendous proportion of the Basin-Dakota wells then drilled.

As a matter of fact, it's only been one year since we have had this formula in operation as an allowable formula, and during that period of time we have only drilled approximately twenty wells of all kinds.

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Our secondary concern, however, is this: As I stated, we have to live with what we have, if we can't get this new formula we're asking for, but we submit, and I submit as management, that where a well becomes an economic failure not due to its own characteristic but by the formula itself, that it's an improper formula.

It will be stated that a 500,000 cubic foot deliverability well never will pay out anyway, never will produce its reserves. I submit that a 500,000 cubic feet well allowed to produce will produce its reserves in twenty years, would pay out in five years. Now, that may or may not be an economic success in the opinion of persons in opposition to this particular request, but it certainly is never going to pay out, it's going to be an 80-year depletion type situation under the existing formula, and it's going to be a 20-year payout. I submit that what we're now living with is a situation whereby the formula permits payouts to vary by 20 to 1 in variation when the outside limits, the extreme freaks of reservoir parameters don't vary by more than 3 to 1, and that the average of the below and above average deliverability wells varies by less than 50%.

Now, we intend to show that even by El Paso's exhibit which was produced to the Commission, on which it based its order, that the variation of the average was only 60% and yet the Commission

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by its orders is allowing payouts on the order of 20 to 1. This is a ridiculous situation. We have not come here asking the Commission for something strictly out of a gain economically for Consolidated Oil and Gas, and this, once again, will be disputed, but I submit that the average deliverability of Consolidated Oil & Gas wells in which it owns interest is 1590 mcfd which is above the average; but we are not concerned with that situation.

We're trying to look past the end of our nose. We would like to participate in New Mexico. We would like to continue participating, we've spent $8,000,000 for ourselves and other associates in the last four or five years. We would like to continue developing. We cannot do it under the existing formula. It's impossible. We have no protection whatsoever against a well being declared an economic failure even though it could pay out in three or four years if it were a million cubic foot deliverability well.

Let's take a look at what's really happened in New Mexico, and principally because of the San Juan Basin and its allowable formula. Last year, and these statistics are taken from the Oil and Gas Journal, the date on it is March 26, 1962, their source of information was from the American Gas Association and the API. I think this causes pause for all of us to look at the San Juan Basin even more closely. New Mexico led all states, all states

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in decreases to crude reserves in 1961, almost 850 billion cubic feet of negative proved reserves as opposed to gains in most other states. In fact, New Mexico more than equaled the other negative numbers of all other states which showed a decline in proved reserves.

MR. EVERETT: May I interrupt? Did you write the article?

A No, I did not.

MR. EVERETT: Is the author to be available for cross examination?

A It is a compilation of statistics which are available for examination.

MR. EVERETT: I object to any further testimony on this line.

MR. STOCKMAR: I would like to ask that the Commission recognize this publication and the article in it, that it take administrative notice or judicial notice of it, and that Mr. Trueblood be permitted to proceed with respect to it.

MR. KELLAHER: For the purpose of the record, Pubco also objects on the ground it's hearsay, irrelevant, immaterial, the author of the article is not here, not available for cross examination.

MR. PORTER: Objection overruled.

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MR. KELEHER: Exception.

MR. STOCKMAR: Please proceed, Mr. Trueblood.

MR. EVERETT: Are we to understand that we are given an automatic exception to the Commission's ruling so that each time we don't have to note our exception?

MR. PORTER: That's right.

A To review, New Mexico more than equaled negative-wise all the other states shown in the negative situation, and yet even with the negative numbers thrown in, the United States as a whole had the largest net gain it's had since 1959. Our opinion, as management, my opinion as management, is that this is due primarily to the fact that we've all been participating in an underground storage project in the San Juan Basin for the benefit of El Paso Natural Gas.

MR. HOWELL: If the Commission please. I have not objected to this witness getting up and arguing his case, but I do object to insinuations and to accusations made without any basis of fact, and I submit that this witness' testimony to the present time has been primarily an argument, and I do object to such statements being brought in here.

MR. PORTER: The Commission rules that the reference to El Paso be stricken from the record and at this time I would like to caution the witness to be less argumentative, please.

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Q (By Mr. Stockmar) Mr. Trueblood, the Commission has ruled that we should proceed more in the line of direct testimony. Do you have an opinion with respect to whether or not the non-development of the Basin-Dakota pool will result either in waste or in the abuse of correlative rights?

MR. EVERETT: I object, Your Honor, so far as the record is concerned, he's asking for a conclusion of the witness, yet there's nothing in the record to show that there's any non-development in the pool. I object on the basis that it's not a proper question because there's no evidence in here that there is development or non-development.

MR. STOCKMAR: If I may reframe the question.

Q (By Mr. Stockmar) Mr. Trueblood, if the Basin-Dakota Pool is not more fully developed than it is at this time --

MR. KELEHER: I would like to object to that on the ground that it's the contingency that's not in the record at all, no proper foundation has been laid.

MR. PORTER: Mr. Stockmar, is it your intention to establish by testimony that there has been a decrease in development?

MR. STOCKMAR: Yes, this Commission has determined that a particular area is the Basin-Dakota Pool, that it is underlain with a common source of supply, it's own records will show

that only certain spacing units have been developed to this time. It seems to me that that is an adequate foundation for a conclusion by this witness. We could have brought forward testimony. I thought it simpler to simply make the statement myself, as supported by your own findings and record. We can come back to this point later after Mr. Trueblood has testified as a petroleum engineer, if you wish.

MR. PORTER: Suppose we proceed on that basis, Mr. Stockmar.

Q (By Mr. Stockmar) Mr. Trueblood, in your capacity as an expert, will you briefly describe the Basin-Dakota Pool?

A Without boring the Commission in general, and repeating what has been said many many times, basically the Basin-Dakota Pool is a common source of supply. It's a fairly massive continuous sandstone with local variation in permeability, local variation in porosity and local variation in water saturations, but it's widespread, it's fairly uniform on the overall picture.

It has low permeability, and, therefore, low rates of production compared with the gas in place. However, it is an extremely large reservoir with communication, and the long life of the field will permit redistribution of the gas in the reservoir if disproportionate withdrawals are made.

It is essential that the allowable formula protect correlat-

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ive rights. We agree that there are localized changes in character, but on the whole, no matter what the change in character could be, the wide variation of the characteristics or the reservoir parameters making up the Basin-Dakota Field does not vary over one to three at the extreme and not over 50% on the average of the above and below average low deliverability wells.

You can find extreme cases where you have extremely high permeabilities, extremely high deliverabilities and thin sand sections whereby the reserves in this instance would be very small unless the drainage radius was much larger than 320 acres, which has been decreed by the Commission as the proper spacing unit for the Basin-Dakota Pool. We have no argument with the spacing in itself or the 320-acre spacing as the best balance in economics and the ultimate recovery. We do submit that spacing in itself does not protect correlative rights. It only prevents drilling of unnecessary wells.

Now, the economic atmosphere is all important in this consideration, and although the Commission is primarily concerned with correlative rights, it should concern itself with the thing that has been brought up many times, that there's nothing wrong with the good old American way of making a profit if you have a profitable well. For the existing allowable or allocation formula to cause uneconomic wells which could be economic, we submit

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is improper.

Q Mr. Trueblood, is it your opinion that the Basin-Dakota Pool is fully developed at this time or less than fully developed?

A It is considerably less than fully developed. As a matter of fact, it appears that based on the Commission's finding as to the limits of the Basin-Dakota Field, it is less than 10% or approximately 10% developed at this time.

Q If the field is not fully developed, would this, in your opinion, result in waste or the abuse of correlative rights?

A The loss, or the leaving of hydrocarbons in the ground undeveloped and untapped that are producible hydrocarbons is waste. By the same token, to allow hydrocarbons from under a 320-acre tract that is not developed to be produced through an adjoining 320-acre tract which is, strictly because the allowable formula would not permit the development of that 320-acre tract, is an obvious abuse of correlative rights.

Q Although it may be quite clear to the Commission, based on your prior statements, would you again state your opinion as to the propriety of the existing formula in terms of the weight given to deliverability?

A This weight given to deliverability has caused a deliverability raise. It's causing the operators to put a maximum incentive on large fracture treatments which may or may not

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necessarily be needed to drain the specific 320-acre tract, or to attain the recoverable gas from under its 320-acre tract. Operators are almost compelled by this to utilize in some instances unnecessary extra fracture treatments. Operators are prevented, if they happen to be unlucky enough to have a well that did not penetrate a particular fracture system which may be somewhere else on its 320-acre tract, of never being able to produce the gas under the existing formula because of the weight.

MR. STOCKMAR: Gentlemen, at this point we had hoped to have a blackboard available so that Mr. Trueblood could demonstrate something. In its absence we have prepared a sketch that might do as well.

Q (By Mr. Stockmar) Mr. Trueblood, so the record may be complete, would you explain what is there and explain for the record any marks which you make upon it?

MR. PORTER: Before we start into this exhibit we will take a five or ten-minute break.

(Whereupon, a recess was taken.)

MR. PORTER: The hearing will come to order, please. Mr. Stockmar, you may proceed with your witness.

Q (By Mr. Stockmar) Mr. Trueblood, before the intermission you had been giving some testimony with respect to correlative rights and so forth. Would you proceed to amplify

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that testimony near the drawing up there?

A Before proceeding I would like to issue my apologies to Mr. Howell for mentioning anybody's name. I did get carried away, and as far as that goes he's a partner of mine and a stockholder.

We have been bandying this correlative rights situation around loosely now for about thirty minutes and I think it would be well to examine what we are talking about in as simple terms as possible.

What is correlative rights? We had hoped to have the use of a blackboard here, and this, as you can see, is not a very artistic exhibit. We didn't intend it as an exhibit. We would like to examine correlative rights if we may, for a minute, and we have here a surface square mile area in which there are located two 320-acre drillsite units as declared as drillsite units by the New Mexico Oil and Gas Conservation Commission.

If I may for a minute, we have given this depth so as to give it a little perspective with respect to sand thickness, and that sort of thing, and if I may for a minute assume that each one of these sides of this square mile has four and a half billion cubic feet of gas identical. We have put an invisible shield, if you may, between these two 320-acre tracts. We have sunk an orifice which has an opening of the size of 800,000 cubic feet per day in this side. We have sunk an orifice, if we may, which

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has 2,000,000 cubic feet per day on this side. The invisible shield remaining and allowed to produce uncontrolled, this particular well, without any formula, would produce all of its gas in less than fifteen years. This well would produce all of its gas in seven or eight years.

If we may, for a minute, however, put a 25% acreage and 75% deliverability on each side, when this well has exhausted itself--

Q Mr. Trueblood, for the record, would you identify which well you are referring to?

A When the 2,000,000 cubic foot well has completely exhausted itself under the existing formula, 50% of this volume will still be left. Under the reverse of 75% acreage and 25% deliverability, 20% will be left.

Now, obviously this isn't what happens. By the use of gardol or what have you, we remove the invisible shield, what happens? There must be flow from the 800,000 cubic foot well to the 2,000,000 cubic foot well, and that's as simple an interpretation of correlative rights as I can possibly make it. With this in mind, what we're asking for, mind you, is a 60-40; a 60-40 would leave something like this and still create drainage.

The next question arises, why didn't we ask for 85-15? Frankly, we didn't have the guts to ask for it. We felt that we would be so opposed even at 60-40 in the change that at least

we felt that this was a moving in the right direction, and that the Commission could review it for a period of eighteen months similar to what it's reviewed to date, and perhaps it should be 85-15. Now, we submit that this same square mile in depth occurs over and over and over again throughout the entire Basin-Dakota Field.

Q Do you have a specific example of this, Mr. Trueblood?

A Yes, I do, if you will bring up Exhibit 1 for a minute.

Q First, Mr. Trueblood, would you identify the drawing there?

A This drawing is a drawing of just this type of situation of two offset wells immediately adjacent to one another. One of them is the Consolidated Oil & Gas Government Gross No. 1-7, one of them is the Consolidated Oil & Gas Government Leeds No. 1-8.

Q Was this prepared by you or under your supervision?

A It was prepared under my supervision. Now, we submit that basically from log interpretation, and we have had it investigated by others and ourselves, and our own interpretation, that these are almost identical wells in sand thickness, pore count, water saturation, et cetera. There are local little variations, but for the most part they are almost identical.

Once again, going back to this drawing, the question

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is which one gets drained first? Which twin has the Toni? We've submitted to others, been guesses on both sides as to which one is going to produce the gas. This is the problem that every San Juan Basin operator is faced with every time he drills a well. Which one is going to be a non-commercial well under the existing formula and which one is going to be the commercial well? I submit which one is going to be the commercial well. We can all hazard a guess, and I would like for you to all hazard a guess and then we will take a look at it.

This well in February had an allowable of 10,000,000 and deliverability of 709. This well, the Government Leeds well, had a deliverability of 1387, and an allowable of almost 16,000,000 cubic feet. It is obvious that under the existing formula that there can only be drainage from this to this; with differences in ownership of the existing working interest, there is no protection of correlative rights. None whatsoever. And yet this is repeated time and time again, you can look at 20,000,000 cubic foot deliverability offset by 500,000 cubic feet deliverability wells in various parts of the Bain. This is not peculair to one area. There are areas of somewhat higher permeability, somewhat higher porosity, we call them the sweet spot of the Basin-Dakota Field, which we are fortunate enough to have a participating interest in, but even in the sweet spot these same variations

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between 320-acre tracts exist. This thing could just as well have been 2,000,000 cubic feet and 6,000,000 cubic feet, just as well. If we may move on to our Exhibit No. 2.

MR. STOCKMAR: Excuse me, Mr. Trueblood. We would like to have this paper marked and accepted as Exhibit No. 1.

MR. PORTER: The exhibit will be marked at this time and then you can offer all the exhibits at the same time.

(Whereupon, Applicant's Exhibit 1 was marked for identification.)

A May I have Exhibit 2 and 3, please?

(Whereupon, Applicant's Exhibits 2 and 3 were marked for identification.)

Q (By Mr. Stockmar) Would you identify and describe Exhibit 2 and the matters therein?

A Gentlemen, Exhibit 2 is an exhibit taken from the Basin-Dakota Gas Pool from the February, 1962 proration schedule.

Q Was this prepared by you or under your supervision?

A It was prepared under my supervision. The number of participating wells in the pool at that time was 507. Of all the wells used, which were 473 on which we had available deliverability factors, and in a few instances there appeared to be typographical errors with relation to allowables versus the deliverability factor, so we threw them out; in any event we used a total of 473 wells as participating wells, which is a substantial percentage

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of the 507 participating.

These wells had an average deliverability of 1404 MCFD. The total deliverability for the 473 wells was 664,031 MCFD. The average allowable per well for the 473 wells was 16,039 MCFD; the total allowable of all wells, the 473 wells, was approximately, incidentally, the D shouldn't be on this last item, 7,586,552 MCF.

Now, moving on to Exhibit 3, we have broken down these wells into their ranges of deliverability, and we find that the deliverability range of 0 to 1,000 MCFD was represented by 58.8% of the wells, and those below 2,000,000 totaled almost slightly over 80% of the wells in the field. Then we had the freaks from there, 0 to 20 percenters, and it would be well to note at this point that the over 6,000,000 cubic feet per day deliverability wells had 12 times the allowable of a well of the group from 0 to 1,000. In other words, these ten freaks get approximately 120 wells' equivalent allowable of the below 1,000,000 deliverability class.

For this to be equitable and protect correlative rights, these wells would have to have 12 times the reserves of a well with a million cubic feet or less deliverability. It is our very firm opinion that no such relationship exists.

Now, reviewing this particular item, we attempted to find a proper formula; as before stated, it appeared to us that it

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should be 75% acreage and 25% deliverability, but because of the controversial nature, we determined to submit our application for 60% acreage and 40% deliverability.

Now, a study of the entire Basin-Dakota Field in magnitude is far beyond the scope of our limited facilities. We do have an independent consultant analysis of our own properties, but it was not broad enough; we did find, however, on our own properties that we had approximately 63% below average deliverabilities and 37% above. We also found that the average variation in the average below and the average above deliverability wells was less than 50% in reserves, and that the extremes from the extremely high to the extremely low variation was certainly less than 3 to 1. We next, after considering a fieldwide reserve and lacking the staff, we next went to the, what we considered, or what the Commission had considered proper and very good engineering work in presentation by engineers of El Paso Natural in its first allowable formula hearing, and this was presented in Case No. 2095 in January, 1961.

Now, if I may have that -- this is not our exhibit. This is just reintroducing what El Paso had introduced, and apparently what the Commission had acted upon.

MR. STOCKMAR: I would like to further explain that this is a blown up picture of an exhibit previously entered with

respect to this field.

Q First, Mr. Trueblood, it's my understanding that the small numbers appearing beside the circles were not on the original exhibit, but that they were adduced by testimony at the time, is this your understanding?

A This is my understanding.

MR. STOCKMAR: We have additional small copies of this.

Q Will you proceed, Mr. Trueblood, and first possibly explain why you are again bringing forth this work of theirs?

A Once again, I reiterate that information on the Basin-Dakota Field as such, published information is sparse, work of any magnitude on reserves versus deliverability, even though we don't subscribe to that concept, work of this nature is fairly hard to come by, and since the Commission based its original order using this as a guidepost, or one of its guideposts, we determined to take a look at El Paso's work.

This chart represents a case study of 160 wells. We presume that it was done under engineering supervision of one or more people, but being done by the same people would substantially relate itself to work within their own ideas of deliverability versus reserves. Now, once again I reiterate that we do not subscribe that there's a direct relationship between deliver-ability and reserves in place. There may be some relationship

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in the lower ranges of deliverability because obviously you have to have some permeability or you can't produce any reserve. We do not subscribe, however, that that particular point, given time to produce, and disregarding anything else but time to produce, that even a 300,000 or 250,000 cubic foot well could eventually produce its reserves.

Let's take a look at a 250,000 cubic foot well. In El Paso's instance, on a deliverability of that type they had something less than a billion cubic feet of gas reserves; 250,000 a day would still only take ten to twelve years to deplete, and undoubtedly a well of that low magnitude wouldn't be getting somebody else's gas if it were allowed to produce. But the most important thing about this particular chart is, getting back to our average concept, average, average, knock out the freaks, the three on one end and the one that obviously is never going to be produced under the existing formula, we had no way of knowing where the individual deliverability points might be in each of these wells, the twenty-two wells up and down the scale, but we were able to establish that the average reserve from this chart, weighted average reserve was 3.6 billion cubic feet of gas.

Now, this case study of 160 wells was taken from 214 wells in the September proration schedule. We have no idea what 160 wells they utilized of the 212 available, but we do know that

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the average deliverability in September of 1960 at the time they studied it, was approximately 1225, which happens to relatively agree with their 3.6 billion cubic feet of gas.

Now, we then discovered that on this chart, as developed, that approximately 66% of the wells, no, pardon me, 69.6%, as best we could tell, had below average deliverability, and once again we don't know the range in each specific point, but that it appeared eyeballing that approximately 70% of the wells fell in a range below this average deliverability and 30% fell in the range above the average deliverability.

How did this relate to the field today, February, we felt that this would be important to see if this case study done very early in the field's history would be representative of the day's work. Where do we stand today? Is this any good or should we throw it out? We found that in February of this year that 66% of the wells fell in an average under 1404, if you'll refer again to Exhibit 3, excuse me, 69.6% of the wells on Exhibit 3 fell in the below 1404, and 30.4 fell above. So we were amazed to find the work done this early in the stage of the game is so accurate of the field today. We were quite amazed, as a matter of fact, but we hope that we enjoy the amazement because the one thing we did establish is that the wells, if that is true today, that this 70-30 concept still exists, we found that on this chart the

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average weighted reserves of the below average deliverability wells was 3,000,000,000, that the average reserve of the above average deliverability wells was 5,000,000,000.

We submit that this is the range existing in the field today. In other words, there's only a 60% variation in reserves on this average concept, throwing out these freaks, and, therefore, in order to protect correlative rights you must stay in this range or there will be cross drainage. There is no question about it.

Now, what does it take to stay in that range? We investigated that it takes 75% acreage and 25% deliverability factor to stay in this range. Exactly 180 degrees difference than we now exist today. This, we think, is the most important thing that must be brought to this Commission's attention. One, that we have a situation here where, back to Exhibit 3 again, we have wells getting 12 times the allowable, 12 times, and yet the variation on the average even by El Paso's work is only 60%. We submit that there's no equity involved in this. There can't be equity. There can't be a protection of correlative rights.

Now, we would like at this time to get back to Consolidated's basic point, we do not believe basically that given time that any well, and we'll say from 250,000 cubic feet or 300,000 cubic feet, given time and given a proper formula, that it can produce its

reserves; only if it's given the formula can it produce its reserves, and yet today on the payout situation all wells having a million cubic feet a day or less are anywhere from 10 to 25 or 30 years in payout. Using 6% present worth, anything that pays out in 12 years, you have gotten nowhere. In other words, the formula itself is creating this economic inequity, the basic formula.

Now, we all would like a bigger piece of pie. We would love to have a tremendous piece of pie and we hope that the transmission companies will be able to get this bigger piece of pie. Even if it is bigger, which would encourage development -- even if it is bigger, we still couldn't protect ourselves on the correlative rights problem no matter how big the pie is. We have to have our piece. This is the Commission's duty that we get our piece of pie. Everyone will say that Consolidated is here for its own economic consideration. I reiterate that basically our overall average allowable of all the wells in which we have an interest is above the field average. We are interested in staying in the San Juan Basin and we are interested in further development of the San Juan Basin, and we are interested in bringing this negative gas, proven gas reserves position back the other way. But we can't do it under the existing formula, and no management person can ever purposely continue to drill wells that are delcared

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uneconomic in advance.

Now, what does this say? This says that 70% of the wells, excuse me, 60% of the wells, 58.8 are by Commission ruling, and under the original order, are uneconomic by administrative order. This can be corrected. We would at least like to have a correction for the same period of time of eighteen months that we have been living, or fourteen or fifteen months that we have been living under this uneconomic situation to study it. During this period of time additional reservoir information will be available. The Commission will probably want to take it under review fourteen or fifteen months down the line. We submit that they'll want to move it higher acreagewise.

Q To forestall the comment that you are again becoming argumentative, I would like to move on to Exhibit 4, if you will.

A All right.

Q Mr. Trueblood, would you just identify and explain this exhibit?

A Once again, tying back to the El Paso work of the 70-30 relationship as it apparently is still in existence today, in our examination of the above and below average deliverability wells in February of this year, Exhibit 4 once again repeats that of the 473 field wells represented, approximately 69.6% of the wells in the field had below average deliverability, and those

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above average deliverability remained 30.4.

Going back to El Paso's average once again of three and five relationship, using three billion per well for the average of the below average deliverability wells, and five billion for the average again of the above average deliverability wells, we find that the below average deliverability wells had 62% of the field reserves in the Basin-Dakota Field, and that these high deliverability wells had only 37.7.

Now, where were they, however, in the February field allowable? 329 of the wells, or, once again, this 69% had only 38.8% of the allowable. On the other hand, 144 wells had 61.2% of the allowable. What can that possibly mean? It can mean only one thing, drainage.

Now, the February, 1962 average per well allowable of the 25-75 was 8.9 million cubic feet, and of the above average wells there was a 32.3 million cubic foot allowable under the existing formula. Under our proposed formula this 69.6% of the wells would be getting an average of 12.2 million cubic feet for that month as opposed to 24. We have still granted, even under this request, drainage, but at least, once again, if we are participating in underground storage projects we can cut out some of the lease.

Q Mr. Trueblood, would you again state how great a deviation in the reservoir characteristics is necessary to justify

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a say two to one difference in reserves?

A The reservoir characteristics per se obviously would have to have a 200% difference in sand thickness or porosity or water saturation exclusive of permeability in order to change the in place reserves. We submit that this is not the case, and even by El Paso's work there's only a 50% difference on the average.

Q Mr. Trueblood, will you specifically state your opinion with respect to whether or not the proposed 60% acreage, 40% deliverability formula will better prevent waste and protect correlative rights than the existing formula?

A It is my firm opinion that, as demonstrated through these exhibits, that it is not a cure-all, but it is at least a step in the right direction; and failure to take that step, in my opinion, will discourage further exploration and development of new reserves, will discourage possible new market outlets from being sought because the only way that market outlets are created is through pressure to create them of having capable gas at a shutin capacity.

It is my further conviction that it will deprive the people of New Mexico of the needed taxes by the lack of expenditure for further development in the field under the existing order; and furthermore, we feel that it unduly penalizes those operators who

have already come down here, already been here, have adopted New Mexico as a place to spend money and like to stay.

If we can't be given some kind of encouragement by you in the face of the fact that 70% of the wells that are being drilled are committed to economic failures before they're being drilled, this has got to go the other way, we can't spend the money here. There's no way. And yet we would be willing to, if we felt that we were being protected correlative rights wise, where if we happened to get a well less than one million deliverability or so, that we might at least some day see a payout.

Q Mr. Trueblood, were all four of the exhibits which have been presented been prepared by you or under your supervision?

A They were all prepared under my supervision.

Q Will you refer to Exhibit 2 for a minute? I believe a typographical error has crept in there. I call your attention to the parenthetical statement which appears twice, "For distribution of deliverability, see Exhibit 2". Should not this be corrected to read "Exhibit 3"?

A Yes, it should.

Q The last exhibit with respect to which you testified, we would like marked and identified as Exhibit 4, and with that we would like these four exhibits accepted.

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(Whereupon, Applicant's Exhibit 4 was marked for identification.)

MR. PORTER: The record will show that Exhibit 4 has been marked. Does anyone have any objection to the introduction of these exhibits? The exhibits will be admitted into the record.

MR. STOCKMAR: I would like to submit the witness for cross examination or questioning by the Commission.

MR. PORTER: Any questions of the witness? Mr. Keleher.

CROSS EXAMINATION

BY MR. KELEHER:

Q Mr. Trueblood, one statement on direct examination, it is my recollection that you said that 60% of existing wells in the Basin-Dakota were economic failures?

A That is correct.

Q And in other parts of your testimony you said that 70% of the wells are committed to economic failure?

A Well, I'm very sorry if I said 70 in the second instance, it is 58.8% pursuant to Exhibit 3.

Q When did Consolidated acquire the acreage on which you have drilled?

A Mr. Keleher, we have been acquiring acreage in the San Juan Basin periodically since 1956.

Q How long have you been with Consolidated?

A Since its foundation, January 1st, 1955.

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Q Have you directed drilling of the wells on the leases that you acquired since 1956?

A They have been under my supervision directly or through other members of my staff.

Q How many wells have you drilled on the leases that you acquired since 1956?

A Of all types of wells, Mr. Keleher, or Basin-Dakota wells?

Q Yes, and Basin-Dakota wells.

A We have drilled or participated in with other operators approximately 60 wells.

Q You say that that's 10% of the wells drilled in the Dakota?

A Approximately. I believe actually the correct number is 57 through February which ties in to the type of Dakota we have actually presented here.

Q Can you give us the names of some of those who are participating with you in the drilling of these 60 wells in the Dakota?

A Well, actually, this happens to be a matter of public record, but of personal concern of mine, that it is not common practice to distribute names of drilling participants for obvious reasons of competition for looking for tax dollars when you are raising money from drilling participants. There are some

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twenty-five or thirty people.

Q There are some twenty-five or thirty participants?

A Yes.

Q And you would prefer not to mention their names?

A That's correct. I don't mind mentioning El Paso Natural Gas or Southern Union that have been our partners where we have been the operators.

Q To what extent have your wells proved, during your administration proved economic failures?

A Well, exactly none of them were economic failures until February 1st of last year, Mr. Keleher.

Q Well, you've drilled a number of wells since then, have you not?

A That is correct. Most of which are just being put onto the pipeline due to the necessary delays that seem to go on with the pipeline companies, but we do have some production history on the wells drilled last year, a very limited amount.

Q When you became a chief administrator of the Consolidated you were aware of the prorating rules that were in effect here by the Commission?

A Prorating rules for the Basin-Dakota formation?

Q Yes.

A There were no prorating rules for the Basin-Dakota

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formation.

Q Well, you have been familiar with it ever since the rule was established?

A Since February 1st of last year, yes.

Q What you want this Commission to do is to give you your piece of the pie, as you described it?

A That is exactly correct.

Q You believe that you are not getting enough pie at this time?

A Actually, I'm getting more than my share, Mr. Keleher.

Q Are you here representing Consolidated or representing other operators?

A I am here representing Consolidated and in the interest of conservation and correlative rights.

Q You believe that under this present formula you are getting more than your share of the pie?

A That is correct.

Q Then aren't you a trifle inconsistent in saying that you are getting your share but you want, as you describe it, a piece of pie that belongs to you?

A I want all wells that are possible economic wells to be--

Q Failures?

A -- to be placed in that category. I believe that's as

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I presented it. I don't necessarily ascribe to two-year payout when economic wells could be six or seven that are now fifteen.

Q You want all wells placed on a par regardless of location?

A Beg pardon? No, not regardless of location, strictly on reserves, Mr. Keleher.

MR. KELEHER: I have no further questions.

MR. PORTER: Does anyone else have a question of the witness? Mr. Everett.

MR. EVERETT: W. H. Everett, Ohio Oil Company.

BY MR. EVERETT:

Q Mr. Trueblood, in stating your qualifications, I think you stated that you had a Bachelor of Science degree in petroleum engineering from the University of Texas in 1948?

A That is correct.

Q You also stated that you had worked for some oil companies in the capacity of petroleum engineer?

A That is correct.

Q And that you had acted as a consultant in various capacities either for an independent operator or on a consulting basis?

A That is correct.

Q I wonder if you could give us a little more of the

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background of your present company and your affiliation with it from the standpoint of when you started the first company, whatever its name was, and so forth, that is now and I guess resulted in the name Consolidated Company, can you get into that for us a little bit?

A Well, now, if you want about thirty minutes I will go through the corporate issue.

Q I think that would be fine, it would be very interesting to me.

A All right. As a consulting petroleum engineer during the years 1953 to January 1st of 1955 I acted in the capacity as a consultant to certain individuals. I formed a company called Twin T Drilling & Producing Company. I didn't form it, I participated in a drilling rig venture, which was very catastrophic, which many of these ventures turn out to be. I reorganized the company, took it over and changed the name and borrowed some money and paid off the creditors and started as Consolidated Western January 1, 1955. We operated as Consolidated Western Exploration until April 30, 1958. During that time we participated in drilling ventures in the San Juan Basin. We came here in 1955 as Consolidated Western.

We took farmouts, drilled some of the earliest Basin-Dakota wells that were drilled in the field. Drilled probably ten or

twelve of the first forty wells that were drilled in the San Juan Basin. We had some modicum of success and at the time we were able to sell some gas. We determined that we were going to need a considerable amount of corporate money to continue our acquisition program of buying producing oil properties and drilling gas wells.

To try to sell a closed corporation of twelve stockholders, such as Consolidated Western Exploration, to the public in 1957 was an absolute stark impossibility on Wall Street. We became publicly held through merger with a company called Consolidated Rimrock Oil Corporation. Now, Consolidated Rimrock Oil Corporation has a rather lurid history and I won't get into the details, but it did take a tax loss and carried forward some tax props and eighteen irate stockholders, at least. By merging into them and reversing, splitting the stock, we were able to take over two-thirds' control of the company, and if nothing else we had sellers of the stock even if we didn't have any buyers, so this was how our market was created.

We subsequently replaced by paying $150,000.00 in stock at two and a half dollars a share, which gave us a little equity money to move along. We subsequently went to our stockholders and raised $400,000.00 in equity money in September, 1960.

In the meantime we had been continuing our drilling program

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in the San Juan Basin. We acquired additional oil and gas production in other states and by 1961, February, 1961, we purchased a company known as Midland Oil Company via the merger route, through a purchase of 40% of the stock prior to the merger, merging the companies and acquiring five hundred more stockholders in that manner.

Q Were they irate?

A Fortunately they weren't, because the stock immediately moved up from two and a quarter to an equivalent four dollars and a half, and if they were irate prior to that time they weren't afterwards.

By this time we had approximately 4,000 stockholders. We continued our operations in the San Juan Basin and acquisition of properties until February of this year, at which time we acquired a company known as the Tekoil Corporation, which was in fairly dire straits financially.

MR. PORTER: What was the name of the corporation?

A Tekoil. In so doing we acquired our opponents in this particular thing, the second largest stockholder in Consolidated Oil & Gas, namely El Paso Natural Gas Company.

MR. STOCKMAR: If the Commission please, I think this is very interesting, and aside from proving that Mr. Trueblood is an excellent manager and investor as well as an expert engineer, I

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wonder if it is relevant to the procedure. I would like Mr. Everett to --

MR. EVERETT: I think it's very relevant. I am leading up to your annual reports which Mr. Trueblood has signed as president, and the area in which he wishes to deal as a matter of economics, I think it's very material as to what the financial base of the Consolidated Oil & Gas Company is.

MR. STOCKMAR: I still do not see the relevance of the company's financial report to the questions of waste and correlative rights that are under inspection by this Commission. I would like an adverse ruling on the part of the Commission to the continuation of this line of questioning.

Q (By Mr. Everett) I think you are up to the last one, Tekoil was the last one?

A No, no. I'm not through yet.

MR. EVERETT: I beg your pardon.

MR. STOCKMAR: Mr. Trueblood, the Commission is considering my motion.

MR. PORTER: Mr. Everett, would you tell us as simply as you can what you propose to show by this line of questioning?

MR. EVERETT: Yes, sir, I propose to show by this line of questioning the position in which Mr. Trueblood finds himself and his company as caused by the various Consolidated mergers,

consolidations, mergers, financing and other operations they have got into, which I think will prove rather conclusively to the Commission that there's nothing wrong with the formula, that the trouble is that Consolidated has put itself in the position where it's not even getting a portion of the income from the wells in which it has an interest. They're asking this Commission to bail them out of a situation which they created and not one which was created by any equities in the formula.

MR. STOCKMAR: If the Commission please, Mr. Trueblood's testimony has been directed to what he as an executive plans to do in the future with respect to drilling in the San Juan Basin. His testimony with respect to the economics of particular wells was based on each well as an individual problem, without respect to who owned interest in it, whether he borrowed money against it, or the financial position of his company. I again submit that this is a kind of red herring that has nothing to do with the issues before us today.

To the best of my knowledge Mr. Trueblood is entirely satisfied with the status of his company as it is now, its rate of growth, that is not the issue before us. I would earnestly like to have this particular pursuit abandoned.

MR. EVERETT: I ask you to change, that you change the red herring to red apple, I think it's the bad apple in your

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barrel.

MR. PORTER: Objection sustained. Mr. Everett, would you pursue some other line of questioning?

Q (By Mr. Everett) Mr. Truchlood, you have stated in your direct examination that no management person can continue to drill wells which are declared uneconomic in advance. Who declares a well uneconomic in advance?

A I would say, based on my testimony, that we are already on notice on what is available today that a million cubic foot or less well is uneconomic and that if more wells are drilled they are declared uneconomic in advance, and this is the basis for my statement.

Q Did the Ohio Oil Company farm out some acreage to you, to your company, I think it was Consolidated Western at that time?

A That is correct.

Q Referred to in one of your exhibits as the Gross No. 1-7?

A Right.

Q And didn't the Ohio Oil Company declare to you in advance that it considered that location uneconomic for it to drill?

A That is correct, but the economics of the oil company and the economics of the drilling participants in higher tax brackets are two different things, Mr. Everett.

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Q What elements enter into whether or not an operation is economic?

A Well, I think the basic concept is a fair return on your investment.

Q Does the matter of salary of officers enter into it? Do you consider that a part of your operation?

A Certainly.

Q Your overhead is another item?

A That is correct.

Q The cost of leases?

A Not necessarily cost of leases, particular items of capital item, capital plant item.

Q Cost of drilling a well?

A Cost of drilling a well is, once again, a plant item.

Q Cost of casing? A Plant item.

Q By plant item, you mean you consider that an element of cost that enters into your determination as to whether drilling any particular well will be economic?

A That is correct.

Q Do you, in your company, have you arrived at any operations cost, let's say, on a per thousand cubic foot basis for your operations in the San Juan Basin?

A Depending strictly upon the rate of withdrawal in each

individual well, the percentage of the amount that you sell changes dramatically. In other words, it costs the same amount to operate a well that's only produced three days a month because of its restricted allowable and small volume as it does to produce a big volume well three days a month or four days a month and produce a big volume. I would say that the range of cost of operation will vary anywhere from 2% to 100% under the present formula.

Q Wouldn't it vary under any formula?

A It would vary under any formula, but the range will probably not be so great because the smaller volume wells would be producing larger volumes in any given month, which in turn would give a larger gross income in which to charge your operating expense.

Q To get back again to my basic question, what is Consolidated's cost figure per MCF of gas in the joint well they operate with Ohio, is it two cents?

A The cost figure?

Q Is it twenty-two cents, or what is it?

A The cost figure in the one we own jointly with Ohio?

Q Yes.

A We operate a Mesaverde well jointly with Ohio.

Q I'm speaking of the Dakota, you operate that and we have

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an override.

A That's right. That specific well, the operation cost is probably something on the order of 40% of the revenues that will be ultimately received, or the rate of revenues that will be received under the present formula.

Q 40% of what?

A Of the gross sales.

Q What dollar number is that?

A The gross sales in that specific well probably is on the order of, something on the order of 80 million cubic feet of gas for the year. I don't have those figures handy, and I wouldn't know exactly what it was, but in 1961, the gross sales in that specific well, which happens to be an average well, the below average deliverability well, it would be my guess that they're probably less than $12,000.00 in total revenues received from that well.

Q Your cost of operating that well you think is approximately 40% of the total?

A It could be as high as 40%. I don't know if it would be in that specific well, but wells of that order.

Q Well, let's take the other one.

A This is considering depreciation on the equipment and what have you, into the cost of operation, as are all costs

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computed.

Q Well, now, let me ask you another question concerning, we can go back to the Gross or I can take any one of the three others that you operate.

A I prefer that you bring up the three others, they are nicer wells.

Q Well, let's take the Leeds well, you think that, from your testimony you apparently think that the Leeds well and the Gross well are exactly the same reservoirwise, is that your testimony?

A That is correct. That is exactly correct, reservewise.

Q Reservewise? A Right.

Q In drilling the wells, are you familiar with what was encountered in the drilling of those wells insofar as the productive section of the Dakota-Basin pay is concerned?

A Oh, I would say the overall gross thickness pay was on the order of 80 feet of sand. The net effective thickness was probably on the order of 55 to 60 feet.

Q In both wells? A Right.

Q Was that net pay contiguous in the sense that there were no intervening strata in one well and not in the other?

A I don't understand your question. Are you saying that the same indicated porosity in the same basic sand section is

the same in each well?

Q No, I'm asking you for the net effective thickness of the pay.

A I stated, I believe, in my testimony that the net effective pay thickness was approximately the same in both wells, based on log interpretation.

Q Were those wells cored, did you have core analysis?

A We did not core them.

Q You did not core them. Did you find in the wells the Dakota pay, the net pay of 65 feet you say in the Leeds well, for example, was that net pay contiguous or was it in a number of streamers?

A It was in a number of individual sand sections, but basically two to three massive bodies of sand.

Q Was it the same in the Gross well?

A Basically.

Q What do you mean, basically?

A Well, I mean that there will be local lensing variations where one lens might be twelve feet thick in one and eight in another, and other lens vice versa, might be twelve and eight and so forth.

Q Now, to get back to the matter of economics again, as I understand your testimony, Consolidated does not own 100% of

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the working interest in any lease which you operate, is that correct?

A Well, not in any lease which we operate. In a substantial majority of the leases which we operate.

Q What in round numbers is the percentage of your ownership?

A Of the working interest?

Q Yes, sir.

A As a general rule we are from approximately 3/8ths, 1/4 to 3/8ths working interest per well.

Q You have 25 to 37½% interest?

A Right. We have as high as 100% and a number of wells with 50, others with a sixth.

Q I respect your desire not to reveal the names of those who participate in the drilling of wells, Mr. Trueblood, and I will try and do the best I can to elicit from you the information with reference to your joint interest owners, which I happen to have because of division orders which we have signed as an overriding royalty owner. I think in the Gross well that you refer to, which is located in Section 7, Township 31 North, Range 12 West, the Ohio Oil Company owned the lease on the Southeast Quarter of that particular section at one time, I believe, and is it or is it not true that we farmed that out to Consolidated?

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A That is correct.

Q And in that connection --

A I presume it's the Southeast.

Q And in that connection is it a fact that the Ohio told you that it did not wish to drill a Dakota well, it didn't feel it was economic?

A As a matter of fact, Mr. Everett, the Ohio Oil Company stated at the time that they didn't believe that the Dakota formation was economic in the San Juan Basin.

Q But we did farm the acreage out to you?

A That's correct.

Q And you felt it was? A That is correct.

Q And agreed to drill a well to the Dakota so as to earn the acreage in that Southeast Quarter?

A That is correct.

Q And Ohio retained an eighth override in that Southeast Quarter?

A That is correct.

Q Later it was communitized with the Southwest Quarter on which Consolidated or someone else owned the lease, is that correct?

A That is correct.

Q So that our override in that particular half section,

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then, was reduced to a 16th?

A That is correct.

Q A full 16th override? A That is correct.

Q Now, from the division order which I have and, there again, I want to protect you if I can, but I want the record to show what the situation is, and I have a division order dated September 6, 1960, covering the Government Gross 1-7 well located in Township 31 North, Range 12 West, NMPM, Section 7, the South Half, and in analyzing that division order, Mr. Trueblood, and I'll hand it to you if you want to check my calculations on it, they are approximate.

A All right.

Q And I'll not introduce it in evidence unless you insist, it gives the names of all the interested parties. I find there that there are fourteen working interest owners, no, fourteen overriding royalty interest owners?

A Right.

Q Fourteen overriding interest owners, the Ohio Oil Company having an overriding royalty of .6324913 which is the equivalent of 1/16th, I also find that there is a production payment in there in the amount of $3,905.25, which is figured at the rate of $25.00 per acre, I believe on 156 acres, which was owned by one of the parties, which, when that is paid off,

converts into an overriding royalty of .24703 to one party and .24707 to another, is that correct?

A I presume it is. I'll take your word for it.

Q I wouldn't want to state those figures are exactly accurate because I'm not a very good mathematician, but it all adds up to an overriding royalty of approximately 12½%?

A That is correct. It's approximately a 75% lease.

Q The total working interest is 75% in that Gross lease?

A Right.

Q From which, if I understand the basic contracts and so forth, Consolidated, as operator, must pay all operating expenses from 75% of production?

A Consolidated, et. al.

Q Well, Consolidated and the other working interest owners?

A Right.

Q I find also from reviewing that same division order of September 6, 1960, that there are seventeen working interest owners, which includes Consolidated and sixteen others?

A Well, it seems logical.

Q Well, I can introduce it in evidence if you want me to, Mr. Trueblood.

A That's all right.

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Q I don't want to embarrass you or Consolidated, either one, but I think the facts are important. I find that Consolidated is the largest working interest owner, with 35 plus percent in the breakdown.

A That's right.

Q The next largest one has 9.37½%, there are four with 4.63%, one with 2.34%, two with 1.15%, one with .15%, one with 1.7%, three with three-fourths of a percent, and two with .7 or approximately a half a percent. Do each of those working interest owners, are they billed by your company for their costs of operation or are these what we refer to, or any of them, what is commonly referred to as a carried working interest?

A None of them carried working interest.

Q I notice that one of these working interest owners has the same name as the well is named. Can you tell me how it happened that that well was named Gross No. 1?

A Well, actually, in order to avoid confusion on 65 kinds of United States Government numbers and sets of numbers, we determined to name certain of our wells in honor, or in some cases maybe not in honor, of a specific individual who was a participant, Mr. Everett.

Q I just wondered, did Mr. Gross pay anything extra for that honor?

A No, as a matter of fact, the only thing extra that he paid for the honor is the fact this was drilled in 1958, '59, prior to the present formula.

MR. PORTER: Mr. Everett, may I interrupt at this point?

MR. EVERETT: Yes, sir.

MR. PORTER: We are going to recess the hearing until 1:30, at which times you may resume your cross examination of the witness.

MR. EVERETT: Thank you.

MR. PORTER: The hearing will be in recess until 1:30.

(Whereupon, a recess was taken until 1:30 P.M.)

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AFTERNOON SESSION
April 18, 1962

MR. PORTER: The hearing will come to order. Please proceed, Mr. Everett.

CROSS EXAMINATION (Continued)

BY MR. EVERETT:

A Excuse me one second. I would like to correct one item in my previous testimony.

Q Yes, sir.

A As concerns operating costs on the Gross No. 1-7, my staff informs me that the operating cost at the time that we drilled the well and during 1960 was 10 percent; during 1961, the first year of proration, was 25 percent; and on the projected 1962 allowables, it's 40 percent.

Q Thank you. We were discussing those items of operating cost. I presume you have a gas sales contract that covers the production from this Gross 1-7 and the other wells with reference to which you've testified?

A That is correct.

Q With whom are those contracts?

A Actually the contracts are with two different concerns. One is Southern Union Gathering Company, in the one instance, combined with El Paso on some sort of a swop-out arrangement; and the others are with Southern Union Gas Company.

Q Do you know whether either of those contracts is a sale for resale in interstate commerce as that is defined in the

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Natural Gas Act?

A Insofar as the gathering company, Southern Union Gathering Company contract is concerned, it is an FPC item.

Q Is the contract with El Paso also subject to Federal Power Commission control?

A It is.

Q So that both of your contracts are subject to the provisions of the Natural Gas Act, and to the regulations and orders of the Federal Power Commission?

A Only insofar as the Gross 1-7 farmout from Southern Union and us is concerned; and as to the other farmouts of the other three wells with Ohio are concerned, those are all intrastate.

Q What about the sales from the other properties in which you have, or Consolidated owns or has an interest, or operates?

A Approximately sixty percent of them would be under intrastate contracts and forty percent would be under interstate contracts.

Q What prices are provided in those contracts?

A Well, in the El Paso contract, which is the interstate contract, it provides for twelve cents per thousand base, with a one cent minimum on our share of the LPG products. In the instance of Southern Union Gas, the sales price is a straight thirteen cents per thousand.

Q Those contracts do not cover, then, what do you call it,

condensate or --

A Condensate; no, they do not.

Q What is it, let's say in barrels per million cubic feet of gas, what is the content or the average content of the gas which Consolidated owns or produces?

A From which wells, Mr. Everett?

A Well, from all wells. Do you have an average?

A Mr. Everett, for our projection of economics, as a general rule we use from twelve to fifteen barrels per million cubic feet. However, we have wells that produce as high as thirty to thirty-five barrels per million cubic feet, and we have wells that produce as low as six per million cubic feet, depending on the particular area that we have, the wells in the particular portion of the Basin.

Q Do you recall it in the Gross and Leeds wells?

A I would say in the twelve to fifteen per million bracket.

Q And you have arrangements under which you sell the condensate in this gas?

A That is correct.

Q What does it bring per barrel?

A At this moment I don't know, because it's changed anywhere from five to fifteen cents at various and sundry times during the life of these particular wells; on the order of two fifty-five or two sixty-five per barrel, less trucking charges.

Q Which would leave a net of what, two twenty-five?

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A Two twenty-five, two thirty-five, two forty-five.

Q Have you figured that out as to how much that amounts per MCF of gas?

A Mr. Everett, we use in our economic studies, for purposes of our gas payouts and in order to relate it strictly to gas, we use fifteen and a half cents, fifteen to fifteen and a half cents per thousand cubic feet, and include the condensate therein; and thereby make our projections on the required amount of cubic feet which would have to be produced from a given well to acquire payout.

Q Over a given period of time, so that if your payout -- you say you used the figure from fifteen to fifteen and a half?

A Right.

Q So when you were referring to payout period of thirty years, you were figuring fifteen to fifteen and a half cents per MCF as to the gas ultimate recoverable under the present formula, to arrive at that total payout figure?

A Yes, that's correct. Under the existing gas price. We, of course, all hope for an increase.

Q Do you recall whether your contracts have a provision in them for an increase?

A They have an escalation provision of one cent each five years. I believe that, in both cases, that the escalation would become effective on January 1st, 1964, provided that the FPC goes along with the escalation.

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Q In estimating the payout period, did you consider that you would or would not receive that increase in price?

A We have considered that we would get the one cent increase each five years.

Q So that would it be fair to assume that in reaching your calculations, you have used the most favorable picture, I mean from the standpoint of making that payout period as short as you could?

A We certainly would like to. We have one hidden factor, which is the declining market per well, and this has been an unknown factor to us in our calculations before we drill a well.

Q If you add fifteen and a half cents -- I can do my figuring better if I use sixteen cents per example, because I can divide it by the 1/8th. You make your calculations and just assume we can apply these figures to fifteen and a half, but for convenience of counsel, let's use sixteen because I can't keep up with your mathematics too well. If you have an eighth royalty to pay on the proceeds of gas from your lease, then that cuts the working interest by two cents, doesn't it?

A Approximately, that's correct.

Q So that you would then have fourteen cents with which to figure your payout?

A No, twelve cents, because there's an eighth royalty to the Government also.

Q You have an eighth royalty, that's two cents, and then

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an eighth override?

A So you have twelve cents.

Q So you figure twelve cents?

A That's right.

Q In applying that same eighth to a payout number of thirty-two years, let's say again for my convenience, if you had an eighth override and a thirty-two year payout, why that would increase that payout period by four years, wouldn't it?

A That's correct.

Q So that in your economic picture, so far as you are concerned the payout period would be extended in direct ratio to the amount of overriding royalty you had to pay on a given lease?

A No question about it.

Q I think that should be made clear, and I had hoped that you had made your calculations along those lines.

A Right.

Q I had no reason to believe that you wouldn't. Now then, you testified, I think, that you had an interest in or operated about ten percent of the wells in the Basin-Dakota Pool?

A That is correct.

Q Sometimes you engineers refer to a figure that doesn't mean too much to me, but how many wells are you talking about when you talk about ten percent, sixty wells?

A I said I believe it was fifty-seven, in order to be commensurate with our February numbers that we were utilizing

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in our testimony, and it's slightly more than the 507, slightly more than ten percent.

Q You testified that the working interest of Consolidated in those wells was 25 to 35 percent, I think?

A Averaoe.

Q That's 25 to 35 percent average. To get your engineering term, how many net wells out of the 57 would you say Consolidated had?

A Net working interest wells or net division order wells?

Q Well, tell me what's the difference.

A Well, there's a considerable difference. When you report net wells, as a general rule, to your stockholders, you are reporting net working interest wells without regard to royalty; in that instance, we're talking about something on the order of twenty net wells. However, our average overridina royalty or our average lease is something on the order of 80 percent, so we are talking about in the order of fifteen to sixteen net division order wells.

Q Well, I mean one way, then, if I understand your net well figure, if you exclude your overrides then you have more net wells, and if you include your overrides you have less net wells, is that correct?

A That is correct. In other words, in the working interest wells, for purposes of computing operating costs, you must look upon it as net well operating cost; and for purposes of

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payout or purposes of income, you must look at it from net division order wells.

Q Well, that is for the reason that, to reimburse the operator for the cost of production he has to pay it out, reimburse himself only out of that portion of the gas to which he's entitled under the division order?

A That is correct. I would like to amplify that in that all of our participants own their share of the gas and own their share of the royalty, and also have an interest in the cost of operation.

Q Let's go back to the No. 1-7 well for a moment. In there, I believe, if my calculation is correct -- and again I don't want to embarrass you the least bit, Mr. Trueblood, by introducing this division order in evidence, and I don't propose to do that, but I think I speak correctly that there are 17 working interest owners in there. When, if you recall, did you sell the working interest to your working interest or co-owners?

A Well, actually, in this instance, Mr. Everett, and I'm glad you brought that up because we have a 160-acre tract in the specific well to which you refer, the Gross No. 1-7, which was in an original farmout from Southern Union Gas Company, in which we had certain participants in a very substantial block of some 3,000 acres in the general area we're speaking of. We subsequently acquired additional farmout acreage from Ohio in the form of approximately three and a half drilling units, the one-half adjoining the

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Southern Union acreage; and our partners who were with us when we came to the San Juan Basin carried their interest and paid for their prorata invoice cost of participation to the extent of their share of the 160, whereas new participants who had joined us in 1959 -- as opposed to having been with us in 1956 -- participated in the other 160 to the extent that their interests were in the total 320. So this accounts for the fact that there are 17 owners involved in this, whereas the general rule of thumb is around eight owners in our various units.

Q Now that well, Gross No. 1-7 well is in the South Half of Section 7 in the Dakota formation, but the joint operation to which you are referring now is one that was in the Mesaverde formation, is that correct?

A No, even the joint operation as it pertained to the Dakota formation, the participants who were with us in the original 160 were not necessarily with us in the separate 160 farmout, as to the Dakota rights themselves.

Q To be specific, I don't have the numbers, of course, but if you recall, did any working interest owner pay more than the fractional percentage, as shown on the division order, of the cost of drilling Gross Well 1 No. 7?

A Those who were in the new 160-acre tract who participated in the -- I'll call it the Ohio farmout, in a three and one-half well farmout, did pay approximately fifteen percent more than the invoice cost for that participation in those wells.

Q The net result, then, in drilling Gross 1 No. 7, was that Consolidated to the extent of that fifteen percent overage was relieved of paying what otherwise it would have paid, which was approximately thirty-five percent of the drilling and completion, equipping costs of that well?

A I believe your numbers are thirty-five percent division order, which is forty-five percent working interest or thereabouts, and so that the other participants in this instance who were in the Gross Well, insofar as the Ohio 160 is concerned, the markup involved represented less than five percent of the total cost of the well, if you follow me.

Q I'm trying to follow you. I wondered what the net percentage of that well Consolidated paid.

A We would have paid approximately forty percent of the working interest for the forty-five percent that we paid in that specific well.

Q I'm not going to burden the record by going through all of the correspondence and what-not we have had with Consolidated, but for the record, I think it should show, and I believe you've confirmed this -- and there again, I have a communitization agreement dated September 1, 1961, which communitizes the entire South Half of Section 7 as to the Dakota, and prior to that time it had been assumed that the two halves which you show on your map here were equal in acreage?

A That is correct.

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Q But it was discovered there was a slight variance in acreage. I think the portion that you, Consolidated and others contributed to that unit had 156 acres and Ohio's acreage was 160, so that there's a slight difference in there; but so that our override spread over the 316 acres was a little more than the 160?

A That's correct.

Q Again, I hand you the communitization agreement. I don't propose to introduce it in evidence, but that's the Basin-Dakota Agreement. In summarizing that, I find that either your particular -- under what's defined as Tract 1, which is the Joe Reed lease, the Federal lease FSP-023, that there are 27 working interest owners.

A No, that is not correct. Mr. Everett, I don't believe most of these others are overriding royalty, if you'll look at the top of page 2. As a matter of fact, there are only five working interest owners other than ourselves in this particular tract.

Q Then the overriding royalties are on page 2 of the agreement, and how many of those are there?

A Appears to be about eleven, plus two on page 3 is thirteen.

Q If my figures are correct, that override in that case totals about a sixteenth --

A That's correct.

Q -- on the entire tract. Now let's take some of the

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other wells, what about the Leeds wells, you testified with reference to the Government Leeds 1 Well 8. I have a division order from our files dated September 6, 1960, covers Leeds No. 1-8 well, Section 8, West Half, Township 31 North, Range 12 West, NMPM. That covers gas production from the Dakota formation under those lands, and in there I find the Government having a royalty interest of twelve and a half percent, and the Ohio Oil Company having an override of twelve and a half percent, or one-eighth; and I find one, two, three, four -- twelve working interest owners with interest varying from one and a half percent to as high as 9.375 percent. Is that the way that lease is owned?

A That appears to be correct, that's correct.

Q What about the costs of drilling that well?

A The costs of drilling this well were borne approximately forty-eight percent by Consolidated Oil and Gas, and fifty-two percent by its associates in this particular drilling unit; and once again, we have our fifteen percent markup.

Q Is there any significance to be attached to the naming of that well as Leeds Well?

A Very similar to the Gross, same reason.

Q You are just honoring Mr. Leeds?

A Correct.

Q You didn't charge him anything for the honor?

A No. As a matter of fact, he got quite an honor, because it was above average deliverability well.

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Q As a matter of fact, I think Mr. Leeds had about nine percent or plus, nine plus percent interest in that well. I would like to go through the rest of these. Is your general plan of financing wells where you have joint working interest owners to have what you call a markup of fifteen percent?

A That is correct. This is what we call our charge to cover our general administrative overhead expenses for the purpose of looking for deals for drilling associates in high tax brackets.

Q Going back to your exhibit, I guess you didn't introduce it, the drawing that you had this morning. If I recall your testimony this morning, it was your opinion that the size of the well bore had something to do with deliverability, is that correct?

A No, it is not correct. However, it does have something to do with it, but very minute in this instance. My purpose of illustration in this instance was to try to create what I would call an orifice or a needle valve on a fixed volume tank, and that needle valve is cracked open to 800,000 cubic feet a day, and this needle valve is cracked open to 2,000,000 cubic feet a day, and it merely, stated very simply -- and this doesn't require a lot of engineering prowess -- when this one was exhausted, that this one would be only half exhausted if it had the same volume of cubic feet of propane or butane or natural gas or what have you, inside.

Q That's based on the assumption that the volume that's

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inside of that box is the same throughout the box, is that correct?

A That is correct. This is the only purpose of this. This was merely an attempt to hit at a lay explanation of what correlative rights basically is.

Q And to further that same explanation, I think you introduced another exhibit that referred to the Leeds and the Gross wells?

A This is our Exhibit No. 1.

Q Was it your intention to leave the impression that that which is shown on Exhibit 1, plus your testimony with reference thereto, was to bring it into direct relation to this other graph that you have drawn?

A My purpose in this instance was to illustrate that this condition exists on offset wells throughout the San Juan Basin, that you have very similar sand characteristics on immediately offsetting wells from a standpoint of porosity, water saturation, sand thickness, and all the elements that go into gas in place; and that in this instance we merely show this as one. There are probably 50 or 100 such cases; unfortunately, we didn't have the time to present 50 of them, but in any event, we just merely point out that here are two wells completed by the same man, perforated in the same manner, fracture treated in exactly the same way, with apparent same log characteristics, and in one instance you wind up with a deliverability of an average deliverability well; and the other is an economic failure. That was the purpose of this.

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Q Is the Commission to assume that your testimony is that that situation exists throughout the entire area which it has defined as the Basin-Dakota area?

A It exists, not in every single square mile, but it exists innumerable times in the different areas in the San Juan Basin, whether these numbers are 2,000,000 and 6,000,000, or whether these numbers are 300,000 and 600,000.

Q Is it your testimony as an expert witness, petroleum engineer -- put that hat back on, if you will, for a minute -- that this Basin-Dakota formation under this field, it would be reasonable to expect it to be the same throughout the area covered by the field?

A It is basically and generally a fairly consistent reservoir with local variations in particular lensing and, for example, what a great number of people call the graneros section is well defined and well developed in portions of the field, and less well defined in other portions; but it appears that when the graneros becomes more defined in a lot of instances, that the Dakota one, two, three, call it what you may, the benches of the Dakota formation itself in some instances begin to disappear.

Q Do all benches of the Dakota appear the same in these two wells, referring to your Exhibit 1?

A For purposes of this exhibit, we would call this our graneros section, we would call this what we group together as our main productive Dakota zone in this area.

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Q You are referring to the bottom half of the Gross --

A The bottom half.

Q Gross 1-7?

A That is correct. With the apparent same thicknesses in each of these zones. Now in this one instance, we have a penetration of one little particular piece here that was not shown on the log here.

Q You are referring now in Leeds 7, you have a penetration that you didn't find in Government Gross --

A We didn't drill as deep.

Q You didn't drill it?

A At the time that we logged it.

Q What area, if you know, is covered by the Commission's definition of the Basin-Dakota Field?

A As I recall, it was fairly broad in that it stated all of Rio Arriba and San Juan Counties which is productive of gas from the Dakota formation. That is what I was leading up to today, is that we don't know the size of it, but apparently from indicated productive Dakota wells throughout the Basin, that it must be something on the magnitude of possibly 5000 320-acre units.

Q And you think that each acre there is equivalent to each other acre, at least 85 percent equivalent?

A On an average.

Q No, your testimony was that you thought the formula should be 85 percent acreage and 15, but that you didn't have

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enough guts to ask for more than 40-60.

A I would say --

Q I'm referring back to your 85 percent. Just what area are you referring to when you say it should be 85 percent acreage?

A I'm saying that the Basin-Dakota Field as a whole fits within this average concept of approximately three and a half to four billion cubic feet; three and a half billion cubic feet, if you will, and in order to properly drain and get your fair share of the gas under each 320-acre tract, that you must not have a formula which grants more than a 60 percent -- even by El Paso's -- a 60 percent variance in withdrawals, no matter what the deliverability is, in order to stay on the average.

Now the New Mexico Oil Conservation Commission has a very unique system of eliminating all of the problems of the wells that won't make it, in that they redistribute and the bigger wells get their share of the left over underproduced allowable; so that in fact, even if they instigated this 60-40 or 85-15, those that didn't make it would go back to the higher deliverability wells, anyway. It's a pretty mathematically sound approach.

Q That is your opinion?

A It seems to be mathematically correct, if you have something over and you redistribute it.

Q Isn't it based on the assumption that 85 percent of the acreage in this area which has been defined is equal, insofar as the Basin-Dakota Formation is concerned?

A Only on the average, and that's average, above average deliverability and below average deliverability; and going back once again, if it gets outside of the norm of the average, it's taken care of through the redistribution schedule, and this is the basis of my statement.

Q That's the basis of your statement. But aren't there also many areas in the field which would be comparable to your 640-acre box where there are dry holes that also penetrate this same formation?

A I have stated that we have extremes out here and there's no question about zero permeability, zero deliverability being zero reserves. I think we have a common denominator for that that's called a dry hole. As we move up from that point, Mr. Everett, I stated further that at 200,000 cubic feet per day, that's just some deliverability, granted enough time could produce its half billion cubic feet of reserves by El Paso's work. It just has to have its chance; and that in order for it to have its chance, I say it takes an 85 percent acreage factor to even get the chance.

Q Then you have no objection to cutting down the good deliverability wells in favor of a dry hole then?

A Well, obviously a dry hole doesn't get any deliverability at all.

Q It gets 25 percent of nothing under the present formula, and you want to increase it to 60 percent of nothing, so I can't --

A I can't see how it gets anything, it never gets

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completed. One of your requirements is, in your gas contract, that you have to get El Paso or Southern Union to come and get it. I think we have eliminated these freaks of 250 and 300,000 down because they won't come and get it in the first place.

Q Let's get back to your average well. Isn't it a fact that the Basin-Dakota Pool has been fairly well defined by dry holes drilled almost around the entire perimeter of the Pool?

A I'd say that the area on the southwest side of the Basin is fairly well defined from the standpoint of water problems. I would say that we have defined very well the northwest end of it with a couple of dry holes and some that we have attempted to complete; through cement failures or otherwise, we were unable to complete as economical wells. I would say that the northeast side of the San Juan Basin, which is over in the Colorado portion, it is of no concern to this Commission, has not been as well defined as some of the other portions. I would say that the southeast portion of the San Juan Basin is not even nearly clearly defined at this time, although we don't yet know whether we're dealing with oil wells and gas wells in that particular area.

Q Would you say that in the areas where the dry holes have been drilled, you said you had drilled a couple, Consolidated has drilled a couple -- let me back up a notch. If you know, what kind of a structure is this?

A What kind of a structure?

Q Yes, sir.

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A Well, actually --

Q Is it an anticline, syncline?

A It's a basin, per se, with localized structure present in the Dakota formation itself. What are you speaking of, the San Juan Basin as a whole? It's a sedimentary basin.

Q Is it a stratigraphic trap, isn't that what the geologists call it?

A Which formation are you talking about, again?

Q The Dakota.

A It is basically a stratigraphic trap with localized Dakota highs and localized Dakota strokes. As a matter of fact, where the localized situations seem to occur appears to influence in some way the natural fracturing system that is present. If we knew the answer, well, we would have a lot higher deliverability wells than we do.

Q Well, I think no one would drill any dry holes, either, but you are asking this Commission to 85 percent treat this area as if that formation was the same under 85 percent of the wells, and I don't believe you'll testify that the formation is the same.

A Actually, Mr. Everett, this is not what I said at all. If you will go back to what I actually did say, is that the formula we've asked for, which has now disappeared from the board, still gives -- this 60-40 that we've asked for still gives a two to one advantage to the higher deliverability wells, even in spite of the fact that it should be the other way around.

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Q Then the correlation as between gas in place and deliverability actually exists, then, doesn't it?

A I also testified that at some lower range this is probably true, at the very very low range, but on El Paso's work it is immaterial. Back to your gymnastics, you can draw any kind of line through these points that you might desire.

Q My gymnastics -- let's go back, if we want to talk about gymnastics, let's go back and get your remarks on oranges and apples. I intend to be courteous with you, but don't call my cross examination gymnastics. I take personal exception to that.

A I was talking -- I am talking about the gymnastics of drawing a line through this.

Q Who is the vice-president of your company?

A J. B. Ladd.

Q Would you recognize his signature?

A Yes.

Q Would you look at this, please? Is this Mr. Ladd's signature?

A Yes.

Q Is this Consolidated's letterhead?

A That is correct.

MR. EVERETT: Would you mark this Ohio Exhibit A, please?

(Whereupon, Ohio's Exhibit A marked for identification.)

Q (By Mr. Everett) Why don't you be seated, Mr. Trueblood, my temperature has gone down now.

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A All right, sir.

Q This is a letter dated September 29, 1959 --

MR. STOCKMAR: Could I have an opportunity to peruse this before we seek to have it introduced in evidence?

MR. EVERETT: Yes, sir. I just found it Friday. I did get the photostating department to make two copies. I apologize for not having more, but that's all the time I had.

MR. STOCKMAR: We have no objection to your use of the letter, Mr. Everett.

MR. EVERETT: I'll offer the letter dated September 29, 1959, from Consolidated Oil and Gas, Inc., addressed to the Ohio Oil Company, Post Office Box 120, Casper, Wyoming; Attention, Mr. R. W. McCanne; marked for identification as Chio's Exhibit A, and I'll offer it in evidence in connection with this cross examination.

I would like permission of the Commission, if I may, to substitute a photostat for the original, since this is an original company record. Do you have any objection to that?

MR. STOCKMAR: No.

Q (By Mr. Everett) You have read the letter of Mr. Ladd, have you, Mr. Trueblood?

A I have.

Q Without getting into too much detail in it, it was addressed to the Ohio Oil Company on September 29, 1959, and you refer to our jointly owned Government-Owens No. 1-7 well in Section

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7-31-12, and are seeking us to go along with the proposition to deepen that well to the Dakota, is that correct? I mean, the letter speaks for itself.

A Actually, to re-enter the well which had been drilled to the Dakota originally by Ohio and Consolidated, and to hang a liner and complete same as a producing Dakota well, since we had learned in the area that you didn't have to have a natural flow, necessarily, to make a commercial Dakota well.

Q In that letter to us, you advised us that you had drilled that Mesaverde well, one that was completed to the Mesaverde, to the Dakota penetration of 89 feet, and that you had a drill stem test of the whole Dakota interval, which established a stable natural flow of 10 to 15 million feet of gas a day.

A I believe that was 10 to 15 thousand cubic feet of gas per day.

Q You are correct.

A Which is quite a difference.

Q Yes, there's quite a difference, I realize that. Then in the letter, in some detail you tell us of the completion method which you propose to use in your Owens 1-7,"to build a simple sodium bentonite mud with a low water loss characteristic, drill the seven inch casing plug, wash to the top of the cement plug opposite the Dakota Formation, drill the Dakota plug, and deepen to approximately 6860 feet. We then would run a 5 1/2 inch liner with turned down couplings as we have done in several instances

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in this area, hanging it from the base of the 7 inch and circulating cement around same. We would then after WOC run a collar log and perforate the prospective Dakota Formation. If necessary, we would selectively break down the various Dakota intervals with acid and then proceed with a sand-water frac utilizing some 60,000 lbs. of sand in 40 to 60,000 gallons of water."

Then you go ahead and describe how you would complete the well, and so forth, and that you might want to mud acid wash the Mesaverde when you got through with the Dakota frac. You estimate a cost with reference to the well, and attach a cost sheet to it showing the cost of that rework to be your estimate of $53,200.

I do not have the original of Ohio's response to that letter, but I have obtained from the files and records of the company regularly kept in the due course of business a carbon copy of the letter which was addressed to Mr. Ladd. I will ask you, Mr. Trueblood, if you recall ever having seen the original of that letter?

A No, I don't remember seeing it, but I'm sure that it was sent because of my knowledge of the subsequent transaction.

MR. EVERETT: I will ask if you will mark this Ohio's Exhibit B.

(Thereupon, Ohio's Exhibit No. B marked for identification.)

MR. EVERETT: We offer in evidence Ohio's Exhibit B, and ask permission to substitute a photostat of it, if we may, and

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withdraw the original for our permanent record.

Q (By Mr. Everett) Referring to Ohio's Exhibit B, which was an answer to Mr. Ladd, Mr. Trueblood, in response to the letter which is marked Ohio's Exhibit A. Mr. McCanne, our Division Manager, advised you that: "As far as we are concerned we would much prefer to continue to produce the Mesaverde formation, which to date has made in excess of 100,000,000 cubic feet of gas, and not take a chance on injuring this formation by attempting a dual completion. A study of the existing Dakota completions indicates that the production varies considerably throughout the area, and it is possible that the economics of the majority of the Dakota wells may be marginal, at least resulting in long-term payouts."

MR. EVERETT: I understood the Commission to give me permission to withdraw these.

MR. PORTER: Yes, that's correct.

Q (By Mr. Everett) Following this letter, did Ohio make a farmout to your company of the Dakota rights under that particular acreage?

A Under that, plus three other drilling sections.

Q Plus three other drilling sections?

A That is correct, or Half Sections, I should say.

Q Did you, following that farmout, drill a well on the South Half of Section 7?

A We did.

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Q Which you referred to as the Gross well?

A Yes.

Q You did not attempt to complete it in the Mesaverde?

A It already had a Mesaverde completion.

Q It had a Mesaverde completion?

A That's right.

Q You deepened the well, then?

A No, we drilled a new well, but the rights were already gone, and participated in by Ohio, and there was no way to Mesaverde dual since the unit had been formed and was being completed through the Owens No. 1.

Q The well that you drilled under the farmout was a Dakota well, is that correct?

A That is correct.

Q Would you explain to the Commission how you completed that well?

A Well, actually --

Q If you know.

A I didn't physically complete this well. However, we drilled to the depth, of which I don't know the exact depth, set 5 1/2 inch casing, perforated, fracked, and I'm not even sure of the number of fracture treatments involved in that specific well. However, I am familiar that the two wells involved had identical treatments.

Q The two wells, meaning the Gross and the Leeds Dakota

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well?

A And the Leeds, that's right.

Q They had identical treatment, yet I think your testimony was that one had a deliverability of 709 and the other one had a deliverability of 1387, as shown on Consolidated's Exhibit No. 1?

A That is correct.

Q So having had the same treatment in the drilling thereof, to what do you attribute the difference in that deliverability?

A I wish I knew. The only thing it could possibly be, obviously, is that there is a difference in the fracture system penetrated in the specific well bore in which each of the wells were drilled.

Q Then if I understand your testimony as an engineer earlier, the formation under those two wells is the same?

A Yes, basically is the same; it contains the same amount of reserve.

Q And you can't explain the difference from any known fact, then?

A The only factor that it could be is whether one of the wells happened to penetrate a natural fracking system that the other did not, which is not to say that, had the location instead of the Southeast Southeast would have been in the Northeast Southeast, it may not have penetrated the same fracture system that the other well did.

Q But there is a difference in the permeability, did you

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say?

A Yes, because of fracturing.

Q Because of fracturing?

A Yes.

Q You don't think it's a natural difference?

A I do not think there's a natural matrix permeability difference to amount to anything, more than maybe five or ten percent variation.

Q You testified with reference to two dry holes which were drilled by your company. Did you attempt to complete them in the same fashion you attempted to complete these two?

A As a matter of fact, we did not attempt to complete the two wells in the same fashion. In one instance, the Dakota sandstone was at a very shallow depth, we drilled on what is known as the hogback area, and was so broken up and so unlike Dakota wells in that instance a couple of miles away, and indicated from porosity and the characteristics of the log that it was not worth an attempt to complete in that particular formation.

In the other instance, we drilled a well on the extreme east side of the San Juan Basin, and I believe 28 North, 2 West, which was -- we called our No. 1 Jicarilla, which we wound up fishing in a beer can at about 8400 feet. By the time we got to total depth and were unable to complete it in any way, in any event, because we could just barely penetrate the Dakota formation and had no log of it.

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Q And on an acreage basis, you would have 100 percent allowable for both of those wells?

A Not if I couldn't hook them up. You only get an allowable, Mr. Everett, if you have a well hooked up. We have numerous wells right now awaiting hookup that we would love for them to go getting an allowable now, but they don't get them until they are hooked up.

Q It's your testimony, then, that this formation, whether or not it's productive depends solely on the manner in which the well is completed?

A No, I do not make that statement. I made the statement that the deliverability of a specific well might vary from well to well with the techniques used, and we don't know that we have the finest techniques or the worst techniques; but if we employ the same techniques then the only thing that we can possibly attribute this specific change in deliverability to is because of natural fracturing which might be available to that specific well bore, or may not be attributable to that specific well bore, none of which you can actually read effectively from your logging tools.

There are indications of fracturing, but they don't measure width nor extent nor lateral extent or what portion of the 320-acre tract these fracturing systems might be running.

Q Let me put my question another way. Apparently I'm not, I just don't understand your position, quite. You testified a moment ago that you drilled a dry hole in the Dakota formation,

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you didn't complete it because that formation was so broken up that you didn't think it was worth while to complete. Is it reasonable to assume that that situation might exist throughout the field?

A No, it is not.

Q You think that's one place?

A This is just one place that happens to be a localized situation on the hogback at almost the outcrop of the Mesaverde formation.

Q Let's take some of your other wells now. I don't know how many of your wells fall in what bracket that you have there, but let's take a well that has low deliverability, it's a Dakota gas producer. Maybe you can give me one so I can have a specific example,where it was completed in the same manner that you completed the Gross and the Leeds well,which had a lower deliverability or higher, shown on those examples. Are those exemplary of all the wells in which you have an interest?

A No, it isn't. We have,for the most part, wells -- well, as a matter of fact, our operated wells and our operating interest, as I stated earlier in my testimony, the interest in the wells in which we own interest, we have an average deliverability factor of 1590 MCFD. Even as to our farmout of the three wells, we are very pleased and very happy even under the existing formula that we have, the specific units, because they're still, even under the existing formula, average or above average, with the one

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exception of the Gross well, they're average or above average deliverability wells.

Q How do you explain the difference in the Gross well, then?

A The only thing it could possibly be, in my estimation, is the lack of accessibility to local fracturing within the well bore itself, which is not to say that if the well bore had been moved 40 acres within its drilling unit that it might not have encountered those same fracture systems; and you are unable to predict them from the surface or unable to predict --

Q Do you find the porosity and permeability the same in all the wells?

A Basic variation, if you are talking about permeability of the Mattix, the basic variation from what we can tell on the logs, and the porosity, probably varies from six to eight, at most 20 to 25 percent, which is far below what we see in the average relationship here of this 60 percent change.

Q Is it your opinion that that difference in the fracturing capability, let's say, of the formation, that that should not be given consideration by the Commission in fixing the allowable, except to 40 percent, I think you propose now?

A That is correct. We are proposing to give it a try at 40 percent deliverability factor.

Q How long have you been operating in New Mexico?

A Since 1956.

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Q Have you read your application which was filed in your behalf by Mr. Kellahin?

A No, I have not.

Q You have not. I won't ask you any question about it, then. I have here Consolidated Oil and Gas Company, Inc., 1960, Annual Report.

MR. STOCKMAR: If the Commission please, it was my understanding that an objection to testimony relating to the financial affairs of the company has been sustained by the Commission. This seems to be an effort to renew that.

MR. EVERETT: I don't think your objection -- I didn't understand it to be leveled at the Commission knowing the affairs of this company. You have come to this Commission complaining that your correlative rights are not being protected and asking that those of others be destroyed for your benefit, and I would --

MR. STOCKMAR: We are not asking that.

MR. EVERETT: I would like this Commission to know what the president of your company has had to say when he was not under oath in connection with this Field. Now that's the purpose of this, Mr. Stockmar.

MR. STOCKMAR: May I inspect that before we proceed? Do you have specific portions, Mr. Everett, that you are referring to?

MR. EVERETT: I'll submit the whole report.

MR. STOCKMAR: Gentlemen of the Commission, before

proceeding, I would certainly like to have Mr. Everett announce what his purpose is in getting into this Report to the Stockholders and Annual Report. It still seems to me to be totally removed from the scope of this particular hearing. I don't think it's material to the questions before us how much money Consolidated made or lost at any given period.

MR. EVERETT: I won't go into the financial statement part of it, if that's your only objection to my using it.

MR. STOCKMAR: I'm trying to see what bearing it has on the matter at issue here, as to whether or not this is a proper and fair allocation formula.

MR. EVERETT: I think it has a lot to do with it. He has testified with reference to reserves having no relation to deliverability, but when you are telling the stockholders about it, it has a great deal of importance. As I understand his testimony, he complains about the payout period; yet he tells the stockholders that's a good thing because we are going to have gas for thirty years down the future. Now he has to make up his mind one way or the other which way he is going to go. This is contrary to what he has testified to. Now that's my purpose, to impeach your witness. I think I am entitled to a shot at it. I think I can impeach the witness with his own Annual Report.

A I don't have any objection to it.

MR. STOCKMAR: We feel this is entirely outside the scope of this hearing, but Mr. Trueblood has issued a letter to

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his stockholders, or a report, I'm sure he's willing to stand behind it. If you can impeach him, go ahead.

Q (By Mr. Everett) Mr. Trueblood, I hand to you, and ask you what it is.

A It's the 1960 Annual Report of Consolidated Oil and Gas for the fiscal year ended November 30, 1960.

Q This is a facsimile of your signature, "The President's Message to the Stockholders" appearing on pages 2 and 3?

A That is correct.

Q Your signature on page 3?

MR. EVERETT: I will ask that this be marked Ohio's Exhibit C in connection with this cross examination. I will ask permission to substitute a photostat. I just got it the day before yesterday, and with the strict understanding that I would return it to one of your stockholders, Mr. Trueblood.

(Whereupon, Ohio's Exhibit No. C marked for identification.)

Q (By Mr. Everett) In this Report to Stockholders, there's some items which appear to me, Mr. Trueblood, and possibly you can explain what appears to me to be a difference between your testimony this morning and what you've stated in this report. If you can explain to me and the Commission, why, we'd certainly welcome that explanation. I appreciate your courtesy and frankness in discussing your report.

A May I preface it by saying that I am a lot smarter about the Basin Dakota Field under the present proration of 1962 after a

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year of proration than I was on November 30, 1960, prior to any proration in the Basin-Dakota Field.

Q Let me ask you a question. You have been operating in New Mexico since 1956, and in your calculations and so forth, had you considered the very real possibility that the Commission would probably prorate this Field along with others in the State?

A Absolutely. I always operated under the idea that I felt that El Paso Natural, in its demands for gas on the West Coast, were going to alleviate the future sales problem from the San Juan Basin. Certainly I wouldn't have come here in 1956 had I had a different belief, and I still share that belief at this time.

Q I am not testifying. I was going to say off the record that I thought El Paso had been trying to do that, but they've eavesdropped. Here in this report you say: "As seen graphically on the opposite page, Consolidated's new production potential was followed by higher rates of production in the last month as the period of higher demand for gas began."

Isn't it true that each year you have peak demand and low demands, is that correct--

A That's correct.

Q -- in the gas market, even though it's limited?

A That's correct.

Q In the winter months there is more gas produced than in the summer months?

A That's correct.

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Q Then you state that: "While posting only a 27% increase in sales of oil and gas over 1959, Consolidated's net proven gas reserves had a sound 85% increase."

A That's right.

Q So that from the standpoint of your testimony this morning, reserves are a factor, a very definite factor in the allocation formula. At least, you put a great deal of credence on them in this report?

A Actually, I think it's everything in the allocation formula, if you stick to correlative rights, it's whose reserves is the question.

Q Isn't it also a matter of the formation giving up the production, that fracture system you referred to?

A Certainly, but I've already testified that, given time, that a 200,000 cubic foot well will eventually drain its cubic feet.

Q Then you state that: "Net proven reserves of oil and condensate increased 28%." I believe at the time of this report you had some interest in some oil wells, but can you state as between what portion of that 28 percent relates to the condensate that you developed in the drilling of the wells in the San Juan Basin?

A I have no idea at this time, Mr. Everett.

Q You stated: "It is noteworthy that on November 30, 1959, Consolidated had approximately 65 billion cubic feet of net

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proven gas reserves," and that: "Slightly less than fifty per cent were developed. By the end of fiscal 1960, total proven gas reserves had almost doubled, but were still about fifty per cent developed. Thus we are assured of a successful development drilling program for 1961. Nevertheless, Management is maintaining its active search to further increase Consolidated's reserves in the same effective manner as in the past."

"Information concerning our 95% success ratio in drilling during 1960 was contained in the December 1960 President's Progress Report. Of twenty-four wells drilled or deepened for completion attempts in a new horizon, only one was unsuccessful."

I think you are entitled to brag there; that's considerably higher than the industry average for gas wells.

A Well, it was twenty for twenty in '61.

Q You did better the next year. Then you state: "Successful wells during 1960 increased our potential deliverability from natural gas wells by 280% over fiscal 1959. As a result, your Company's net share of gas production capability reached 12,000,000 cubic feet per day as shown on the graph. This is the income equivalent of $570,000 per year, not counting crude oil or condensate sales."

Then coming on down, and I'm not being critical of your telling your stockholders, don't misunderstand me, but as to the matter of economics and what this Commission should consider, you state: "Five more wells were drilled on our Fulcher-Kutz Dakota

gas properties at no out-of-pocket cost to Consolidated."

A That's correct. That is a carried interest ownership.

Q Where are those wells? Where is the Fulcher-Kutz Dakota?

A We own a third of everything that Sunset International owns, that happens to be our opponents in this instance, in the Fulcher-Kutz or Kutz Canyon Area, Dakota formation production.

Q Those wells were drilled free of cost to you?

A That's right.

Q And they are paid for out of production?

A They're paid out of production, at which time we come in for our full interest.

Q Have they paid out yet?

A Some of them may never pay out, in spite of the fact they had high deliverability, since they had initial cost in one well that exceeded $243,000. I must add in the defense of Sunset that it was prior to the time they owned the well, but in any event, we haven't received yet our interest, and I think the well's probably produced in excess of two billion cubic feet at this time.

Q Since it doesn't cost you anything to pay them out, the gas, that's bound to be an economic proposition out of those five?

A Actually there are twelve of them.

Q Twelve of them?

A Yes.

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Q How far is this Fulcher-Kutz Dakota gas properties from these wells and the other wells that Ohio farmed out to you and those that you owned in that same area?

A Oh, twenty, twenty-five miles.

Q Is this Commission to take your statement, or are they to understand and believe that what you have testified, that this formation should be given the same consideration in the Fulcher-Kutz Dakota area as it is in the La Plata area where the other wells are drilled?

A From strictly a reserve standpoint?

Q From the standpoint of the Commission being charged with, when you have a limited market, with allocating production.

A No, it's my feeling that the Fulcher-Kutz wells probably average on the order of six billion to six and a half billion cubic feet of reserves, and the other wells in the area average four to four and a half cubic feet. So, no, I say that they should have 50 percent more allowable, and in fact, our formula, we're giving them 200 percent more allowable.

Q Too bad Ohio didn't have some over there. You stated that: "Most of our unconnected, shut-in gas wells as of November 1959 have since been connected into gas gathering systems."

You refer on page 5 of this report to a total expenditure in excess of $2,000,000 in the drilling of more than 135,000 feet of hole during the fiscal year 1960. "Of the twenty-four wells in which the Company participated, only three may be considered

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as exploratory. Twenty-one were development wells in furtherance of Consolidated's policy to expedite growth of daily gas productive capabilities."

Do I understand from this that Consolidated itself, for its portion of these wells, spent $2,000,000, or is that the total cost?

A That's the total cost, Mr. Everett, for ourselves and others.

Q Yourselves and others.

A As a matter of fact, throughout, so you won't have to ask it any more, it's always ourselves and others in practically every instance.

Q You talk about on page 6, your liquids production being 20 percent higher than 1959, and "Our Company's improvement is gratifying, especially in the face of a 1960 national average of approximately a one-half per cent decline in crude production and a six per cent increase in natural gas liquids production."

Then the next paragraph, you say, "Part of the increase in liquids production may be credited to our 42% increase in natural gas production over 1959," then give the total and refer to the $2.25 and $2.45 per barrel, and then you say that: "Net producing gas well interests increased by 7.19% during fiscal 1960."

A Yes, that's working interest wells, once again.

Q That's working interest wells?

A And that would be approximately a third, as I have

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stated in the past, of the wells drilled.

Q Then on page 6, how many wells, how many actual wells, if you remember, did you have at that time, Mr. Trueblood?

A I wouldn't have the vaguest idea. I now have 2900, so I don't know what I had then.

Q Well, you say this: "At this time, Consolidated had varying interests in almost 10% of all Dakota wells in this portion of New Mexico."

A At that time, Mr. Everett, in 1960, we were still being sort of the bellwether in the Basin-Dakota formation, and there were very few wells that had been drilled and completed to the Basin-Dakota formation. For example, 160, I believe, or 207 or something on that order was all that had been drilled by the time El Paso made their investigation at about the time this report was written.

Q You state in your next paragraph, "Proration, or State regulated limitation of production, will commence around February 1, 1961, for the Dakota formation in New Mexico. This regulation has been in effect for other oil and gas producing formations for several years."

"The consequence of proration on Consolidated's natural gas interests in this area is one of balance between realizable income and productive well life."

"Consolidated has long-term gas sales contracts with El Paso Natural Gas Company and Southern Union Gas Company,

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operators of gas transmission lines. These contracts contain escalation clauses which provide for periodic increases in prices received by Consolidated for its gas. Equally important is the 'take-or-pay' proviso which generally assures our Company of payment for a minimum of fifty per cent of a well's annual potential deliverability into the line."

"Proration reduces possible gas sales from 100% of a well's capacity, but allows each well a ratable portion of the total available market for natural gas."

Then I underline and stress this sentence because it seems to me that is almost in direct conflict with what you were complaing about this morning, as I understood, and that is the long payout:

"Offsetting the possible annual decrease in total income from gas sales is a 25-35% extension of the productive life of the wells. Here again, a balance is achieved between over-all income from higher volume gas sales at near term prices or equivalent total gas sales over a longer term with escalating prices."

"An important aspect of Consolidated's growth base is the accuracy with which natural gas income may be forecast. This has proven to be a significant factor in receiving expansion and development loan assistance from financial institutions."

Do you have any comment to make with reference to that?

A I certainly do, and that is, at the time that I made that projection, I had hoped that the Commission would adopt a

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proration formula or an allocation formula that would be a realistic one and would recognize the economic problems of the individual operator. I don't believe anybody, at the time that this was written, had any idea as to what the significance of a 25 percent acreage factor and a 75 percent deliverability factor would in fact do to the Basin-Dakota, but we sure know it now after the fact, fourteen months later.

Q As a matter of fact, did the Commission have a hearing in October of '60, prior to the time that this report was written?

A That's actually true, and that's the reason we said that it would be adopted on February 1st.

Q Didn't they actually adopt that order in November prior to November 30th, to be effective February 1st, so that you either knew or could have known what that formula was to be, as of the time you wrote this report?

A That is correct. But at the time I didn't know the nominations of the pipeline, and the other thing I didn't know was how many wells were going to be developed.

Q You state in your forecast for 1961 -- and I don't know whether you are referring to Dakota-Mesaverde or Dakota-Pictured Cliffs, or what, but possibly you can tell me, page 11 of your report: "With twenty-five proven undrilled 320-acre Dakota gas units, a successful drilling program for 1961 is assured . . . several wells will be dual zone completions, either as Dakota-Mesaverde or Dakota-Pictured Cliffs gas wells . . . the Company's

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interest in these wells should approximate sixteen net wells. . . completing development of the remaining proven undeveloped gas reserves."

Do you have any comment with reference to that?

A Well, actually, other than the fact that we drilled twenty of the twenty that I mentioned in 1961, we did drill twenty for twenty, and by the end of 1961 still had varying kinds of locations to the extent of twenty-eight, I believe, locations by the end of 1961. I might also say that we were very fortunate in having several dual zone producers, or we would really be having problems in being able to stay in the San Juan Basin at this time.

Q I hand you this instrument and ask you to tell me what it is, please.

A This is the 1961 Consolidated Oil and Gas, Inc., Annual Report for the fiscal year ended November 30, 1961.

MR. EVERETT: I ask the reporter to mark that Ohio Exhibit D for identification.

(Whereupon, Ohio's Exhibit No. D marked for identification.)

MR. PORTER: What was the exact date of the previous report?

MR. EVERETT: The previous report was written November 30th for the year 1960. It's dated January 28, 1961, but covers the period up to November 30, 1960.

Q (By Mr. Everett) Is that correct, Mr. Trueblood?

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A That is correct.

MR. EVERETT: It shows on page 2 the date of the report and page 1 the covering.

Q (By Mr. Everett) Referring back to the 1960 report for a moment, there's a note to financial statements, Mr. Trueblood, which appeared apparently on a financial statement on an unnumbered page by Mr. W. L. Clasquin, an accountant, I assume, dated January 11, 1960. He says: "During the fiscal year 1958, the Company sold a $440,000.00 gas payment for $340,000.00 to be repaid out of the proceeds of production from certain gas properties. At the time of sale, the Company management estimated that it would take approximately seven years to recover the $440,000.00. The $340,000.00 has been considered deferred income and as the gas is actually produced that amount will be taken into earned income. As of November 30, 1960, there was a deferred income balance on this gas payment of $252,812.77."

Then, without reading it in detail, the next paragraph describes during the fiscal year ended November 30, 1959, the Company sold another oil and gas payment for $220,000.00 plus an amount equal to six and a half percent of the unpaid balance to be paid out of production from certain oil and gas properties; refers to another sale on September 23, 1960, of $580,000.00, to increase that payment to $800,000.00, and the Company estimated it would take five years to recover the $800,000.00 plus the six and a half percent, and then this rather significant statement:

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"The consideration of $800,000.00 was received in the form of $565,000.00 cash and an installment note for $235,000.00 of which $90,000.00 is payable on or before February 1, 1961, $70,000.00 on or before April 1, 1961, and $75,000.00 on or before April 1, 1964. As of November 30, 1960, there was a deferred income balance on this oil and gas payment of $796,724.92."

Can you tell us, Mr. Trueblood, the exact nature of these production payments? Does that money, has it already been received by your company, and the production from any of these gas properties assigned to discharge it, or is it the other way around?

A Oh, actually, for tax purposes, in order to prevent a loss carried forward, Mr.Everett, from expiring with the cash out, under ABC method, you can sell future income plus, for the most part, a growth factor of six and a half percent, which is a non-resource loan or a non-resource sale from specified interests in oil and gas properties, retaining enough division order interest in each of the wells to pay, or to pay for our own operating costs for our specific interests, which places the obligation on our books in a long-term category and in a non-resource category, in lieu of issuing bonds or debentures or what have you, such as Ohio or El Paso might do.

This has been a continuing method of ours and you'll find it to be true in the 1961; you'll also find it to be true if we are sitting in here again in 1962.

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Q But it has a definite due date in which that payment must be made?

A Absolutely not. We are carrying out and selling an economic reserve in the ground, plus a growth factor of six and a half percent; and at the time we made an estimation of how many years of future revenues we are selling. It's based on the information at the time; for example, under 1960 allowable we thought we sold a five-year payment; projecting the same interest on the same wells in 1962, we sold a ten-year payment.

Q Well, that means for whatever period it takes to pay off -- let me put my question another way. When you sell these production payments, you sell a $440,000.00 payment, for which you receive three hundred --

A We received three forty in that instance, in lieu of a growth factor in that particular instance. The other ones, we continued to add to and amend.

Q All right. The income to your Consolidated working interest in these wells, what percentage of that income goes to discharge this production payment?

A Around 75 percent.

Q So that if Consolidated and its associates owns 75 percent of the working interest in a given lease, then 75 percent of what you and the other working interest owns, do they join in it?

A No, no, they do not join in it. They don't have the same problem of losing tax carry forwards as we do. To put it

another way --

Q In other words, if you have 75 percent of the income from the property --

A To put it another way, it's this simple --

Q Please explain it.

A It's this simple. It's nothing more than a straight bank loan on production, except in this instance it's non-resource.

Q Meaning there is no personal liability on the company?

A On the corporation.

Q What I would like to know, and for the Commission to know, is what percentage of the income, after meeting these production payments and so forth, is left for Consolidated to pay its operating expenses out of?

A Approximately 25 percent of the interest we own.

Q Twenty-five percent of the interest you own?

A In other words, if we owned 36 percent division order interest, we might assign a 28 or a 27 percent division order interest specifically, specific 27 percent division order interest in a well, and another one we may have 60 percent, and another one ten, with whatever our varying interests are; so we try to retain 25 percent for working capital.

Q So your operating expense remains fairly constant, is that a fact?

A Operating expense remains fairly constant? Percentage-wise, no, it doesn't, because frankly the 1960 Annual Report

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there that you showed, we had a potential into the line capacity of twelve million cubic feet, at which in November, as I recall offhand, we had reached an actual sales capacity of five million cubic feet. I might say that it's taken us twenty more wells and one year later under the existing formula to get back to the same six million cubic feet; and now we have a potential of about twenty million cubic feet a day.

Q You are looking at it from the standpoint of income, then, to the company, rather than correlative rights; and you measure it by income instead of by the factors which the Commission must give attention to, which is acreage, porosity, permeability, and other pertinent factors?

A I don't know what you are asking, Mr. Everett.

Q I think it's apparent from the report, Mr. Trueblood, if you don't understand my question I'm sorry. Now let's go on with this Ohio Exhibit D, which is your '61 report. I'm not going to make but a few references here. This report is for the fiscal year ending November 30, 1961. To start off with, and to show that you did give considerable attention to reserves, you stated: "Natural gas reserves rose 26%, giving the company net proven reserves of 152 billion cubic feet at year's end. Crude oil and condensate reserves at the same time were 2.413 million barrels -- an increase of 24 percent."

"Consolidated participated in the drilling of 20 wells during fiscal 1961, for a success ratio of 100%!"

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Then your letter which is addressed to the shareholders is not dated, but I assume that it was written sometime after November 30, 1961?

A Sometime in December.

Q The accountant's report is dated January 17, 1962. Then you say in this report, referring to page 3, "Drilling activities were limited to development of the Company's proved gas reserves which resulted in a 100% success ratio of twenty gas wells completed out of twenty wells drilled, inclusive of ten dual zone gas producers."

Then you go on and tell the stockholders that: "..the dollar cost of assets of Consolidated rose 56% during 1961, but when considered in the light of the value of new reserves added, the assets again almost doubled for the fourth consecutive year."

Then you talk about the adverse factors which you had, one of them was, for the first quarter of the fiscal year you had "practically no development drilling due to the Midland Oil Company merger which required the attention of all available personnel. This lack of development necessary delayed new well hookups, and gas sales were reduced accordingly during the year. Another adverse factor which tended to reduce the percentage increase in sales was the instigation of Dakota gas proration in the San Juan Basin on February 1, 1961. This proration reduced gas sales to approximately two-thirds of that previously forecast for 1961."

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I assume that is still correct, is that right?

A You mean --

Q The statement that you make here that the proration reduced your sales approximately two-thirds?

A For that year, yes.

Q For that year.

A Of our projected.

Q In other words, you made a bad guess the year before, is that correct?

A Well, we merely made our guess for '61 based on our '60 sales, and assumed that they would be approximately the same under the proration formula once it was tried; and to our shock and amazement, it didn't work out to be that. It was thirty percent less.

Q Well, I'll let the report speak for itself. And the balance of that part, you state that: "Over 90% of Consolidated's developed and producing gas reserves are located in the San Juan Basin of New Mexico where severe marketing restrictions are imposed." Is that situation still the same today?

A It's worse today.

Q Worse today. So that as to the marketing restrictions, are you referring to the Commission order or are you referring to the lack of market provided by El Paso and Southern Union?

A I'm referring to the Commission order of allocation of the producible gas from the various wells in the San Juan

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Basin-Dakota Field.

Q Well, then you go on and say, "Purchasers must take, or pay for, a specified minimum amount of gas each year from each specific group of wells." Your purchasers have to pay you for so much gas whether they take it or not, is that what I understand?

A Well, we have been led down the primrose path to think that this was possibly true. However, we have been advised by counsel in recent times that by the time we ever prove this in a court of law, that probably it wouldn't make any difference anyway. So I must admit that in future Annual Reports I'll refrain from mentioning "take-or-pay" clauses.

Q Then you state, as you've already testified, that: "Purchasers must grant price escalations each five years, one of which became effective two years ago after being readily approved by the Federal Power Commission." Then this statement: "Purchasers must recognize a 'favored nations' proviso which assures an automatic increase in sales price commensurate with better prices which any buyer might have approved for the purchase of gas from other operators in the San Juan Basin."

Did you discuss that last statement with your counsel before you wrote this report?

A No, I did not discuss it with him before I wrote that report. All I can do is rely on the fact that it is included in our contract, and that apparently, from my dealings with the various transmission companies, they are super-sensitive in making

any general change for the benefit of others, because they must have some idea that the "favored nations" clause might be triggered and everybody would be in the soup.

Q Do you know, or do you not know, or did your counsel ever advise you that the "favored nations" clauses have been ruled out by the FPC?

A Actually, in our instance, since sixty percent of our wells are intrastate wells, it's no concern of ours, with respect to those wells, what the Federal Power Commission does at this time.

Q Did you or did you not know that the Federal Power Commission had ruled out "favored nations" clauses?

A Oh, on new contracts, yes. I was aware of that.

Q Have you had any instance in which the price increase had been granted solely upon the basis of a "favored nations" clause?

A No, but I'm familiar to a little extent, strictly from hearsay, that contracts have been negotiated and eliminated these "favored nations" clauses, and at the same time the contracts were re-negotiated, the prices that would have been prevalent had the "favored nations" been in effect were placed in effect at that time, with the elimination at the same time of the "favored nations" proviso.

Q Now this was in January or February of '62 that this report was released; it was for the year 1961, ending November 30,

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and you state this, which seems to me to be exactly contrary to your testimony this morning where, in effect, you were telling the Commission, "My company's not going to spend any more money in New Mexico if this formula stays in effect." Here is what you told the stockholders: "Management is convinced that the long range gas marketing picture is excellent; it is only necessary to weather the current period of restriction."

Do you have any comment with reference to that statement?

A I absolutely believe this, and I believe it even now or we wouldn't have drilled the wells we drilled. However, the wells we drilled in the recent months have all been dual zoned wells, because we can't drill single Dakota wells under the existing formula unless it's to meet an obligation.

Q You are saying it would not be a prudent operation--or it would be a more prudent operation to dual a well than it is to drill one from the grass roots?

A No question about it.

Q So there again, that enters into the matter of your operations cost. When you dually complete a well to the Mesaverde or Pictured Cliffs, and take it down to the Dakota, how do you allocate the cost of that well as between the two formations?

A We don't allocate between the two formations.

Q How do you determine your operation cost, then?

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A The operation cost is merely taken on as the well itself totally produces, and total cost to operate without regard to zone.

Q Your testimony to wells being uneconomic in the Dakota this morning did not refer to the Dakota; it referred to the Dakota and Mesaverde or Pictured Cliffs?

A No, that is not true. I was speaking only of the Dakota formation, because we have a number of single zone wells which we drilled relying on 1959 and 1960 sales, which we now have found suddenly to be uneconomic as a result of this order.

Q That's your conclusion. When you state in this report: "The development of new reserves and capacity from these new wells was enhanced by the fact that ten wells were dual-zone completions. These dual-zone wells develop essentially twice the capacity and reserves with only about 10% additional expenditure for any one well."

Does that statement apply to your testimony this morning?

A It absolutely does.

Q So that if you have a well that is dually completed, it's your position that it becomes uneconomic in the Dakota because of this order?

A As a matter of fact, the only reason we could drill to the Dakota formation under this existing order at all is that we do have a Mesaverde deliverability to go along with it, so that

we could possibly have a ten-year payout.

Q Then you state: "As a result of this intensified development of proven gas reserves during 1961, the company's capacity for daily net gas production was increased approximately 65%." I take it your complaint today is that you are not getting to produce that sixty-five percent of capacity?

A Oh, no, our complaint at this time, today, is one in which we would like for the market, total market to be higher so that we weren't operating at thirty-five percent of the end-of-the-line potential. Our main complaint today is that we desire to stay, as I stated, first, to stay in the San Juan Basin and further develop wells, if wells are placed in an economic category. That is our primary concern. We have to live with what we have.

Q Well, that brings us to your 1962 Forecast. I think you testified, I believe, before counsel interrupted, that you had planned to and had taken over the Tekoil Corporation, is that correct?

A That is correct.

Q And in that you say that "at least six additional development oil wells are available. . . new waterflood operations may be instigated . . . new equipment for old waterflood projects should substantially increase production . . . new gas well development on Jonnell Gas Company properties should substantially increase developed gas reserves ..." -- Jonnell property, I believe, is in Texas, isn't it?

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A That is correct.

Q ". . . debt will be orderly retired by production from properties . . . probable secondary reserves should be changed into proven as a result of new development activities . . . gross sales should exceed $4,000,000 . . . cash flow should increase to 80¢ or 90¢ per share . . ." Then this statement: ". . . net income will disappear as a result of Tekoil's very high depreciation and depletion rate." It seems to me, Mr. Trueblood, and possibly you can answer this in some some way, but I just don't quite understand your testimony this morning with your statement here that net income is going to disappear this year. I think it may be on account of your Tekoil acquisition rather than on account of, as you would describe it to the Commission, its order entered in this R-14760, whatever it is, 1670-C.

A Actually, Mr. Everett, I think that it would be well at this time to refresh the problem of a discussion of cash earnings and what they really mean to an oil company, as opposed to net earnings.

As you well know, Ohio Oil and El Paso and everybody else pays their debt with cash earnings, and they drill new wells with cash earnings and they develop properties with cash earnings, and the net income itself is of very little significance other than, once again, the public's favor or disfavor of the price of their stock as on the listed exchange.

MR. HOWELL: In lieu of a company that has operated for

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many years as a public company on borrowed money -- I would like to have stricken from the record the assumption on which the witness states that the El Paso operates. It has nothing to do with the issues in this case.

MR. STOCKMAR: We have no objection to your sustaining the objection made by Mr. Howell; but I would like to say that some years ago in the Senate elevator in Washington, I encountered Senator Lehmann of New York. I even asked him how the filibuster was coming, and he said, "Young man, I am not engaged in a filibuster, I am educating the people."

Now if this program of interrogation of the witness is in aid of the education of the Commission, then by all means it should go on. If not, I respectfully request that it be terminated.

MR. PORTER: The reference to El Paso's operations, how they operate, will be stricken.

MR. EVERETT: If it would please counsel more, he can read this report, if he likes.

A Mr. Everett --

MR. EVERETT: I will not interrogate with reference to this one.

A May I interject one other thing that my counsel cut me off on. I think it's material on the acquisition this morning.

Q (By Mr. Everett) You ask him, not me. I ask the questions.

A On April 1st, and since the things that you are bringing

up here, we have since bought, 700,000 in cash for one, a hundred thousand shares of our stock, with the stock trading at four and a quarter on the American Exchange, and we have the funds with which to meet our obligations. If you want to proceed on that tack, go ahead, but we can be here for two weeks.

MR. PORTER: We'll take a ten minute break.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, please. Mr. Everett.

Q (By Mr. Everett) Mr. Trueblood, I hand you a letter and ask you to identify it, please.

A This is a letter addressed to the shareholders of Consolidated Oil and Gas, dated January 18, 1962, in which we gave notice to our shareholders of a proposed merger of Tekoil Corporation into Consolidated Oil and Gas, and with which we transmitted a Proxy Statement which should have been filed under the requirements of the Securities Exchange Act of 1934, because we were a listed company, listed on the American Stock Exchange, and we were required to file a more formal Proxy Statement than is usually required.

MR. EVERETT: Will you mark this for identification as Ohio's Exhibit 6?

(Whereupon, Ohio's Exhibit No. 6 marked for identification.)

(By Mr. [illegible]) Now, I hand you this [illegible] and ask

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you if this is a Notice of Special Meeting?

A This is a Notice of Special Meeting of Stockholders of Consolidated Oil and Gas, Inc., which is a Proxy Statement.

MR. EVERETT: Will you mark this for identification as Ohio's Exhibit F?

(Whereupon, Ohio's Exhibit No. F marked for identification.)

Q (By Mr. Everett) Referring to page 3 of Ohio Exhibit F, which is the Statement of Consolidated Oil and Gas Company, Inc., there is a note under the Capitalization, showing the debt and capitalization of Consolidated Oil and Gas, which refers to a number of items of indebtedness, including the following, and I'll hit them very briefly:

A note dated May 31, 1961, maturity January 31, 1964, with monthly installments of $11,500.00, payable to Central Bank and Trust Company of Denver, in the amount of $380,000.00, showing a balance of $287,327.88 on 11-30-61, bearing 6 1/4 percent.

A note dated 2-28-61, payable to Mid-Continent Supply Company in 25 monthly installments of $3,000.00, total amount of $75,000.00, balance $51,000.00 as of 11-30, bearing interest at 7 percent.

Note dated September 30, 1961, payable to Mid-Continent Supply Company in 30 monthly installments of $2,000.00, total amount of $60,000.00, reduced to $56,000.00 at November 30, 1961, bearing interest at 6 1/2 percent.

Note dated March 1, 1958, in the principal amount of $14,266.76, payable to Mountain States Investment Company, payable over 30 years, reduced to $13,147.07 as of November 30, 1961, 3 1/4 percent interest.

Note dated May 25, 1960, with maturity of 6-1-64, payable to California Bank, Los Angeles, California, in the principal amount of $100,000.00, reduced to $54,497.34 on November 30, 1961, payable in monthly installments with 6.5 percent interest.

Note dated October 10th, 1958, maturity date 5-1-62, payable to First National Bank, Farmington, New Mexico, in monthly installments, 6 percent interest, principal amount of $5,700.00, reduced to $1,352.36.

Note dated 7-3-61, payable to Western Pipe and Tube Company, maturity date 6-1-64, 6 percent interest, principal amount of $30,000.00, reduced to $27,499.90 on 11-30-61;

and some others that are listed there which I'm not going to read at this time, the record will be sufficient.

I would like to ask you this question, Mr. Trueblood, in connection with those note payments. Are they payable out of the 25 percent of the working interest, which I understand -- 25 percent of your interest which still remains and out of which you pay operating expenses?

A You mean from the gas properties, the answer is no. These are loans principally against our oil properties, with the Central Bank and Trust, with the United California Bank. The

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loans with respect to payments to the Mid-Continent Supply Company and to Western Pipe and Tube are payments which are secured by production payments receivable, which we have purchased from certain of our drilling participants out of certain specific division order interests and certain wells that they had, in order to cure their particular tax problem in a given year. The other items are relatively incidental. They have to do with a house we own in Farmington which we would be most pleased to sell to anyone here, and a few other little odds and ends of that type.

Q It is a personal obligation of the company, is it?

A That is correct.

MR. EVERETT: I call the Commission's attention to the other financing arrangements which Consolidated has which appear commencing at page 29 of Exhibit F.

I offer Ohio Exhibits A through F in evidence, and ask permission of the Commission to withdraw them for the purpose of making copies and to substitute the copies in their place.

MR. PORTER: Any objection to the counsel's motion?

MR. STOCKMAR: If the Commission please, to the extent that counsel for Applicant has not already waived the admission of some of these, I do object in their entirety to the admission in evidence of these exhibits as irrelevant and not material to the proceedings at hand.

MR. PORTER: The Commission will admit the exhibits to the record, but will not consider anything which has to do with

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the capital structure or the financing arrangements of Consolidated.

MR. STOCKMAR: I presume that the automatic exception to all rulings applies to the Applicant as well as the proponents. For the record, I would like to note an exception as to each adverse ruling.

MR. PORTER: Yes, sir.

MR. EVERETT: Well, I made a general submission or offer in evidence of these exhibits. I think the financial structure of the Applicant is indeed material to these proceedings, particularly when you consider their testimony, the witness' testimony in connection with payouts, with the economics, and what he calls the declaration that a well is uneconomic.

MR. PORTER: The Commission has already ruled on that, Mr. Everett.

MR. EVERETT: Thank you.

Q (By Mr. Everett) Mr. Trueblood, how many wells were drilled by Consolidated in the Basin-Dakota Pool in 1959, do you recall?

A We drilled twenty wells in the Basin -- I mean we drilled twenty wells in the Basin in 1959, as I recall. I don't know the number of Dakota wells. I do recall that we had three dry holes that year.

Q The next year I think your testimony was that you drilled twenty and all of them --

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A No, twenty-three out of twenty-four the following year.

Q Twenty-three out of twenty-four the following year. How many last year?

A Twenty out of twenty.

Q Twenty out of twenty. So that in rough numbers, that would make approximately sixty wells that your company's drilled in the Basin in the last three years?

A Yes.

Q Do you know how many wells were drilled by others in the Dakota formation, or completed in the Dakota during the same period of time?

A Well, basically, I know that there were 207 wells that were completed and tied into the Basin-Dakota pipeline system by September of 1960. I know that there were 507 participating wells in the Pool in February, 1960, proration schedule, which is some year and a half later. To that extent I'm familiar with the number of the wells.

Q Are you familiar with the ratable take law and rule of the Commission in effect in the Basin and elsewhere as to gas produced and gas producers?

A You mean from a legal standpoint, Mr. Everett?

Q I mean are you familiar with the fact that there is a ratable take law and rule in effect in New Mexico?

A I have been advised of that. I don't know the details of it. I'm not an attorney.

Q It's Rule 902, and the Commission, of course, would take notice of it. It provides, referring to Rule 902, that the purchases, if you have a common purchaser in a pool, that "Such purchases shall be made without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells."

Is it your contention that there has been any unreasonable discrimination in favor of one producer over another?

A Only insofar as the allocation formula as it exists today is concerned. That within itself, I think is discriminatory if it does not protect correlative rights.

Q Will you grant any exceptions to your statement? You have just testified that there were some sixty wells drilled by you, and the difference between two hundred some and five hundred some drilled in the last year or so, whether there was proration or not, Mr. Trueblood, isn't it a fact that the market that exists would have decreased as to Consolidated every time a new well was hooked into the line?

A No question about it, regardless of the formula.

Q So that you will grant an exception, then, that this discrimination does not exist solely on account of this proration order?

A Oh, yes, to that extent I would agree.

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Q Isn't that a rather large extent, with that number of wells?

A Could you ask me --

Q Well, you had two hundred wells and now you have something in excess of five hundred.

A Oh, I'm quite aware of this and I had hoped, in my anticipated projection of living with the San Juan Basin as it existed in 1959 and 1960 and hoped to live with it in the future. My main concern is not for Consolidated as much at this time as for the participants who own varying interests in varying wells who have no protection against drainage under the existing formula.

MR. EVERETT: No further questions. Thank you, Mr. Trueblood.

MR. PORTER: Does anyone else have a question of the witness?

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company. If you don't mind, may I just retain this seat here -- I have a few papers here -- and question from this position rather than going up to the table?

MR. PORTER: That's fine, Mr. Howell, I believe you can be heard from back there.

BY MR. HOWELL:

Q Mr. Trueblood, in your opening argument this morning when you referred to the article in the Oil and Gas Journal, in which I believe you stated there was a loss in gas reserves in New

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Mexico of 850 billion, what portion of the State did that loss occur in?

A Mr. Howell, I did not prepare the figures in question; therefore, I do not know the source.

Q Do you know whether that was in the San Juan Basin or in Southeastern New Mexico, or where it was?

A I presume --

Q No, I'm not asking your presumption. I'm just asking you a simple question. Do you know of your own knowledge where the loss occurred that you referred to this morning?

A No, I do not.

Q All right, sir. During the period of 1961, your testimony is that you drilled twenty wells. Were those the wells in which you were operator, or were some of the wells drilled by others?

A Some would have been drilled by others, but principally we were the operators in at least 75 percent of the cases.

Q Generally speaking, in the Basin, the working interest owner that owns the major portion acts as operator, when there's a joint interest well, isn't that right?

A That is correct.

Q So that as a rule you have drilled as operator most of the wells in which you and your associates together had the largest single interest?

A That is correct.

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Q Do you include in that twenty that were drilled last year any of these that Sunset International drilled in which you had a third carried interest?

A Well, actually it's a one-sixth carried; it's a third of their position.

Q Well, were any of their wells in that?

A One was drilled during 1961 and three were drilled in 1960, and prior to that time I believe that eight had been drilled.

Q Now you have some wells, now I believe you said numerous wells, waiting connection. How many are there in which you are the operator?

A I believe there's six.

Q As a matter of fact, of the wells of which you are the operator, you have six connected to El Paso's system as of the April proration, 1962, schedule, have you not?

A Seven.

Q I have here a copy of the April 1962 schedule showing your connections with the El Paso system. I'll ask you to count the wells that are connected.

A All right, I have got a Mesaverde well.

Q Six is the correct number of Dakota wells?

A Yes.

Q At the same time, the same month, your connections with Southern Union Gathering system of the wells in which you were operator totaled twenty-nine, did it not?

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A I couldn't say.

Q Well, let's look at the schedule and see if it isn't. This one marked Southern Union, and the other one marked Southern Union Gathering.

A You have got me lost here, Mr. Howell. You will have to come back here. I don't think you have it paper-clipped properly. We are talking about the Basin-Dakota. You have me back in the Fulcher-Kutz Pool.

Q Right here is the Basin-Dakota Pool. Is it twenty-eight, and one on the Gathering?

A No, I counted twenty-seven.

Q Twenty-eight, you testify as to the number that is connected. Now you are also familiar with the fact, and I believe you testified that you were aware that El Paso did have an arrangement with Southern Union whereby it was taking rather large quantities to attempt to balance the wells connected with Southern Union's system so that they wouldn't fall behind their share of El Paso's market, isn't that right?

A It is my understanding that there is some balancing effect in order to create the ratable situation.

Q The ratable take, and that El Paso is actually taking into its system and sharing a part of its market with Southern Union?

A Insofar as the gathering system is concerned.

Q That's correct. Now, Mr. Trueblood, referring again

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to this schedule, I find -- and if you'd like to look at it I'll show it to you, but I think I can just read it from here -- the deliverability of the wells you have attached to El Paso's system is as follows: 273 for the Clayton 1; the next well, no deliverability is shown; the Montoya has a deliverability of 73 -- and these figures, I understand, mean thousand cubic feet, is that correct?

A That's right.

Q The Haines Apache Northeast --

A Is not ours.

Q What is it?

A That's not ours.

Q It appears on the proration schedule -- I beg your pardon, Pan American State 1 was the one that had the deliverability of 73. No, Pan American had a deliverability of 126. Those deliverabilities are the correct deliverabilities of the wells that you have connected to the El Paso system?

A Yes, that is correct, because they are dual wells and we drill them primarily for Mesaverde production.

Q Now then, I'll ask you to check the figures, if you are not satisfied with them, but the addition of the wells in which you are operator shown on the Southern Union schedule, on the April proration schedule, shows an average of 662 MCF for the wells in which you are operating. Would that be approximately correct?

A I wouldn't have any specific idea, Mr. Howell.

Q Well, you wouldn't deny it, would you, that 662 represents the deliverability average of the wells in which you are operator, attached to the Southern Union system?

A Somewhere, I think it's somewhere in the range of 700,00, 750,000.

Q Now that's a substantially lower figure than this 1,591 that you gave as the average deliverability of your wells, isn't it?

A That is correct.

Q Now let's look at your model up here from which you took off a statement, this illustration and the testimony that you gave concerning it is based upon the assumption that each of these blocks has the same recoverable gas reserves in place, is that not correct?

A That is correct.

Q So that that illustration is appropriate only in the event there are the same recoverable gas reserves in place?

A Absolutely correct.

Q Now, I believe in your letter which was introduced by Ohio that your Executive Vice-President, and I assume you stand by his testimony, stated that the fracturing systems brought in additional lenses that weren't noticed the first time, when the hole was drilled, and prior to fracking, is that correct?

A I don't think it was lenses. I don't believe that was

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exactly it. I think that it was, that our production indications in the San Juan Basin of how to complete a Dakota well from the time in which we had originally drilled jointly with Chio to a total depth and had had a minimum type of gas show natural, by drill stem test, from that period of time until a period of time some two years later we had found in other wells in the immediate area that we had been able to frac those wells; and at that time on the initial potential and initial deliverability, delivered deliverabilities on the order of anywhere from 800 MCFD to 1500 MCFD.

Q All right. Your Executive Vice-President stated that: "Subsequent experience in the area has pointed up two important factors: (1) If an effective frac can be accomplished, prolific production can be established from the Dakota in this area even in the face of zero natural flow: (2) Several Dakota sand stringers below our Owens penetration depth are productive." That second point, isn't that a lenticular string of formation that is brought in by fracking?

A As a matter of fact, we found out the very hard way that the lower lenses which we thought were going to be productive and were indicated to be productive on the electric log in this specific area of the San Juan Basin was an extra lens and turned out to be water-bearing, much to our dismay and to our subsequent cost in trying to shut off the water.

Q So in this statement, you do not ascribe today to the

statement that your Executive Vice-President made in 1959?

A On that specific well.

Q Now then, in determining this gross pay in there, you take in all characteristics of producing sands, do you not, in determining a gross pay thickness?

A That is right.

Q Now there's lots of differences, are there not, in the type and character of those sands when there's shale in there or when there's water in a formation, just as there was in here; or when there's a stringer that runs out in a short distance, those sands do not have the recoverable gas reserves that a good clean consecutive sand body has, do they?

A No, under the circumstances as you have set it out, they would not.

Q And there is variation throughout the San Juan Basin in the Dakota formation in the character of the sand itself, is that not true?

A That is correct.

Q It is your experience and you have seen others who have drilled a dry hole next to a pretty good producing well, on the offset location in the Dakota, isn't that true?

A In the San Juan Basin?

Q Yes, sir.

A A dry hole offsetting a producing well?

Q Yes.

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A What do you define as a dry hole, an economic failure or a completed and abandoned?

Q One in which the operator elects not to complete it.

A Well, once again this would depend upon the individual operator. Yes, I have seen cases where a specific operator elected not to complete a particular well and subsequently abandoned it.

Q When it would be an offset, a direct offset of a fairly good producing well?

A That is correct.

Q Now, Mr. Trueblood, I do want to compliment you particularly on one thing. As I recall, here in 1960 your position was exactly the same as it is today, that you opposed the 25 percent acreage, 75 percent deliverability times acreage factor. Is my memory right?

A That's correct, in that apparently I got in some few words stating our position, not being an attorney, and was subsequently admonished for it, but that is true, but I did make my statements well known.

Q Well, you haven't changed your position at all in the year and a half, have you, Mr. Trueblood?

A No, I have not.

Q So that in October, 1960, you at that time were opposed to this formula and are opposed to it today?

A That is correct.

Q Now then, in the intervening time you drilled twenty

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wells, in spite of the predictions which you made in October of 1960 as to the effect of this formula, did you not?

A Not fully realizing, or not fully knowing your nominations --

Q I am just asking, your company drilled the wells?

A Our company drilled the wells, ten of which were dual producers whose economics are different than single producers, five of which were shallower wells, and five of which, I believe, were single zone producers.

Q And you have some other wells that were drilled that are awaiting connection now; you have drilled some this year?

A That's correct.

Q How many have you drilled this year?

A For the most part, the wells that we have drilled this year have in every instance been a dual, a Mesaverde well or a Pictured Cliff well, with the exception of two wells which were required offset wells to then existing production.

Q You have drilled some wells --

A I believe we have drilled four dual zone Dakota-Mesaverde producers, one dual zone Dakota-Pictured Cliffs producer, and five Pictured Cliffs wells.

Q Now, I believe your testimony was that you came to the Basin in 1956, and between that time and 1960, the shallower formations were operating on the same 25 percent acreage, 75 percent deliverability formula, were they not?

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A That is correct.

Q And you were familiar with the operations of that formula in the other pools?

A That is correct.

Q You had some wells that were operating in those pools?

A Well, in the Mesaverde formation.

Q In the Mesaverde formation. Now you are also aware of the fact that there hasn't been any certification for additional market out of the San Juan Basin for a period of several years, aren't you?

A Yes, Mr. Howell, and this is, of course, in line with Mr. Everett's request as to my prediction in my Annual Reports, is that I kept hoping somewhere along the line that the FPC would become a little more generous to El Paso.

Q I assure you, Mr. Trueblood, that we share that desire. No one feels it to a greater extent than we do. Now this morning, were you in here this morning when the nominations were made?

A No, I wasn't.

Q If I were to tell you that the nominations of purchasers for April, 1962, were less than one percent different, insofar as the entire Northwest is concerned, than they were for 1961, would you be willing to accept that?

A From all formations, I presume?

Q That's correct.

A Certainly, if you make that statement I have no reason

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to doubt it.

Q Also Mr. Utz' analysis showed that the nominations for the Dakota involved an increase of 28 percent. Would you be willing to accept that?

A I would love to accept it.

Q What is the effect of transferring 28 percent of the market to the Dakota from the other pools in the San Juan Basin?

A It obviously is going to reduce the allotted or allocated monthly proration for each of the other pools.

Q And will make the amount of market available for the wells in the Pictured Cliffs and the Mesaverde just that much poorer, is that right?

A That is correct, I would assume.

Q Now let's go to something else for a minute. Do you have your Exhibit 3 there?

A Yes, I have it.

Q Just look at it for a minute. We don't need to put it up, I think enough people have it. I believe there's a typographical error in the last column. Would you look at the heading of the last column on Exhibit 3? I think you show MCF per day.

A Yes, this same mistake was made all the way through Exhibit 2 and 3.

Q So the figure that's given there is a monthly figure rather than a daily figure?

A That is correct.

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Q According to your calculation in Exhibit 3, you take the lowest group of wells in the Dakota formation and you estimate their share of the allowable at some 7,980,000 cubic feet per month, is that approximately correct?

A That was taken specifically from the February --

Q From the February allowables?

A -- allowables.

Q Now rather than to get into fractions, because I got lost in them, for the purpose of illustrating the point let's assume that is close enough to an 8,000,000 per month allowable that we'll just call it 8,000,000. What amount of money would that produce, using the figure that you showed in discussion with Mr. Everett as the working interest owner's share of the production after he pays the royalty and pays the override when he takes farm-outs? I believe he used 12 cents as a reasonably fair figure?

A Right. That would be $1,000.00.

Q In the neighborhood of $1,000.00 a month?

A That's right.

Q And so under the existing formula, according to your own calculations there, the lowest group of wells in the Dakota formation gets an allowable which permits, on a 75 percent net working interest basis, a return of close to $1,000 a month to the operator?

A Are you saying that on a yearly basis, Mr. Howell? Is that what you are asking me?

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Q I'm asking you --

A Mr. Howell, the average --

Q -- if that would apply on a month?

A The average, historical, for 1961 --

Q Suppose you just answer my question. Let's go back through it and --

A The yearly allowable for 1,000,000 cubic foot well, that's the maximum, in 1961 was 114 million cubic feet, total.

Q Well, now, on the February, looking at the February and taking your figures there, am I correct in saying that shows a thousand, practically $1,000.00 a month income during that month for the lowest group of wells in the Dakota?

A That is correct, for that specific month.

Q All right. Do you know any other pool or field in the San Juan Basin that did as well as that, in which the lowest group of wells averaged as well as that?

A Well, actually, Mr. Howell, to answer your question, no, because the physical characteristics are entirely different, capacity-wise.

Q One other question and then I'm finished. Your Exhibit 3 and your exhibit 4 were based entirely, were they not, on grouping wells by deliverability? That is, you took well groups by deliverability and then drew some pictures resulting from that?

A We attempted to establish in Exhibit 4, we attempted to establish the average of the average deliverability below what was

going on. In other words, we had taken your chart and had compared it to February in the range of below and above average deliverabilities. We at that time took the average of 1404, which was then in existence, split it down the middle and said that a similar situation exists today and that the weighted average of your own work of the reserves, we didn't have the deliverabilities from which you worked, but of your own reserves below the average deliverability, our work indicated to us to be a weighted average reserve of approximately 3,000,000. We were attempting to establish --

Q You used as the reserve factor for each of those wells -- look on that exhibit for just a minute, Mr. Trueblood. What is the relationship between wells falling in the zero to one billion recoverable reserve bracket, as compared with these of the higher reserves? What's the ratio of difference in reserves?

A From this point --

Q Yes.

A -- of eight-tenths, to a --

Q Well, the average --

A You have got an odd point clear out here, but I would say the average variation would be from maximum, variation would be from eight-tenths on your work to 7.3. I don't know what you base your work on.

Q In other words, that would be approximately nine times --

A Well, I think the number --

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-- versus the reserves; that's just a mathematical calculation, isn't it?

MR. PORTER: I think the record will be clearer if you don't interrupt each other.

Q (By Mr. Howell) That is just a mathematical calculation?

A That's correct.

Q So that that factor as shown by that study does have a variation to the extent of nine times --

A Yes, on your study it does.

Q I believe that your testimony, however, was to the effect that the maximum differences in reserves were three to one, did you so testify?

A That is correct, because in my testimony I eliminated these three odd points off here, and this nine billion, I don't know where you got that, I would like to know where that well is, I eliminated those two specific odd points and said that the ratio of one and a half to possibly as high as seven; however, you only have four points as high as seven million, and that if you weighted average this whole picture, the average reserve of the picture is 3.6 billion, and that the whole range of a deliverability well of 579, of the average deliverability of the wells underneath, and the 3,289,000 over in this side happened to fall in the three to five range, still speaking of averages.

Q I realize, now, let me see if I understand you correctly,

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Mr. Trueblood. It's your position, as I understand it, that the Commission should disregard wells at the extremes in determining a factor that would apply to the major portion of the wells in the field?

A Well, based on the work that we've done, first of all, Mr. Howell, we would be further in, anyway. It is our contention and -- it is our contention that there is probably no more than a three to one variation in sand porosity, water saturation, all the different factors that go into making up the in place producible reserves.

Q In spite of the fact that studies have shown a variation as between as much as one billion and as much as nine billion in reserves, you still think that three to one would be the maximum?

A First of all, I don't know where this point came from. I have no idea of how it was arrived at. I don't ascribe to the fact that there's a nine billion cubic foot well in the San Juan Basin.

Q If evidence should show that to be the variation, then your three to one maximum would be out of line as to a well with a one billion reserve factor, and one with a nine billion reserve factor, wouldn't it?

A That is correct, on the work that you have done.

Q You have answered the question.

A All right.

Q Actually, Mr. Trueblood, whenever in one year 367 addi-

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tional wells were drilled in a pool that at the beginning of the year had approximately 300, and there is no increase in the market, the only result can be to cut down the allowables for all the wells in the pool, is it not?

A That is correct.

MR. HOWELL: That's all. Thank you.

MR. PORTER: Anyone else have a question of the witness?

MR. SWANSON: Kenneth Swanson, representing Aztec Oil and Gas Company. With the Commission's permission, I will retain my seat. I think my cross examination will be short.

MR. PORTER: That will be permissible.

BY MR. SWANSON:

Q Mr. Trueblood, I would like to discuss a little bit a few areas that seem to me are ones that all of us express agreement in. That is, allowables should be tied as correctly as possible to reserves; I believe you have testified to that fact?

A Yes, sir.

Q And you are probably aware that the Commission was charged with allocating reserves or allocating allowables and protection of correlative rights; and has defined correlative rights as giving the operator an opportunity to produce the gas in place under his leases?

A That is correct.

Q Using his proportionate share of the reservoir energy. The formula that we have today uses a 75 percent deliverability

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factor. Therefore, I think I would be correct in saying that today's allowables do vary almost directly with deliverability?

A That is correct.

Q Now, I'm going to direct your attention to your Exhibit 4, the El Paso curve.

A That is not an exhibit of ours. We just brought it up, it's in the Commission records. Our Exhibit 4 is this exhibit.

Q Well, we have discussed certain matters from this data that is shown on that chart. I believe you made a statement that you determined on the basis of the reserves that El Paso has developed there, that the average reserves of the wells then developed in the Dakota Pool were, I believe, 3.6 billion cubic feet. You've said that 70 percent of the wells fall below the average figure, and the average reserves for the below average wells is --

A Three billion.

Q -- three billion. You have also averaged the reserves above the average, and that figure I believe is five billion?

A That is correct.

Q Have you taken the same average procedure and applied it to deliverability shown on that chart?

A We have no access to deliverabilities, Mr. Swanson.

Q I mean the deliverability that is shown on the chart.

A We don't know in any one of these specific points, Mr. Swanson, what deliverabilities might be. In other words, a well in the 44 wells at this specific point, which happens to fall at

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the 3.4 billion range, we don't know that El Paso in their volumetric studies didn't take wells varying in deliverabilities all the way from three million down to a half a million, and group them in that point at that specific deliverability point. We have no way of knowing that.

Q Well, as a matter of fact, we assume they did?

A We assume that whatever the two and a half billion or the three and a half billion groups of wells that they did volumetrically, that they averaged them all arithmetically and chose a point and put it in a plot of deliverability versus reserves.

Q Following the same procedure, they used to establish the average reserves for that particular plat?

A I'm sorry.

Q They used some procedure to weight the deliverability for perhaps the 34 wells --

A 44 here at three and a half billion.

Q 44. They will average the deliverability from those wells and they arrive at a point for it; they averaged the reserves for those wells and arrive at a value for it. That's the point that's represented by that point on the curve, is it not?

A No, no. I presume that they took all the wells that they studied and in a range of three to four billion cubic feet of reserves, and averaged those to arrive at approximately a three and a half billion cubic foot reserve figure; and I further presume that without regard to deliverability, that they made an arithmetic

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average of all the deliverabilities on those same 44 wells and arrived at an average deliverability and placed that point on the chart. They seem to have been consistent every half billion cubic feet. They have here mainly between five and a half billion, eleven wells, and one and a half billion, twenty-two wells, constitutes by far the majority of their study. The is the range of, one and a half billion to five and a half billion range.

Q Well, as I understand, what they probably tried to do and I may be incorrect, but I believe you have used the exhibit to show something about average reserves, the range from three plus.

A Well, we merely, to answer your question and to refresh you, we merely took their work to see if it might be applicable to the reservoir as it appeared today as far as above average and below average deliverability wells. From their work it was indicated, with a 1225 average deliverability of the 209 wells available during their study period, and they had 160 wells in study, that there was approximately 3.6 billion cubic feet of gas in an average well, of the wells studied; and from that point we checked it against the position as it appears today and we said that a 1404 average deliverability factor happens to fall on their work at 3.8 billion cubic feet.

Q The point of my question --

A We then averaged all wells below, in order to determine a weighted average reserve of all wells below an average deliver-

ability and a weighted average reserve of all wells above an average deliverability, not having access to their deliverability.

Q My question to you was, have you also applied the weighted average procedure to the deliverabilities that are represented on that curve, and I believe you answered you have not?

A We have no way of knowing it.

Q You have not done that?

A We have no way of doing it.

Q You applied it to the average figure for reserves, but you have not applied it to an average figure for deliverabilities?

A No way, because you might have a two million cubic foot deliverability well only, have three billion cubic feet of gas. We have no way of knowing where this situation of a high deliverability well is,and even El Paso's calculation is a low reserve figure.

Q But we're dealing only with averages here?

A That's right. We are trying to establish -- we tried to establish an average picture that the Basin as a whole appeared.

Q For that purpose you have shown the Commission from the average on that chart that the average range and above and below an average figure, as far as the average reserves, is three billion to five billion. I think you said 60 percent of the high, a 60 percent spread?

A 1.6 more than the other.

Q Without asking you again whether you have done it, would you be apprised that during the recess I calculated on the weighted

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average procedure the average deliverabilities represented by those points, and came up with figures for average well below the average of 910 MCF, and calculated the average deliverabilities for the wells represented above the average figure and came up with an MCF of 1660. Now the low figure there of the wells below average is 54 percent of the figure for the wells above the average. It seems to me that using the method you wished to use to show the Commission that the reserves was only 60 percent will also show the range of deliverabilities is only 54 percent.

A Well, Mr. Swanson, I don't know how you established the deliverabilities without having the points that are spread up and down in any one of these points what the average deliverabilities were, but we went to -- but we did go to the specific average deliverability in all the wells available at the time, which was 1225. This was the actual in existence in September when their study was available, and we felt this was as accurate as we can possibly come up with.

Q My point is, if that information demonstrates that the average reserves vary from three billion to five billion, it also demonstrates that average deliverabilities vary from 910 to 1960. We have the same relationship to deliverability and reserves, and it seems that the allowable tied directly to deliverabilities is well within the range.

MR. KELLAHIN: For Southern Union, I want to make an objection to this line of questioning. It's argumentative, it's

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in the form of testimony in statements by counsel, and is not a question directed to the witness. I ask that it be stricken from the record.

MR. SWANSON: If the same analysis has been made of the chart in all respects, why, it could have been possible for Consolidated to come forward with this evidence. All I'm attempting to show is that he has used this chart to demonstrate a relationship. The same relationship is apparent from the evidence that he has placed before the Commission to show the facts that we have been discussing.

MR. KELLAHIN: The witness has testified that on the basis of the information on El Paso's exhibit, he cannot determine what the deliverabilities are in any individual point. If Aztec can do so, it would be incumbent on them to produce a witness and put him on the stand and make him subject to cross examination as to how he arrived at those figures. The statement of counsel as to what was done is certainly not subject to cross examination and we object to it.

MR. PORTER: The Commission will sustain the objection, and that portion of Mr. Swanson's statement which has to do with calculations of the average reserves here which he did will be stricken; and if he desires to develop that on direct testimony, he may do so.

MR. SWANSON: Thank you.

Q (By Mr. Swanson) Mr. Trueblood, may I explore a little

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bit the method by which you came up with the weighted average for your wells above the average and the wells below the average value insofar as reserves are concerned?

A We took the number of wells on each specific point times the reserves given that well, averaged all of those up on a strictly weighted average basis, took an arithmetic average of the wells so determined, and found that it approximated three billion cubic feet.

Q Did you take the values shown -- I believe the first point, the lowest value represents three wells with deliverabilities somewhere in the neighborhood of 200,000 and reserves less than a billion, is that correct? It's hard to see from here.

A Well, this point is three.

Q Yes.

A All wells were considered in this instance.

Q Did you go to El Paso's information on each of those three wells and make your study from the separate well?

A We made no study whatsoever on El Paso's work.

Q You have used the information that we're referring to here on the board?

A We only referred to this exhibit which was introduced in the original hearing as a source of a type of relationship of deliverability versus reserves.

Q Thank you.

A A published source.

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Q You have established your average from the information that's on the El Paso chart?

A That is correct.

MR. SWANSON: Thank you. No further questions.

MR. PORTER: Anyone else have a question?

MR. STOCKMAR: Does the Staff have any questions?

MR. PORTER: There is no indication that the Staff has any questions. Would you like to ask some questions on redirect?

MR. STOCKMAR: I would like to ask two or three questions, yes, sir.

REDIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, should the order of this Commission be based on a recognition of the extreme cases of deliverabilities, high or low, that appear occasionally, or on the vast majority of the wells in the reservoir?

A The vast majority of the wells in the reservoir, or the average consideration.

Q Mr. Trueblood, with respect to your testimony on the general economics with respect to wells that you called commercial failures, was your testimony made on a general basis in terms of accepted standards and values in the industry, that is, without express recognition of your own financing problems, your own overriding royalty burdens; or did you, were you referring to your own

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position in your own wells?

A We actually based our payout or economic considerations strictly on a payout based on $90,000.00 of a well cost, and ten cents per MCF net price after deduction of royalties and operating costs consideration, whatever it might have been, and we attempted in our royalties to establish a pattern for the field as a whole, not for Consolidated Oil and Gas per se.

Q Mr. Trueblood, lest there be any false impression that you are here as a charitable venture and have nothing to gain or lose, would you once again summarize why you are here and why you think the order should be amended?

A Our first principal reason is that we would like to continue development of gas wells in the San Juan Basin; second of all, we have a problem and a very real problem of having a fortunate situation wherein our net interests in all the wells we have an interest in happens to fall above the average, contrary to whatever opinions might have arisen, that we have a real problem with respect to the protection of our various associates who do not necessarily appear in each well but in different wells; and that some of our associates are realizing extraordinarily fast payouts and others extremely slow to no payout whatsoever, which we believe can be brought more properly in focus with a change in the formula to the one requested.

In summary, we feel very strongly that we have watched a lot of the independent operators drop by the wayside in the San

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Juan Basin since we have been there, they are continuing to drop out, and we'll be amongst the casualties ourselves in the years to come unless we are able to protect ourselves in the form of protection of correlative rights; and finally, we have shied away in our basic policy decisions from any extensive further development in the Basin-Dakota without benefit of a second zone.

MR. STOCKMAR: That's all the questions I have. Thank you, Mr. Trueblood.

MR. PORTER: Does anyone else have a question? Mr. Everett.

MR. EVERETT: I would like to ask Mr. Trueblood one or two more questions.

RECROSS EXAMINATION

BY MR. EVERETT:

Q How do you define a commercial well from the standpoint of your company continuing to operate it? In other words, when would you abandon a well?

A When would I abandon a well?

Q Yes, sir.

A I would abandon a well when the operating costs exceeded the allowable sales, once I've already expended my funds in the first place.

Q In your operating costs, I think you testified this morning that you included an element of depreciation on what you call plant investment, is that right?

A Right. I believe we were discussing at the time net income.

Q Could be. I'm just wanting to relate that testimony, --

A I believe we were discussing net income.

Q --when Consolidated reaches the point of abandoning a well. You are generally familiar with the oil business, having been in it for a long time. As a matter of fact, isn't a commercial well considered to be one which will pay something to the operator over and above his actual cost of operation, which does not give any credit to plant account, to capital invested, to drilling costs, to casing, to all the other items which you have in there?

A That is correct.

Q You would not, then, I take it your testimony is that you would not abandon a well unless it got to the point where, excluding the capital items that we've mentioned, would not return to you more than your actual cost of having to go out and turn on a valve, and so on?

A That is correct.

MR. MORRIS: I have one question.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q Mr. Trueblood, along those same lines, could you tell me what the average operating cost on a Dakota well is for your company?

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A About $150.00 a month.

Q That's for a single zone completion?

A That's right.

MR. MORRIS: Thank you.

MR. PORTER: Any further questions?

MR. EVERETT: Excuse me. Following Mr. Morris' question, I have another one.

BY MR. EVERETT:

Q I think you said your work was done on the field average rather than on Consolidated's work,with reference to cost?

A Right.

Q You used $90,000.00 investment figure?

A Right. This takes into consideration wells anywhere from 8300 down to 5500 feet.

Q Yes. Well, we're talking about a Dakota well. And your testimony further was that you used a ten cent figure as the working interest income, ten cents per MCF working interest income from that type of well?

A We tried to be uniform throughout, regardless of the deliverability, so that we could establish a look at the various ranges of deliverability and the various ranges of payout; so rather than say it's eight cents for one deliverability well and twelve cents for another, or eleven cents, or whatever it might be, we tried to strike a field average and look at the field average position of any specific well.

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Q In connection with the work you've done on the field average basis, do I understand this is your testimony, in effect: That your gross income from gas would be sixteen cents per MCF, from that you deduct an eighth royalty, or two cents, from that you deduct an eighth override or another two cents, and from that you deduct another two cents which represents the operating cost we're talking about?

A Right.

Q So that for your field average you used ten cents per MCF to take care of all your investment amortization and everything else out of the work interest?

A Not -- no, the two cents is merely the operating cost.

Q You use the ten cents, not the two cents?

A The two cent drop from twelve to ten is merely operating.

Q So that your cost is $150.00 a month; as to your company, would you say that any well which produced less than --

A A million and a half cubic feet.

Q -- a million and a half cubic feet, then your costs are higher than the average cost which you used in the field?

A Right.

MR. EVERETT: That's all.

MR. STOCKMAR: I would like to ask one or two more questions because of Mr. Morris' questions, if I may.

REDIRECT EXAMINATION

BY MR. STOCKMAR:

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Q Mr. Trueblood, if the order which you are requesting the Commission to grant were granted, would this result in any reduction of your average monthly operating costs?

A Would it --

Q Would operations under the order that you would like to have result in any reduction of operating costs?

A It would obviously lower operating costs with respect to the lower deliverability wells, and since it costs the same to operate a higher deliverability well, the fractional percentage change would be insignificant.

Q As to a well approaching abandonment, if the operating costs were lower under the order you ask, would this mean that more gas would be produced prior to abandonment?

A Absolutely.

Q Basically, is it your intention in behalf of your company to extract every cubic foot of gas that you conceivably can on an economic basis from this reservoir?

A This is the intent and policy of this company, to try to make a profit wherever the opportunity avails itself.

MR. STOCKMAR: That's all I have. Thank you very much, gentlemen, for your attention.

MR. PORTER: Does anyone else have a question of the witness? Mr. Utz.

RECROSS EXAMINATION

BY MR. UTZ:

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Q Mr. Trueblood, could you give us the average costs or your average cost of the single zone Dakota well completion?

A Mr. Utz, I would say it is on the order of $90,000.00. We have wells varying from 8300 feet, and the shallowest are approximately 6200 feet. We do equip them quite elaborately with separators.

Q That figure includes separation equipment?

A That is correct.

MR. UTZ: That's all.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: We are going to recess the hearing until 9:00 o'clock tomorrow morning. It appears that at the rate we have been going today, we should finish by the 28th of the month by working Sunday.

The hearing is recessed until tomorrow morning at 9:00 o'clock.

(Whereupon, the hearing was recessed.)

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MORNING SESSION

April 19, 1962

MR. PORTER: The meeting will come to order, please. We will continue with Case 2504. The Commission will recognize Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin, representing Southern Union Gas Company. We will have two witnesses, the first one I would like to call is Mr. Oran Haseltine.

MR. PORTER: I believe he has already been sworn.

MR. KELLAHIN: That is correct.

ORAN HASELTINE

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Oran Haseltine.

Q By whom are you employed and in what position, Mr. Haseltine?

A Southern Union Gas Company, Executive Assistant.

Q In connection with your duties as Executive Assistant for Southern Union Gas Company, have you anything to do with the Basin-Dakota Gas Pool in Northwestern New Mexico?

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A Yes, sir, that's one of our primary concerns.

Q Have you previously testified before the Oil Conservation Commission and had your qualifications made a matter of record?

A Yes, sir.

Q Have you ever worked in the San Juan Basin?

A Yes, sir, from the fall of 1958 until the early part of 1961.

Q Was that employment with Southern Union Gas Company?

A Right.

Q In connection with that, did you have anything to do with the Basin-Dakota Gas Pool?

A Right. That's during the early stages of development.

Q What was your position in connection with that?

A Drilling Superintendent and Production Superintendent.

Q Have you made a study of the Basin-Dakota Gas Pool?

A Yes, we have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. PORTER: Yes, they are.

(Thereupon, Southern Union's Exhibits 1 & 2 were marked for identification.)

Q (By Mr. Kellahin) I'll ask you, Mr. Haseltine, to refer to what has been marked as Southern Union's Exhibit No. 1.

A Let me put one of these up.

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Q Would you refer to what has been marked as Exhibit No. 1 and identify that exhibit, please?

A Our Exhibit No. 1 is a depiction of three cross sections taken through the San Juan Dakota-Basin Pool. These three cross sections vary in length from seven to fifteen miles and there are two particular things that we want to point out as being demonstrated by this exhibit. Cross section A-A^{1}, being some ten miles in length, shows, first of all, that the Basin-Dakota Pool is blanket and fairly uniform in its characteristics throughout. The Dakota log looks like a Dakota log no matter what end of the pool you are on.

Now, there are slow changes in some of these sand members. Some of them tend to become thinner and less well defined and others become more strongly developed, but none of these changes are rapid, and that's the first thing we want to point out from this exhibit. Any change in lithology or in sand thickness or porosity or any of the factors that go to determining reserves are slow changes throughout the Basin.

You take a cross section here fifteen miles long, certainly there are changes in the characteristics from this well over to this well, but they're slow changes, slowly occurring changes clear across the Basin; there are no rapid changes in stratigraphy or lithology on any sand thickness from location to location.

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The changes occur fairly slowly across the Basin, and in support of that, a geologist who is familiar with the Basin up there, once he has the elevation of his location, can pick the top within thirty feet, certainly, and our geologist claims that he can pick them within fifteen feet before it's drilled. So, when you drill to the Dakota you know where it's going to be and you know what it's going to look like.

The second thing that is shown in this exhibit is the extreme lack of uniformity in the deliverabilities, statutory deliverabilities that are given to each well. Now, then, on this exhibit the small numbers under each well log represents the statutory deliverability as reported to the Commission. The bar graph erected on each location is proportional to the size of that deliverability.

Now, then, the contrast comes here. You have a uniform Dakota formation changing slowly from one end of the Basin to the other, but you have an erratic spread of deliverabilities from location to location that in no way can be correlated with any of the subsurface information that is available to the operator.

We have picked some examples, a well that we have called here on the log A-7 has a statutory deliverability of 1,013 MCF, and the two offsetting locations are 90 to 100% above that. The logs are typical Dakota logs. There's no striking change in the logs

from one location to the other. There's nothing subsurface-wise that you can put your finger on to show why that deliverability varies so widely, and certainly there's nothing that you can tie that range of deliverabilities there back to reserves and say that this well only has half the reserves under its 320-acre drilling unit as compared to the reserves under the two offsetting locations.

Take another example in through here where the wells are a little wider spread.

Q Would you identify the wells that you are pointing to?

A B-3 and B-2. From the looks of this they would be probably one mile apart. There should have been a well in here, and apparently it wasn't drilled. At least we didn't have the log on it. But B-3 shows a deliverability of 1919 MCF. B-2 shows deliverability of 8663, more than four times the deliverability of this well, and again, there's no way that you can support a range of reserves between those two locations of four to one.

Q Would you make a comparison between the C-3 and the C-4?

A The C-3 and C-4 are just outstanding examples of the same thing I'm talking about. C-4 has every bit as good section as C-3 and more section open and it has a deliverability of less

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than a million, and C-3 has a deliverability of thirteen million.

Q Is there anything, based upon the information available, which would indicate there were more reserves in one well than the other?

A Absolutely not. If anything, C-4, if a person didn't have the deliverability figures available, C-4 would be given more deliverability than C-3.

Q On the basis of the log?

A On the basis of any subsurface information available.

Q What accounts for the difference in the deliverabilities between these wells in your opinion?

A Well, none of us can be positive as to why, but the cores that we've seen, that I've seen, exhibit some recemented fractures, hairline fractures. Now, those recemented fractures probably don't contribute anything substantial to reserves or pore space because they are recemented, but if an operator is successful in cracking those recemented fractures open and propping them open, then he will have a high deliverability well. I think that the recemented fractures, the presence or absence of those determines to a large degree if a person is going to be successful in getting a high deliverability or low deliverability well.

Q Does that factor have anything to do with reserves in

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place under the tract dedicated to the well?

A The cores that I have seen, those recemented fractures represent such a small portion of the total volume, either pore space or total reserve, that they couldn't possibly contribute more than just, oh, 5% or less. Personally, I think it's less than 5%, but to be generous, they might contribute 5% to the pore space or the reserves.

Q But it would not account for nine times difference?

A It couldn't possibly account for it. If those fractures were open, if they contributed to pore space, they would contribute to the natural deliverability of these Dakota wells and everybody here knows that Dakota wells don't have much natural deliverability. It's a freak when you find one that will make much of a well without artificial fracking.

Q Then your completion practices govern the deliverability you are going to end up, is that correct?

A Completion practices plus whether you are fortunate or unfortunate in being drilled into some of those recemented fractures that will lend themselves to refracking, reopening.

Q Does the number of frack jobs on any given well change the deliverability of that well?

A Well, there again, you can never do the same well twice. Some operators think so, and I'm inclined to think that would

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probably lend to it. If you can go in and selectively frack and break down several different separate zones, it's logical that you will get a more effective fracturing on each one of those intervals.

Now, I think most operators have gone to about two stages of fracking, but some have gone to three and claimed that they derived benefits in initial deliverability from three frackings. I never heard anyone claim that he gained anything in reserves.

Q Does that complete your testimony with regard to Exhibit No. 1?

A Yes, sir.

Q Turning to what has been marked as Exhibit No. 2, would you identify that exhibit?

A Exhibit No. 2 is a map of the central portion of the Basin-Dakota Pool and we have drawn, first of all, on this map, the cross sections that we've referred to here. This is cross section A, starting from the southwest portion of 29, 11 and going in a northeasterly direction, and this cross section B down close to the Angel Peak area and then cross section C starts down in 27, 11 and goes northeasterly. On this cross section, or on this map of nine townships, we've spotted the Dakota development to date and we have put by each well its statutory deliverability as reported. One thing we want to notice there that I should

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have caught and didn't, the draftsman, where the proration schedule left the deliverability blank because it hadn't been reported, the draftsman marked that deliverability zero, but I'm sure that the well has some deliverability, so those zeros should have been blanks.

Then, in addition, in each township in the central figures we have shown the low deliverability in that township and the high deliverability, and in parenthesis below that the percentage that the high figure represents of the low figure. Once again, we recognize that there are differences in the Basin-Dakota Pool from one end to the other, there are good areas and there are poor areas, but one township probably represents around 2%, maybe 2% of the Dakota-Basin Pool, and in a given township the range of deliverabilities is far, far wider than the range of reserves that occur in that township simply because the Basin-Dakota doesn't change that rapidly in any of the characteristics that contribute to reserve calculations.

We could pick a few examples, here's a good one here. Well, first of all let me point out this, this is 29-11, which is probably average Dakota stuff. A range of almost 600% between the low and the high. Here in the Angel Peak, which is better than average for the Dakota, we still have a wide range of deliverabilities from 830 to almost 7,000, 819% difference in

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deliverabilities there in that one township.

Moving on down to 27-11 again, there's a range there from ~~196~~ MCF a day to almost 13,000 MCF, a change from low to high of 6,500 and 70%. To correlate that with reserves and make deliverabilities, a parameter of reserves would require a 65 to 1 range of reserves on those two wells.

Q Is there such a range in reserves on those two wells in your opinion?

A Couldn't possibly be.

Q What factor affecting reserves accounts for the difference in deliverability in your opinion, beyond the 5% you previously testified these small fractures might contribute?

A Well, where there is a little better sand development it's going to add a little to the deliverability. I don't think it's anything that we could measure quantitatively, but we couldn't deny it either, that if you have a little better sand development, why you should expect and get better difference; but taking the best sand development compared to the mediocre or poor sand developments, any of those wells have to be fracked to make a well at all.

Q In your opinion would a frack job have more effect on the deliverability of a well than the reserves would have?

A Yes.

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Q Have you any conclusions to draw from this testimony, Mr. Haseltine?

A Just to repeat briefly what we said, naturally, that two characteristics of the Basin-Dakota Pool are outstanding in considering the question that's before the Commission now. One is the slowly changing nature of the Dakota as you go across it. A Dakota log looks like a Dakota log, and when you drill one location you know about what the next location is going to look like.

The other thing to compare with that is the wide variation in deliverabilities from location to location that can't be supported by any subsurface information that's available.

Q Were Exhibits 1 and 2 prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 and 2.

MR. PORTER: Without objection the exhibits will be admitted.

MR. KELLAHIN: That concludes the direct examination of this witness.

MR. PORTER: Does anyone have a question of Mr. Haseltine?

MR. HOWELL: Ben Howell, representing El Paso Natural

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Gas Company.

CROSS EXAMINATION

BY MR. HOWELL:

Q Mr. Haseltine, would you say that in the Basin-Dakota Field, taking a township consisting of 36 sections and averaging the factors that are considered in making reservoir determinations would be a reasonable basis for determining the average factors applicable to that area?

A Well, if all you are after is average it would be, because that's what you are after.

Q Well, is taking an area such as a township to determine your average a reasonable means of doing it?

A It's reasonable if that's what you are trying to achieve. Now, you could average every Dakota well and you could say "This is the average Dakota well".

Q But you have already testified, have you not, that there are variances, I believe you said that the Angels Peak area is better than the others, that may be the sweet spot of the field, is that correct?

A I think so.

Q So that if one took the township around Angels Peak and took the average of the several factors that go into the reservoir, is that a reasonable method of determining average reserves in the

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Angels Peak area?

A Well, I would think that it would be a reasonable approach. I'm sure that any engineer that would do that would examine it as he went along to see if he wasn't getting himself into a corner by taking in something that shouldn't be there, some extreme condition, but as a general statement I think that that would be the place to start.

Q One does find very extreme conditions up in the Dakota Field, does not one?

A Yes.

Q Actually you know of your own knowledge of dry holes or wells that were plugged and abandoned that offset location of the producing wells, do you not?

A No, I can't name you a single direct offset Dakota to a producing Dakota. Now, there may be some, that was testified yesterday.

Q You wouldn't say there weren't any?

A Not to my knowledge there are or are not.

Q The characteristics of the Dakota formation in this Dakota Field, I believe you testified that there wouldn't be any wells at all that would be commercial without fracking?

A Well, I don't know that I said that. But I would say that there are very few, practically none.

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Q Well, you said you would have to frack every location to make a well, I believe is exactly your testimony.

A There may be exceptions, to my knowledge you would have to frack, right.

Q In your opinion, every well has to be fracked?

A I know of no exceptions personally.

Q Is not the purpose of fracking to make available to the well bore the gas that is in the formation?

A It's to make it available at a commercial rate.

Q If the gas that is in the formation does not become available to the well bore, that gas could not be considered as a recoverable gas reserve, could it?

A That's right.

Q So that the existence of fractures either made by nature or made by man in fracking a well, is the difference between reserves that may be in place and the reserves that are recoverable gas reserves, is that correct?

A Again, we have got to talk about what time we are talking about.

Q Well, let's talk about within the economic life of a field. I believe that we in the gas business have to talk to the Federal Power Commission on the basis of twelve years' reserves. Assuming that you are faced with that twelve-year period,

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would you not find a difference, a substantial difference between the reserves that exist in the rock and the recoverable gas reserves that are made available to the well bore by reason of these fractures?

A You sure would, right.

MR. HOWELL: I think that's all.

MR. PORTER: Mr. Morris, I believe you had a question.

MR. MORRIS: Yes.

BY MR. MORRIS:

Q Mr. Haseltine, I believe we're all interested here at this hearing to determine what formula will best allow each well in this pool to produce the equivalent of the recoverable gas under its proration unit. Now, based upon the information that you have presented to the Commission here on your exhibits this morning, what formula, what percentage of deliverability, if any, do you see would produce this ideal formula?

A Well, as long as we are dealing with only two parameters, acreage and deliverability, we'll never have an ideal formula. We have to be practical, though, and try to get some optimum formula that's going to come the closest to what we can work and live with. Based on what we have done here, we certainly need to decrease the emphasis on deliverability.

Now, how low we should go on that, I don't know. I'm certain

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in my own mind that to go to the 40-60 formula that's before the Commission now is just a step in the right direction. It's not far enough to be equitable, based on what I've seen in the Dakota Pool. But, how far we should go in that direction I just wouldn't try to say. Certainly farther than the 60-40.

Q Based on the information that you have presented this morning, would you recommend that any deliverability factor be included in the formula?

A Well, I wouldn't recommend eliminating something that would compare or give you a measure of the reserves in place. Now, then, we have to go farther than 100% acreage. We have to have something in there to relate it to reserves in place, and the Dakota Pool, unlike the shallower formations' deliverability, just isn't the parameter we're after if we're going to give it very much weight. There may be some other parameter that will work better than deliverability.

You take formation of units up in the San Juan Basin, there are other factors that are involved in trying to determine those correlative rights and those equity interests before a unit is finally consummated. And acreage is just one of those. Certainly acreage wouldn't be the whole picture here, but emphasis on deliverability I feel is the wrong way to go to supplement the acreage portion of the formula.

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Q You would agree that the inclusion of some deliverability factor would tend to give the operators an incentive to complete their wells in a more efficient manner?

A Right. And some of them have told me just exactly that as to why they use a three stage frack instead of two.

MR. STOCKMAR: Ted Stockmar for Consolidated Oil & Gas, if the Commission please.

BY MR. STOCKMAR:

Q Mr. Haseltine, you said that the producible reserves from any given well depended upon the gas available to the well bore. I think you responded to Mr. Howell that in a twelve-year period substantially more gas would be available to a high deliverability well than to a low deliverability well. Is it your opinion that this reservoir will be depleted or exhausted in twelve years?

A No, sir.

Q Do you have an estimate of the period of time within which it would be depleted?

A No, sir, I don't, but I don't think twelve years is anywhere near the life of the Dakota Pool.

Q Does not the lengthening of the time increase proportionately the amount of gas available to a particular well bore?

A Yes.

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Q Given enough time would not even a low deliverability well produce the reserves under its drainage area?

A I think so, and as long as none of us are going to try to change the spacing, why that's the thing we all admit one way or the other.

Q Mr. Haseltine, I think you said that one township was approximately 2% of the Basin-Dakota Pool. By my calculation this would mean that in your opinion there are approximately 3600 spacing units, that being 50 times 36 square miles, it would be 1800 square miles times two spacing units, that would be 3600 spacing units in the area that you are speaking of, is that correct?

A That's about right. I was just roughing out a figure of the 50 townships for the areal extent of the Basin-Dakota. I could be subject to correction on that, but I think we are in the neighborhood when we're talking that way.

Q That would equal 3600 spacing units?

A Yes.

Q Somewhere between five and six hundred completed wells, is this not the equivalent of fourteen, fifteen, sixteen percent development of the pool?

A Yes.

Q I think in response to someone's question you said that

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there was no variation in the basic characteristics of the reservoir that measure reserves as great as a nine to one variation, did you not say that?

A In commercially completed wells, that's right.

Q Do you have in mind some idea as to the degree of variation that does or can exist because of the characteristics that you can see from your log studies and other information available to you, omitting deliverability?

A Yes, I do, but if, with your permission and with counsel's permission, I'd like to defer that, I think our other witness will go into that in more detail.

MR. PORTER: Mr. Everett.

MR. EVERETT: Hume Everett, Ohio Oil Company.

BY MR. EVERETT:

Q Referring to your exhibits and your testimony with reference to the areal extent of the Basin-Dakota Pool, I think you said it was 50 townships and a township, if I recall, has 36 square miles in it. What would be the outside perimeter of the area in miles?

A I don't know. I'd have to measure it. It's kind of V-shape as far as the State of New Mexico is concerned.

Q But it's a very large pool, isn't it?

A Yes, it is.

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Q So that you have about 1700 square miles, I think it is 1500, 1700 square miles. Your testimony was that you thought there was about 50 townships, 36 square miles in a township, it comes out 1500. Now, your cross sections up there, A-A^1, I guess it's B-B^1 and C-C^1, how many miles is covered in your A-A^1, did you say ten miles?

A I believe that one is ten miles, yes.

Q And your B-B^1, how many miles in that?

A Seven, and C is fifteen miles.

Q And C is fifteen? A Yes, sir.

Q Then your Exhibit 2, you have nine townships?

A Yes.

Q And the work that you have done is all within this nine-township area?

A No, sir. That's just the work that I used to prepare exhibits.

Q Do you have a map showing the location in the Dakota of your cross section lines as to where those ten, seven, ten and fifteen mile areas are?

A Yes, sir, they are on this exhibit right here (indicating).

Q They are on Exhibit 2? A On Exhibit 2.

Q A-A^1, could you name the townships and ranges, I can't

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see them?

A A-A[1] begins in Section 31 of Township 29 North, Range 11 West, and ends in Section 10 of Township 29 North, 10 West. B-B[1] begins in 22 of 28, 11 and ends in 34 of 29, 10, and C-C[1] begins in 30 of 27, 11 and ends in 33 of 28, 9.

Q Do I understand your testimony to be that within the area shown on your Exhibit 2 that the Dakota formation is uniform in all characteristics under that nine township square area?

A No, sir. It's slowly changing, slowly changing.

Q How far is it from the upper left-hand corner in miles, that would be the corner of Range 11 West, Township 29 North, to the furtherest point in the southeast corner of your map?

A Twenty-four miles.

Q Twenty-four-mile area there. And the total area shown in your Exhibit 2?

A Total area would be nine times 36 less one and a half tiers of section across this short township. It would be, oh, we could call it eighteen miles times sixteen, whatever that is.

Q That is an area eighteen miles by sixteen miles, and your testimony is that under that area the characteristics are the same in all respects?

MR. KELLAHIN: I object to counsel's stating, restating a statement that Mr. Haseltine has just denied he made.

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MR. EVERETT: No, he said it was excluded.

MR. KELLAHIN: He did not say that. He never said it.

MR. PORTER: Would you ask the witness what he did say?

MR. EVERETT: That's what I just asked him.

A I said it was slowly changing, that there are no rapid changes in lithology or stratigraphy or any of the factors that entered into the laying down of the sedimentary basin in the first place. The factors are slowly changing; sure, we could go to one end and we can go ten miles in the other direction and see differences, but they didn't occur in one location.

Q (By Mr. Everett) I think in answer to Mr. Howell you testified that to your knowledge you knew of no dry holes which were offset by producing wells?

A To my knowledge there are no Dakota dry holes offset by a Dakota producer, but it was testified yesterday that there were, so apparently my knowledge isn't complete.

Q Do you have any knowledge that there were any dry holes drilled any way in the Basin-Dakota Pool?

A Yes, sir. As a matter of fact, there is one, I believe it's right in here. I believe it was plugged and abandoned in 1955, but today from the looks of the log it would make a Dakota well.

Q But it was never produced?

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A In '55 fracturing was a new thing, particularly in respect to the Dakota, and the well was plugged and abandoned.

Q In your opinion, and based on the work that you have done, would you say that that well which was drilled in '55 which has never produced is entitled to the same amount of allocation as one of the best wells that you may have there?

A No. I don't believe that cemented hole is entitled to the same amount of allocation.

Q But you think it should have some allocation even though it can't produce?

A No, sir.

Q Well, what would you have the Commission do with that area when you get in the problem of acreage, your testimony, as I understand it, in answer to Mr. Morris --

A There's no well there.

Q There's no well there?

A A plugged and abandoned well, as far as the Commission is concerned, is no well.

Q But you would like for them in areas that haven't been drilled, the areas where there are no wells, you would like the Commission to give the same allocation that you give to the areas that have been drilled?

A No, sir.

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Q What would you have the Commission do?

A I think they are going to have to give allocation to completed wells as they have done in the past, and an undrilled well certainly will get no allocation.

Q As far as determining recoverable reserves, unless there's a well there, if I understand your testimony, unless there is a well there, you should give no consideration to the recoverable reserve just because it's under an acreage in an area?

A I will have to ask for that question over.

Q Well, I'll frame it a little differently. Let's look at your Exhibit 2. Are there some undrilled locations which are offset by producing wells?

A Yes, sir.

Q Would you indicate one of them?

A Well, when you get right here in the good part of it -- here is one right here.

Q Pointing to what?

A This looks like Section 23 of 28, 10, surrounded by Dakota that are capable anywhere from a deliverability of 2300 to 4700, offset on three sides.

Q Offset on three sides by drillable locations where there are no wells?

A By completed wells.

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Q Where is this location that is not drilled?

A It would be the Southeast Quarter of that section, depending on which you were dedicating in halves.

Q Is it your position that the Commission should give the same weight to that undrilled location as it does to the surrounding offsetting wells?

MR. KELLAHIN: I object to this line of questioning. The witness has already testified that he does not think that the Commission should assign an allowable to anything but a completed well in accordance with its rules. Giving consideration to undrilled acreage has no bearing in this case.

MR. EVERETT: He's objecting to the Commission giving, and to the weight that's given to the recoverable reserves. We all know that you don't give a recoverable reserve to a tract unless it is drilled, Mr. Kellahin.

MR. KELLAHIN: He has so stated.

MR. PORTER: I think the objection is very well taken, Mr. Everett.

MR. EVERETT: All right, I will pursue a different line of questioning.

Q (By Mr. Everett) Is it your position that this situation, which is depicted by approximately 10% of the areal extent of the Basin-Dakota Pool, exists throughout the pool from north

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to south and east to west?

A I think it's representative of the two characteristics that we set about to demonstrate, the slowly changing nature of the Basin-Dakota on the one hand and the wide disparity of deliverabilities on the other hand, and to that extent it is characteristic of the entire Basin Pool.

Q It is characteristic of the entire Basin Pool. Let's take from one end of the pool to the other, I think you testified it's about thirty-six miles across here. From one end, the north end up in the La Plata area clear down to the most southerly producing part of that pool, do I understand that, your testimony to be that this is representative of that area which is something over a hundred miles, I don't know the exact distance?

A It's representative insofar as we are talking about those two characteristics.

Q That is, that the formation is uniform and changes slowly from well to well, do I understand your testimony?

A Changes slowly from location to location.

Q Between the upper northeast corner and the southwest corner of the productive area of the pool, is it or is it not a fact that there are many dry holes between that area that's separated by a hundred miles?

A Not to my knowledge.

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Q You know of no dry holes?

A I didn't say I didn't know of any. You said many. You asked me if there were many.

Q If the evidence shows there were dry holes in there, would that change your testimony any?

A I could be re-educated on any question, but to my knowledge of the Dakota-Basin Pool, and as far as I've looked at it over the past three or four years, I don't think that what you are talking about is in existence. I don't think that there are.

Q I think the evidence will so show, but I'm not going to argue with you.

A Okay.

Q These wells that you made the graph from, what basic information did you take to make your A-A^1, B-B^1, C-C^1 graph?

A The reason I chose these locations, first of all, this is right out of the central part of the Basin so it seemed a logical place to start. I didn't want to draw a picture of the whole pool. The reason I chose these particular locations instead of some other is because we had most of the logs in the files and only had to go out and buy two or three.

Q What kind of logs were they?

A The logs that were run on completion, electric logs and gamma ray neutron.

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Q Did you have any core analyses in any of the wells that were depicted on your Exhibit No. 1?

A No, if we did, I didn't look at them. I don't think there had been very much coring done on any of those wells, and probably none.

Q How can you tell from a log, or reach the conclusion that you have reached, that the formation will or will not give up gas to the well bore?

A Now, what's that again?

Q How can you tell from an electric log whether or not a given formation will give up gas to the well bore? What's the porosity, what's the permeability, what's the nature of the sand and so forth? Don't you have to take a sample or a cutting of that sand and have it analyzed in order to reach that conclusion?

A If you are talking about one well in a new area, one electric log or SP or one neutron curve might not give you much information, but in the Basin-Dakota where five hundred wells have been drilled and completed, one log tells you whether or not you are in the Dakota or what it looks like. You know what it looks like to start with. You don't need this other information. Operators just don't gather that kind of information on development wells.

Q How can you tell whether or not the Dakota formation is

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tight, whether gas will flow freely through it or the other things that are essential to determine whether or not that well is going to produce gas? Do you just guess that as an operator or don't you have some other measure that's better than the well log? You know the location of the formation, I won't argue with you about that.

A No, that's all you have when you decide to complete a well, all you have is the log, it tells you where to shoot and perforate and you go ahead and frack. There are Dakota wells that are up there that have been completed as good producers that the natural flow from those wells was too small to measure. The wells weren't cored, the wells weren't drill stem tested or anything else, all we had was the log, but they were successfully completed, that's all we needed, just the log.

Q You considered these wells all the same insofar as reserves are concerned, did I understand your testimony?

A All the same as what?

Q I said insofar as the reserves are concerned under the tract on which the well is located.

A No.

Q The recoverable reserves?

A No, reserves vary from well to well.

Q Based upon your measurement of the formation and the

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manner in which you completed the well, is that your testimony?

A Now what's that?

Q How do you determine your recoverable reserves in a given well? You say well to well. Let me have your calculation.

A As to how we determine --

Q Your ultimate recoverable reserves under a given tract on which a well is located.

A I think the best way, considering the lack of bottom hole fluid data that's available, in other words, the lack of bottom hole samples and the lack of cores that have been cut out of the section we're talking about, the best way to calculate reserves under any given tract right now is through a pressure decline history and pressure build-up data on that well.

Q Now, that requires production performance. Do you have such performance in connection with these wells shown on your graph?

A On some of these, and it's been presented before the Commission.

Q You think that would be the best, and how long a period would you have to have before you, as an engineer or professional man, would consider that production decline curve as the best method for measuring reserves, how long a period would you have to have that information before you would feel you were in a

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reasonable position to give an accurate estimate of recoverable reserves?

A Well, to actually make calculation of reserves, we feel that we can get a pretty good picture of it with one year's production history, but those calculations are subject to continual review and revision and personally maybe I shouldn't be saying this, but I don't quite see how this bears on what we're getting at.

Q The formula is based in part on recoverable reserves, and I think it's important for the Commission to know, and certainly I want to know how you arrived at your conclusion in making your recommendations that you have made.

A My conclusions and recommendations have been to decrease the emphasis on deliverability.

Q I understand that.

A As I told counsel for the Commission, I'm not prepared or not taking the position to say what parameter should be inserted in lieu of deliverability. I am just saying, and have concluded that deliverability does not deserve 75% emphasis in the formula, and I think should be actually lower than the 60, 40 that is asked for.

Q You have already told him that you wouldn't suggest anything, but are you suggesting that the Commission base this

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formula more on acreage and less on deliverability, is that correct?

A That's correct.

Q And it's your testimony that throughout the entire Basin covered by this vast area that the Dakota formation underlies has a very gradual variation from well to well throughout the entire Basin?

A Yes, sir.

MR. EVERETT: That's all.

MR. PORTER: Any further questions of the witness?

MR. HOWELL: If the Commission please, I would like to ask a few more. Ben Howell with El Paso Natural Gas.

BY MR. HOWELL:

Q Mr. Haseltine, in response to Mr. Stockmar's questioning, you stated that the life of the pool would exceed twelve years. Now, it is a fact, is it not, that there will be gas that never will come out of the rock in this pool?

A Yes, sir.

Q And that the gas which we're interested in is the gas which can be recovered and produced during the time that the wells and the pipeline system is available to transport gas?

A Yes, sir.

Q And it is also a fact that whether that period be

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twelve years, twenty-five years, thirty years, the difference between the capacity or ability of gas to move within one section to the well bore, and the lesser ability in other sections, will permit one section actually to produce and deliver a larger proportion of the gas in place, will it not?

A When you speak of sections, Mr. Howell, are you talking about a section of the formation or section of land?

Q I'm talking about an area in which the movement from the rock to the well bore is easy as compared to one in which such movement is difficult. Regardless of whether it be twelve years or thirty years, there will be differences in areas as to the percentage of gas in the rock that will be produced, will there not?

A I think so.

Q We might illustrate it this way, that when the Basin had only Indian trails, regardless of how much production of peaches there might be, you could only take a small amount out on Indian trails and then we got some wagon roads, you could take more out, and when you get highways and railroads you take a whole lot more out, is that correct?

A Yes, sir.

Q And that the fracking, the fracking of wells whether it be done off the formation, whether by nature or by man, permits

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over a given period of time a great deal more production to be taken from the area that has the highways than from the area that has the Indian trails?

A Yes, sir.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question?

MR. KELLAHIN: Just one question.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q In response to Mr. Howell's question you said fracking permits a great deal more production of the area. What area are you talking about when you agreed with him?

A It would have to be the drainage radius of the well, that that could be up to two miles, as demonstrated before to the Commission at an earlier time.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused.)

MR. KELLAHIN: Mr. Porter, this witness has not been sworn.

A. M. WIEDEKEHR

called as a witness, testified as follows:

DIRECT EXAMINATION

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BY MR. KELLAHIN:

Q Will you state your name, please?

A A. M. Wiedekehr.

Q By whom are you employed and in what position?

A Southern Union Gas Company, Vice President in charge of exploration, gas supply, et cetera.

Q Now, Mr. Wiedekehr, you have previously testified before this Commission, have you not?

A Yes, I have.

Q As a petroleum engineer? A Yes.

Q For the benefit of the record in this case, would you briefly review your background and experience?

A Actually, fifteen years ago I went to work for Magnolia Petroleum Company, spent five years with them, the last three being in the reservoir section of the Natural Gas Department of the old Magnolia, now Mobil Oil Company. During that three-year period I had the responsbility of calculating reserves under all of Mobil's gas properties in the South Texas area, that included everything south of San Antonio in Texas. Ten years ago I went to work for Southern Union Gas Company and was hired as a reservoir engineer, and for about two years did all of Southern Union's reservoir work, and since that time have been in charge of the department that handled reservoir work for Southern Union.

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Q Now, in connection with that work, are you familiar with the Basin-Dakota Gas Pool?

A Yes, I am.

Q How did you become familiar with that pool?

A We, Southern Union Gas Company was a partner, I guess, in the drilling of the first Dakota well drilled in the San Juan Basin and have constantly been in touch with it since the Dakota came into its own some three or four years ago. We had either under contract or owned some four, five hundred locations that either are productive or appear will be productive from the Dakota.

Q In connection with your duties with Southern Union Gas Company, have you made any calculations on reserves in the Basin-Dakota Pool?

A Yes. If the Commission please, I don't know how this is going to affect you, but we have had two series of reserve studies made in the past year. One, made by Dehaulier McNaughton covering some twenty-five producing wells and some forty undrilled locations; another one just completed by the firm of Ralph S. Davis in Houston, covering the same area, including the total five hundred locations or so that I mentioned previously.

Now, I worked in direct conjunction with these two firms going over their data, supplying them with the information that

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they required and then checking out their answerswith respect to the reserves underlying the Dakota formation in the San Juan Basin.

Q Now, in anticipation of questions which will probably be asked on cross examination, could you briefly state what information was used in making these calculations?

A We had available a very limited amount of core information which we tried to correlate against the induction electric logs, and the microlog sonic logs.

Q Were you able to make that correlation?

A It is rather hard to do, frankly, because of the scattered information that you have with respect to core analyses. You can get a relationship, though, that can be used if you'll interpolate it with a little common sense. In addition to that we have run a number of pressure decline studies on some of the wells which have been on production long enough to give you what I consider to be decent information. The results of these studies indicate that the reserves in the San Juan Basin, underlying any given 320-acre tract, at a maximum will range in the five to six million foot category, and in the very extreme edge of what is now known as the Basin-Dakota Pool which is producing the reserves, appear to be in the range of one and a half to two billion feet.

Now, we ran these studies both in the good parts of the field

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and in the poor parts of the field.

Q That will give a range of reserves roughly of three to one, the maximum, is that about right?

A Three, three and a half to one is the ratio between the poor area and what we call the heart area.

Q Have you made a comparison of the range of reserves as you have calculated them to the range of allowables under the present formula?

A Yes, we have. In Township 28 North, 11 West, which is one of the better areas, we have a range of deliverability in the range of about 766%. In that same township our reserve information would indicate that the reserve variation was in the range of 225%, which means that under our present formula we are giving to the high deliverability wells about three times as much gas as they should receive if we were basing it strictly on the reserves underlying any given 320-acre tract. I'm not saying the reserves that will be recovered because in a previous case before this Commission we showed that in certain areas it was possible to drain gas over an area much larger than a 320-acre tract.

That is the problem we face today in that if we maintain our present formula we are not protecting correlative rights as between wells within the Basin-Dakota Pool. I did some work which indicates that as of February, 21.7% of the wells in the San Juan

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Basin received 52.1% of the allowable.

MR. PORTER: How many wells?

A 21.7% of the wells on the proration schedule received 52.1% of the, this is an uncorrected allowable. That's before you take care of previous overages and underages and so forth. This is somewhat approximately twice as much as our calculations indicate should be given to these 21.7% of the wells. I had 118 wells, used 118 wells as the 21.7% based on my addition of the number of wells under the proration schedule.

Q In your opinion, then, does the present formula cause a violation of correlative rights?

A Yes, I think that is one of the problems we must face is that the present formula does violate the correlative rights situation as it now exists in the San Juan Basin. Any time you allow a well to produce in a ratio of three or four times its reserves to its offset tract, then if it is not occurring today within this period of twelve or twenty or thirty years we are talking about, it has to take place.

Q Mr. Wiedekehr, your company, in addition to being an operator of the wells in this pool, is it also a purchaser?

A Yes, sir.

Q Does the situation which exists on account of the present proration formula pose any special problems to your company?

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A From the standpoint of a pipeline company operating in the State of New Mexico, we would be better off today when there is an excess of capacity, if we could shut in every good well and take all our gas from the poor wells. What we are doing, in effect, under this present formula, is gutting the heart of the field, gutting the good wells, and some time in the future, and we, none of us know when that will be, we will need all the gas we can get out of the Basin. At that time the good wells are going to be gone and we are going to have to be relying entirely on the good wells that are now poor because we have gutted them, and the poor wells that we now have.

So, strictly from a pipeline standpoing we'd be better off to take a majority of the reserves, the majority of the take today from the poor well and leave the good deliverability until such time as we needed it.

I made the statement to our President, in discussing this case, that one of these days we were going to have the Kutz Canyon Hill covered with more compressors than we can count. That is an economic waste. I recognize that is not one of the things that is of prime importance here, but that, in conjunction with the fact that we are violating correlative rights, makes me think that we need a change in the formula as it now exists.

Q Do you have anything further, Mr. Wiedekehr?

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A No, I don't think so.

MR. KELLAHIN: That's all the questions I have of the witness, Mr. Porter.

MR. PORTER: We'll take a ten-minute recess.

(Whereupon, a recess was taken.)

MR. PORTER: The meeting will come to order, please. Does anyone have a question of Mr. Wiedekehr?

MR. STOCKMAR: Stockmar for Consolidated Oil & Gas.

MR. PORTER: Mr. Stockmar.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Wiedekehr, you stated on direct examination that if the high deliverability wells are gutted, I think was your term, that you would have to install compressors in the field. Would this raise the cost of producing the gas and, therefore, raise the cost of gas to the citizens of New Mexico?

A About two cents a thousand to compress.

Q You may not have been here yesterday, but there was a lot of testimony with respect to the economics of a million deliverability well. In your opinion, is a well with a one million MCF deliverability a commercial well if it's allowed to produce? Will it drain its reserves in a reasonable time? Will it provide a reasonable economic payout to the operator?

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A I would recommend to our company that we drill a well that we knew would make a million cubic feet of gas a day in the pipeline if I knew we could sell that million cubic feet of gas a day, yes, I feel like a well of that category would definitely drain its reserves in an economical and economic time limit.

Q Is the same thing true for a 500,000 MCF deliverability well?

A Yes, your economics gets a little poorer there, but that would still give you fifteen million a month and you can justify drilling one of those.

MR. STOCKMAR: That's all the questions I have.

MR. PORTER: Mr. Howell.

MR. HOWELL: Ben Howell, El Paso Natural Gas Company.

BY MR. HOWELL:

Q Mr. Wiedekehr, where would you put the breaking point on an economic well?

A Somewhere in the range of three, let me back up here, somewhere in the range of eight to ten million per month; any well that will not make that much gas will not give what I consider to be a fair payout time.

Q So, then, a well that is in the range of a deliverability of four to five hundred thousand per day is right about the breaking point on an economic well?

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A That's correct.

Q Mr. Wiedekehr --

A Let me qualify that as that is correct for a company such as ours who are in the 52% tax bracket. Now, that does make a difference.

Q Mr. Wiedekehr, at the present time there is substantially more gas available in the San Juan Basin than there is a market for such gas?

A Yes, sir.

Q And Southern Union wears two hats in the Basin just like El Paso does, it's both a producer and a purchaser?

A Correct.

Q Now, from the standpoint of the purchaser, I understood your testimony earlier, you would prefer as the ultimate from the purchaser's standpoint to have the high deliverability wells shut in and kept for the time of high need?

A Mr. Howell, let me give you an example there of the way we feel about it. Down in the Lapicito Field we have one well and it's been offset by a number of operators in a lot of directions trying to find it with a capacity of roughly ten million a day in the pipeline. All summer long that well is shut in, we own it jointly with Humble, and nobody can drain the gas out of it, so we shut it in all summer long. We use it for peaking

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purposes in our winter months. Now that's ideal. I recognize that we can't have that ideal situation in the Basin.

Q That's right, from the pipeline purchaser's standpoint the ideal situation is to keep your best wells shut in to use for the period of high demand?

A Correct.

Q Now, then, you say that you are going to have compressors all over the area. As a matter of fact, the purchaser's under contractual, under existing contracts, as the well-head pressures go down, is required itself to produce additional compression, isn't it?

A I understand that your contracts so called. Ours are somewhat different.

Q You put the burden upon the producer?

A In certain instances, yes.

Q Now, the effect of shutting in the higher producing wells tends toward creating a storage project, doesn't it?

A As much as I hate to answer your question, yes.

Q If there's anybody that advocates a storage project in that Basin it isn't El Paso, isn't that correct?

A Actually I think we are getting a little off the subject.

Q I'm sure we're off the subject, Mr. Wiedekehr, but there were some rather wild and rather unnecessary accusations made

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yesterday and I would just like to nail them down.

MR. KELLAHIN: If the Commission please, the accusations were made and the objection made and they were ordered to be stricken from the record.

MR. HOWELL: I beg to differ, the same statement was made by the witness at another time. The emphasis or the impact is in the minds of the people that heard it, and I think we are entitled since that did exist to clear the matter up a little bit.

A If the Commission please, I will answer that question in this manner: El Paso, by asking for a high deliverability, is not, in effect, asking for the creation of a storage reservoir. They might, by buying gas in other areas and leaving a lot of San Juan gas shut in, be creating a storage reservoir.

Q To carry that a little further, Mr. Wiedekehr, you don't have any Federal Power Commission limitations on the amount you can produce and sell, do you?

A Only as a producer, not as a pipeline company.

Q And, as a matter of fact, El Paso is taking an average of approximately fifty million feet per day of your gas in the San Juan Basin in order to try to equal your takes with El Paso?

A That is correct.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question? Mr.

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Everett.

BY MR. EVERETT:

Q As a purchaser you are familiar with the ratable take provisions of the New Mexico laws and regulations?

A Yes, sir.

Q And you endeavor to comply with those regulations, I'm sure?

A We do.

Q I think you testified that you participated in the drilling of the first Dakota well in the Basin?

A I believe the first Dakota well that was completed in the Basin, we were a party to that under a unit agreement.

Q When was that drilled?

A Oh, this must have been back in, oh, early, in the early 50's, I would guess, and the exact time on that, I can't tell you the exact date.

Q When did you first have a market for the gas from that well, if you remember?

A Immediately thereafter. It was drilled in the old Kutz Canyon-Fulcher Kutz, I guess at that time it was called the Kutz Canyon-Pictured Cliffs Field, and a market was available right along with the rest of the producers at that time.

Q And since that time how many wells have been drilled

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in the Basin-Dakota, if you know?

A I would guess that as of today there are probably 600, 550 to 600 wells in the Basin-Dakota Pool.

Q You are talking about the productive wells?

A Yes.

Q Do you know whether or not there have been any dry holes drilled?

A Yes, sir.

Q Do you have any idea how many?

A I would guess that there probably are fifteen or twenty. I don't know the exact number. The only ones that I'm familiar with are the ones that we drilled or participated with, but I would guess there are fifteen or twenty dry holes in the Basin that were drilled in the Basin specifically for Basin-Dakota production.

Q Let's look at the market a little bit and the ratable take law. If you had a given market which is limited in this case, as we know, and you had 200 wells to supply that market, and then three years later you had the same limited market but had in the neighborhood of 550 to 600 wells to supply that market, wouldn't the effect be, under the ratable take provisions, and regardless of any allocation formula, wouldn't it be to cut down the amount of gas that the 200 wells would supply to the market by the addition

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of the other 350?

A Certainly, when you drill wells you don't need, you slice your pie a little thinner.

Q That would exist regardless of the allocation formula, is that correct?

A That is correct.

MR. EVERETT: Thank you.

MR. PORTER: Does anyone else have a question?

BY MR. UTZ:

Q You have done quite a bit of reserve work?

A Yes, in Tocito.

Q Would you care to state how much reserves under a 320-acre tract that you would have to have to pay out a Dakota well?

A We placed our cutoff at the very minimum economic limit at four million cubic feet per acre, which on 320-acre spacing would be 1.28 I guess, billion.

Q About one and a quarter billion?

A Right.

Q I believe you testified to the effect that the maximum reserves that you calculated for some four or five hundred tracts was six billion?

A That's right.

Q Then the ratio of reserves between the lowest economic

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tract and the highest reserves would be in the order of 1 to 4.6?

A I don't have my slide rule, but if you divide six by one two five, that would be the answer, somewhere in the range of four to five.

Q Yes, sir. Now, any well below a billion and a quarter reserves would be sort of a salvage operation?

A It would be that, yes.

Q So, in arriving at a proration formula where you have deliverability involved, would you say that a proper formula would be one which gave you the same allowable ratio as you had to reserve ratio in the pool?

A If we are going to have a deliverability factor in the proration formula, then a formula with that ratio would be probably the most fair formula that you could come up with, yes.

Q In other words, you couldn't come much closer to allowing each operator to recover his fair shares of the reserves under his tract?

A No. And if the operator had production scattered throughout the Basin where we would run into problems in one area, it would tend to offset it out in the other one. I think a formula on that type of basis would be fair.

Q Do you have an opinion as to how much deliverability you should allow in the formula to arrive at that sort of a ratio?

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A We have done some work, and frankly any time you get into the use of a deliverability factor in a formula you have to make some other assumptions, but we feel as far as being completely fair, that probably the allocation to deliverability should be in the range of one-third. I do not particularly disagree with the formula that is proposed here now, 60, 40, but I feel like something in the range of 33, 66, in that range, is one that would be fair in this Basin-Dakota Pool.

Q At any rate, whatever the ratio is, it's your feeling that it should be in the same ratio to provide allowables in accordance with the reserves?

A That is correct.

MR. UTZ: That's all I have.

MR. HOWELL: Ben Howell, representing El Paso.

BY MR. HOWELL:

Q Mr. Wiedekehr, Mr. Utz asked you as to your figures, and I believe you said approximately one and a quarter billion in recoverable reserves was the point which you thought was the breaking point for a commercial well?

A That is a very minimum that you can expect to ever get your money back.

Q You figure that in cases in which your percentage of gas as working interest is around 85 to 87½%, isn't it?

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A Actually ours is about 82½, Mr. Howell.

Q If you lower it to 75 or 70, then obviously your break even point gets higher and you have got to have more reserves to get a payout?

A That's correct.

Q Now, as to the formula, I think we are all in agreement on the fact that in a formation such as the Dakota, which is a tight formation and requires stimulation to give up the gas to the well bore, that consideration must be given to deliverability. You agree with that premise, do you not?

A No, I don't. I don't agree that deliverability has to be in the formula at all. I do agree that straight acreage alone is not enough. We need something to take care of the other factors that influence reserves, and you could reach up in the air and pull out another factor that had acreage and pressure and come up with something that could be just as fair as a formula with deliverability in it.

Now, back again, we as a pipeline company, like some deliverability in one, but there's no reason that deliverability has to be in a proration formula for it to be fair.

Q In this formation, in this particular formation some consideration must be given to the availability of the gas, is that not correct, whether you determine that by pressure --

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A Right.

Q -- or whether you determine that by measured deliverability?

A Correct.

Q We're all in agreement as to that factor?

A We need something besides acreage, yes.

Q Now, then, the problem that is before us is one of determining the effect that should be given to the deliverability in order to give a fair proportion of the recoverable gas reserves to each owner, is that correct?

A I think that's right, yes.

Q And in such a situation I believe you'll also agree that what we must consider is averages for the pool as a whole, recognizing that there are individual freaks that occur in any gas patch?

A Yes, I think that since it would not be feasible to calculate the reserves under each given 320-acre tract in this fifty square mile area that we are talking about, or whatever it is, that we are going to have to use something that is an average figure.

Q And you would in general say that the formula should fit the majority, the great majority of the wells in the pools even if it may not fit certain freaks?

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A I think that if you have freaks you ought to have some provision for taking care of them. I would say that you need a formula that fits the majority of the wells and then you can take care of the freaks.

Q You would have to look at the freaks on an individual basis when that came up to determine that they were freaks?

A That's right.

MR. HOWELL: Thank you.

MR. PORTER: Mr. Everett.

BY MR. EVERETT:

Q In your calculations, did you or have you made a determinatcn of your cost of operation in terms of cents per MCF of gas?

A Not exactly on terms of MCF, cents per MCF. We know what our average cost to operate a Dakota well is, and we use an operational cost figure based on our experience.

Q Could you translate and give it to us in terms of cents per MCF?

A No, sir, that would be impossible because of your fluctuation in takes from the various wells. If all wells were allowed to produce the same MCF, yes, but it costs just as much to operate a poor well as it does a good well. So there's no relationship there from an operational standpoint.

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Q Well, yesterday one of the witnesses testified that in their calculations they used an average number throughout the pool, cost of operations of two cents per MCF. Do you think that is a proper figure?

A There's no way that you can apply a cents per MCF to the field as a whole, because it's going to vary from well to well. If you give me an average well and give me two cents per MCF I can tell you whether I think that's fair or not.

Q Well, we had another figure of $150.00 a month per well. How does that compare with your costs? Let's take one of your wells, any one you want to take.

A Our average cost to operate the Dakota well in the San Juan Basin is slightly under a hundred dollars a month.

MR. EVERETT: Thank you.

MR. PORTER: Anyone else have a question of the witness? You may be excused.

(Witness excused.)

MR. KELLAHIN: If the Commission please, that concludes the presentation by Southern Union.

MR. PORTER: I believe that concludes the presentation of those favoring the application. We have an indication by El Paso, Pubco, Aztec, Sunset and Calkins that they will present testimony opposing the application, and in the order of their

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appearances Pubco will be first.

MR. HOWELL: If it please the Commission, Ben Howell of El Paso. I've been asked by the group to raise this point. We, of course, think that we and the Commission are on the same side since we are in support of the Commission's formula. We notice, however, that there is a Commission witness who was sworn and some of us have witnesses who, when their testimony is finished, we may release to go home. It's a little embarrassing to ask this, but I think we would like to know if the Commission proposes to advocate any changes in the formula. If it does, then we would feel that we'd have to keep our witnesses here, and I suggest that in the interest of time, rather than putting them on twice in the event that whatever the Commission might advocate, would be something that we would close that we could do it all in one time if the Commission intends to advocate any change.

If it does, I suggest that it might appropriately come in now since that would probably cut down the time of the hearing since we could cover everything in one presentation.

MR. PORTER: Mr. Howell, the Commission doesn't have any proposal. One of the staff members will present some testimony concerning minimum allowables. Our attorney is out right at the moment. I wouldn't like to make that decision until

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I have seen him, see whether he wants to go on now with his witness. I think that can be determined immediately. Off the record.

(Whereupon, a discussion was held off the record.)

MR. PORTER: Back on the record, please. The Commission will recognize Mr. Morris.

MR. MORRIS: If the Commission please, we have no objection to presenting our evidence concerning the establishment of minimum allowables at this time. It would appear to be out of order, but if those in opposition to the application have no objection to it we will be glad to proceed with that testimony at this time, Mr. Howell.

MR. KELEHER: Pubco has no objection and prefers that the Commission staff members testify at this time.

MR. HOWELL: El Paso certainly feels the same way.

MR. PORTER: Mr. Utz, you have already been sworn, I believe?

MR. UTZ: Yes, sir.

MR. PORTER: You may come forward and take the stand, please.

MR. MORRIS: May I have a moment?

MR. PORTER: Yes.

MR. MORRIS: Before we proceed with the testimony of

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Mr. Utz, the attorney for Pan American, Mr. Buell, would like to make a motion in connection with Case 2049 and 1641. Mr. Buell.

MR. BUELL: May it please the Commission, with respect to both of those cases and considering the lateness of the hour and the day of the week and the fact that we are at the present time at about the half-way mark in the Basin-Dakota case, I would like to respectfully move that both of these cases be continued until the regular May hearing.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin, Kellahin & Fox for Val Reese and Associates. We join in Mr. Buell's motion.

MR. BRATTON: Howard Bratton for Redfern & Herd. We join in the motion.

MR. MORRIS: Before the concurrences proceed, may I ask if the Commission wants to consider these cases at the May regular or defer them to the June regular when it will be heard here in Santa Fe, inasmuch as the Commission hearing in May will be in Hobbs?

MR. PORTER: Mr. Morris, the Commission is concerned, it appears that we'll have a short hearing in Hobbs next month. Probably the cases which we anticipate which we advertised will not cause us to run past noon. So it seems that May would be a good time to have them. Mr. Howell.

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MR. HOWELL: El Paso Natural Gas Company would concur in the request for continuance.

MR. PORTER: Are there any objections to the counsel's motion? Mr. Cooley?

MR. COOLEY: William J. Cooley for Great American Associates. We would strongly urge that it be continued to the June hearing due to the geography involved. That's about eight hundred miles round trip.

MR. PORTER: Mr. Buell, would you care to express yourself as to the date?

MR. BUELL: May it please the Commission, on behalf of Pan American, we would have no objection to a continuance to either date. It is the consensus of the operators that the present rules will be recommended to be continued for another year, so I do not see that a two-month delay will hurt anyone at all.

MR. PORTER: Mr. Morris, do you anticipate any cases for the June docket that might be time consuming other than these two?

MR. MORRIS: No, sir, I do not.

MR. PORTER: The June hearing will be heard on Thursday, which is one day later in the week. How would the June date suit you, Mr. Kellahin?

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MR. KELLAHIN: I think that will be satisfactory.

MR. PORTER: Mr. Howell?

MR. HOWELL: Completely satisfactory.

MR. PORTER: In that case, Cases 2049 and 1641 will be continued until the June regular hearing date. The orders are such that the rules will remain in effect until further orders are issued.

Back to Case 2504.

ELVIS A. UTZ

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Utz, will you please state your name and position?

A Elvis A. Utz, gas engineer for the Oil Conservation Commission.

Q Mr. Utz, have you made a study of the production and the deliverabilities of wells in the Basin-Dakota Gas Pool with the view toward the establishment of a minimum allowable in that pool?

A Yes, sir, I have. However, before we get into the testimony proper I would like to make a correction on one of my exhibits for the benefit of all of those who have them so that they

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won't get a distorted picture of what they're trying to show.

Exhibit 2, if you'll refer to it please, it's the bar graph. Under the three million minimum if you will just scratch out the zero and the three thousand under the bar and reverse those figures, then it will depict what I intend to show. In other words, the zero curve is actually the three thousand and the three thousand curve is actually the zero curve. Under the eight thousand minimum the same thing is true. If you'll just reverse those headings, then the zero curve as now labeled will be the eight million bar graph.

Q Do you have any further corrections to the exhibits before we proceed, Mr. Utz?

A No, sir, I believe that's the only one that I know of now that I goofed on.

Q Mr. Utz, at the outset of this consideration I would like for you to briefly explain why you feel the Commission should consider the establishment of any minimum allowable in conjunction with a proration formula in this pool.

A Well, I intend to show in this case a need for a minimum allowable, and I also intend to show the effect of various minimum allowables, namely no minimum at all, three million minimum and an eight million minimum. The need for a minimum, as I see it, from the standpoint of trying to administer gas proration, is one to

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prevent premature abandonment of small wells which receive allowables based on the present formula lower than an economic limit, and thereby prevent waste which would be due to the abandonment of these wells at an earlier date than a minimum would provide.

Second, is to establish a producing level in the Basin-Dakota below which wells in the pool would not be subject to the requirements of R-1670-C, so long as these wells do not produce above that level. These requirements of 1670-C consist of deliverability testing, the wells being subject to overproduction shut in. That's all I can think of at the present time. Wells in this category would be classified as exempt marginal wells.

Q Are you getting into your different categories of wells now?

A No, I'm just stating the second reason why we need a minimum allowable.

Q All right.

A Wells in this category will be classified as exempt marginal wells. The purchaser usually leaves this classification of wells on the line continuously, which enables them to produce a little more gas. This will also relieve the Commission of considerable administrative duties relating to small wells which are of questionable economic value. Without a minimum, these

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wells have to be classified and reclassified from time to time, this is done every six months. Whereas, with a minimum they would stay in the exempt classification so long as they produce less than whatever the minimum is set.

Q So the major reason for considering a minimum allowable is in keeping with the statutory obligation of the Commission to prescribe minimum allowables to the end that production will repay reasonable lifting costs and thus prevent premature abandonment and waste?

A That is correct.

Q Now, Mr. Utz, at the time that the formula in the Basin-Dakota Pool was originally put into effect, there was some discussion of the fact that the 25% acreage factor was intended to and would operate as a certain minimum allowable. Would you explain why you believe there is a need for a minimum allowable in addition to this acreage factor that's already built into the formula?

A Of course, when I do this I'll probably be getting somewhat outside the scope of this particular hearing as relating to the Basin-Dakota Pool. Actually, our acreage factors for the Basin-Dakota Pool during the first year of proration is about 2800 MCF per month. Now, of course, this in effect sets a minimum of just that. Low deliverability wells based on 75%

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deliverability get an insignificant amount of allowable due to their acreage times deliverability.

The reason I feel at this time that we should have a minimum allowable in the Basin-Dakota is that I know, based on my thirteen years' experience in dealing with gas proration, that the day will come when we need a minimum allowable for the reasons, the two reasons that I have stated previously. In other words, the acreage allowable will not provide enough gas to keep a well on the line and prevent premature abandonment. We've seen that in Pictured Cliff pools which have acreage allowables as low as 300 MCF a month.

Q So the 25% acreage factor just doesn't provide a sufficient minimum to prevent premature abandonment?

A That is correct.

Q Mr. Utz, let's turn to the study that you have made for presentation at this time.

A Let me clarify that. I want it to be clear that at this point the acreage factor does, in my estimation, does provide enough minimum allowable. But I'm not asking for this minimum for the immediate. We'll need it on down the road. As long as we are getting into minimums in other pools, I would like to present this testimony here and try to get one in the order for the Basin-Dakota as well as the other pools.

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Q Now, turning to your study, would you first state what periods of time were involved and how many wells you considered in the study that you have made?

A At the time I started this study I had production information available to me as of 11-30-61, so I took, I wanted to stay within a balancing period, so I took the production from February 1, 1961 through November, '61, which was, of course, ten months' production.

Q How many wells did you consider during that period?

A I considered 435 wells.

Q Even though there are at the present time, of course, more wells on the line, you had to confine your study to the number of wells that were on the line during the period involved?

A At the end of the period involved, yes, sir.

Q Yes.

A In order to project that over two complete proration periods, or through January, I divided that figure, total figure of production by 303 days and multiplied it by 31.416 days, which is the average number of days in a twelve-month period. That was my monthly domand that I used for this study.

Q What data did you use as the basis of your study? Did you use the actual production figures or the calculated deliverabilities of the wells, or what figures have you used as the basis

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of your exhibits?

A I used the market demand as just explained, which is 3,366,372 MCF a month, the 435 wells which were on the line at the end of this period, and the acreage factors and the deliverabilities of those 435 wells.

Q You also used the actual producing abilities of the wells?

A Yes, sir. In classifying wells as we do now, we classify wells, marginal or non-marginal, depending on their average producing ability for a six-months' period. Recognizing that this was true, I wanted to make this study as realistic as I possibly could, so I classified wells, these 435 wells, I classified them on the basis of their average production for the period involved, and all wells below a breaking point are actually on 100% deliverability, based on their average producing ability for the period. All wells above that point are calculated on the basis, their allowables are calculated on the basis of the formula 25, 75.

(Whereupon, Commission's Exhibit No. 1 was marked for identification.)

Q Mr. Utz, would you refer now to your Exhibit No. 1 and explain, first, if you would, the four categories of wells that you have used throughout your study of minimum allowables?

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A Well, perhaps first it might be well, Mr. Morris, to explain the significance of what I have called the breaking point. The breaking point is calculated on the basis of market demand and the acreage and AD factors available for the number of wells involved. You have a certain market demand that you have to divvy up among all the wells in the pool. Obviously if you don't calculate a breaking point, than there are some wells which receive an allowable in excess of the amount of gas that they're capable of producing. In order to assign wells an allowable which is consistent with their producing ability, it's necessary to use cut and try method and calculate that breaking point.

In this case, using no minimum allowable whatsoever but the straight formula, the breaking point, based on producing ability, is 77 MCF per day. That's about 2342 a month. In other words, all wells below 77 MCF per day are on 100% deliverability, so-to-speak, or 100% producing ability if you want to put it that way. All wells above 77 MCF have their allowables computed in accordance with the 25, 75 formula. If this holds true for the breaking point of the three million calculation and the eight million calculation, except for the fact that these lower wells receive a certain minimum determined as three million in one case and eight million in another case, so all wells below this point are put on a hundred percent deliverability or ability to produce. In

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other words, the breaking point is the same as it is in the zero minimum except it includes more wells, because we have raised the allowable on a few wells.

Q So the wells below that breaking point constitute one category of the four groups that you have considered in your study?

A No well shown in this study has received an allowable in excess of its ability to produce. Referring to Exhibit No. 1, which is the tabulation, the second sheet on most of the ones that you people have, I have divided the wells vertically into four groups, horizontally I have put the data for zero minimum, for each of these groups 2500 minimum, which is not effective at this time, three million minimum and eight million minimum.

Now, Group No. 1 is the producing ability of less than the zero minimum breaking point. There are twenty-four wells in this group. The wells in that group, as you will note, are the same all the way across. In other words, they don't change for each study.

Group No. 2 i a group of wells which have the producing ability of more than 77 MCF per day and less than the minimum allowable in cases where minimum allowable calculation was made.

The third group of wells is a group of wells with the producing ability of more than the minimum allowable, but actually calculate an allowable of less than the minimum. Therefore, are

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assigned the minimum allowable. In other words, if we're going to have a minimum we have to assign a minimum to all wells that are capable of producing. So, by using the cut and try method and the average producing abilities, I placed certain wells in that category. Of course, No. 4 group is the last group of wells, the wells which are prorated in accordance with the formula. Based on the market demand and the number of wells previously stated, if you'll follow vertically under zero minimum, we have 24 wells or 5.5% of the wells which have a producing ability of less than 77 MCF. This group of wells received in this instance 1.1% of the allowable, or 36,305.

Since we are not calculating any minimum here, we have no wells in groups 2 or 3, but the prorated wells in this case consist of 411 wells or 94.5%, which received 98.9% of the allowable assigned to the pool.

Now, the zero minimum breaking point calculates an allowable at 77 MCF, well, actually it's at 106 MCF, an allowable of 2500 MCF per month. It so happens that between 77 MCF and something slightly above, I could say what it was but I don't believe it's necessary, slightly above 106 MCF, there are no wells in this deliverability group.

Therefore, the jump from 77 to the next deliverability group, the wells in that group calculate an allowable, or wells below

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that group calculate an allowable with 2500 MCF. Therefore, in trying to arrive at a 2500 minimum, the minimum is not effective under these conditions of market demand and development.

In the next group to the right I calculated a three million minimum. Group 1 is the same as it was for the other groups. This is the point at which a minimum allowable does affect the allowables of wells above the zero minimum breaking point. In other words, in Group 2 we have 10 wells or 2.2% of the wells which receive an allowable based on the zero factors of 26,598, based on the three million factors of 27,583 or .79% of the allowable in the first instance and .82% for the three million.

Group 3 consists of 13 wells. Now, these are the wells which have the ability to produce above the minimum. This consists of 2.9% of the wells in the pool, and these 13 wells under the zero minimum formula receive 1.02% of the allowable in the pool, and with the three million minimum receive 1.5% of the allowable in the pool.

Of course, the wells above that point which are actually calculated on the basis of the formula consist of 89.4% of the wells. The zero minimum allowable would be 97.1% of the allowable assigned to the pool, the three million minimum would be 96.6%, or about 1.5% less.

Now, you notice that I have a little bar with a couple of

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arrows on it beside the zero minimum allowable. Obviously when you assign wells an allowable, or any wells in the pool an allowable above their calculated allowable for no minimum, that allowable has got to come from somewhere, you don't just reach out of the air and get it, so when you transpose the allowable from one point to the other, it comes from the better wells in the pool. That bar and the arrows are intended to show where that allowable comes from and where it goes.

You'll note at the bottom of the zero minimum column we have an allowable of 3,269,175 assigned to those 388 wells. That's where the allowable comes from that goes to groups 2 and 3. Distribution of that is shown by the arrows. In other words, Group 3 receives 4,706, or .14% of that allowable, and Group 2 receives 985, or .03% of the allowable. Both groups together only receive .17%, that's .17 of 1 percent or less than a quarter of a percent of the allowable assigned to the 388 wells. This is under current conditions, of course.

Now, moving on to the eight million minimum column, Group 1, of course, is the same. Group 2 consists now of 150 wells or 3% of the wells. The allowable assigned to these 150 wells for the zero minimum factors consists of 17.4% of the allowable. Under the eight million it consists of 23.7% of the allowable, and Group 3 we have 153 wells or 35% of the wells, which receive under the

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zero minimum factors 28.7% of the allowable. Under the eight million, 36.4% of the allowable.

Group 4, of course, consists of only 108 wells or 24.8% of the allowable, which receives 52.8% under the zero factors and 38.8% under the eight million. The transposition of allowable in this case has to come from the No. 4 group of wells, again, because that's the only place it can come from so a portion of the 1,777,218 goes to Groups 2 and 3 as shown by the arrows; Group 3 receiving 14.5% of that allowable and Group 2 receiving 11.8% of the allowable, or the two groups receiving 26.3% of the pool allowable from 24.8% or 108 wells. That's quite a shift in allowable for the eight million.

I might say at this point that I calculated this data on the eight million minimum not because I intend to recommend an eight million minimum, but because it was proposed in informal meetings that an eight million minimum was necessary in order to provide a well with a reasonable payout. I wanted the Commission to be aware of what the results of an eight million allowable would be, that's why I calculated it.

Q Do you have anything further with respect to Exhibit No. 1?

A I don't believe I do.

Q Have you prepared an exhibit showing the comparisons

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of these various minimum allowables?

A I found, to my dismay, that trying to graphically portray the information contained on Exhibit 1, it was a little difficult to do. Exhibit No. 2 is an attempt to do this, and I must admit it's not as clear as I would like for it to be.

(Whereupon, Commission's Exhibit No. 2 was marked for identification.)

Q You have used the same four categories of wells as shown on Exhibit No. 1 in your preparation of Exhibit No. 2?

A That's correct.

Q And these various categories are shown by number on the left-hand side of each bar graph?

A That's correct.

Q Would you explain to the Commission what you have depicted on your Exhibit No. 2?

A I've used percentages of wells and allowable on the vertical scale. Of course, on a bar graph there is no horizontal scale. I've divided these bars into three groups, zero minimum, three million minimum and eight million minimum. Under each group the left-hand bar represents the percentages of the wells in each group.

The next one over in the case of the zero minimum is the allowable, of course, in percentages. In other words, let me just run through this one briefly. At the bottom of the first bar

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we have 5.5% of the wells in the pool. Following the line between the two bars we see that that percentage of wells received in this case 1.1% of the allowable. In the case of the prorated wells in the pool which consist of 94.5% of the wells, they receive 98.9% of the allowable. Under the three million, the middle bar or the second one, the first one to the right of the percentage of the wells is the three million minimum bar, and the one on the right is the zero minimum. Now, looking at the bars at the bottom, I've tried to display as best I can without making the graphs unwieldy long, to show what percentage of wells in the pool receive what percentage of allowable under the two conditions shown. In other words, the effect of the three million minimum as compared with the zero minimum. I'm sure that is exactly what everyone here is interested in knowing is how a minimum allowable is going to affect them and their wells and their pocketbooks, incidentally.

As can readily be seen, without going into detailed figures, I will if you think it's necessary, the effect of a three million minimum under conditions as computed here is almost insignificant. On the right-hand column I've shown the very same information for the eight million minimum. You will note that when you go from three million to eight million that the relationship between the percentage of wells, as well as the relationship between the

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allowables between the eight and zero groups of wells, change very substantially.

Q Mr. Utz, you say that the three million minimum affects the situation very little as shown on your Exhibit No. 1. Referring back there for a minute, it only affects 23 wells, being 10 wells in Group 2 and 13 wells in Group 3, is that correct?

A That is correct, 23 wells are involved and are affected and the allowable transfer from the largerwells in the pool is only .17% of that allowable, of the Group 4 allowable.

Q Do you wish to discuss the information on Exhibit No. 2 any further?

A I don't believe it's necessary.

(Whereupon, Commission's Exhibit No. 3 was marked for identification.)

Q You have also drawn some curves as shown on your Exhibit No. 3 to show this comparison of effect for the various minimum allowables, have you not?

A Yes, sir, I have. This is another attempt to show the effect of the minimum allowables which have been computed here on the basis of allowable per month on the vertical scale and the deliverability MCF per day on the horizontal scale. Now, the previous exhibit just showed the relationship of wells to allowable. Naturally since we are involved with deliverability in the

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proration formula in this pool I thought it would be necessary that I show what the relation of allowable shift was, and the relation between the three curves which are allowable curves and deliverability. The curve which is marked zero minimum, which is the upper curve, depicts the distribution of allowable per month in relation to the deliverability of the well. This curve, as you see, runs on down here to where it intersects the hundred percent deliverability, or 100% ability to produce, whichever way you want to say it, curve. Then drops straight down to zero. In other words, this point here is the 77 MCF ability to produce previously discussed.

Below that group are 24 wells, as shown on previous exhibits. Above that group is 311 wells. I might say at this time that I only went to six million per month since that included, oh, I don't remember the percentage figure, but all but about five or six wells in the pool. Anyway, I'm not too interested in showing what happens out here, I just want to show the relationship between these two curves up to a reasonable point.

The next curve immediately below the zero minimum curve is the three million per month minimum curve. You will note that it is only slightly below the zero minimum curve. Down about, oh, in the neighborhood of 1300 MCF per day deliverability it actually crosses, this is a phenomena that just happens when you start

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shifting allowable. It actually crosses the zero minimum curve. From that point on down the allowables indicated on the basis of formula are very slightly above the zero minimum.

The breaking point in this case was 204 MCF per day. Therefore, all wells below 204 producing ability were put either on a hundred percent deliverability or a minimum. In this particular instance there were 13 wells to which the minimum applied. Those 13 wells are the wells which have the producing ability above three million a month.

Over to the left of the hundred percent deliverability curve there are 34 wells, ten of those wells are the ten wells that are shown in Group 2 on Exhibit 1. Those are the wells that are assigned a hundred percent deliverability or ability to produce, but are assigned more allowable in the instance of three million than they would be in the instance of the zero minimum. This can readily be seen, this relationship is relatively insignificant.

Now we see a decided change in the eight million curve. Actually, when you go to a minimum as high as eight million, some things begin to happen to you that you didn't quite anticipate when you started. We again calculated a breaking point here which is right at 1700 MCF per month ability to produce. From the breaking point down to the intersection of the zero minimum curve we have 30 wells. I'll come back and say a little more

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about those thirty wells. To the left of the zero minimum curve we have 123 wells. Now, again, these are 123 wells which have the ability to produce more than eight million but are assigned the minimum. From 261 MCF per day ability to produce, from there on down to zero, all wells are assigned a hundred percent deliverability. There are 174 wells in that group. In other words, this simply depicts that wells from this point of 1700 MCF per day ability are calculated on the basis of the formula and the factors, the A and AD factors that are left to allocate the gas to above this point here.

I said I was going to get back to these 30 wells. When we go to eight million per month minimum, and when we use the usual methods of determining the acreage factors and the AD factors for the wells which we have got to prorate, the remaining allowable left after the minimums and 100% deliverability is taken out of the pool allowable, we note that this eight million curve crosses the hundred percent or the zero minimum curve. Now, it's not my intention in recommending minimums to reduce the allowable substantially below the allowables that would be calculated by using the formula which we now use and which is our Order 1670. Therefore, I don't think that I would recommend an eight million minimum for the reason that by virtue of this minimum we have 30 wells in the pool which actually are assigned less allowable than

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the zero minimum allowable we calculated.

Q Mr. Utz, while you're referring to your Exhibit No. 3, would you care to speculate upon what that curve would look like if the present application before the Commission were approved?

A You mean the 40% deliverability and the 60%?

Q Yes, sir. In other words, your recommendations for minimum allowable are not solely dependent on the Commission retaining the present allocation formula?

A No, sir, they are not. I'm recommending that the Commission adopt a minimum regardless of what formula they decide to use.

Q So, if the Commission should go to a formula that included less deliverability and more acreage as factors for the allocation of production, how would you expect your minimum allowables to affect such a changed proration formula?

A As far as the position of this curve is concerned?

Q Yes, I thought you might be able to.

A Yes, sir, I can. I say I can come close to it. I can say this, I can hit it on the head as far as the fifty-fifty formula is concerned, because I happened to calculate one. That's this curve right here. Based on the same information that was used here by using a fifty-fifty formula, the position of this pointer would be the location of the curve which, in other words,

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down in here all wells below about a 7200 MCF per month producing ability would be on 100% deliverability. Those wells, of course, would be marginal wells or exempt wells, exempt marginal wells, whatever way we want to classify them, and all wells from this point up, which, incidentally, would be about 235 MCF per day deliverability, would have their allowables calculated on the basis of the formula.

Now, we can readily see what that does. That shifts allowable from up in here and down to this area in here. It was interesting to note that where the curve intersected the 75-25 curve with no minimum, the upper wells only from above about 5100 MCF deliverability, no, correction, make that 5,000 MCF deliverability per day, would receive less allowable under the 50-50 formula than they will under the 25, 75 formula. That is a very small percentage of the wells in the pool.

Q Now, Mr. Utz, in considering the establishment of any minimum allowable to prevent premature abandonment, you have to consider the economics of the production from Dakota wells, do we not?

A Yes, sir, we do.

Q With that in mind, have you prepared your Exhibit No. 4 for presentation?

A Yes, sir, I have.

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(Whereupon, Commission's Exhibit No. 4 was marked for identification.)

Q And your Exhibit No. 4, I believe, is an example of the income from various minimum allowables for wells in the Basin-Dakota Gas Pool. Would you explain to the Commission how you have prepared this exhibit?

A Well, it's relatively simple. I have calculated the general economics, based on a minimum of two million a month, 2500 a month, 3,000 a month and 8,000 a month. According to the best information I have, the value of Dakota gas at the present time, including liquids, is thirteen cents per MCF. I've used that figure as a gross income for each minimum. I've assumed that in most cases they have a royalty of 12.5%. As we found yesterday, there are cases where we have as much as 25%, so that would further reduce the economics.

I have used an actual well operating cost of $100.00 per month. Now, I realize that this figure can vary from company to company, and it is a very hard figure to pin down exactly. In the past few years we've heard quite a bit of testimony, we have done quite a bit of investigating, and we have heard in this hearing testimony of an actual operating expense of slightly below $100.00 a month and $150.00 a month. In the previous case, I think specifically in recent weeks, we had $175.00 a month testified

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to, so I feel that $100.00 a month is a reasonable actual operating cost to use in this case.

First, let me say that I made this computation on the basis of two million and 2500 simply because I wanted to show that if the Commission decides to adopt something below what I recommend as a minimum, what the economics of that condition would be. To be sure, the two million and the 2500 minimum under the present conditions of development and market demand will have no effect.

Now, the last column I've probably erroneously marked "gross monthly income". Actually, it ought to be gross monthly income after royalty and operating costs. We see a well with two million minimum would have $127.50 left. Now, this is the amount of money that the operator's got to put in his pocket and to consider future expenditures. It might be necessary, in order to keep the well on the line producing its reserves.

Under a 2500 minimum we'd have $182.38 left. Under three million, $241.25. Under eight million minimum, $810.00.

Q Mr. Utz, let's just pick the figure of three million for a moment. Do you feel that monthly income, $241.25 after royalty and operating costs would be enough for an operator to keep the well on the line and, therefore, prevent the premature abandonment?

A Mr. Morris, I feel that an operator that has $90,000.00 in a Dakota well and he's lucky enough that that well will produce

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three million MCF per month, and if he's further lucky enough to only have a 12.5% override, that $241.25 a month is a pretty insignificant figure, actually, in order for him to have any cushion so that he may make whatever necessary repairs that he might have to make to the well in order to keep the well producing gas into the line.

Now, on a five or six thousand foot Dakota well you can hardly move a rig over the hole for less than two or three thousand dollars, and that would include a swab job or various things of that nature. I'm not going to try to attempt to say here that kind of operations would be necessary for him to keep the well producing gas into the line, but I feel that $241.00 a month is as little as an operator should expect from this Commission in the way of income in order to do what little he has to do, minor operations for which he could expect a reasonable payout. Now, by reasonable, I mean anywhere from twelve to twenty-four months. Therefore, I recommend to the Commission that they set a three million minimum in the Basin-Dakota Pool.

Q Mr. Utz, from the information that we have available at the present time for the production in the Basin-Dakota Pool in 1962, since the period in which you made your study here, how many wells would have been affected by your recommended three million minimum?

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A Well, you're giving me one there, Mr. Morris, that I didn't calculate. I didn't calculate it simply because there's quite a little time involved in making these computations, it's not as simple ar it looks like on the graph. As a matter of fact, I spent two or three months at it. Therefore, I can't answer your question. I don't know how many wells would be affected. Certainly it would be, well, I'll put it this way, after I got December and January production in I discovered that the market demand which I should have used is about 20% higher than the one I did use.

Now, as far as I'm concerned, this is in my favor because these curves here show the effect if the market demand would drop 20% over what it is at the present day. If the market demand were 20% higher we would have less effect than I show on this curve.

Q Isn't it a possibility, or very good probability that because of the high demand in the first part of 1962 and the last part of '61 that no wells would have been affected by your three million minimum?

A It's quite possible since there are only 23 wells affected now. Further, I might say, for what it's worth, that I think that some of the increases in production at the present time is due to the fact that there were somewhere around 100 to

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150 Dakota wells which were tied into the Pictured Cliff lines during the middle part of 1961, and simply because they didn't want to produce the allowable then which is legitimate, if they produced the allowable they would cut off Pictured Cliff allowables, but consequently those wells accrued a goodly amount of underage. They are now connected to Dakota lines and are now, in my opinion, producing a large amount of that underage.

Q Mr. Utz, would you very briefly review the effect of a three million minimum upon the four groups of wells that you have used as the basis of your study?

A In reviewing the effect of a three million minimum as recommended, we only need to refer to Exhibit 1 again. Now, the only wells that can possibly be affected adversely under present conditions is the Group 4 wells; these wells under the present formula without a minimum would receive 97.1% of the allowable. It's 388 wells. Those wells are the ones that's going to have to contribute allowable down to the minimum wells. And the percentage of the 3,269,175 MCF that they will contribute is .17% of 1%. Divided among 388 wells they probably will have to get something different than a slide rule to figure out what the loss in income would be.

I'm not saying that this is the condition that's going to exist on down the road because as the pool depletes, this minimum

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is going to have more effect.

Q With more wells having been drilled in the pool since the time you made your study, it still wouldn't necessarily affect the percentage of allowable that would be shifted from your Group 4 wells, though, to your Group 2 and 3 wells?

A I didn't quite understand the first part of your question.

Q In other words, we have had more wells drilled in the Dakota and put on the line since the time you made your study?

A Oh, yes.

Q That would not necessarily, however, affect the percentage of allowable transferred from the Group 4 wells to the Group 2 and 3 wells?

A It would depend on the relationship of market demand and deliverability of the newly connected wells.

Q But just the fact that there have been more wells would not necessarily affect your percentage?

A If there were, there might not be any affected except the upper wells. They might all be affected. Well, they couldn't all be affected because there has been about 150 wells connected.

Q Did you prepare Exhibits 1, 2, 3 and 4 in this case?

A Yes, sir, I did.

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MR. MORRIS: If the Commission please, we offer Exhibits 1 through 4 as prepared by Mr. Utz in this case.

MR. PORTER: Without objection, the exhibits will be admitted.

Q (By Mr. Morris) Do you have anything further you would like to offer?

A I'll probably offer something further, but not now.

MR. MORRIS: That concludes the direct examination of Mr. Utz.

MR. PORTER: Mr. Utz will take the stand again for cross examination immediately following the noon recess. The hearing will recess until 1:30.

(Whereupon, a recess was taken until 1:30 P.M.)

AFTERNOON SESSION

MR. PORTER: The meeting will come to order, please. Mr. Utz, will you take the stand, please?

MR. MORRIS: With the permission of the Commission, Mr. Utz has one statement that he would like to make as a matter of direct testimony before he is cross examined. Mr. Utz, did you have something further to offer?

A Yes, sir, I have one more statement in the matter of direct testimony which I would like to make. I'm not entirely sure that the Commission understands exactly what will happen,

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at least I don't feel that I made it clear exactly what would happen without a minimum.

MR. WALKER: Is it absolutely clear to you, Mr. Utz, as to what would happen?

A I'll say this, if it isn't now, it never will be, but without a minimum the same thing will happen in the Basin-Dakota later on in the depletion life of the pool that is now happening in all the Pictured Cliff pools except Tapicito and also in the Mesaverde, whereby the formula actually calculates and assigns two well allowables in the category of 300,000 a month. Many of them are under a million a month.

Now, to assign a well this amount of allowable when the well is capable of producing more than this, in my opinion, is causing premature abandonment of these wells and thereby causing waste of the reserves which would otherwise be produced if the wells had a little more allowable. That's all I have.

MR. PORTER: Anyone have a question of Mr. Utz? Mr. Keleher.

CROSS EXAMINATION

BY MR. KELEHER:

Q Mr. Utz, as I understood your testimony, you stated that the presence of a 25% acreage factor actually in itself provides an adequate minimum allowable in the Basin-Dakota Pool at this time?

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A At this time under the present market demand, which is up over the period that I made these calculations from, the acreage allowables for the last four months have been in the neighborhood of thirty-five to forty ~~thousand~~ Hundred.

Q Would not the effect of establishing a minimum allowable in effect increase the acreage factor in the current formula, would this effect not increase as time goes by, and additional wells are drilled in the pool?

A As I stated, Mr. Keleher, as the natural depletion of this pool goes on, on down the road somewhere, I can't say where, maybe five years, maybe ten years, that this pool will reach the same stage as some of our prorated pools are now, and we will, actually, based on the 25% acreage, assign allowables less than the minimum I recommended.

Q Now, in your concern for the prevention of so-called premature abandonment of wells, it is, of course, true, is it not, that all of the wells some day will have to be abandoned because of the depletion of their recoverable reserves?

A Oh, I think that's very apparent and true.

Q In order to artificially extend the productive life of certain wells approaching abandonment, is it your recommendation to the Commission that actual market allowable be transferred from the wells with substantial remaining reserves in order to

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extend the life of those wells, the reserves of which have already been depleted, would this not result in a transfer of reserves from the non-depleted wells to the depleted wells and be a direct violation of correlative rights?

A In the first place, Mr. Keleher, the question is quite long, in the first place I think you have made an assumption that these wells which I recommended minimums for are depleted. In my opinion they are not depleted, they just don't have allowable or enough current income to keep them on the line or pay the operators to keep them on the line so they can go ahead and produce their reserves.

Now, to be sure, when that day comes you are going to have to take allowable from the better wells in the pool to supplement these wells. I don't think that's improper.

Q Since there is apparently a serious question in your mind as to the actual effect as to the minimum allowable suggested in the future, and since you have stated that it is not necessary at this time, would it not be more logical to consider the recommendation at a future time when the facts are available in the light of future development and drilling of additional wells?

A I don't think so, sir, or I wouldn't have been up here giving this testimony today. I think we know what's going to

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happen on down the road, we are not sure of the exact figures or the exact effect, but we know that one day these wells are going to be assigned allowables calculated under the formula too low to keep them producing on the line. This much I know for sure, Mr. Keleher, that it doesn't sit just right with me having to administer the gas allowables to assign a well less than a million cubic feet per month, and the income from that will not allow him to do a thing for the well. He might not even pay his current operating expenses and then I turn right around and kick him in the teeth once more by saying "You have got to test that well whether it can be tested or not". Most of the little wells have water problems, liquid problems that's almost impossible to test them. If I am going to assign them allowables under a deliverability formula, I have to have a test on them. I just don't feel like it's right.

MR. KELEHER: I have no further questions.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Stockmar for Consolidated.

BY MR. STOCKMAR:

Q Mr. Utz, referring to your Exhibit No. 3, the graph on the board --

A Yes, sir.

Q -- the small triangle, which I understood to be a

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result of a 300,000 minimum, is that correct?

A You are referring to this small triangle in the vicinity of 200, 300 deliverability?

Q Yes. Before that horizontal line curves up it does not cross the zero minimum line, does it?

A It doesn't until it reaches around 1400 deliverability, I believe. No, 1200 deliverability.

Q Then it would be possible because you were, in speaking of the eight million minimum, you were concerned about the thirty wells that might be put in a category, it would be possible to substantially increase the minimum over the, what is it, three million, yes, it is three million a month, is it not?

A That's what I recommended.

Q It would be possible to substantially increase that without crossing the line, as you say, and bringing wells into this awkward category?

A Yes, sir, it would be. Anywhere between three million and eight million, somewhere, I didn't make the calculation to see because I didn't feel that I was in the position of recommending minimums in excess of three million for the purposes of premature abandonment, and that's what I'm here for.

Q Yes. Referring, if you will, Mr. Utz, to your Exhibit 4 which is the example of income for various minimum allowables?

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A Yes, sir.

Q I believe that you testified that the royalty figure was at the minimum twelve and one half percent?

A Yes, sir.

Q The amount deducted, I believe, because of some small overriding royalty, say five percent, which the Government has used as a minimum for small wells in the past might add another ten dollars to that royalty figure?

A That would be pretty close.

Q I believe you testified that the operating cost of $100.00 was a bare minimum?

A I feel that it's below the average.

Q Now, as I understand your table here, each additional one million increases the gross monthly income, as you have tabulated it here, by $113.75, is that correct?

A Each million?

Q Yes, sir.

A $130.00 I believe. Oh, you are referring to the gross income figures?

Q Yes. I subtract $127.50 from $241.25.

A That will be very close.

Q And it is consistent with the $110.00?

A Yes.

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Q $113.00 a month for each additional one million minimum. It has occurred to us that a very important practical problem that each operator must face realistically is the possibility of the salvage value of his wells. Let us assume that that is in the area of $15,000.00, does this sound reasonable to you?

A From what I know about it, and from testimony that's been given to me in various hearings, I think that's a reasonable figure.

Q Looking at the three billion minimum column, I believe you testified that this extra money of $241.00 a month was just barely enough to provide a slush fund to maintain the well to take care of it. To provide funds for workovers, repairs, tests, that kind of thing, was that correct?

A That's true, and profit, if any.

Q Then an operator who is in business to make money with a 3,000 minimum is looking at $241.00, which is a break-even figure at that point, may or may not include any profit. He is also looking at his equipment which is worth $15,000.00 to him in cash that he can take and invest elsewhere. He has the very real practical problem, does he not, of deciding whether to go along breaking even with his equipment deteriorating, rusting, or take his $15,000.00?

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A Is that the end of your question?

Q Yes, sir.

A I don't think he'd be a prudent operator if he didn't make that consideration.

Q Let us see, sir, then what in a sense the present worth or monthly income necessary to equal $15,000.00 is. At 6% on your money, that's what, $75.00 a month?

A On $15,000.00 I get 90.

Q $90.00 a month? A Yes, sir.

Q If the operator, he would still just be breaking even at the first $90.00 because that's simply what he could earn on his money. Would he not normally rather have the money if he plays in the oil business at all, does he not expect better than 6% return on his money? He might seek $180.00 or $270.00 at that point before he would prefer to leave the equipment and to continue to produce the well. Is that not a reasonable attitude for him to take?

A Yes, I think so.

Q Then, to replace the present worth of that money to him, if we add additional millions to the minimum at $113.75 a month, we have to add two and a half million, raising it to five and a half million, do we not?

A If you are going to make that consideration, yes, sir.

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Q These are based on conservative estimates of the royalty burden, of the operating costs, and so forth. I realize that in directing your attention to this problem you are staying within the confines of the statute?

A That's correct.

Q But is there in this money any interest factor, return on his investment for drilling the well, there is not, is there?

A Very little, if any.

Q Is there any room at all for a recovery of his investment, the $90,000.00 that he spent for the well?

A Well, sir, that depends on how long the well has been producing. If he only had a three million well to begin with, no. If the well had been producing at volumes in excess of that in order to receive a payout before he reached this point, well, yes, he wouldn't have a consideration as far as payout is concerned.

Q I assume if he's not receiving either interest on his money or recovery on his investment, then there's not also any profit to him involved?

A I think that follows.

Q As I understand our discussion here, which it has been, it would seem that a realistic minimum might be five and a half million, six million, which, referring back to Exhibit 3, will not place any unusual number on wells in the difficult category, is

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that a reasonable assumption?

A Answering your question in this manner, if you consider the things that we have discussed here, I think that's true. However, my legal counsel advises me that there's some question as to what would constitute proper lifting costs, and that is within the scope of the statute. In other words, I didn't feel like I could get on the stand here and argue about what lifting costs was above something that might be reasonable.

Q If the construction we have placed on this here in this interrogation does meet the legal requirement, is it possible that you might be willing to revise your recommendation with respect to the minimum upward to five and a half million or six million?

A You say if it does meet the legal requirement?

Q Yes, sir.

A I think that it has some merit.

MR. STOCKMAR: That's all the questions I have. Thank you.

MR. PORTER: Does anyone else have a question of Mr. Utz? Mr. Everett.

MR. EVERETT: Everett for Ohio Oil.

BY MR. EVERETT:

Q Mr. Utz, referring to your example of income, I notice you use a number or a figure for the worth of gas or the value

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of gas of 13 cents per MCF. Does that take into consideration any of the value of liquids in the gas?

A Yes, it sure does, about a penny.

Q You disagree with the testimony yesterday to the effect that that gas had a worth of 16 cents per MCF?

A I know nothing about Consolidated contracts, I got this figure from a purchaser which tells me that the price, the base price of gas is 12 cents per thousand with a guarantee of one cent per thousand, and on the average it doesn't run over a penny a thousand.

Q But, if the evidence showed that the value of the liquids, when added to the 13 cents, and I believe the testimony of Mr. Trueblood yesterday was it was 12 cents plus a guaranteed minimum of a cent, his testimony was, as I recall it, was 12 cents plus a minimum of one cent, plus an additional two cents for separator liquids, or the liquids that are taken out of the gas, making a total of 16 cents per MCF. Do you recall his testimony?

A Yes, I believe that's true.

Q Well, is that accurate or inaccurate?

A I was trying to use an average figure here. Not all Dakota wells produce liquids. The average GOR of Dakota wells are in the neighborhood of 70 thousand to one. If the 13 cents

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does not include those tank liquids, well, then, there would be income in excess of the 13 cents.

Q Let's take your figures, and using the testimony we had yesterday, let's add the three cents a thousand to the value of gas. You are looking at the economics, you have to, in my opinion, you must look at all of them, and certainly whatever value is in that gas is part of the economic picture. Isn't it a fact if you added three cents to the price of your gas that your figure for the 2,000 minimum on this exhibit would be increased by $60.00?

A $60.00 for which one, the two million?

Q The two thousand minimum, your figure for gas at 16 cents, we are reading it now instead of being 260 would be 320, is that correct?

A Well, it would increase my last figure, if that will suffice for an answer, to $187.50.

Q Instead of $127.50?

A Of course, that doesn't include royalty.

Q You would also have to increase your royalty. You can check my figures. I have figured it out, I can't testify, but you can. Gas at 16 cents, and going across your line 1 following that, my calculation is that the $260.00 would be increased to 320, the 325 number would be increased to 400, the $390.00

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would be increased to 480, the 8,000 minimum figure would be increased, the 1,040 would be increased to 1280. Your second column, your royalty colum or schedule across there would be increased as follows: $40.00 instead of $32.50; $50.00 instead of $40.62; $60.00 instead of $48.75; $160.00 instead of $130.00.

The third column I have left the same, your gross monthly income column would then wind up $180.00 instead of $127.50; $250.00 instead of $182.38; $320.00 instead of $241.25 and $1,020.00 instead of $810.00.

I think the record does show that the value, certainly at least insofar as the record at this point indicates, that the values of those operators who have testified is 16 cents per MCF. If that is the fact, then, in figuring the economics of those operators, would these numbers I have given to you be approximately correct?

A Just eyeballing them, I'd say they'd be close.

Q So that your economic picture changes. You also heard the testimony yesterday that some of the gas contracts have escalation or price increase clauses, did you consider that 13 cents per MCF would be the highest price received for gas during the remaining productive life of the field, or did you take into consideration the possibility that there would be an increase in price of gas?

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A I don't propose to try to out-think the Federal Power Commission as far as price increases are concerned.

Q Well, we're all in that same boat. One other item which was mentioned in some of the examination concerned an over-riding royalty. Do you feel that it's proper for the Commission, or that you should recommend to the Commission in the way of a minimum formula, or a minimum allowable, a number that would take care of an operator whether he improvidently or otherwise had high overriding royalty on his production?

A Well, firstly, I think you should understand that is quite normal to have an additional 5% override, which I didn't put into my calculation here, anywhere from zero to 5%, since that does vary I didn't want to put it in here. To further answer your question in regard to royalties in the neighborhood of 24, 25%, I think that all operators, large or small, and I also think it's the American way of life, to take a gamble. The Pilgrims did. If he is taking a gamble on paying that much royalty I think he should be given some consideration for it.

Q You think that that's the proper function of government to protect him against his own gambles?

A No. That is why I didn't include any more than 12.5% in my figures.

Q Then, your answer to my question is that an overriding

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royalty regardless of amount should not be considered in determining the economic life of a well?

A I think a reasonable overriding royalty should be considered. And by reasonable, I would say 17.5%.

Q Total royalty or overriding royalty?

A Overriding royalty.

Q Making a total royalty of 25%?

A No, sir.

Q 32.5%?

A No, total royalty of 17.5%.

Q You are talking about a 5% override now?

A That's true.

Q The evidence showed that it had no override on its leases, none whatever, do you think that it should be penalized because it did not have that override, by having some of its income taken to take care of the fellow or the company which it might have helped by giving it acreage to drill?

A Mr. Everett, I don't propose at any time to try to study the economics on each and every well for which we should give a minimum to. I have strived here to use figures which were average, and I thought normal. Now, if he has more royalty than I figured here, he's just going to have a little rougher time getting his gas out of the ground under my recommended minimum.

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If he has less, well, then, he's just lucky.

Q As I understand the statute with reference to determining the premature abandonment of wells, and you said you had been advised by your attorney, what items did he advise you as being proper to include in determining whether or not any given lease or well might or might not be prematurely abandoned?

A The figures that I have used here as being normal and reasonable.

Q Beyond that he would not advise you to go, I take it?

A That's true.

Q It was based upon his advice that you used these minimums, then, instead of some other figure?

A I think that we would very well have gone along with another 5% royalty.

Q I'm asking you what your advice was, that this was the maximum to which you could go?

A No, I wouldn't say that that was the precise advice. The precise advise was that we could use whatever we could reasonably call lifting costs.

Q In your figuring lifting costs, did you endeavor to figure it on a cents per MCF basis?

A No, I consider lifting costs included in the $100.00 that I have included here, plus some other incidentals that we

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all know, and you, too, that do incur in the operation of a well.

Q But you didn't endeavor to figure it on a per MCF basis, that was my question?

A No, sure didn't.

MR. EVERETT: That's all.

MR. STOCKMAR: May I correct the record?

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: I believe that Mr. Trueblocd testified that as to all wells, the total cost of gas and condensate might average 15½ cents. It was Mr. Everett that testified that 16 cents would simplify his calculations. That convenience should not carry over into the record here.

Secondly, let us look at the realistic results of the operation of a small well. Does a small well produce the average amount of condensate per MCF?

A No, sir, it does not.

BY MR. STOCKMAR:

Q Is it possible that a three million well will not produce any condensate or a very small amount per month?

A Usually most Dakota wells produce some liquids. We have GOR's which I've looked at in the San Juan Basin in the Dakota Pool that range from, well, zero to some of them as low as 4,000. I think that's evidence in itself that just because

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you are going to get three million cubic feet of gas, you can't be assured of any amount of liquids.

Q You might get something like five barrels a month, is that per million?

A You could.

Q And that you have to put into the tank?

A That's true.

Q Might take several years to fill the tank, is that correct?

A Well, it would depend on the size of the tank.

Q If it's any larger than a bucket, will a certain amount of evaporation take place so that the condensate cannot be sold at a profit?

A These are high volatile liquids, if they are let to weather too long you will lose a lot here.

Q Is the remaining two and a half cents of Mr. Everett's three cents a realistic figure to consider to add to your 13 cents for these small wells?

A That is the reason I didn't consider liquids, because if a fellow has liquids that he can gather in a well, I think he's just one of the fortunate operators, and because, I can't rest assured that he's going to have any liquids at all, I didn't include them in this thing because they vary too much.

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MR. STOCKMAR: Thank you.

MR. EVERETT: I think the record will show I used the 16 cents as a matter of convenience. It will also show that the 16 cents was used by the witness as a matter of actual calculated price.

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company.

BY MR. HOWELL:

Q Mr. Utz, of all of the gas pools in the San Juan Basin, the Basin-Dakota at the present time has the fewest wells that are in need of a minimum allowable, does it not?

A Excluding Devils Fork, I think that's true.

Q Devils Fork is a rather peculiar situation since there is a volumetric formula in effect there?

A That's correct.

Q So, of all the pools, would you not say at the present time there is less need of going into the problem of the minimum allowable in the Basin-Dakota than there is in any other pool?

A At the present time, yes, but the day will come.

Q Now, in your opinion are there pools in which this problem is a serious one that must be met?

A Yes, sir.

Q Well, wouldn't it be better to put a patch on the

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fellow that's got a hole in his side than one that's got his thumb stuck with a needle?

A Well, Mr. Howell, maybe we ought to take some precautions to keep from getting that hole in his side.

Q Aren't you, if you accept a certain figure in this Basin-Dakota Pool, to some extent prejudging questions as to minimums that may arise in other pools?

A I wonder if you would repeat that?

Q Aren't you, by establishing a minimum here, assuming that the Commission should accept your recommendation, aren't you then setting a precedent in this pool that may be effective in other pools that have entirely different characteristics and entirely different problems?

A You mean precedent as to a minimum allowable or a certain minimum allowable?

Q Either.

A Oh, not necessarily, I've known the Commission to do things that it didn't repeat.

Q Well, if according to your testimony--of course, you have known some of us to change our minds too, haven't you?

A I have. I didn't mean to infer that was improper.

Q But my point is this, that if you take the pool that has the least need of minimum allowable of any in the Basin and put it

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in at this time, doesn't that, to a marked degree, prejudge cases involving other operators who have had no right to appear and no right to present their arguments pro and con?

A Well, Mr. Howell, I think when we set the 25, 75 formula in the San Juan Basin, we did just that, and I don't see any more harm in prejudging a minimum allowable than I do a formula in a pool.

Q You would not, then, carry the recommendation as to the amount of the minimum allowable in this pool over into any other pool?

A No, sir, I would study it for what it was at the time I made the study.

Q And would recommend that be done in the event the question is raised in another pool?

A Yes, sir.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question of Mr. Utz?

MR. MORRIS: I have a question on redirect.

MR. PORTER: Mr. Morris.

REDIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Utz, in determining how much monthly income a well should have in order to prevent premature abandonment, did you

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take into account costs of workover?

A No, sir. I merely used what I would say is a minimum judgment figure as to the amount of pocket money, shall we say, that an operator should put in his pocket for profit, or a reasonable payout on minor repairs that he might have to make to his well in order to keep that well producing into the line and recover the reserves and prevent waste.

Q Would it be a fair statement that costs of workover would be recouped by the additional ability of the well to produce as a result of the workover and, therefore, you did not consider that in your calculations of reasonable lifting cost?

A I did not consider that, Mr. Morris, for the reason that a workover on a well is a matter of judgment as far as the individual operator is concerned and can be just as risky as drilling the well in the first place.

Q Mr. Utz, adding another 5% or so of overriding royalty to the 12.5% figure that you have already used in your computations, would make little difference in the figures that would be available to an operator's monthly income, would it not?

A Yes, that's true, it would, and for that very reason, as I stated, I'm using minimum figures here.

Q In fact, it would make such little difference that it would make no difference as to your recommendation in assigning

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3,000 minimum?

A I think we are talking about pennies as far as investment is concerned.

Q Mr. Howell was concerned on cross examination with our giving consideration to the establishment of minimums in the Basin-Dakota Pool at this time, and expressed concern that perhaps the Dakota needed help less than other pools in the San Juan Basin. Is the Commission and are you presently engaged in a study of minimum allowables in other pools at this time?

A In every other pool in the San Juan Basin.

MR. HOWELL: Ben Howell with El Paso.

RECROSS EXAMINATION

BY MR. HOWELL:

Q One other question, Mr. Utz. Mr. Morris mentioned a workover. From your experience, wouldn't you say that when an operator works over a well he expects to recover his workover costs out of the increased production from that well?

A Well, I think he wouldn't be a very prudent operator if he didn't expect to, he may not do it, you know.

Q That's right, he may not do it. On the other hand, when the operator works over that well he intends to make a profit out of the workover, and it shouldn't be charged against the current production that he's got there. He's not intending to pay it out

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of that current production, is he?

A On the minimums I recommended here he couldn't possibly do it.

Q So that any workover he would anticipate, if he were a prudent operator, that he would recover those costs from increased production?

A He should.

BY MR. EVERETT:

Q You testified, Mr. Utz, and I think this is an accurate transcription of your testimony at this time, the acreage factor does provide an adequate or sufficient minimum. Do you recall that testimony?

A Yes, sir, that's true.

Q At what time in the future do you think the present acreage factor would cease to provide an adequate or sufficient minimum?

A Well, Mr. Everett, I haven't looked at my Ouija board lately, it hasn't been too good anyway. I can't sit here and tell you how the Basin-Dakota Pool is going to develop from now on and what the deliverabilities of the wells that are going to be drilled from now on or whether there's going to be 10% of the acreage developed or 100% of it, so I can't make any prediction as to exactly what is going to happen as far as these minimum

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allowables are concerned on down the road. Heaven knows if we don't do something for the market in San Juan Basin there probably wouldn't be any more development in Basin-Dakota.

Q To get back to my question, you wouldn't even hazard a guess whether it's five years, ten years or what?

A I think we can probably to some extent, at any rate, I'll say to a large extent, judge the Dakota Pool by what has happened in the Mesaverde. They're probably about the same size in areal extent, the only difference is that we don't need the gas now and we did when they were developing Mesaverde. And I would say that the development in the Basin-Dakota is going to be substantially slower than it was in the Mesaverde. Probably, well, I don't think I would be too far wrong in saying that the pool wouldn't be fully developed in five years, and maybe longer.

Q But I'm asking you about whether the acreage factor does provide an adequate or sufficient minimum. You have already testified that it does?

A At the present time.

Q Are you saying that you cannot or will not give your best opinion as to when it will cease to provide an adequate or sufficient minimum?

A Anything I gave you, Mr. Everett, would be a stark guess. If you want me to guess, I'll guess right with you too

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years.

Q That's what I want is your guess. You recommend to the Commission to put it in effect now, and I wondered as to when we might need a minimum from the standpoint of your testimony.

A Of course, if we get a substantial increase in market demand it might be five years too.

MR. PORTER: Does anyone else have a question of the witness? Mr. Buell.

BY MR. BUELL:

Q Mr. Utz, recalling your testimony generally with respect to your Exhibit 4, and particularly with reference to your testimony relating to the difficulty you had arriving at your hundred dollar operating cost figure, do you recall that testimony?

A Yes, I recall the testimony. I don't recall that I was unduly worried about the difficulty.

Q You know that you pointed out that you had seen one operator with an average cost of 75, another one with slightly less than a hundred, another one with one hundred and fifty, and you recalled in a hearing a few weeks ago 180, I believe it was.

A 175.

Q I wonder, Mr. Utz, due to that difference with an individual operator from less than 100 to 175, don't you feel that the Commission could more intelligently appraise and realistically

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set a minimum if it was considered on an individual well basis rather than a poolwide basis?

A Yes, sir, I think that's true, but I think it would be most impractical.

Q Well, impractical from what sense, Mr. Utz?

A Well, let's say from the administrative standpoint if nothing else. We would have to set up --

Q I realize it would be easier for you to set it on a pool-wide basis, but don't you feel that the opportunity for violation of correlative rights would be more apt to occur when you handled it that way than if you looked at it on an individual well basis?

A I'm not real sure they would be.

Q For instance, Mr. Utz, let me advise you, or let me ask you to assume that Pan American's average operating cost on a Dakota well is $50.00 a month.

A I understand that.

Q If your recommendation of a gross monthly income of $240.00 or $241.00 will prevent premature abandonment, Pan American could operate a well without abandoning it prematurely with a minimum of only 2500, 500 less than your recommended minimum, because our operating costs are only $50.00 rather than a hundred a month.

A In arriving at operating costs, as you well know,

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Mr. Buell --

Q So we would get almost the same monthly income with 2500 as an operator with $100.00 a month would get with 3,000?

A I was still cogitating the last question. Will you repeat that?

MR. PORTER: I don't believe it was a question. I believe it was a statement.

Q What I was saying, Mr. Utz, and what I will ask you, with our $50.00 a month well costs --

A Yes.

Q -- we would achieve the same gross monthly income with a minimum allowable of 2500 as would an operator with a hundred dollars a month average operating costs get with the 3,000 a month minimum?

A That's true, if your $50.00 includes the same items that the operator with the hundred dollar cost included.

Q Yes, sir, I feel sure it does, and assuming it does and Pan American was granted a blanket minimum of 3,000 as you recommend, it would be violating the correlative rights of the other operators in the pool, would it not?

A I'm not real sure that would be true, no, sir. At least I can say this to answer your question --

MR. PORTER: Just a minute until he finishes his answer.

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A I can say this, that you would be making a little more money than the other fellow but I wouldn't say that you'd be getting more than your share of the gas. That's correlative rights.

Q But I would be realizing more gross monthly income than would be necessary to prevent premature abandonment?

A Well, if you want to take about $50.00 a month, yes.

Q Mr. Utz, I believe the record is crystal clear that it is your opinion that there is no need for this minimum at this time. I wonder if the record is as clear that the relationships that you've established with your categories and the effect of adopting the minimum at this time would be greatly changed by the time a minimum became necessary?

A The effect of a minimum is difficult to anticipate, Mr. Buell. It depends on the development in the pool, the relationship between acreage factors and deliverability as far as the basis, and the reason for having a minimum outside of increased costs on down the road, there are other factors in operating a well, the price of gas, possibly they wouldn't change.

Q I don't believe I made my point.

A The principle would still be there.

Q Excuse me?

A The principle would still be there to prevent premature

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abandonment and waste.

Q I don't believe you understood the point I was driving at. The Commission here today, looking at your work that you have introduced, they would say to themselves this, "We adopt the 3,000 minimum, it would affect the good wells very little". I believe you said one percent that you would take from the good wells to give to the poor wells?

A Less than a quarter of a percent.

Q Isn't that true because at this time there is no need for a minimum?

A A minimum at this time would not be effective. I think there's just as much need to put a minimum in the rules now to be used on down the road, as it is for some other pools.

Q But, at the time that minimum is actually needed, Mr. Utz, is it not a matter of fact that the disturbance of correlative rights will be much greater in that you will have to take a lot of gas away from the good wells to give to the poor wells?

A The shift in allowable will be greater, yes, sir. I wouldn't --

Q Don't you think there would be merit in the Commission waiting until a minimum is necessary so that you could make another study similar to the one that you have made so that the Commission could then tell what the actual effect of adopting a

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minimum was going to be on the pool?

A No, sir, I don't.

MR. BUELL: That's all.

MR. PORTER: Mr. Kellahin.

BY MR. KELLAHIN:

Q Mr. Utz, I want to clarify one point brought out by Mr. Buell, if I can. I believe you testified that in the event a minimum of 3,000 cubic feet were assigned to Pan American, they might get more than their share of the money but not more than their share of the gas, is that correct? Did I understand it correctly?

A You mean my answer to Mr. Buell?

Q Yes.

A Yes, sir.

Q In effect, then, are you saying, Mr. Utz, that the wells in the Basin-Dakota Pool have sufficient reserves that with the assignment of 3,000 cubic feet there would be no possibility of violation of correlative rights? That would be the result of your answer?

A No, I don't believe it would.

Q On what do you base your conclusion, then, that there would not be a violation of correlative rights with the assignment of this allowable, the minimum allowable?

A That there would not be a violation of the correlative

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rights with the assignment of the allowable?

Q Yes.

A The assignment of a minimum, to be sure, takes some allowable from the higher wells, the bigger wells. Now, if you make the assumption that you are protecting correlative rights with the formula that you have now by allowing each well to produce the reserves under his tract, which is my understanding of what we are supposed to do, then in that instance if I assign a well more allowable than the formula permits, I would be disturbing correlative rights, but not to any great extent.

Q Then, on the basis of your recommendation you feel there would be no violation?

A Again, I'd have to make the same assumption to answer your question.

MR. KELLAHIN: Thank you.

MR. STOCKMAR: One more question.

BY MR. STOCKMAR:

Q Mr. Utz, your work is based on 435 wells?

A Yes, sir.

Q On that basis, then, the existing 25% acreage you say is the near equivalent of a minimum allowable. In connection with this ten-year guess that you made a moment ago, does it not follow that the moment you have 870 wells, twice what you have

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now with the same market, that the time has come to double the acreage factor?

A Why it certainly does. If you don't increase your market demand you double the number of wells, you are very nearly if not exactly, I'm not real sure how it would calculate, but you would be approximately halving your acreage factor.

MR. MORRIS: One more question, please.

MR. PORTER: Mr. Morris.

REDIRECT EXAMINATION

BY MR. MORRIS:

Q Of the 435 wells in your study I believe you have testified previously that 23 of them were actually affected by a 3,000 minimum, is that correct?

A Well, 23 wells have an increase over the zero calculated allowable.

Q Yes. So those 23 wells were affected beneficially if the 3,000 minimum had been in effect?

A That's true, and there would be a lot of other wells that would be very minutely affected adversely.

Q So it would not be a fair statement to say that the 3,000 minimum would have no effect whatsoever?

A No, sir. No, sir, it would have an effect, using the additional wells that have been connected since the time that I

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drew a deadline and started my study and the increase in market demands, I don't know for sure whether there'd be any of those 23 wells affected beneficially or not, but in my opinion there would still be approximately that many.

Q Mr. Buell suggested that we ought to look at minimum allowables on a well by well basis. We all know what happens when the Federal Power Commission decided to look at each company on a company by company basis instead of on, say, an area pricing basis?

A Yes, sir, they had a landslide of papers.

MR. MORRIS: No further questions.

A I think that's just what would happen to us if we started having hearings on every well. We would either have to set up an administrative procedure, which in itself would be subject to much scrutiny, an operator can do a lot of things with his figures that he would submit for operating costs. He could include things that other operators wouldn't include. You'd have a heck of a time deciding whether it was a proper picture.

MR. PORTER: Any further questions? The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Kelehar, are you ready to go forward

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with your testimony?

MR. KELEHER: We are, Mr. Chairman. The witness has been sworn.

BILL A. STREET

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q I will ask you to state your name to the Commission.

A My name ic Bill A. Street.

Q Have you been qualified as an expert witness before this Commission?

A No, I haven't.

Q What are your qualifications, Mr. Street?

A I received a Bachelor of Arts in 1949 and a Master of Arts in 1951 in geology from the University of Missouri. I worked for the Pure Oil Company for three years from 1951 to 1954 in the four corners area. After leaving the Pure Oil Company I went to work for Pubco Petroleum Corporation in 1954 in the San Juan Basin of New Mexico. I have worked for Pubco eight years and am now chief geologist for this firm.

Q Are you familiar with Pubco's operation in the San Juan Field?

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A Yes.

Q What is Pubco's acreage position in the San Juan Basin at the present time?

A Pubco has approximately 40,000 acres under lease in the San Juan Basin.

Q Does Pubco plan to drill any wells in the San Juan Basin in 1962?

A Approximately 18 wells are scheduled for this year.

Q What is the total number of wells Pubco has an interest in and operates in the San Juan Basin at the present time?

A Pubco has an interest in 162 and operates a total of 81 gas wells.

Q Does Pubco operate any Dakota gas wells in the San Juan Basin?

A Yes, nine at this time.

Q State the present average depth of those Dakota wells.

A Approximately 6800 feet.

Q Will you state the average deliverability of Pubco's Dakota wells?

A The average deliverability is about 1700 MCFGPD with associated distillates.

Q How does this compare with the average Basin-Dakota deliverability?

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A Pubco's average is about the average for the surrounding operators.

Q Can you state Pubco's position relative to the proper proration formula testified to here yesterday and the day before?

A In the opinion of Pubco Petroleum Corporation, the present proration formula, based on 75% acreage times deliverability plus 25% acreage has proved to be a workable formula, a 100% deliverability would allow each well to produce according to its deliverability. The deliverability is directly proportionate to the recoverable reserves under each well. A hundred percent deliverability would provide a more equitable proration formula. Pubco opposes any proration formula which favors acreage factors as the proposed 60% acreage plus 40% acreage times deliverability.

Q Can you state to the Commission your reasons for the opposition to the proposed change?

A The first objection I have to the proposed change in the proration formula is that all the acreage within the Basin-Dakota Gas Field is not of equivalent value and should not be considered as such in a proration formula. It follows that if a large acreage factor is included in the proration formula it will be detrimental to the correlative rights due to the fact that operators will not be allowed to produce their fair share of the gas for available market in relation to their reserves.

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The present formula provides more than adequate acreage consideration, and this acreage factor is in itself a minimum allowable. Secondly, a large acreage factor in the proration formula reduces the incentive to search out those areas which will produce gas commercially. It is economic waste to drill wells which will not return the well costs. A formula based upon 100% deliverability would be the premium offered to the operator who seeks good sand developments and porosity trends, or who attempts to improve completion techniques.

The third objection to the proposed change is that investments have been made in exploration acreage and well costs in the San Juan Basin on the basis of the present proration formula. Any change will work an economic hardship on the companies who have made these investments. Definite efforts have been made by most operators to be selective in their investments. It does not appear reasonable to change the proration formula so that areas which have been proved to be economic become marginal in order to bring other areas which are uneconomic up to a marginal status. During a period of low market demand all producers will not realize a good return. However, when the market is good problems are minimized. The incentive to search for the commercial hydrocarbon accumulations should be maintained.

Q I believe you stated earlier that all the acreage in

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the Basin-Dakota Gas Field is not of equivalent value. Are you prepared to prove this statement?

A Yes. The parameter I wish to present on the Basin-Dakota Gas Field of the San Juan Basin of Northwestern New Mexico is that of sandstone thickness. This variable is very important in that without a reservoir present in the bore hole the result of the test will be a dry hole. If there is a varying thickness in reservoir, the quantity of hydrocarbon reserves will increase or decrease providing the other reservoir parameters remain constant. These major variables are porosity, permeability, saturation and pressure. In plain language there must be a container present in a well bore in which hydrocarbons may be stored and produced from in order to complete the well as a commercial producer.

I have, or have had a series of maps and cross sections of the producing portion of the San Juan Basin, Basin-Dakota Gas Field prepared, which I would like to present. These will illustrate the thickness variation of the Dakota formation.

Q Were you in charge of the preparation of these exhibits?

A Yes.

Q And to the best of your knowledge and belief do they truly reflect actual conditions?

A Yes.

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Q At this time I will ask you to produce one of the exhibits.

MR. KELEHER: May I ask the Commission at this time if the witness is accepted as being qualified?

MR. PORTER: Yes, sir.

MR. KELEHER: I will ask you at this time, Mr. Street, to mark that exhibit Pubco No. 1.

(Whereupon, Pubco's Exhibit No. 1 was marked for identification.)

Q (By Mr. Keleher) Directing your attention to the Exhibit No. 1 for Pubco, I will ask you to state what it is.

A This is a map of a Dakota isopach map of the gross producing sandstone in a portion of the Basin-Dakota Gas Field of the San Juan Basin, New Mexico. The isopach interval is 20 feet. The map shows all of the holes' producers as well as dry tests drilled through the Dakota in this portion of the Basin-Dakota Gas Field to February 15, 1962. The dry holes are shown with double circles. The drilling wells are not shown.

There were 47 electric logs used in the preparation of this study. To aid in the interpretation of this map, a three-fold color system has been used. Less than 40 feet of gross thickness is colored in yellow, from 40 to 60 feet is colored green, and 60 feet and thicker is colored red. These are the various color-

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study. Gross producing sandstone, as used in this study, includes any zones which have been perforated or open to the casing. If the electric log indicates a sandstone or shaley sandstone, the log thickness has been used. The gross perforated interval has not. The gross producing sandstone thickness is not to be construed to mean that we have definite knowledge that all of the zones are contributing to the production of hydrocarbon, but that there is the mechanical possibility they are productive.

I wish to point out that there is a major difference in gross sandstone thickness and net reservoir thickness. The net reservoir thickness requires the knowledge of porosity, water saturation and permeability; these data require core analysis information as well as a good set of electric logs to set up an interpretable parameter for the various net reservoir values.

I believe that the difference between net reservoir and gross producing sandstone thickness can best be illustrated by an example. A gross sandstone bed may be 50 feet thick, but because of no permeability, low porosity or high water saturation, only 25 feet is capable of producing hydrocarbons. Thus, the gross would be counted as 50 feet, but the net thickness will only be 25 feet. Because of the magnitude of the study and technical knowledge of the reservoir parameters required, a net reservoir analysis has been made of the wells along the cross

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sections only.

I believe the gross sandstone study, as presented, adequately illustrates the variance in the Dakota formation to justify disallowing a large acreage factor in a proration formula. I have mentioned the parameters of permeability, porosity, water saturation, and another important parameter is thickness, which this map depicts. The quantity of net sandstone is important, along with quality, in order to have commercial hydrocarbon accumulation.

This gross sandstone isopach map cannot be used for reserve calculations. However, it does represent the maximum possible thickness or quantity of sandstone in the well bore. Inasmuch as the gross thickness is always as much or greater than the net reservoir thickness, it follows that any variation in gross thickness also means a variation in net thickness.

This map illustrates the lateral changes in thickness of the Dakota sandstone in the proved productive areas. It further indicates the thinning of the gross sandstone beds around the outer margins of these productive areas. As you can see, in all of these productive areas there is a shading down into yellow from the thickest portion which is red in all of the producing areas. The lack of the reservoir beds around the margins of the producing areas is also indicated by the presence of the dry holes which I have mentioned earlier that are shown in double

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circles.

Q Do you have another exhibit that might be identified as a companion exhibit?

A Yes, I have.

Q I'll ask you to place it on the wall and identify it as Pubco Exhibit No. 2. After it has been placed on the wall, I would like you to state to the Commission what it purports to show and to ask you whether or not it was prepared by you and under your direction or supervision. I will ask you first to identify that as Pubco Exhibit No. 2.

(Whereupon, Pubco's Exhibit No. 2 was marked for identification.)

Q I will ask you whether or not that exhibit was prepared by you or under your direction and supervision?

A This cross section is an electric log cross section which was prepared under my supervision.

Q Does it, to the best of your knowledge and belief, reflect the actual conditions as you know them?

A Yes, sir. This cross section is an electric log cross section along the line labeled CC' as shown here on the isopach map, starting in the northwestern portion of the producing area and terminating in the southeastern portion. Each of the wells represented on this cross section have been assigned a number

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which is shown in its corresponding position on the isopach map so you may follow the line of section. This cross section shows the lateral variations within the Dakota formation on a gross aspect basis.

Q What is the purpose of submitting this exhibit identified as Pubco's 2 exhibit to the Commission?

A The purpose is to show on a gross basis, because this is a large field, these vertical and lateral variations which do occur in the Dakota formation.

Q The wells that are depicted on this Exhibit 2, are they identified?

A Yes, sir. I wish to discuss each well individually, if I may.

Q Proceed.

A First, I wish to point out that the Dakota formation has been defined by the Commission in Order R-1670-C, Rule 25, as follows: "The vertical limits of the Basin-Dakota Gas Pool shall be from the base of the Greenhorn limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota formation and the productive upper portion of the Morrison formation."

This exhibit graphically represents the difference in gross producing sandstone and net. The well shown as No. 1 has been

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perforated over a great interval as is shown in orange, which will allow a large gross interval. However, the gamma ray log indicates the major portion of this interval to be a shaley sand, thus the net or effective reservoir thickness is small. The gamma ray portion of the curve is the dashed line along the normal SP track. The better portion of the sand is shown down here at the base, which gives the idea of the cleanliness of the sandstone, and the reduction in this curve to the right indicates the increase in shaliness.

Q Whose well is that?

A This well is the Consolidated Oil & Gas O'Shea No. 1, located in the Southwest Quarter of Section 3 of Township 31 North, Range 13 West. In this well a large portion of the Dakota section has been perforated. However, the more massively developed sandstone bed is located, as I mentioned earlier, at the base of the formation.

Just as a matter of interest, a gross thickness of 101 feet has been open to the bore of this well, but the net reservoir is 26 feet. The reported IP is 1,825 MCF. Well No. 2, which is located here and in the cross section right here is the Southwest Production Company Raymond Simmons No. 1, located in the Southwest Quarter of Section 17 of Township 30 North, Range 11 West. It is approximately 12 miles southeast of Well No. 1.

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As can be seen on this cross section, the producing horison is located at the top of the Dakota sandstone and is represented by 27 feet of gross interval as compared to a net reservoir thickness of 25 feet. The reported IP on this well is 3,106 MCF. Even though the gross perforated interval is approximately one-fourth the amount perforated in Well No. 1, a comparison of net reservoir thickness shows them to be essentially equal, and the IP of Well No. 2 is almost twice as great as Well No. 1.

Well No. 3, which is this well here, is located in the central portion of the better producing area of the Basin-Dakota Gas Field which is locally called the Angel Peak Pool. It is the Pan American Petroleum Corporation J. C. Davidson F-1, located in the Southeast Quarter of Section 28 of Township 28 North, Range 10 West. It is located approximately 14 miles south, southeast of Well No. 2.

As can be seen on the log, the producing horizon is again located in the upper portion of the Dakota sandstone and is represented by a massive sandstone body occupying a gross interval of 84 feet. I wish to point out that it is obvious from the electric log qualities that this sandstone possesses better reservoir characteristics than the previous two logs. The net reservoir thickness is 51 feet. The IP on this well was 5,981 MCF.

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Well No. 4, which is a dry hole located here on the cross section and approximately at the end of a producing area is the Kay Kimball Liberman No. 5 located in the Southwest Quarter of Section 19, Township 26 North, Range 7 West. This test, as I mentioned, is a dry hole and the electric log, as illustrated here on this cross section indicates the lack of reservoir beds. To me, a dry hole with a complete lack of reservoir section is real proof that all of the acreage in the San Juan Basin is not of equal value or potential, which again more than justifies the ommission of an acreage factor in the proration formula. Very little more can be said on this well in that if there are no producing horizons present in the Dakota formation, it is obvious that the well is incapable of producing any allowable.

Well No. 5 is this one located thusly on the isopach map as the Pan American Petroleum Corporation Jicarilla Contract 147 No. 3, located in the Northeast Quarter of Section 6 of Township 25 North, Range 5 West. This well is approximately 12½ miles east, southeast of test No. 4. As shown on the log, this well was completed in a reservoir development referred to as the Graneros, which immediately underlies the Greenhorn formation.

The gross pay interval in this well is 16 feet, the net reservoir thickness is 7 feet, the reported IP on this well is 1,077 MCF. I believe it is obvious to all of you viewing this

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cross section that this well is producing from an interval that is stratigraphically higher than any of the producing zones on the previously discussed wells. This illustrates the wide vertical variation in the producing section of the Dakota formation in the San Juan Basin. It is entirely possible, I suppose, that additional production might be obtained from the Dakota portion of this well which is in here as evidenced by the log character. However, I can only consider this as a matter of speculation in that certainly Pan American Petroleum Corporation is a capable operator, and if they considered it worthwhile they would have considered a completion in this portion of the Dakota.

Well No. 6, which is located here on the cross section and is here on the isopach map, is the Skelly Oil Company Farming 1-E, located in the Northeast of Section 2, Township 24 North, Range 6 West. It is approximately 6½ miles south, southwest of Well No. 5. As is shown on this cross section log, this well is producing from a lower massively developed sandstone member of the Dakota formation, which is located here, and the other well is located, producing from the Graneros.

This, again, indicates the wide variation of reservoir position in the stratigraphic sequence of the Dakota. This well has a reported IP of 3,050 MCF and has a gross producing interval of 61 feet. The net reservoir thickness is 32 feet, the electric

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log characteristics indicate possible pay zones above the producing horizon which have not been included in the gross sandstone thickness, these intervals in here, inasmuch as they are not at the present time contributing to the gas production from this bore hole. I believe it is rather apparent in comparing just these two logs, 5 and 6, that they would not be of equal dollar value. If they are not equal in value because of reservoir thickness alone, is there any justification for an acreage factor in the deliverability formula?

Well No. 7 is the Sunray Mid-Continent Apache No. 1 located in the Southwest Quarter of Section 21 of Township 23 North, Range 5 West, and located 10 miles southeast of Well No. 6. Well No. 7 appears to be more similar in character to the Well No. 1 in that the apparent log characteristics indicate the poor reservoir quality existing in this bore hole. There has been a gross productive interval of 69 feet perforated in this well as compared to a net reservoir thickness of 14 feet.

The reported IP is 520 MCF, the major and most apparent item in all of the logs studied in this cross section to this point is that there's a wide variation in the producing intervals and that there is not an absolute correlation of gross perforated sandstone interval with the production. However, it is readily apparent that the better reservoir development, as indicated on

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these electric logs, has resulted in the better wells.

Well No. 8, which is the last one, is the Pubco Petroleum Corporation Jicarilla 23-5, located in the Southwest Quarter of Section 23 of Township 23 North, Range 5 West. This well is located approximately two miles east of Well No. 7. A comparison of logs from Well No. 7 and No. 8 indicates a more massive sandstone present. This well lacked permeability, and even after a large frack job, production was not obtained from Well No. 8. This test illustrates the earlier statement that thickness or quantity is only one consideration for obtaining a commercial well.

To sum up these exhibits, the isopach and cross section, I believe it is readily apparent that over a large horizontal segment of the Basin-Dakota Gas Field there are many discreet producing reservoirs in the Dakota stratigraphic sequence. The isopach map has shown the horizontal variations in the thickness of the gross producing sandstones, and this cross section CC' shows the vertical variations. It is, therefore, evident that an acreage consideration of any magnitude provides an injustice to a prudent exploration and exploitation plan of operation in the San Juan Basin. We have observed the horizontal and vertical variations within the Basin-Dakota Field. I wish to further illustrate the vertical and horizontal variations within the Dakota formation on a more localized area. I wish to introduce another exhibit.

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Q Do you have another exhibit which you have prepared?

A Yes.

Q I'll ask you to place the next exhibit on the wall and identify it as Pubco's Exhibit No. 3.

(Whereupon, Pubco's Exhibit No. 3 was marked for identification.)

Q Would you mark that Pubco Exhibit No. 3?

A Yes, sir, I have.

Q Was that Exhibit 3 prepared under your personal direction and supervision?

A Yes, sir.

Q Do you state to the Cor ssion that it correctly depicts and sets forth the situation that it purports to indicate?

A Yes, sir, it does.

Q Now, state to the Commission what that Exhibit 3 might be.

A Exhibit No. 3 is an electric log cross section along line AA^1 as shown on this isopach map, which is a southwest-northeast line of section, and this line of section was selected because of the continuous well control across the best productive area. The wells are located on the conventional northeast and southwest spacing pattern. Consequently, there's approximately the same distance between wells along this line of section. These logs have been correlated using the base of the Greenhorn

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formation as a stratigraphic datum inasmuch as that point is referred to as the top of the Dakota formation by definition.

Only the perforated sandstone intervals have been counted along this cross section for the gross sandstone thickness. These intervals are shown on the cross section in orange. It is identical in preparation to Exhibit No. 2. Well No. 1 on the cross section AA^1, which is this well, is the Southwest Production Company Mudge Federal No. 6, located in the Northeast Quarter of Section 32, Township 27 North, Range 11 West. This well has a gross perforated sand interval of 25 feet, the net sand interval is 21 feet.

Well No. 2 is the Frontier Refining Company Frontier-Aztec B 1-D located in the Southwest Quarter of Section 28 of Township 27 North, Range 11 West. This well has a gross sandstone interval that has been perforated for production of 30 feet, with a net of 14 feet.

Well No. 3 is the Frontier Refining Company Polack D-4, located in the Northeast Quarter of Section 28 of Township 27 North, Range 11 West. This well exhibits the lateral and vertical variations in the Dakota in that the southwest offset well No. 2 has a gross sandstone thickness of 30 feet which has thinned down to the gross thickness of 14 feet in Well No. 3. But there is a member overlying this horizon in Well No. 3 which

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has a gross thickness of 15 feet and a third sand below the major horizon which exhibits a gross thickness of 35 feet.

I wish to point out that this lower sand is not present in the offset well to the southwest. The net sand thickness in Well No. 3 is 42 feet as compared to a gross sand interval of 64 feet.

Well No. 4 is the Southwest Production Company Hancock Federal No. 1, located in the Southwest Quarter of Section 22 of Township 27 North, Range 11 West. In this well the major sand body has a gross thickness of 39 feet, as compared to 14 feet in Well No. 3, and the lower sand body in Well No. 3 has thinned from 39 feet to 19 feet.

The gross sand thickness open to production in Well No. 4 is 58 feet and has a net sand thickness of 34 feet.

Well No. 5 is the Southwest Production Company Scott No. 8 Well located in the Northeast Quarter of Section 22, Township 27 North, Range 11 West. This well has a gross sand thickness of 32 feet in the major sand body, and the lower sand body as found in Well No. 4 is missing. Here in a distance of approximately one mile we see a nice sand development in Wells No. 3 and 4, and it is absent in Wells 2 and 5.

The gross sand thickness open to production in Well No. 4 is 32 feet compared to a net thickness of 29 feet.

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Well No. 6 is the Southwest Production Company Hancock Federal No. 2, located in the Southwest Quarter of Section 14, Township 27 North, Range 11 West. The gross sand thickness in this well is 36 feet, which compared to a net of 23 feet.

Well No. 7 is the British American Corporation Fullerton No. 8, located in the Northeast Quarter of Section 14 of Township 27 North, Range 11 West. This well has extremely poor sand development in the Dakota formation. And, as can be seen from this perforated interval as indicated on the log of 66 feet, a considerable section was opened to the bore hole in an attempt to establish production. However, it was unsuccessful and was plugged in the Dakota.

This test is offset to the southwest and northeast by producers. Yet it is not capable of producing hydrocarbons in commercial quantities from the Dakota formation even after stimulation. This illustrates the point that one must have a reservoir present in the bore hole in order to obtain production, and that by any acreage allocation this test would have an allowable which it obviously could not meet.

Well No. 8 is the Pan American Pipkin No. 11, located in the Southwest Quarter of Section 12, Township 27 North, Range 11 West. This well has a major sand development in the top of the Dakota formation which has a gross thickness of 30 feet as

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compared to a net thickness of 15 feet.

Well No. 9 is the Pan American Pipkin No. 12, located in the Northeast Quarter of Section 12, Township 27 North, Range 11 West. The total sand development open to production is 32 feet, which corresponds to a net thickness of 12 feet.

Well No. 10 is the Pan American Volt J-1 located in the Southwest Quarter of Section 6, Township 27 North, Range 10 West. The sand development in the upper portion of the Dakota has increased over Well No. 9, and in Well 10 has a gross thickness of 37 feet. The sand development in the upper portion of the Dakota has increased over Well No. 9, and in Well 10 has a gross thickness of 37 feet with a corresponding net of 20 feet.

Well No. 11 is the Sunset International Kutz Federal 2-J, located in the Northeast Quarter of Section 6, Township 27 North, Range 10 West. In the major sand body there is a gross thickness open to production of 36 feet and additional zones overlying this interval in the Grameros have been opened, one of six feet, the other of ten feet, making a gross thickness open to production of 52 feet, as compared to a net of 36 feet.

Well No. 12 is the Sunset International Kutz Federal A No. 1, located in the Southwest Quarter of Section 32 of Township 28 North, Range 10 West. This well has a thicker major producing interval, having a gross thickness of 46 feet, and immediately

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below this development there is another pay interval of 19 feet, and yet another of 6 feet. Both of these lower sands are either not present or are poorly developed in the offset southwest and northeast well bores. There is a gross thickness of 71 feet as compared to a net of 47 feet.

Well No. 13 is the Pan American Fred Feasel No. 1-L, located in the Northeast Quarter of Section 32 of Township 28 North, Range 10 West. The major sand body that is indicated to be present in nearly all of the wells in this cross section is indicated to be thickening in this well and has a gross thickness of 58 feet as compared to a net of 34 feet.

Well No. 14 is the Pan American Davidson F-1, located in the Southwest Quarter of 28, Township 28 North, Range 10 West. This well shows the nice increase in thickness of this major sandstone bed, and the same bed which is 58 feet in Well No. 13 has a gross thickness of 84 feet and 14, the net thickness is 51 feet.

Well No. 15 is the Sunset International Nuts Federal No. 1, located in the Northeast Quarter of Section 28 of Township 28 North, Range 10 West. The major sand body is found in Well No. 14, has thinned from 84 feet to 65 feet in Well No. 15. However, additional zones have been perforated both above and below this major reservoir body. Two zones above have respective gross thicknesses of five and eight feet, while the three zones below have

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respective thicknesses of 6, 10 and 11 feet, making a gross total of 105 feet. However, in this particular bore hole the net is counted as 53 feet. It is apparent that even though considerable section has been open to production in this bore hole, Wells No. 14 and 15 have essentially the same net reservoir thickness.

Well No. 16 is the Kingwood Oil Kutz Canyon No. 1, located in the Southwest Quarter of Section 22 of Township 28 North, Range 10 West. The major sand body in this well is 66 feet, with one zone above of 13 feet and one zone below of 13 feet, making a gross sand thickness of 92 feet and net thickness of 69 feet.

Well No. 17 is the Pan American Davidson H No. 1, located in the northeast corner of Section 22 of Township 28 North, Range 10 West. This well has a gross producing thickness of 59 feet, with a corresponding net thickness of 52 feet. It is illustrated here on the cross section that the major sand body is thinning to the northeast as well as to the southwest.

Well No. 18 is the Aztec Oil & Gas McClanahan B-1S, located in the Southwest Quarter of Section 14, Township 28 North, Range 10 West. The major sand body has thinned from 59 feet in Well No. 17 to 38 feet in Well No. 18. The Graneros section has been opened to production in this bore hole and has a gross thickness of 11 feet, which makes a total of 49 feet of gross sandstone as compared to a net thickness of 41 feet.

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Well No. 19 is the Aztec Oil & Gas McClanahan D-19, located in the Northeast Quarter of Section 14, of Township 28 North, Range 10 West. The gross thickness open to production in this bore hole, which includes major sand development and the Graneros section, is 52 feet, as compared to a net thickness of 36 feet.

Well No. 20 is the Pubco Petroleum Corporation State No. 29, located in the Southwest Quarter of Section 36 of Township 29 North, Range 10 West. The gross sand thickness open to production in the bore hole is 75 feet with a corresponding 44 feet of net reservoir. The major sand body has thinned from a thickness of 38 feet in Well No. 19 to 24 feet in Well No. 20. However, three additional zones are present in the bore hole of No. 20. The upper one has a gross thickness of 18 feet and the lower two zones have 21 and 22 feet respectively.

Well No. 21 is the Pubco Petroleum Corporation State No. 28, located in the Northeast Quarter of Section 36 of Township 29 North, Range 10 West. There's a total of 83 feet of gross sand open to production in this well bore from seven beds, as compared to a net thickness of 32 feet. I believe it is obvious to all of you viewing this cross section that the major sand body has major variations in thickness, and the various sandstone beds have definite limitations. There is a common well in exhibit

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No. 2 and Exhibit No. 3 which depicts the northwestern thinning of this major sand body. This comparison on cross section CC[1], is with log No. 3, which is the common log in both cross sections, and log No. 2, and here, the comparison, and there is nearly 14 miles difference between these two wells, and in Well 2 there was a gross thickness of 27 feet and in Well 3 of 83 feet.

Also there are several examples of erratic sand development overlying and underlying this major sand body, which do contribute hydrocarbon to the well bore. Here again, in a local area we can see the horizontal and vertical variation in the Dakota formation which will affect the reserves of each individual well. Since 320 acres are allocated to each of these wells, an acreage factor of 320 remains equal. However, the reservoirs are certainly not of equal valve. Test No. 7, which is a dry hole, is certainly not of comparable value to offset wells 6 and 8, and they in turn are not of equal value with Wells 13, 14 and 15 in the major portion of the Angel Peak sand development.

It should be readily apparent from this localized cross section why it is more desirable to have a proration formula based on deliverability which is directly related to the reserves rather than on an acreage consideration plus deliverability.

I would like to present another cross section which further illustrates the lateral variation of the Dakota formation.

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Q I would like you to take the proposed exhibit and place it on the wall and identify it as Exhibit No. 4.

(Whereupon, Pubco's Exhibit No. 4 was marked for identification.)

MR. PORTER: We'll take a ten minute recess.

(Whereupon, a recess was taken.)

MR. PORTER: The meeting will come to order, please. Mr. Keleher, would you continue with your examination of the witness?

Q (By Mr. Keleher) At the time that the recess was taken, Mr. Street, I think you were going to introduce another exhibit.

A Yes, sir, I have placed it on the exhibit board at your request and have marked it Exhibit No. 4.

Q Will you state whether or not that was prepared by you and under your supervision and if you know that correctly delineates what you purport to testify to?

A Yes, it does.

Q Can you explain to the Commission what it does purport to show?

A This Exhibit No. 4 is cross sectioned along the line BB[1], which is shown here on the isopach map. It's a very short interval. This cross section has been prepared in the same manner as the previous two, in this case only three wells were used,

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located in Sections 25 and 26 of Township 27 North, Range 12 West.

Q Why were those wells selected?

A Because they are offset well locations as indicated on the index map here. They're drilled on the normal southwest, northeast spacing pattern as has been approved for the Dakota.

Well No. 1 is the Southwest Production Campbell Federal No. 3 located in the Southwest Quarter of Section 26, Township 27 North, Range 12 West. Well No. 2 is a Southwest Production Company Campbell Federal No. 2 located in the Northeast Quarter of Section 26 of Township 27 North, Range 12 West.

Well No. 3 is the Southwest Production Company Campbell Federal No. 1 located in the Northeast Quarter of Section 25 of Township 27 North, Range 12 West. There is approximately 4,000 feet between each of these wells on the normal northeast, southwest quarter spacing. Being offset wells, one would expect relatively consistent thicknesses in the productive horizons. However, this is not the case. It is obvious that in Well No. 1 two beds, or beds No. 2 and 3 have a gross thickness of 28 feet, as compared to the gross thickness of 54 feet in beds 2 and 3 in Well No. 2. These two beds in Well No. 3 are represented by gross thickness of only 20 feet.

This small cross section, then, shows the rapid lateral changes which do occur in the Dakota formation in that wells on

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either side of Well No. 2, Wells No. 1 and 3 have less than one-half the gross thickness in the same beds as found in Well No. 2. The net reservoir thickness on these wells is as follows: Well No. 1, 11; Well No. 2, 38; Well No. 3, 13; thus showing the same sharp lateral variation as the gross sand thickness.

I believe that it has been adequately demonstrated that there are many lateral variations in the Dakota formation in the Basin-Dakota Gas Field, and that the better wells occur in the better sand development, whereas dry holes have been drilled around the margins of these areas where the sandstone development is less and constitutes a poor reservoir.

With this proved lateral variation in the thickness parameter, it is obvious that reservoirwise all the well locations in the Basin-Dakota Gas Field cannot be of equal value, and as a consequence reserves present in a bore hole should be the basis for proration formula, in my opinion the variations in deliverability from well to well in the Basin-Dakota Gas Pool is directly reflective of the actual differences in reserves. Thus, the reserve index deliverability should be used.

To further the statement that all the acreage within the Basin-Dakota Gas Field is not of equal value, I would like to present another exhibit.

Q Can you place that exhibit on the wall, please, and

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mark it Pubco Exhibit No. 5?

(Whereupon, Pubco's Exhibit No. 5 was marked for identification.)

Q I will ask you to state to the Commission what that purports to show, Exhibit 5.

A This exhibit is a contoured deliverability map based on the 1961 deliverabilities for the Basin-Dakota Gas Field.

Q Was that Exhibit 5 prepared by you or under your direction and supervision?

A Yes, it was.

Q Do you know of your own knowledge that it reflects the testimony that you propose to give?

A Yes, it does. The data for this map is from the 1961 Oil and Gas Conservation Commission deliverability schedule covering some 491 Dakota gas wells. The reported deliverability numbers are shown on the map by the corresponding well. As in the gross sand isopach map, a three-fold color scheme has been used to aid in the interpretation. Deliverabilities of less than 500 MCF are colored in yellow, from 500 to 1,000 MCF are colored in green, and deliverabilities above 1,000 MCF are colored in red.

The red, as shown on this deliverability map, indicates the better producing areas of the Dakota formation, which corresponds

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to red areas or thicker gross sand areas observed on the isopach map or Exhibit No. 1. There's a reduction in the deliverability which compares to a thinning of the gross sand development towards the margins of these individual producing areas. Because of the correlation of deliverability and gross thickness over such a vast area, I believe that the relationship between the reservoir parameter thickness, which is one of the major reserve considerations, correlates with deliverability.

This tends to support the premise that well deliverability is an index to the reserves attributable to a bore hole, and that it is justifiable to use the deliverability as the major parameter in a proration formula.

I wish to briefly sum up the testimony which I have presented. Exhibit No. 1, the gross producing sandstone isopach map shows the lateral variations within the producing areas of the Dakota formation. Exhibit No. 2, which is cross section CC' shows the vertical variations within the Dakota formation over a large area. Exhibit No. 3, cross section AA', illustrates the vertical and lateral changes of the Dakota formation through the better producing area of the Basin-Dakota Field. I might add it is a localized cross section on which there are no extrapolations, every well site has been drilled that can be on a 320-acre spacing.

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Exhibit 4, cross section BB' shows the rapid lateral changes between offset wells. Exhibit No. 5, the 1961 deliverability map shows the better producing areas of the Basin-Dakota Gas Field which correspond to the thicker sandstone developments as shown on the isopach map. Through the use of these exhibits it has been shown that the Dakota formation reservoirs vary laterally, vertically, in thickness and in quality. Dry holes have been drilled throughout the proved Dakota gas producing area of the San Juan Basin, and these in themselves have been testimony to the fact that not every well which penetrates the Dakota formation will be a commercially productive gas well.

Because the Dakota is not a homogenous and continuous reservoir, which I feel has adequately been illustrated by these exhibits, it does not appear justifiable to have a proration formula with acreage as a consideration in that a hole incapable of producing or incapable of producing gas at a commercial rate is, in effect, a dry hole and should not be given an imaginary allowable.

Q How many years did you work in the San Juan Basin, Mr. Street?

A About five years.

Q You were there personally for five continuous years?

A Yes, sir.

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MR. KELEHER: At this time we would like to offer in evidence Pubco's Exhibits 1, 2, 3, 4 and 5.

MR. PORTER: Is there objection to the admission of these exhibits?

MR. KELEHER: We have no further questions of this witness.

MR. PORTER: The exhibits will be admitted.

MR. STOCKMAR: Ted Stockmar for Consolidated Oil & Gas.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Street, I believe you testified that the deliverabilities be directly proportionate to the reserves under the well, is that correct?

A Yes, sir.

Q What do you mean by the reserves under the well?

A Those reserves which may be recovered by that particular bore hole.

Q By that particular bore hole?

A Yes, sir.

Q Is this without respect to the spacing order?

A In what respect.

Q Are you saying that the reserves attributable to a well include all of the gas that you can cause to flow out of

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that well?

A No, sir. The reserves under the 320-acre spacing unit.

Q How do you control the well so that you produce only the gas under that 320 acres?

A That is one of the reasons for the proration formula, to protect correlative rights.

Q What is your definition of a commercial well?

A I don't believe that I'm in a qualified position to define a commercial well.

Q You testified that certain wells would be commercial and other wells would not be commercial, and that the conservation depended on the operators seeking out only the commercial wells.

A I believe that has best been illustrated by preceding testimony in which various operators have various operating costs.

Q But you have no opinion as to what constitutes a commercial well?

A I might say do not.

Q You do say, however, that conservation would best be served by the operators seeking out the commercial wells and leaving the non-commercial areas alone, is that correct?

A That is correct.

Q If there is gas under the non-commercial area, then you

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do not recommend drilling it nonetheless?

A If it is unrecoverable gas I don't think that it is possible to get it out. Gas in place does not mean that it is recoverable gas.

Q Those big white spaces on your chart there, is there gas under those?

A Sir, we are discussing that which has bean proved, not which may become a matter of speculation.

Q Do you know whether or not there is gas under that area?

A I personally do not.

Q How you going to find out?

A By use of our exploration techniques Pubco has tried to follow in the past and will continue to follow.

Q Does that include drilling a well?

A If the geological considerations are such it would justify it, yes.

Q If you do not drill a well, will you know whether or not there is gas there?

A That is true.

Q So, if drilling is discouraged in those areas because you don't know whether or not there is gas there, we are not fully exploring the reservoir, are we?

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A It depends on whether you are seeking commercial production or just for drilling the holes themselves.

Q Pardon?

A I say it all depends on whether or not you are seeking commercial production or just drilling the holes.

Q Does your understanding of commercial production include the concept that the amount of gas that you can or are allowed to produce depends upon the allocation formula?

A That is true.

Q Then a well which might be nearly commercial under one formula might be completely commercial with an adjustment of that formula, is that correct, if the well will produce the gas?

A That would be a matter of mathematics, and I believe it has been testified that mathematically you can prove just about anything you wish.

Q I think I said that. When you say Pubco has a program, an exploration program of looking for commercial wells only, does that mean high deliverebility wells, is that it?

A Those wells which would have commercial reserves, which in this case would compare with high deliverabilities.

Q How can you tell where you can find high deliverabilities?

A As I say, our exploration program attempts to delineate

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those areas and we drill accordingly.

Q Have you concluded your program or not?

A No, we have not.

Q These two exhibits, which I believe to be Pubco Exhibit 1 and Pubco Exhibit 5, you have used as a comparison between gross sand thickness and deliverabilities, is that correct?

A Yes, sir.

Q And you say that there is a relationship demonstrated by this map?

A I believe that it is rather apparent to anyone observing the two exhibits that there is a relationship of the areas colored in red corresponding.

Q They are not identical, are they?

A Not on a line for line basis, no, sir.

Q What are you attempting to prove by comparing gross sand thickness with deliverabilities?

A The reason that gross sand was used was to show the maximum amount of potential reservoir present which would be giving everyone the benefit of any doubt, and the thickness being a parameter in reserves, which is a major consideration.

Q The gross thickness is?

A No, a thickness is. I am saying gross thickness was used because that gives us the ultimate or the most optimistic

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quantity that could be anticipated. I think I have mentioned in my testimony that the gross sand map could not be used for reserve calculations. However, I have also stated in my testimony that the gross sand represents the maximum development that can be anticipated and the net sand cannot be, maybe as great, but never greater than the gross sand.

Q Well, only some part of the thickness as shown on your gross map contains net pay according to your interpretation?

A That is a gross sand isopach map and all numbers by the well symbols are gross sand thicknesses, not net, not necessarily net.

Q Is there producible gas in any part of that except what you've called net pay?

A Sir, I haven't called it net pay. I have used in the —

Q In several dozens of wells you said there was a net thickness and gross thickness for each well?

A Which exhibits now are you referring to? Are you still on the gross sand map?

Q I'm still on your Exhibit No. 1.

A All right.

Q I asked, is only some part of the thickness which you have shown for each particular location net pay according to your definition?

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A Yes.

Q Have you shown on here what that net part is?

A No, I have not.

Q Does the part that is not effective net pay contain any recoverable gas?

A That, as I've mentioned, is a parameter which would be necessary to know before you could make a net reservoir analysis.

Q Does net pay mean the part of the sand that contains producible gas?

A Yes, sir.

Q And the rest of it is not net pay, is that right?

A If it is incapable of producing it would not be net pay.

Q Then it doesn't have any producible gas in it, is that right?

A That would be correct.

Q I thought you said that what we were comparing, that there was a direct relationship between reserves which is producible gas which must come from net pay and deliverabilities, is that not your testimony?

A Yes, sir.

Q What do these two exhibits show when you compare gross pay, something entirely different with deliverabilities?

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A As I've mentioned before, the gross pay sandstone isopach map would show the very maximum reservoir development that could exist in that bore hole consequently, and if there are any variations in the gross pay it is reasonable to expect variation in thickness of the net pay. In other words, I have used the greatest margin of optimism and it still correlates back to deliverability; as we have noted on the cross sections, there are some cases where the gross and net are essentially the same.

Q Is the net pay always the same fraction of the gross pay in all the wells?

A No, sir, it isn't.

Q Does it vary substantially?

A As I mentioned in my testimony, to arrive at a net pay you would need to know all the variables of porosity, permeability, saturations, pressure and thickness.

Q You are saying, then, that there is no easy common relationship between gross pay and net pay, is that right?

A No, sir, not necessarily.

Q Then we cannot use these two exhibits to show any relationship between net pay and deliverability, can we?

A I believe we can from the standpoint that if the maximum, the very maximum reservoir consideration is shown,

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knowing full well that the gross will have to be equal to or greater than the net, and you still see a correlation that that is reasonable justification for using this correlation.

Q You mean if all the gross pay contains producible gas, then we can use it, is that what you are saying?

A No, I am not. I am saying that the gross thickness, this one parameter for reserve calculations is represented on the map and it corresponds to the deliverability, then it must have a reasonable correlation to the thickness parameter.

Q You keep saying that gross pay is a parameter in determining reserve.

A Net pay is the parameter in determining reserves. Gross pay has been the number used in isopaching the productive areas of the Basin-Dakota Gas Field.

Q Have you made any similar maps to your Exhibit 1 covering net thickness?

A No, I have not. I have viewed others and like the correlation even better with the deliverabilities.

Q Would it not be a better way to demonstrate the relationship, if any exists, between net pay and deliverabilities?

A That is true.

Q That is true? A Yes.

Q But you have brought these two instead?

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A That's right, because of the -- as I believe I have mentioned in my direct testimony, the magnitude of the study and the technical knowledge required in determining net pay.

Q Let's talk about net pay a little bit. How do you define net pay when you look at a particular well?

A The basis for log interpretation and for reservoir analysis is core analysis, or has been generally accepted as such, so that to have a proper consideration for determining net pay, one should have some core analysis data to correlate to the electric log, and therefore a good set of electric logs is required then to determine the net pay parameters or variables.

Q You have by some mechanism selected a net pay for all of the wells shown on Exhibits 2, 3 and 4, I believe they are. You have cores for each and every one of those wells?

A No, that has been a compilation or a study between the core analysis and the logs and an attempt at an empirical approach has been made to interpret well logs based on the core analysis and well log characteristics.

Q Let me ask first how many logs on Exhibit A-A', or cross section A-A', for example, how many of those 21 wells did you have cores to match up with your logs?

A At this moment I could not, there were only three wells

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with core analysis on this particular cross section.

Q One-seventh of those wells?

A Yes, approximately.

Q How many cores did you have on the seven wells shown, or eight wells shown on cross section CC[1]?

A I do not have any.

Q You did not have any? A Right.

Q How did you determine the net pay of each one of these when you had no core?

A As I mentioned earlier, the relationship between the core analysis and the log run in a particular well bore is used, this comparison then is an empirical approach to try to arrive at an interpretable net value.

Q In other words --

A It is an extrapolation.

Q -- from some comparison you can carry it over to another well and use the same comparisons?

A That is the approach.

Q When you do this, is it helpful if the reservoir is fairly uniform, the characteristics more or less the same?

A It would be very helpful.

Q I gather that if the characteristics are wildly different from each other, then this is not such a good method?

A There would be complications and there may have to be adjustments accordingly.

Q Did you make those adjustments when you made all of the analyses of the eight wells on cross section CC[1]?

A There's the attempt, yes.

Q You have testified that those are wildly variant from each other, have you not?

A I have testified that the thickness which is apparent on these cross sections are variable.

Q You have no logs with respect to those eight wells?

A The logs are on the cross section, so I believe it is obvious.

Q Excuse me, no cores with respect to those eight wells?

A That is right.

Q They're how many miles apart?

A I believe it is written between each well.

Q What's the total length of your cross section CC[1], seventy-five miles?

A I can calculate it for you in just a minute. Approximately seventy-six and a half miles from Well No. 1 to Well --

Q Were there any logs anywhere near this long, seventy-five miles that you did look at?

A Sir, I believe if you will --

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Q Excuse me, any cores of wells anywhere near this seventy-five mile line?

A I believe if you will recall, in the direct examination I pointed out that there is a common log in both cross sections from which to extrapolate from.

Q Was that well cored?

A No, this particular well was not cored, but it is, however --

Q Did you look at any cores in connection with your work in connection with CC^1, the cross section?

A No, sir.

Q So, then, your determination of net pay was entirely from the logs then?

A Yes, sir.

Q I think you said that one of the parameters for determining net pay was permeability, is that correct?

A That is correct.

Q Can you read permeability from those logs?

A No, sir.

Q Then you did not consider permeability of the well in finding your net pay?

A I believe you are probably aware that considerable work has been done on the Dakota by various logging firms which

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have attempted to come up with what they refer to as permeability indices.

Q But that is not your work?

A That is not my work. It is expert electrical log techniques.

Q Let's look at your Exhibit 2 from another viewpoint, that's cross section CC[1]. Well, first I think you testified that what you show on the top of the chart over each log was the initial potential of the well.

A As reported.

Q As reported. Is that the same as the deliverability of the well?

A No, sir, it is not.

Q What's the difference between them?

A The initial potential is the test run upon completion of a well to find its initial productivity.

Is it as useful for your purposes here as deliverability?

A Not in this particular case.

Q Do they vary directly with each other?

A Not having made a definite study, I would not be in a position to say yes or no. However, I have talked to others who have compared initial potentials and deliverability and they

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inform me there is a similarity.

Q You have testified that reserves which are net pay, as you call it, varies directly with deliverability. Is it also your opinion that reserves vary directly with initial potential?

A No, sir, I am not extrapolating that far.

Q The only purpose of these three cross sections since there appears to be no apparent relationship between deliverability and the net pay, is to show the extravagant variation of the reservoir, is that correct?

A I believe if you will recall my testimony that the intent was to show the vertical and lateral variations within the Dakota formation.

Q Did you hear Mr. Trueblood's testimony yesterday?

A Yes, sir.

Q And Mr. Haseltine's today?

A Yes, sir.

Q With respect to their testimony on the variability of the characteristics of the reservoir, do you subscribe to that testimony?

A I believe if you will look at my exhibits it would be difficult for me to say that I do.

Q You disagree with their testimony then?

A Yes, sir.

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Q Referring for a moment to your Exhibit 3, and I would like to ask that we take down this last one, I think I'm through with that, so we can see the Exhibit 3 in full. As a matter of fact, just move it over on top of Exhibit 1, I think we will come back to it. I wish we had a light behind those so we could see how they do stack up. Mr. Haseltine, with his exhibits, specifically testified that there was a variation from tract to tract, that it was more or less gradual, that there were no substantial variations over short distances, was that not his testimony?

A That is as I understood it.

Q It appears to me, just from looking at that Exhibit 3, on an eyeball basis, that that's what we have. Where are these tremendous variations from section to section?

A What would you consider this, as a rather gradual change from one reservoir character to another in what appears to be overall a stratigraphically similar reservoir?

Q I would call that --

A How about the reservoir present here in well bore 3 and 4 as shown on cross section AA^1 which shows logs offsetting, from wells offsetting both to the southwest and to the northeast that does not have this sand development? I would say that appears to me rather abrupt.

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Q I gather that thing in the middle is a dry hole, is that right?

A Yes, sir.

Q Did they not encounter any sand whatsoever?

A From the log character it would appear that they might have had shaley sand.

Q Is that Dakota? A This is Dakota.

Q Well, you left it out because it didn't have any gas in it?

A I believe if you will read the definition, productive was used. This one is a dry hole, it is consequently not productive.

Q There is gross Dakota sand under that?

A Not gross productive Dakota.

Q Was all the rest of this gross productive?

A They are completed wells. That much is shown in orange.

Q My point is, there is not a complete break in the stratigraphy at that point.

A In their attempts to stimulate and obtain a well in Well No. 7, as shown on cross section AA^1, they failed to obtain commercial production.

Q Is their Dakota sand penetrated by that well?

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A From the log character, which I would like to bring to your attention, it's very poorly developed.

Q There is Dakota sand penetrated by that well?

A There would be some shaley sand, I suppose. The electric log is not the lithology log, however.

Q Then, except for the fact that it may not have had net pay in it, your gross sand does carry right on through, is that correct?

A There could be some gross sand encountered perhaps, but it is not gross productive pay, which is the definition used throughout this testimony.

Q In your judgment, does your map, did Mr. Haseltine's map show the same variation as your map does?

A Not having had an opportunity to study his map, I would not say.

Q Mr. Street, do you recognize this as a duplicate of Southern Union's Exhibit No. 1?

A As I say, not having had an opportunity to study it, I would not be able to truthfully say yes or no. However, I would assume so.

Q Just comparing the two in the broad perspective, do you see --

A Inasmuch as --

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Q -- substantial variations in yours that are different from his?

A Without a vertical or lateral scale, one couldn't determine very much of anything from this cross section.

Q Is your exhibit to scale?

A I'm not talking about to scale. I said without a scale. There isn't a vertical or lateral scale shown here.

Q Are you willing to assume that all of the things are measured by the same scale, whatever it is? Did Mr. Haseltine use a different ruler for each well?

A Well, there is a very definite different vertical scale on these cross sections as employed by Mr. Haseltine and myself, in that these are apparently traced curves showing only a well number and letter, whereas these are actual reproductions of the well logs which I have used.

Q To summarize this point, you say that your cross section is substantially different from his, that your Exhibit 3 shows great variation in the gross sand, is that correct?

A Yes, sir.

Q Does it show any variation with respect to the net sand?

A Yes, sir.

Q It does? Does the exhibit show it?

A It does not illustrate it. I have read it into the

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testimony.

Q It exhibits on its face --

A It does not.

Q Does not show the relationship of the net pay across the reservoir?

A No, sir.

Q Let's go back to Well No. 7, do you know the circumstances of the attempted completion of that well?

A Nothing more than what is reported by the commercial reporting services.

Q You do not know that it was fracked into the water below and the well was drowned out?

A That was not reported on the service, no, and it is my contention, I believe, as I said earlier, that a dry hole is in itself testimony that it is incapable of producing.

Q Have you checked the records of the completion report with respect to that well that's on file with the Commission?

A No, sir.

Q For us to see the variation in net pay from these three exhibits, then, we will have to take the figures which you testified to and do our own coloring so we can see the variation, is that it?

A If you wish.

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Q Well, with respect to the net pay, what, on Exhibit 3 what was your thinnest net pay and which well was that in?

A On cross section AA[1]?

Q Yes, sir. My notes show it to be No. 9, if that will be of service to you.

A Twelve feet.

Q Twelve feet. Which is the thickest net pay?

A Well No. 16 with 69 feet.

Q What is the ratio of the thinnest to the thickest here?

A Well, it would be from zero to 69.

Q Pardon? A Zero to 69.

Q Oh, you are including the dry hole?

A It has to be. It's included on this cross section.

Q What's the ratio? A From zero to 69.

Q I say ratio, not the range.

A In this particular case it would appear to me to be the same.

Q No, ratio, as I understand, is a fraction comparison of two numbers, is that correct? I mean one is something one inch thick and the other is two inches thick, the ratio is one to two, is that correct? Your ratio here is zero to 69, is that a fraction? Well, never mind. Have you calculated the average net pay across this section?

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A No, I have not.

Q Cross section AA? A No, I have not.

Q Would you accept my calculation that the average net pay is 33.2 feet according to your own testimony?

A If you have done it mathematically correct that would be fine.

Q Looking at the averages here, do we have substantial variations --

A May I ask --

Q -- from the thickest well to the average well?

A Pardon.

Q What is the degree of the variation between the average well of 33.2 and the thickest well, 69 feet?

A The thickest well would have slightly greater than twice as much as the 33 feet which was given.

Q Ignoring this economic catastrophe in No. 7 here, and looking at Well No. 9 which has 12 feet, I believe that to be the next lowest net pay. What is the ratio between the thickness of that well and the average well?

A Slightly less than three.

Q Less than three?

A Very slightly less than three. However, I wish to ask you a question, in terms of your 33 average, in that, did you use

the zero as shown in Well No. 7 to include for the average of the total wells?

Q Yes, sir. Mr. Street, if there is any comparison at all between net pay, as you determine it, without core analysis and initial potential which you have shown on the map, how do you explain, or how do you rationalize the relationship say between Wells 6 and 11; Well No. 6 you say has a net pay of 23 feet, Well No. 11 has a net pay of 36 feet, half again as thick. The thin sand has an initial potential of 4849 MCFCGPD, initial potential of 4849, is that correct?

A Would you state that again?

Q Well No. 6 has an initial potential of 4849?

A 4849, yes.

Q And Well No. 11 has an initial potential of 2084, is that correct?

A Yes, sir.

Q Now, Well No. 6 where the net pay is only two-thirds as thick as Well No. 11 seems to have well over twice the initial potential. How do you reconcile this with your statement that there's a direct relationship between deliverability and reserves?

A I would appreciate your asking that question again so that I can follow through on here.

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Q If your exhibits are intended to support your statement that reserves vary with deliverability, or vice versa, the nearest that you have come is to bring forward net pay in lieu of reserve studies, and to bring forward initial potential in lieu of deliverabilities. Are you willing to substitute these two for each other for the purpose of these exhibits?

A No, sir, the purpose of this testimony was to show geologically not the reserve calculations, but the variables, stratigraphic variables within the Dakota formation.

Q Then, can the Commission completely ignore these Exhibits 2, 3 and 4 insofar as your testimony that reserves vary with deliverability is concerned?

A Excuse me. No, sir.

Q Where should they look on these to find this support for your testimony?

A For this one major parameter, thickness.

Q You have not shown the deliverabilities on here, have you?

A No, the deliverability map shows the line of cross section and each well is shown on that map with a corresponding number for the well on the cross section.

Q Is each deliverability shown --

A If it was on the 1961 Commission schedule.

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Q Well, if we compare your last exhibit, the deliverability map, with the net pay, will that support your testimony that deliverability varies with reserves?

A If you will take in the other factors.

Q Pardon?

A If you will take into consideration the factors that do exist along the cross section.

Q You testified that there was a direct relationship, are there other factors?

A The factor which I'm referring to is the amount of time which a well has been on production.

Q This enters into the determination of the reserves?

A If a well has produced so many million cubic feet of gas, I would say that has been recovered reserves.

Q Are there any other factors that must also enter into this direct relationship between deliverability and reserves?

A Well, as I've stated before, the parameters for reserves are porosity, permeability and saturation as well as the pressure and thickness, which this is only one parameter or variable which I have undertaken to illustrate.

Q Does area enter into the determination of reserves?

A The area is taken care of in terms of 320 acres.

Q I'm afraid I'll need your help, Mr. Street, to determine

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what the deliverability of -- why don't you just read off to me the different ones, if you will?

A I have it here at my seat. Now, what deliverability do you wish?

Q This is on Exhibit 3.

A 1961 deliverability.

Q I would like to have No. 1.

A It was not available.

Q Pardon?

A It was not on the schedule.

Q Is it included within your contours?

A No. 1 on cross section CC^1?

Q I'm sorry, AA^1, which is Exhibit 3.

A All right. On AA^1, Well No. 1 was not available. In other words, it was not on the 1961 proration schedule.

Q Is it included -- A The well log.

Q Is it used to contour your deliverability contour map?

A That was not considered for a control point, no.

Q No. 3. A Well No. 3?

Q Yes, sir. A Is 801.

Q Pardon? A 801.

Q No. 9? A 935.

Q No. 11? A 270.

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Q No. 13? A 224.

Q No. 14 and 15? A 918 and 1450.

Q No. 16? A 2365.

Q No. 18? A 6793.

Q Would you repeat No. 15? A 1450.

Q Thank you. Well, now, for our purposes you are willing to say that net pay is a measure of reserves and we can now compare net pay versus some of these deliverabilities?

A If you will take into consideration that gas which has been produced before these deliverabilities were run on these particular wells which were productive before 1961.

Q Would you make the comparison, please, between net pay and reserves as to Wells 15 and 18 for me, please? Would you describe the net pay and the deliverability?

A 15 and 18?

Q Yes, sir.

A 15 had a net of 52 feet, 1961 deliverability of 1450. Well No. 18, a net of 41 feet and a 1961 deliverability of 6793. Now, for the comparison between Well 15 and Well 18, Well 15 went on production in 1958, Well 18 went on production in 1960.

Q Are these deliverabilities based on tests made at the same time?

A These are 1961 deliverabilities of all the wells

which have been included in these data, but that is not saying that I have been fortunate to find all wells were drilled simultaneously. No, there are some older producing wells in this cross section.

Q Well, does deliverability, according to your story, measure the original reserves in place or those available for production at any time?

A If you wish to try to compare direct net reservoir thickness and deliverability, that should be taken into consideration.

Q Well, has there been very substantial production by either of these wells, do you happen to know?

A Yes, sir. I answered your question. You asked if there was considerable production and I said yes, sir.

Q I am sorry. From each of the wells?

A Yes, sir. There, of course, is more production from the well that was producing in '58 than the one that went on production in 1960.

Q Well, we have these deliverabilities taken at the same time anyway.

A Which gives today's values.

Q You said there was a direct relationship between deliverabilities and reserves, correct?

A Recoverable reserves.

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Q You have Well No. 15 at 1450, we have Well No. 18 at 6793. That seems to be at least four, almost five times as great a deliverability for Well 18, is that correct?

A Well No. 18 has produced a year and a half longer.

Q I'm asking you with respect to the ratio of the deliverabilities.

A If you look at the testimony on the current and eliminate the earlier --

Q That's what I want to do.

A -- produced reserves.

Q I want to look at the current. Well No. 18 has a deliverability five times that of Well No. 15, is that not correct?

A Yes, under the present test.

Q Well No. 18, the one with the huge deliverability, has 41 feet of net pay according to your calculation?

A Yes.

Q Well No. 15 has 53 feet, it's larger by 12 feet, is that correct?

A No, it's 52 to, it would be 11 feet.

Q So the one with the thinner sand has five times the deliverability of the other, is that correct?

A On the 1961 schedule.

Q Is this the direct relationship that you are saying

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exists in the field?

A I believe that if you would look at it from the remaining reserves, which I'm not in a position or not qualified as a reservoir engineer to further discuss that, I think that you'll find there's a similarity.

Q Well, you say that the one with 52 feet has in effect 30% more reservoir than the one with 41 feet, is that correct?

A Would you care for the production figures?

Q You say that Well No. 15 with 52 feet, which is larger than Well No. 18, has a reservoir that is larger net pay by 30%, is that approximately right?

A Let me see here.

Q Whatever it is.

A It has 11 feet greater thickness.

Q How much bigger, 11 over 41?

A The thing there, you are using the one parameter trying to correlate it directly to reserve, and one parameter, thickness, is trying to exclude permeability, water saturation, and I am not qualified as an engineer.

Q We got off on the tangent, Mr. Street, because I asked you if these exhibits, even when we leave deliverability in them, are in any way a support for your testimony that deliverability is a measure of reserves.

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A Yes, sir.

Q I'm trying to find out how it is supported.

A As long as you consider all the factors or all the variable parameters that are to be considered.

Q Do these exhibits --

MR. KELEHER: Let's let the witness answer, please.

A There's only one major parameter of this Basin-Dakota Field that I have undertaken to illustrate by isopach and cross section, and that is the thickness.

Q Well, then, these series of Exhibits 2, 3 and 4 do not purport to show any of the other parameters, porosity?

A No, sir.

Q Drainage area of the particular well?

A No, sir.

Q Would you look at Well No. 3 on Exhibit 3, please? Would you state for the record the thickness of that pay sand?

A 42 feet.

Q And the deliverability of that well?

A 801.

Q That is almost the same thickness as Well No. 18, is it not, which is 41 feet?

A Yes, sir.

Q Same net pay. Is the deliverability of Well No. 18, over

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eight times larger?

A The deliverability of Well No. 3 was 801, and of 18 of 6793.

Q Well No. 18 has a deliverability over eight times larger than Well No. 3?

A It has 6793, yes.

Q Your answer is yes? A Yes.

Q With almost equal net pay? A Yes, sir.

Q Would you please refer to your Exhibit 4, which I believe would be cross section BB?

A All right.

Q I think you testified that these three wells were selected, quote "because they are offset well locations".

A Right.

Q Is that your reason for selecting these three?

A Yes, sir.

Q Are there any other three offset wells in the field?

A There could be many others, I elected to select these.

Q Is there any other reason for your selection of these three wells?

A They illustrate this rapid change in the Dakota, lateral variation of the Dakota.

Q This seemed to be a much more rapid variation than you have on cross section AA?

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A Yes; if you consider the magnitude, yes.

Q Is this representative of the reservoir?

A This is a cross section, as I said, of three offset wells which depicts the lateral variation.

Q Are they representative of any three wells in the reservoir?

A I would say they are not representative of any three because there's that much variation. That's what I am trying to illustrate, that there is the variation.

Q You have presented this to show there is great variation over a very short distance?

A Yes.

Q Four thousand feet? A Yes.

Q Is that representative of the reservoir, is there great variation on any four thousand feet in the reservoir?

A That was so indicated.

Q Is that your testimony?

A On the AA[1], yes.

Q That there is substantial variation in net pay over a distance of four thousand feet in the reservoir?

A There may be, yes, sir.

Q There may be, as shown on this, in this instance is it your testimony that this is representative of the reservoir? Is

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there great variation between all of the wells in the reservoir, each to its neighbor?

A From that standpoint, depending on the size of the producing area, the size of the particular sand body which is under investigation on a relative basis, cross section BB^1 as compared to the cross section AA^1, obviously there are wells which will compare fairly closely in a larger sand body.

Q You mean the 21 wells?

A There are the offset wells which would be similar to this one which do have a comparable section, or more nearly comparable; however, there are none that are exact.

Q I'm trying to get just one answer with respect to this exhibit, Mr. Street.

A In speaking of --

Q Were these three wells selected because they are an extreme case and helped you make this point or are they representative of the reservoir?

A I would say they are a sampling of the reservoir.

Q Representative of what you might find in the reservoir if you selected three wells here and there?

A In that you can expect lateral variation.

Q Of the magnitude, the magnitude shown on Exhibit 4?

A It doesn't have to be the same ratio or percentage if

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you wish.

Q Well, is this the average?

A I would not call it an average.

Q Does this show more lateral variation than the average?

A Not having calculated a statistical average on variation, I could not say. However, I believe on cross section AA[1] we can see similar circumstances. If I may, I will refresh my memory, for instance, on logs 3 and 4 of AA[1], which in Well No. 3 there's a sand body of 35 feet of gross thickness and which has thinned down in Well 4 to 19 feet, and in Wells 5 and 2, which is direct offsets, it is not present at all, so I believe that we find, I don't know that there would ever be an average variation, but I believe the sharp lateral changes are rather apparent.

Q Then you do testify that there are sharp lateral variations in net pay over short distances in the reservoir?

A Yes.

Q Mr. Street, referring to your deliverability contour map, we seem to have very definite trends of areas of high deliverability, they almost look like structures, is that not the case? Doesn't this look like a little anticline of some kind?

A There's no relationship of the deliverability contours and structure.

Q I'm asking if it looks like it.

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A If it looks that way to you, fine.

Q Is there any relationship between deliverability and fracturing?

A In the natural sense or in the sense of artificial stimulation?

Q The natural recemented fractures that I understand to be quite common in the reservoir, is there any?

A Not to my knowledge.

Q When you artifically frack a well, oh, first, are there or are there not evidences of fracturing in the reservoir?

A In some of the cores it has been, fractures have been reported.

Q When you artifically fracture a well, what happens?

A It is the purpose of the fracking technique to fracture the formation.

Q Do you open up the natural fractures that are there or do you just tear the rock asunder?

A If natural fractures do exist I would assume that would be the zone of weakness; if they did not exist and you are not able to fracture, I would assume that since that is the purpose that fractures would be created.

Q You do testify that if there are no natural fractures present, by artificial fracking you can cause fractures to occur?

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A Yes, sir.

Q You are? A Yes, sir.

Q You do testify, then, that there is no relationship between deliverability and fracturing?

A Not to my knowledge.

Q Is there any relationship between structure and fracturing?

A Not to my knowledge.

Q Just take a big solid piece of rock and bend it and it won't crack?

A That isn't the question you asked.

Q When these sands were laid down, were they laid down relatively flat?

A It is assumed so.

Q Are they still relatively flat?

A Yes, sir.

Q Are there local variations caused by natural forces?

A Perhaps so.

Q Has there been wrinkling and folding of some kind in the Basin?

A In this Basin around the outer margin there's a surface indication of structure. However, it would all depend on what structural datum you wish to explore, the structural configuration.

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There are enough variations in the sedimentation to cause sedimentational structure.

Q Throughout the Basin, in summary, has there been any folding and bending of the sand from its original condition?

A From a basinal condition, yes.

Q When these things occur, does not the rock fracture?

A Not necessarily. It depends upon the -- the forces involved.

Q In this Basin, when that folding and bending occurred, did fractures also occur?

A That I could not testify, whether they were or were not.

Q You don't know?

A No, I don't know.

MR. STOCKMAR: That's all the questions I have of this witness.

MR. PORTER: At this time we are going to recess the hearing until 9:00 o'clock tomorrow morning.

(Whereupon, the hearing was recessed until 9:00 o'clock, April 20, 1962.)

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

April 18, 1962

CASE NO. 2504

VOLUME TWO

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MORNING SESSION
April 20, 1962

MR. PORTER: The hearing will come to order, please. We will continue with Case 2504. There was something in the paper this morning to the effect that if we did not conclude the hearing this afternoon it would resume at some later date. That date might be in the morning. We'll postpone that decision as long as we can.

Mr. Keleher, would you call your next witness?

MR. KELEHER: Someone else may have questions of Mr. Street.

MR. PORTER: That's right. We weren't through with the witness on the stand, Mr. Street. I was about to let him get off too easy. Anyone have a question?

MR. KELLAHIN: I would like to ask Mr. Street some questions.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Street, on your direct testimony you stated, as I recall, that there is a direct relationship between deliverability and reserves, is that correct?

A Yes.

Q So we all understand just what we're talking about, would you please define reserves for us?

A Reserves are the hydrocarbons in the reservoir rock under a given tract of land, and there is a difference between

reserves and recoverable reserves, as we are all aware. The in place reserves or reserves as such will not all be recoverable.

Q Now in drawing the conclusion you did, this relationship between deliverability and reserves, were you then referring to producible reserves?

A Yes.

Q Are those producible reserves the reserves, producible reserves underlying the tract dedicated to the well?

A Yes.

Q Those are the reserves we are talking about?

A For each individual well.

Q Yes. That is the reserves on which you base your relationship between deliverability and reserves?

A Yes.

Q Direct relationship. On what factors do you base your conclusion that this relationship exists?

A I believe if you would also recall it, the thickness or the isopach map indicated direct proportional relationship between the deliverability map, which is the index to the reserves, the recoverable reserves.

Q This isopach map you are talking about is based on the gross sand thickness, is that right?

A Yes, sir.

Q Didn't you testify yesterday that there was no relationship between gross sand thickness and net pay?

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A I believe I made the statement that the gross sand was the maximum sand in the bore hole which could contain hydrocarbons, and that it was not, it could not, this gross isopach could not be used to calculate reserves; however, by it being the maximum amount, that it was the most optimistic consideration that could be given, and that because the net could never be greater than the gross, then it seemed reasonable if there was a relationship it wasn't the maximum possible in the deliverability. With the thickness parameter which I have attempted to give consideration to here, then there should be even better consideration for net and deliverability for this one reserve parameter, thickness.

Q Then in other words you are saying that while it does not necessarily reflect the reserves, you are using it for that purpose?

A For this one parameter.

Q For this one parameter, and that is the information upon which you find this direct relationship you are talking about?

A Yes, sir.

Q Now refering to this deliverability map that you prepared, and your gross sand thickness map, in effect they both just outline the developed area of the Pool, don't they?

A That was the attempt. Even within the developed areas of the Pool, there was, due to lack of control either through data or drilled locations, there is some interpretation.

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Q Now your deliverability map is contoured on an interval of 500 MCF, is that correct?

A Yes, up to 2,500 MCF.

Q You did not go beyond the 2,500?

A No, sir.

Q Do you know how many wells that would leave not represented in the Pool?

A In what manner, sir, the dry holes or the producers?

Q No, sir, I'm talking about wells in excess of 2,500.

A I believe the percentage figures have been given by others in previous testimony.

Q Well, your next interval of cores, had you gone on on the same scale, would have been 3,000 MCF?

A Yes, sir.

Q Would you accept a statement that this would leave some sixty-one wells in excess of 3,000 MCF that are not represented on your map?

A All wells are represented on the map with the deliverability number indicated by that particular well bore, so it has not been eliminated from the map.

Q Then what you have done is taken the high deliverability wells and averaged them in with the low, in order to arrive at what you say is the best area?

A No.

Q Did you use that figure in making your calculation on

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deliverability?

A I did not make any calculation on deliverability. I took the deliverability for each well as indicated on the 1961 deliverability schedule, and placed them by each well that had given deliverability, and contoured them accordingly.

Q In other words, what I'm saying is, you took the high deliverability figures, averaged them in with the low ones in the same area to find out what your average deliverability was?

A No, there was no average on this. As I say, every well that has a deliverability figure has that deliverability figure written by the well symbol which it represents, and those numbers are on the map, on all maps; every deliverability number that was on the 1961 deliverability schedule is shown on the map.

Q Then you took the high deliverability figure in some instances and ignored an offsetting low deliverability, did you not, in drawing your contours?

A Not for the intervals contoured, no, sir.

Q Would you step over to your deliverability map, Mr. Street, and look at Section 27 in 29 North, 13 West? There are two wells on that section, are there not?

A Yes, sir.

Q What are their deliverabilities?

A The one in the Southeast Quarter was listed as 4,293 MCF; the one in the Northwest Quarter was listed as 3,511 MCF.

Q Does that mean that the one in the Northwest has

approximately eight times the reserves as the one in the South --

A I'm not --

Q You said 3,000, it's not 3,000.

A 30,511 MCF.

Q Does it mean that well has approximately eight times the reserves as the one in the South in the same section?

A I believe there you are talking in terms of the total reserves present. I believe I have always been quite clear that we are talking about one major parameter; the consideration for porosity and the saturation will have to be taken into consideration.

Q You didn't take them into consideration in drawing the conclusion there was a relationship between reserves and deliverability?

A These maps show that the thicker sand bodies occupy similar positions to the better deliverabilities of a million or above, which shows a direct proportional consideration between the thickness parameter and the deliverability.

Q Then the well in the South Half of Section 27 doesn't have as thick a sand body, is that correct?

A On the gross isopach map, if you will refer to it on Exhibit 1, it shows the major portion of Section 27 falling above a gross thickness of 60 feet.

Q For which well, or is that for both wells?

A The interpretation is that both wells would have in

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excess of 60 feet gross.

Q So your relationship between gross sand and deliverability is not borne out there?

A Well, as I say, for the actual reserves, the reserve calculation, you would have to have the other parameters.

Q But you don't have them?

A I don't have them.

Q You haven't offered them in any instance to this Commission in regard to your calculation of relationship between reserves and deliverability?

A I have said there is, that the thickness and the deliverability indicates a direct proportional consideration to the deliverability.

Q But not in this instance?

A I would say so.

Q Well, let's look at a couple of more wells. In 27, 11 and 26, 11, where they join there, you have one contour surrounding wells ranging from 2,860 to 12,894, is that correct?

A Would you repeat where those wells are located?

Q Where 27 North, 11 West and 26 North, 11 West join.

A Would you continue with your question?

Q In one contour interval there, you have wells ranging from 2,860 up to 12,894, isn't that right?

A That is correct.

Q And in that one section where the 12,894 well is located,

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you have another well of 5,995, is that correct?

A That is correct.

Q Do you show a comparable difference on your gross sand thickness in that area?

A They are shown to fall within the 20 to 40 foot gross isopach interval.

Q There again, all you are basing your difference on is the deliverability of the well, then, not on sand thickness at all?

A I believe that what is taking place is that we're attempting to establish on a very minor scale when you consider the areal extent of the Basin-Dakota Field as defined, these erratics as they were, I believe, referred to in previous testimony. And we're talking about a tremendously large area. We're trying to set up the best consideration for a tremendous area, not for an isolated erratic variance. Here again there's the possibility of the difference in porosity and saturations that should be given definite consideration, because I wish to point out that without being a reservoir engineer, I believe that these dry holes as indicated on both plats 1 and 2, or Exhibits 1 and 5, show what is happening just immediately to the west and to the southwest of these producing areas; and I believe that you will see there a tremendous number of dry holes.

Now those dry holes indicate a lack of hydrocarbons present, or they would surely have been completed as producers, so we are seeing these exceptions which you are bringing up along

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the margins of a major producing area.

Q Was the section I pointed to, the last example I brought up, along the margin of the producing area?

A Right here is the producing area that you are discussing, and I would like to point out that in less than two miles from this particular section, which happens to be Section 29 of 27 North, Range 11 West, there are three dry holes --

Q The area we are talking about -- Pardon me.

A -- and to the east of it there are dry holes. In fact, in this particular producing area that you are discussing, occupying a position in 26 and 27 North, Range 11 West, this particular area has dry holes both to the east of the area and to the west, and the producing area that has been proved is approximately four miles wide.

Q There are a number of pools larger than five miles wide in this State?

A But that is the indication of the variable which is another consideration I wish to point out, that this is not a homogenous continuous reservoir situation, and as a consequence, every section in the Basin-Dakota Field as defined is not of equivalent value; and I believe that this particular discussion points this out very readily.

Q Mr. Street, you say that they are not of equivalent value, and yet the area that we're talking about is all in the red color which you defined as being the best area in the pool, is that

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right?

A I would say the better areas, yes, are outlined in red, using the arbitrary deliverability number of 1,000 MCF. This, I believe, was brought out in earlier testimony and I had no knowledge that it would be done, but the figures 500 MCF and 1,000 MCF were the figures discussed as to the economics and that sort of thing, which is a rather interesting thing to me because I developed these maps solely upon a geological basis.

Q Mr. Street, why did you not contour the intervals above 2500 MCF?

A The reason for that, as I say, I used an arbitrary figure on my part, that anything above a million, that there was very little consideration or concern about what area does that well's a million or greater in deliverability have in relation to the areas which have less than that. The isopach contours could be drawn. It would just show the steeper gradient at this particular scale, the contour spacing would be much more intense and would be just a greater mass of lines.

Q As a matter of fact, it would just be completely erratic with high deliverability wells offset by low, and your map would become meaningless, isn't that right?

A That was not the consideration given. I think that all geological maps are prepared on the basis of the scale used and the interval used to best clearly illustrate, and it would be not a physical impossibility but it would be a tremendously unwieldy

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map, say if this scale instead of a one to eight thousand were a one to two thousand scale, which would make it easier to interpret but it would be roughly eight times the size of this one.

Q I think that completes my questions as to that exhibit. Would you like to sit down, please? Now referring to your cross section A-A', that's the small eight-well exhibit, is it not?

A It's the twenty-one well exhibit. A-A' is Exhibit No. 3.

Q Well, let's get on the other one. What's the number of that one?

A C-C'.

Q C-C'.

A Exhibit No. 2.

Q That covers a distance of some 76 miles?

A Yes, sir.

Q With eight wells spread out through the entire area?

A Yes.

Q Actually many of those wells are in what you would call fringe areas, too?

A Yes, sir.

Q Would you not expect substantial differences in that distance in the various locations that you have picked?

A That is exactly the situation that does exist. These were not, the logs were not culled through to select them for this cross section. Well, you realize the scale of this cross section

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A-A' over a small area. Had we attempted to put every log from the C-C' over a distance of 75 miles, I don't believe we would be able to use it in here, so that it became necessary to take what appeared to be just a reasonable stepping out of wells to give the gross idea as to stratigraphic changes within the Dakota formation.

Q Now confining your answer to that cross section C-C', that would not in itself indicate there is not a gradual change from location to location across the length of that pool, would it?

A I believe so, in that by the stratigraphic datum which has been defined by the Commission as the basis of the Greenhorn, which is an interpretable and easily picked datum throughout the Basin-Dakota Pool, any variance from this datum would indicate a stratigraphic, a different stratigraphic position within the Dakota as defined, being 400 foot, an interval occuping 400 feet below the base of the Greenhorn.

Q What is the closest distance between wells?

A Two miles.

Q What is the greatest distance between wells?

A I believe it's fourteen.

Q Now referring to the exhibit A-A', that is the cross section which goes across the center of the field?

A It is across the center of the better proved producing area.

Q Now that cross section runs in a northeast-southwest direction?

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A Yes.

Q Are you familiar with the sand bodies in the Basin-Dakota?

A Yes, sir.

Q Do they lay in a northeast-southwest direction?

A From individual sand isopaching, it would appear that the sand developments are more on a northwest-southeast, which would make this cross section normal or perpendicular to these sand developments.

Q In other words, then, your cross section would of necessity cross sand bars where the well to well location would appear and disappear, whereas if you had run it in the direction of the sand bodies, it changes, or the lower sand bodies would have appeared on the adjacent wells, isn't that correct?

A These lower sand bodies that you are referring to --

Q The upper ones, too, Mr. Street.

A That they would appear?

Q Yes.

A Not necessarily.

Q Not necessarily, but they would be more apt to appear if you were not cutting across them, if you went the longitudinal direction of them as you testified the sand bodies lay in the ground?

A These sand bodies may have, because of their apparent width as indicated on this cross section, their length is corres-

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pondingly small. I would like to point out that this is commonly referred to by the operators as the Angel Peak zone, which is also the common log of 14 represented on Exhibit 3, which is cross section A-A^1, and on Exhibit 2, cross section C-C^1, as Number 3.

Now the well to the northwest some fourteen miles has a stratigraphically equivalent sand represented here, and it has been so correlated, shown as being probably the Angel Peak zone. So that I believe that would answer your question as to this cross section northwest-southeast.

Q Now this main sand body you referred to, your exhibit -- with the exception of that Well No. 7 which we will come back to -- shows it to be fairly continuous and contiguous across that section, doesn't it?

A With vertical, with thickening and thinning.

Q Now your maps over here would indicate that that main sand body is much longer than it is wide?

A Yes.

Q But yet you say that the smaller sand bodies would probably be about the same length as they are width?

A I believe because of the nature of the surveys, with sections being square or approximately square, that even if this sand body did extend two miles northwest-southeast, it is still very definite that the sand is not present in offset wells southwest and northeast.

Q Yet this has been defined as a common source of supply,

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hasn't it, Mr. Street?

A It has been defined as a reservoir, yes, sir.

Q That means a common source of supply in the Basin-Dakota Pool?

A That would be I suppose the legal definition.

Q I believe it was your testimony yesterday that this main sand body is not continuous?

A I believe that is --

Q Did you base that on the situation in your Well Number 7 on your exhibit, that is, the A-A^1?

A Not on Well No. 7, which shows the shaling out of the producing sandstone, but I believe it is also shown on the gross producing -- I mean on the larger areal extent cross section, C-C^1, which if you care to refer to that cross section you can see the Angel Peak zone is not represented as a continuous body.

Q On what do you base your conclusion that the No. 7 Well shows an absence --

A The low resistivity and the low SP, plus the fact that this member was perforated and production was not obtained. I have confined my discussion to the gross producing sandstones, and this, in effect, it's not producing and consequently has not been classified as a producer.

Q Do you know what efforts were made to complete that well?

A No, sir, no more than what is reported in the Commercial

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Q You don't know the result of their frac job?

A It was my consideration in that, not knowing the circumstances involved in every dry hole in the Basin-Dakota Field, that inasmuch as the operator did not elect to complete it, or attempted to complete it and didn't get production, and the State sanctioned the plugging, that was valid enough for me to say that it was not a producing well.

Q That's only one of two dry holes you show on your exhibit?

A On this exhibit here, yes.

MR. KELLAHIN: If the Commission please, at this time I would like to ask the Commission to take notice of its own records on the B. A. Fullerton Well No. 8. I have obtained the Commission's files, and ask them to take notice of the report therein which showed that that well was in the process of being attempted to be completed, killed four times; a Baker Model "D" Production Packer with an expendable knockout plug was set; the Dakota Formation, by the report of the operator, temporarily abandoned and the log shows that the top of the Dakota pay is at 6445.

On the basis of that report, of course, the operator does not consider it a dry hole in the Dakota, although it was not completed, admittedly. In connection with the completion of the well, the well file also shows that a tracer survey was made

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which showed frac fluid at 6602 feet, or 32 feet below the lowest perforation, and into the water zone. On the basis of that, we submit that tne well is not a dry hole in the sense that we are dealing with it here.

MR. PORTER: From which form were you reading, Mr. Kellahin?

MR. KELLAHIN: That's on the USGS Form 930 and on the notes attached to the Summary Report on the well.

MR. PORTER: That's 9330, I believe.

MR. KELLAHIN: 9330, pardon me.

Q (By Mr. Kellahin) Mr. Street, you testified that you need factors other than gross pay to determine reserves, don't you?

A Yes, sir.

Q Would you state what factors are needed?

A You need the net thickness, the porosity, the permeability, the saturation, and pressures in this case.

Q Those are the factors?

A Those are the major parameters. There are many refinements on a volumetric basis, is my understanding.

Q Do you have all that information?

A I believe that we are prepared to present expert testimony on those considerations.

Q But you did not take them into consideration in drawing your conclusions as to the relationship between reserves and

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deliverability, did you?

A Not in toto.

Q Well, not in toto, what did you take into consideration?

A With the thickness being a major parameter, and as I discussed earlier in the direct testimony, that without thickness which would mean without a sand body or a reservoir body being present in a bore hole, that the result will be a dry hole. So that thickness in the presence of the reservoir is a necessity or you have nothing to calculate, even using the finer parameters.

Q You say you don't have any thickness whatever in the Well No. 7?

A Under the definitions which I have outlined, no, sir.

Q In other words, you confine thickness to a producing horizon, is that what you are saying?

A Yes. In this particular study, that is true, because it is my feeling that in glancing over the area which Exhibits 1 and 5 show, that there were in the neighborhood of 100 dry holes, which if one has to be considered potentially productive, then consideration would have to be given to every one of them.

Q Just on the basis of the log, it does show sand present, doesn't it?

A Sandy shale, yes, sir.

MR. PORTER: The Commission will take administrative notice of the British American Government No. 2 well file.

MR. KELLAHIN: Thank you.

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Q (By Mr. Kellahin) Now in connection with that same exhibit, I would like to have you make a couple of more comparisons as you did yesterday, Mr. Street. Would you make a comparison of the net pay and the deliverability of the wells that you designated 9 and 10 on the exhibit?

A Well No. 9 has a deliverability, as reported in the 1961 deliverability schedule, of 935 MCF; and Well No. 10 has 138. The net pay as I reported for 9, 12 feet; and for 10, 20 feet.

Q Does that mean then that there's nine times difference in the reserves of those two adjacent wells?

A With the other parameters which would have to be taken into consideration, I believe that there would be that possibility. However, I would like to point out at this moment that Well No. 10 was producing in 1960, whereas Well No. 9 doesn't start production until in 1961; which would mean that if there is a comparison to be made directly of deliverabilities in the net sand, that one should consider the first deliverability run on the test, in other words, keeping them in numerical order.

In other words, if you have the deliverability on a well that started production in 1958, that's the number that should be used to compare with the 1961 completion.

Q Do you know what the cumulative production on those wells is?

A Yes, sir.

Q Would you give it to us, please?

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A Well No. 9, as indicated on the published cumulative production figures, is 40,143 MCF of gas, and 575 barrels of oil; whereas Well No. 10 has a cumulative of 70,663 MCF and 1,069 barrels of oil.

Q Now, Mr. Street, on the basis of your answer, I would assume you are saying that originally the deliverability test on the Well No. 10 should have been approximately the same as on the Well No. 9, is that right?

A That would be correct.

Q Wouldn't that mean that the Well No. 10 today has produced approximately 83 percent of its reserves?

A I don't know where you get the percentage figures.

Q Well, on the basis of the reduction, proportional reduction in its deliverability. That's the only figure that you are giving us to determine reserves on.

A I don't follow that the 1961 deliverability and the production, cumulative production gives a percentage figure as to the point of depletion.

Q I'm not talking about -- you said that you assumed that originally that well had approximately the same deliverability as the Well No. 9?

A No, sir, I did not.

Q I misunderstood your answer; then does it? Would you assume that?

A No, sir. The point that I made is that if you are

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going to make a comparison or attempt a direct comparison of deliverability and the net sands or the thickness parameter, that it should be the initial one, or if -- Well, just leave it that way.

Q Yet this is the deliverability that you are going to use on this well to make an assignment of the allowable to get the reserves under the tract dedicated to that well?

A That would be the index to the remaining reserves, because you have already produced a certain quantity of gas.

Q All right. That is an index to the remaining reserves. How would you determine what the reserves were originally in this situation?

A There we would go to the reservoir engineer --

Q In other words, the deliverability figure is meaningless?

A No, sir.

Q What does it mean, then? Your answer --

A The relationship of deliverability to the one parameter which, as I pointed out, is a major consideration, is quite good.

Q Well, now, Mr. Street, in answer to my question as to whether there was this nine times difference in reserves between these two wells, your answer was that the first well had been on production for a long period of time. Now what effect does this production have upon your deliverability figure?

A Reserves produced from under a lease reduces the amount of remaining recoverable reserves.

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Q Now to what extent have the recoverable reserves in the No. 10 been reduced, and on what do you base your calculation?

A That I believe is getting into the realm of a total reservoir engineering study.

Q Mr. Street, you've related deliverability to your reserves.

A On a gross Basin-Dakota Field relationship, not on the isolated individual cases; because we are talking about a tremendously large area, and I believe that any data which you or anyone else could develop, you would find erratics because we do know there are differences in the reservoir characteristics, the differences in wells' problems as you have made a point of with the British American test which is represented by Well No. 7; so that mechanically and naturally there are these differences.

Q In effect, then, you are saying that the Well No. 10 never did have the reserves that Well No. 9 did, aren't you?

A No, sir.

Q Wouldn't it be reasonable to assume that on the basis of your testimony, that a well with 20 feet of net pay would have at least as much reserves as one with 12 feet?

A I don't believe it has been disproved.

Q You agree to that, then?

A No, sir, no, sir, I don't believe it has been disproved one way or the other that Well No. 10 has less reserves than Well No. 9.

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Q What would you say the situation is?

A At the present time I would say the situation is that Well No. 10 has produced a longer period of time, has produced more total gas than Well No. 9.

Q Well, agreed, the figures show that, don't they?

A Yes, sir.

Q Almost twice as much?

A Yes, sir.

Q Did Well No. 10 have as much reserves to start with as Well No. 9 did?

A If the other reservoir parameters are constant, it would have greater, yes.

Q It would have greater. And yet today it has less,--

A I don't know --

Q -- substantially less?

A I'm not sure where you get the information or the figures that shows it to have less.

Q Well, I'm quoting from your statement that the deliverability in this case has gotten less. If it doesn't indicate that, I don't know what we are talking about.

A It would have the remaining reserves.

Q It would have less remaining reserves; in other words, today the reserves are less than they were?

A Well, if you have produced half of the contents of the reservoir, naturally they will -- or three-quarters, or if you

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have completed, it would have less reserves than when it started out initially. I believe that follows.

Q Is 70 million half the reserves?

A I am not in a position to say.

Q Well, do you believe it is, --

A No, sir.

Q --on the basis of the study you made of the Dakota Pool?

A No.

Q What are the reserves, on a rough estimate?

A I'm not in a position to give you the exact reserves on this well, and besides, I feel that that is beyond the scope of this particular testimony, in that the parameters which I have set out to illustrate, I believe have been adequately covered, showing the variation within the Basin-Dakota Field and that the relationship of the gross thickness and deliverabilities are approximately coincident.

Q And yet on gross thickness and deliverability, you cannot calculate reserves, can you?

A No, sir, --

Q Okay.

A -- not on the final form.

Q Calculating the net pay on your exhibits, these cross sections, did you correlate your logs with the core information available to you?

A The empirical approach, as I believe I discussed

yesterday is initially taken off from core information.

Q Would you answer my question now? Did you do that?

A No, I have not.

Q How did you pick your net pay, then, on the logs?

A The empirical relationship which has been used is when the sonic log is available, the gamma ray sonic, a porosity cutoff of six percent was used, which corresponds to a velocity of approximately 17,200, or 66 micro-seconds, and was arced, which would be indicated on the induction log if it is available, or the electric log if the bed is thick enough for resistivity of 40 ohmms, and if only the electric log and no other logs are available, an attempt was made, or the empirical relationship of 56 million on volt SP with corresponding resistivity.

Q You say that is the empirical approach to the problem?

A Yes, sir.

Q Is that the approach that you used?

A Yes, sir.

Q On that basis, then, you are making an assumption that all of the factors throughout the entire reservoir are the same?

A Inasmuch as this cross section is of the major producing area, that seems quite reasonable.

Q Mr. Frost, yesterday I believe you testified that you are the chief geologist for Pubco, is that correct?

A Yes.

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Q In your duties as a chief geologist, do you recommend to your company as to whether they will or will not drill particular drilling sites?

A Yes, sir.

Q In connection with that recommendation, do you consider whether a well drilled at any given site will be a commercial well?

A Yes, sir.

Q What is a commercial well?

A Depending upon the quality of control for the -- sometimes we attempt to select those areas which would give us maximum sand development and would give us an estimated or guessed deliverability, or IP in excess of two and a half million on an IP basis, or a million or so on deliverability.

Q In other words, you analyze the reservoir with the expectation of finding a well which will give you 2500 on the IP or a thousand on the deliverability, is that correct?

A Yes, sir.

Q And that you consider a commercial well. Would you consider anything less than that commercial?

A I believe on the aspects of commercial considerations, it depends on a lot of factors.

Q It would depend on the company's own individual situation, would it not?

A Right.

Q What is your cutoff point, Mr. Street?

5-27

A That would have to vary with the market consideration.

Q But roughly you say a million cubic foot well is what you are looking for?

A We would prefer to stay above it, yes, as I believe all operators would.

Q Would you deliberately drill where you anticipated something less than a million, absent any offset obligation or other consideration?

A We have.

Q With the anticipation you would get less than a million in this pool?

A Inasmuch as there are enough variables that you would not expect to hit exactly --

Q In other words, that is a calculated risk?

A We have fallen slightly below a million.

Q In other words, you sometimes do take a calculated risk?

A Yes.

Q Mr. Street, just one further question. You have not made any reserve calculations, have you?

A I myself have not. However, we did have work done on reservoir engineering which, of course, has been compared with the geological approach.

Q You did not make any calculations?

A I myself have not, for this testimony.

Q And you have not offered this Commission any such calcu-

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lations?

A No, sir.

Q And yet you say there is a direct relationship between reserves and deliverabilities?

A The reserves are directly proportional.

Q Directly proportional?

A To the thickness, is the statement that I made.

Q Now, Mr. Street, you've changed the answer. Now you say it's directly proportional to the thickness.

A That's what I have stated in my direct testimony.

Q Your direct testimony, you said that there was a direct relationship between reserves and deliverability; you stated it several times. What is that relationship, that direct relationship?

A That in the thicker sand areas, as evidenced by the comparison of the gross isopach map and the deliverability map, that there is a coincident of thicker sand developments and the deliverability areas of a million or in excess of a million.

Q Now the thicker sand section affects reserves, of course?

A Yes, sir.

Q That is, assuming the net pay is proportional to the gross pay?

A Yes.

Q Does a thicker sand section likewise affect deliverability?

A Normally, yes, I believe that is true.

Q Then factors affecting deliverability and those affecting reserves are in some measure the same, is that correct?

A Yes.

Q What is the direct relationship between reserves and deliverability, forgetting about this sand thickness? It has been used in both calculations, hasn't it?

A Yes, sir.

Q Where is your relationship between reserves and deliverability of the well, what is it? Is it one to one or --

A I do not know of a ratio prepared on that.

Q You don't have it?

A No, sir.

Q You don't know what the relationship is, then?

A Not on a statistical basis, no.

MR. KELLAHIN: That's all the questions I have.

MR. PORTER: Mr. Howell.

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company.

BY MR. HOWELL:

Q Mr. Street, will you please refer to your Exhibit No. 1? I think that's underneath the Exhibit No. 5. Mr. Street, will you locate on your Exhibit 1 Well No. 7 that is shown on your cross section which is at A-A^1?

A (Witness indicates.)

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Q Now, I believe you testified that the direct offset to the northeast was a producing well, and the direct offset to the southeast --

A Yes; southwest.

Q To the southwest. Would you look at the direct offset to the southeast and tell us what you find there?

A It is a dry hole.

Q Now will you look down about a mile and a half to the southwest, and what do you find?

A Another dry hole.

Q And look a mile to the south of that, and what do you find?

A There's another dry hole.

Q Are there any other dry holes in the area?

A There's another dry hole immediately south of that one.

Q Does that indicate to you the existence, not of mechanical difficulties, but of a lack of pay sand in that area?

A That would be the analysis I would make from this map.

Q Is the well which is immediately to the southeast, the southeast offset to your Well No. 7, located between two producing wells?

A There's a producing well on an offset basis to the southeast of it, and to the northeast of it, and one to the west of it. The due south offset to the second dry hole has not been drilled.

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Q Does that indicate to you that there is actually in the sand an abrupt variation at this point?

A Yes, sir.

Q And what is the distance there between the dry holes and the area of the thickest sand development, as shown; the approximate distance?

A The distance between the two dry holes and the thicker sand developments?

Q Yes.

A Let's see, it would be approximately a mile to the east and maybe slightly greater than a mile to the west.

MR. HOWELL: That's all. Thank you, Mr. Street.

MR. PORTER: Does anyone else have a question?

MR. STOCKMAR: I would like to ask a few more questions of the witness.

BY MR. STOCKMAR:

Q Mr. Street, in analyzing yesterday's testimony last night, I now have a better feel of what it is you are trying to say, and I've prepared some questions which I think are limited to what you are willing to testify to.

MR. KELLAHIN: We object, if counsel proposes to again examine the witness on direct examination. He had his opportunity to cross examine. If he wants to examine him on anything that was brought out by Mr. Kellahin -- we ask the Commission to limit what he testifies to now.

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MR. STOCKMAR: That will be satisfactory.

MR. KELLAHIN: Just to clarify the record, and maybe perhaps get some ground rules laid down here, it's a matter which frequently comes up before this Commission. On the case yesterday, Mr. Elvis Utz on the witness stand, there's a cross examination by Mr. Stockmar, by Mr. Everett, by Mr. Everett, by Mr. Ben Howell, by Mr. Morris, by Ben Howell, by Mr. Everett, by Mr. Guy Buell, by myself, by Mr. Stockmar. I am inclined to agree somewhat with Mr. Keleher's objection, but the ground rules have been laid out as they have been in this hearing. I think it's not exactly timely.

MR. KELEHER: Well, we object to any second-guessing. If counsel was not prepared to cross examine yesterday and proposes to go over the testimony and re-examine him, cross examine him, we object to it. If he wants to cross examine him on anything that's developed here now, then go ahead.

MR. STOCKMAR: Mr. Chairman, I think for the moment, as far as I know, what I would like to ask the witness is included within the area that Mr. Kellahin was developing this morning.

MR. KELEHER: We would like the Commission to rule.

MR. STOCKMAR: I would like to defer a ruling until I seem to step outside of it.

MR. KELEHER: We would like the Commission to rule on that particular objection.

MR. PORTER: Mr. Keleher, the Commission certainly notes your objection, and it is in the record. However, it has been the policy of the Commission as a regulatory agency to allow free cross examination of the witnesses and redirect at any time and recross, and so we will proceed on that basis. However, I would like to caution all of the attorneys at this point to avoid repetition as much as possible.

MR. KELEHER: Do I understand, Mr. Chairman, that this recross examination is to be unlimited in scope? He can reopen anything that he went into yesterday and again cross examine the witness on that?

MR. PORTER: As long as it's not repetitious.

MR. KELEHER: We would like to enter an exception to the ruling.

MR. PORTER: The record will show it.

Q (By Mr. Street) With respect to your Exhibit 1, I believe you testified that the areas you colored in red are the thicker sections of the reservoir?

A As interpreted from the available well data.

Q And therefore the best part of the reservoir?

A That the better reservoirs occur in this red area?

Q The better part of the reservoir is colored in red.

A The better reservoirs exist in those portions colored red, yes.

Q Do you know who the owners of the wells within the areas

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colored in red are?

A That would mean knowing the owner of every well in the Basin; no, I do not.

Q Are you acquainted with the operation of Consolidated, the Applicant, of the producing wells?

A I am aware of sone of them, in the location where Consolidated has acted as operator and consequently has their name on the well log.

Q You are acquainted with Consolidated's operation, then?

A Yes. And at this point I would like to bring up that consideration that Consolidated apparently has not, by their own --

Q I think you have answered my question.

MR. KELEHER: Let the witness answer.

A -- has not made available to the industry, through the commercial reproduction companies, the well logs in one of the areas in which they operate the wells.

Q (By Mr. Stockmar) I hand you, Mr. Street, a copy of your Exhibit No. 1, small scale, upon which we have outlined the producing properties and some other properties operated by Consolidated. Will you accept my statement that these do outline properties operated by Consolidated?

A I do not know if the area in Township 28 North, Range 10 West, is operated by Consolidated. They may have an interest, but I don't recall having seen any Consolidated logs or wells in the Reporting Services indicating Consolidated.

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Q Do you have any reason to believe that Consolidated does not own interest in those properties?

A I believe you said "operated" rather than owned interest. I imagine that the majority of the wells in this Basin may have some interest holders, as has been brought out in previous testimony.

Q Mr. Street, is the majority of the acreage which I have marked on here as being owned by Consolidated within the red or the best thickness area of this reservoir?

A The interest properties in Township 28 North, Range 10 West, would fall within a good area, which would be the Angel Peak area. The area to the north in Townships 31 and 32 North, Range 12 and 13 West, I wish to point out that very little well control is available, in that the well logs from these well bores have not been made available.

Q Are you impeaching your own map?

MR. PORTER: Mr. Stockmar, let him finish his answer, please.

MR. STOCKMAR: I am sorry.

A Inasmuch as only the peripheral wells indicating thinner sections or dry holes were in the area, it was, the interpretation was based on very scant control, which would give Consolidated the benefit of a doubt of whether the sands were thicker or thinner, or of what magnitude. There is the indication from smaller areas of gross sand thickness up in Townships 31 and 32 North, Ranges 12

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and 13, in that there are the limiting well gross thicknesses derived by dry holes.

Q (By Mr. Stockmar) Are you through?

A Yes.

Q May I restate that question? According to your map, in the northwest portion of the field, isn't almost all of Consolidated's acreage colored in red?

A Not knowing all of Consolidated's acreage --

Q As I have shown it on this map.

A This primarily falls within a red area; and as I say, I have qualified that with the fact that there is little available control because the logs were not made available through the Commercial Reproduction Service.

Q Are you aware that almost all of those logs have been released and made available?

A Probably I was aware that would probably be the case, inasmuch as it does take time to make well logs. From Consolidated's Farmington office, we received this information directly on wells that had not been released, and the statement was added that there are others.

MR. STOCKMAR: I'm making a sincere effort to ask questions that can be answered yes or no, or in a few words. I would certainly hope that we wouldn't get into the ring-around-the-rosy that we had yesterday. I am anxious to shorten the proceeding.

MR. KELLAHER: We are, too, but if counsel doesn't get

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the answer he expects, he can't complain.

A On a telephone call to the Consolidated Oil and Gas Company in Farmington of April 5th, 1962, wells which had completion dates ranging back to 1959 had not been released; and, of course, logs released to the commercial companies take at least a week or so to be reproduced or be mailed to the participating or purchasing companies, so it was not possible to include the majority of the Consolidated Oil and Gas data, if it has been released now.

Q May I have the map back, please?

MR. STOCKMAR: I would like to offer in evidence and have marked as Consolidated Exhibit No. 5, this re-marked copy of Pubco's Exhibit No. 1, to evidence that the majority of Consolidated's acreage is within the best area of the field, as defined by Mr. Street.

MR. KELEHER: To the introduction of which Pubco objects on the ground that no proper foundation has been laid. Apparently, according to counsel's statement, he has marked it. That is no proper foundation.

(Whereupon, Consolidated Exhibit No. 5 marked for identification.)

MR. PORTER: Object sustained.

MR. STOCKMAR: May I have this back? We will wish to offer it on rebuttal.

MR. PORTER: Yes, sir.

Q (By Mr. Stockmar) Mr. Street, Mr. Kellahin was interrogating you about two wells in Section 27, I believe it's Township 29, 13. Are you familiar with another well located in Section 28 immediately to the west of the Guy Callow No. 1 Well?

A Not on a personal basis, no, sir.

Q From your Exhibit No. 1, do you find such a well in the Northwest Quarter of Section 28, 29 North, 13 West?

A What is the location again?

Q It is in the Northwest Quarter of Section 28, Township 29 North, Range 13 West.

A Yes, sir.

Q What is the thickness of the gross sand as shown from your work?

A The thickness as shown on this well symbol is 70 feet.

Q And you testified that the Guy Callow well immediately to the east in Section 27 was also in excess of 60 feet?

A Yes, sir.

Q Would you now go to your Exhibit 5? What is the deliverability of that Guy Callow well?

A The one in Section 28?

Q In Section 27, that's the Guy Callow well.

A In the Northwest Quarter?

Q Yes, sir.

A That which is reported is 30,511,000.

Q What is the reported deliverability of the well to the

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west?

A One hundred and seventy-three.

Q Is it your considered opinion that there can be a variation in reserves between producible wells that close together--

A Yes, sir, I believe --

Q -- of 18,000 percent?

A I'm staying off of mathematical gyrations. Thicknesses and variations do occur, I believe we have gone through this many times, to the point of having dry holes offsetting. Yes, sir, the one thing, or consideration here which you would be required to know would be the other parameters; and again, as I believe Mr. Kellahin got the point across quite well, that as you reach the margin of a producing area that you expect greater erratic conditions to occur, which certainly is true of these two areas which have previously been discussed, as evidenced by the number of dry holes which limit the production to the west and to the south.

Q My same question again, Mr. Street. If it can be answered yes or no, please do. Is it your opinion that two adjacent producing wells in this reservoir can have reserves varying by 18,000 percent?

MR. KELEHER: We object to that on the ground that there's no testimony here that there is a variation of 18,000 percent.

MR. STOCKMAR: The only testimony that we have is Mr. Street's, in which he relates deliverabilities and reserves. From

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his own map, we find a variation in these two wells, one of them having a deliverability 182 times that of the other, with the same sand thickness. I submit that that is his testimony, and I was asking him to state it succinctly for the record.

MR. KELEHER: This witness has not testified that there was a difference of 18,000 percent. That's counsel's conclusion.

Q (By Mr. Stockmar) Mr. Street, how many times larger than the 173 deliverability well is the 30,511,000 deliverability in terms of percentage of deliverability?

MR. PORTER: I think we are belaboring a point here, Mr. Stockmar. I think the difference is shown there.

Q (By Mr. Stockmar) Thank you, sir. I think you can take your seat again. One of the other major things to which you testified yesterday and this morning was with respect to the determination of net pay.

A Yes, sir.

Q I don't think we asked you whether you, yourself, made these determinations on the 32 wells shown on Exhibits 2, 3, and 4; did you?

A I myself have not made all of them. I have made some of them.

Q Will the person who made the others be available to us to adopt and confirm your testimony and submit to cross examination?

A No.

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MR. STOCKMAR: Gentlemen, I would move stricken from the record as evidence any testimony of Mr. Street based on the work of others, which he did not supervise, who are not here to submit to cross examination. I would like to proceed to find out what work Mr. Street did; and the rest of it, I would ask to be stricken from the record as evidence in this hearing.

MR. KELEHER: May it please the Commission, I would like to ask permission to ask the witness if that exhibit was prepared by him or under his supervision, and if he knows that it is correct.

A I have so testified before the exhibit was introduced into the testimony.

MR. STOCKMAR: I'm sorry. I didn't understand that, Mr. Street.

Q (By Mr. Stockmar) Well, then, Mr. Street, with respect to the determination of net pay, is it necessary to know the permeability of each foot of the gross sand encountered in a well in order to determine if that foot of sand will permit the flow of gas through it into the well bore?

A That would have to do with the recoverable reserves.

Q I think these questions can be answered yes or no. Let's try to do so. To determine which of the footages, feet of gross sand you are going to call net pay, is it necessary foot by foot to know the permeability of each foot before you put it in the net pay category, or throw it out as non-pay?

A No.

Q It is not?

A No.

Q Then if you do not know the permeability of a given foot, which category do you place it in?

A If it is in a single sand body, as illustrated on cross section A-A1 of Exhibit 3, even to the perforation -- I believe this illustrates the answer -- some of these wells have perforated the entire body with continuous perforations; others have not. Here is even a well in this cross section which shows a notch, a single point of entry into this body; so if the sand reservoir is apparently homogenous and does have some permeability in a portion of it, it would be reasonable to expect the reserves to be drainable, or recoverable.

Q You said if it does have some permeability. How do you know this?

A In this particular testimony I have stayed with producing sands. Those wells which are producing obviously have permeability.

Q Somewhere?

A Yes, or you would have no gas available.

Q So if they are producing, you take all of the lenses as you have shown them and call them all permeable sands?

A I called them gross pay in this aspect.

Q You attribute permeability to all of the feet in that

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lens?

A That any reserves present in this particular bed could conceivably be recovered, as long as there are no impermeable barriers indicated on the log.

Q Then your definition of net pay is the same as gross pay --

A No, sir.

Q -- in many, many cases?

A That is possible. I believe there are some examples where the gross pay and the net pay are essentially the same; however, there are other factors which we are ignoring, and that is the shaliness of the sand and the porosity and the saturations.

Q You state that you do not have to know the permeability of each foot, before you count it as net pay?

A That is right.

Q In making whatever determinations of net pay you did make, did you adopt a minimum permeability as a cutoff point?

A No.

Q And include in net pay only those feet of sand having a higher permeability than that minimum?

A No, sir.

Q You did not?

A No, sir.

Q Then you are including in that pay sands having a complete permeability range as far as you know?

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A That's right.

Q From zero to whatever a maximum may be?

A That is right.

Q Is it your opinion that a body of sand having zero permeability will give up gas, will produce gas?

A On a natural basis, I would say no, if it has zero permeability.

Q On a natural basis?

A That's on a natural basis.

Q With the permeability determination that you did make of the natural permeabilities?

A No, sir, I believe that you brought out in your cross examination yesterday, and I believe my answer was that you cannot calculate the permeability from the well log; and you disallowed my statement that logging services have done considerable empirical work in determining permeability indices, which was disallowed because they weren't available for cross examination.

Q Let me get this straight. This is very important. You testified that from these logs of these 32 wells, you were able to, by some means, to determine the permeabilities of the sand sections encountered in those wells?

A I have not made any such statement, that I have used producing sand bodies which obviously have permeabilities or they would not be capable of producing gas, and they are gas wells.

Q But you have no idea of the permeability, then, is that

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correct?

A I personally do not have any idea of the permeability, other than that they are producing gas.

Q Did you use any porosity cutoff in determining net pay through your method?

A I believe if you would have listened to Mr. Kellahin's cross examination, that that has been testified to.

Q What was your minimum porosity below which you considered that there was no pore space which would contribute gas to the well?

A I believe my statement was that based on the sonic cutoff of six percent.

Q Six percent?

A Yes.

Q What is the maximum porosity you have encountered in any of the wells studied in your three cross section exhibits?

A It would be on the order of twelve percent.

Q Twelve percent?

A Yes.

Q What is the minimum porosity which you have encountered?

A Essentially zero.

Q What is the average porosity?

A I have not averaged the porosity.

Q Of these wells, of these 32 wells?

A I have not averaged the porosity.

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Q Does a sand section with six percent porosity contain gas?

A Providing the water saturations are not indicated to be filling the pore space.

Q What is the maximum water saturation percentage which you encountered in your studies of these 32 wells, what porcentage of the available pore space?

A From a log calculation basis rather than converting it to water saturation, we have used the empirical resistivity of 40 ohmms.

Q Can you state in terms of the percentage of the pore space, which I gather is a little hole in the rock that may or may not have water in it, or water and gas, or all gas, what is the maximum percentage of that pore space in any of the pores covered by all of these 32 wells which you encountered in your study; maximum percentage of water content?

A In the producing interval as indicated?

Q Yes.

A Yes, sir. I don't have those figures available, but I believe it would be somewhere in the neighborhood of 35 to 40 percent.

Q 35 to 40 percent. What was the minimum?

A It would be in the order of 30.

MR. STOCKMAR: I think that's all.

MR. PORTER: Anyone else have a question of this witness?

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MR. UTZ: I have one short question.

MR. PORTER: Mr. Utz.

BY MR. UTZ:

Q Mr. Street, do you concede that net pay is a parameter in calculation of volumetric reserves?

A Yes, sir.

Q Referring to your Exhibit 3, I believe it is, your cross section A-A^1, you read into the record certain net pays below each log, did you not?

A Yes, sir.

Q Are these the net pays that you would furnish your Engineering Department to calculate volumetric reserves?

A Yes, sir.

Q I believe the lowest net pay which you gave on that cross section was 12 feet.

A Yes, sir.

Q That is discounting the dry hole, because no allowable would be assigned to a dry hole. The highest net pay was 69 feet?

A Yes, sir.

Q Would you consider this cross section to be representative of the spread in net pays in the Basin-Dakota Pool?

A No, I really would not, from this standpoint. This is of the best producing area, the Angel Peak area of the Basin-Dakota Field. The extreme variations would be, well, obviously from zero to perhaps even greater; in this particular cross section

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Well No. 14 has the greatest single reservoir section.

Q Would you have an opinion as to what the minimum net pay would be in order to have a commercial well?

A No, sir, Mr. Utz, because from this standpoint, that the differences in the saturations and the porosities could make a difference in the reserves in a given sand thickness.

Q But you don't have that information available on each and every well?

A No, sir, I don't.

Q The cross section A-A^1, then, you say would not be representative of the net pay ratio?

A That is right.

Q In your opinion, would it be higher?

A I would expect this to be slightly higher than the average for the Basin-Dakota.

Q The ratio of net pays would be higher?

A No, that the quantity of net pay here would be higher, because this is of the better producing area.

Q Then a ratio of net pays on this would be conservative, is that what you would say?

A May I ask a question to see if I understand?

MR. PORTER: Yes.

A You mean there would be less variation in this cross sectional area than could be expected from all the producing, comparing, say, a well from one producing area to this area?

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Q Yes, sir.

A Then that should be conservative.

Q And the ratio shown on this cross section here would be in the order of .175?

A Well, it would be almost six times.

MR. UTZ: That's all I have.

MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: We'll take a ten-minute break.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, please. Now, Mr. Keleher, I guess we are ready for your second witness.

MR. KELEHER: Pubco would like to introduce the next witness, Mr. Dan Cleveland, who has already been sworn.

DAN CLEVELAND

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q Mr. Cleveland, will you state your name, occupation, your present employer?

A My name is Dan Cleveland. I am a Petroleum Reservoir Engineer for Pubco Petroleum Corporation.

Q Will you state your educational experience and background?

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A I attended four years at Texas A & M College, and graduated in 1955 with a Bachelor of Science Degree in Petroleum Engineering. After graduation, I went to work for Humble Oil and Refining Company in Central Texas; and the first one and a half years was spent primarily concerned with production engineering problems. After that I attended their nine-month reservoir engineering course in Houston, Texas, after which I was assigned to the reservoir analysis group in Humble's Midland Area Office in Midland, Texas. I stayed there in that capacity until 1958 -- excuse me, I went there in 1958 and stayed there until March of 1961, at which time I went with Pubco Petroleum Corporation as the company's reservoir engineer, and I have been in that capacity since that time.

Q Are you familiar with the Basin-Dakota Gas Field in San Juan County?

A Yes, sir.

Q Will you state, as of April, 1961, how many wells there were in that pool?

A In April, 1962, there were about 572 wells, I believe, shown on the April proration schedule; and this, roughly, at 320 acres per well, this is around 187,000 acres that is presently developed in the Basin-Dakota Field.

Q What is the present proration formula that has been used in the Basin-Dakota Field?

A Each month the total pool nomination is determined and

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the allowables are assigned to marginal and non-marginal wells. After deducting the total allowable assigned to the marginal wells, the remaining pool allowable is then assigned to the non-marginal wells. 75 percent of that remaining pool allowable for the non-marginal wells is allocated to those wells in the proportion that each well's acreage times deliverability factor bears to the total acreage times deliverability factor for all of the non-marginal wells. Then 25 percent of that remaining pool allowable for non-marginal wells is allocated in a proportion that each well's acreage factor bears to the total acreage factor for all of the non-marginal wells.

Q In your opinion, is such a formula based primarily on deliverability a just and equitable method in assigning allowables in this particular pool?

A Yes, I certainly do, because in my opinion the deliverability is proportional to recoverable gas reserves; and for this reason, a proration formula based primarily upon deliverability as a factor provides proper weight and value to uncertain rock characteristics such as water saturation, porosity, thickness of pay, permeability, and pressure, all of which are to be considered in determining the volumetric estimate of reserves.

The deliverability is actually the only nearly exact data measurement at our disposal for determining the quality of a well. All these other parameters, porosity, net thickness, water saturation and so forth, of course they're open to quite a

bit of controversy, and generally speaking, there are a few number of core analyses over the field, so when you boil it all down, deliverability is the only thing, it's the only tangible piece of data that we have for every well in the field.

Allocation of production based primarily on deliverability, I feel is necessary and desirable in order to enable each well to produce its fair share of the market in proportion to the recoverable reserves underlying that well.

Now although the assigned acreage for each well is about 320 acres for each well, you do have some variation, but it's certain in my own mind that those pertinent rock characteristics which define the amount of gas that can be recovered from that well are not the same throughout the field, and consequently, it cannot be said that all tracts have equivalent value.

Now conversely, the proposed change in formula giving additional credit to acreage, I feel will certainly permit non-ratable taking of gas from the pool, and drainage between tracts. The present formula does not create waste in my opinion, inasmuch as the 25 percent acreage factor permits the well to produce an allowable well in excess of a reasonable economic producing rate. If the gas is there and the well bore has actually been connected to those reserves, and those reserves can be recovered at an economic rate, in my opinion there just isn't any waste.

Now the economics of paying out one of these wells in a reasonable period of time is a problem that must be weighed and

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risked by the individual operator when he decides to drill a well, based on the current market proration rules in effect at the time, and pertinent geological factor. The current formula has worked very well in times of better market conditions in this pool, and in other pools in Northwest New Mexico. Actually, the amount of gas that's been required that I've gathered from testimony yesterday was that the market hadn't particularly changed, it was just as a result of additional wells being drilled. Now this is a risk that all of us have to face whenever we drill a well. There is no good reason, in my opinion, to change the formula now that the current market seems to be unfavorable to all of us.

Again I would like to say that the present formula does not create waste because of the direct correlation of deliverability and recoverable reserves. The present formula distributes the allowable among the producers on a reasonable, just, and equitable basis. It does not violate correlative rights, inasmuch as the allowable is based primarily on that factor, deliverability, which in my opinion comes closest to recognizing and giving credit to that well having more recoverable gas by virtue of its better rock characteristics such as porosity, permeability, thickness, and water saturation.

Q Mr. Cleveland, what is the variation in the various rock characteristics that determines the amount of gas in place under a tract?

A Well, Mr. Keleher, it's possible for the variation to be

very large across the field, based on core data from about 25 productive wells in the Basin-Dakota, data that were made available to me on a general basis, not strictly on a per well basis. However, I have reviewed and studied about 15 or 16 wells in the field where we have the core analysis data, and concur with these general overall statistics.

These data have been provided to me through a third party, core analysts, who advise me that they plan to make this data available to the industry within a short time. I think it's normal practice that they do this. However, naturally, as you can well see, they can't release this data on an individual well basis.

The average well porosity ranges from 3.9 up to 15.9 percent, for which I calculated a maximum to minimum ratio of about four times, or four to one; while the average porosity is about eight percent. The net thickness ranges from four up to 50 feet, or in a ratio of twelve and a half times, and this net thickness corresponds to a porosity cutoff of three and a half percent from core analysis, or at least it's tied in with core analysis.

The average net pay is 32 feet, and again it corresponds to a three and a half percent porosity cutoff. Water saturation ranges from 28 up to 50 percent for a hydrocarbon content ratio of 1.4 times. The average water saturation is about 34 percent. The permeability ranges from .01 up to 11 millidarcies for an

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average of about 1.4 millidarcies.

Now, with the exception of using the permeability in a volumetric calculation in order to describe to you the range of net reserves that we could be looking at, and I feel it is quite possible that the minimum of these parameters could exist in a particular well -- Now, I have no well that I've found these in, I haven't looked for it, but I am trying to give you a maximum to minimum variation in calculated reserves, provided all the wells had the same pressure initially and the same recovery factor could be assumed. I roughly estimated that the reserves could range from 164 million cubic feet up to about 12 billion cubic feet, or in a maximum to minimum ratio of about 75 to 1. These variations in rock properties across the field show that all tracts, although having about the same surface acreage, do not necessarily have the same quality of rock below or the same amount of recoverable gas in place.

Q You estimate, Mr. Cleveland, that in your opinion deliverability is proportional to the reserves. Do you have any evidence to support that opinion?

A Yes, sir, I have prepared a couple of exhibits.

Q I will ask you to place the first exhibit from which you will testify, and mark it Pubco Exhibit 6.

A You asked that that be marked Exhibit No. what?

Q No. 6.

(Whereupon, Pubco Exhibit No. 6 marked for identification.)

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Q Directing your attention to Pubco's Exhibit 6, will you tell the Commission what that purports to show?

A This is a well location map of a portion of the Basin-Dakota Gas Field, San Juan Basin, New Mexico; and on this map I have shown those wells colored in red which is the location of about 33 wells on which I have made a pressure production -- or I have made a reserve study on those wells and compared it with their 1961 deliverability.

Q Now from what source did you obtain the data that is reflected on that Exhibit 6?

A Well, for each of these wells I have obtained pressures, production data, various deliverability data, from the actual operator's report that's submitted to the Commission.

Q Was this Exhibit 6 prepared by you or under your direction or supervision?

A It was prepared by me.

Q Do you state that that truly reflects the testimony which you propose to give?

A Yes, sir, along with the No. 7 Exhibit; and the purpose in this exhibit is to give you an idea where these 33 wells that I'm working with, where those wells are located across the field.

Q Are they scattered across the field?

A Yes, sir. I think this represents a pretty fair sampling of wells across the field. Perhaps you can't see them out here, but I have got a few up in here and a few down in here,

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some right in here, and two or three up in this corner (indicating).

Q Now explain to the Commission further, that exhibit.

A Well, I think as far as this exhibit is concerned, its purpose was to demonstrate the location of the wells across the field that I'm working with now, the wells which I'm primarily interested in.

MR. KELEHER: I ask you to place that on the board and identify it as Pubco Exhibit No. 7.

(Whereupon, Pubco Exhibit No. 7 marked for identification.)

Q (By Mr. Keleher) How did you determine the reserves by the pressure production?

A Well, these 33 wells across the field were selected for this study because those wells had at least three pressure points from which that I could extrapolate pressure versus cumulative production, down to an economic limit of approximately 27,000 cubic feet per day, which corresponds to an economic limit or an operating cost of about $1130.00 per year.

Now this 27,000, it's roughly correct, corresponding to this $1130.00 -- I think actually calculated, it might be 26, but the margin of error that I'm looking at here is very negligible. After extrapolating the pressure, shut-in surface pressure taken from the deliverability data submitted to the Commission, extrapolating this data on the best straight-line basis through those points that I could, I then used data from the deliverability sheet or the deliverability report to the Commission, and plotted

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a log, log plot of the formula which is analogous to the back pressure equation, which is commonly accepted in the industry.

Now I have used the shut-in surface pressure and the P sub W or flowing pressure at the sand face, and the difference in the squares of those values plotted against the actual measured flow rate, the best straight line was extrapolated through those points to this economic limit of about 27,000 cubic feet per day. Then arbitrarily assuming a line pressure at that time of about 120 pounds, I have back calculated the abandonment pressure.

From this point then I go back to my pressure versus cumulative production curve, and at that abandonment pressure for each of these wells -- Now I'm saying this procedure was used on each well and an abandonment pressure was selected for each well, and the recoverable reserves were determined for that well.

Now in order to show the relationship of deliverability versus remaining recoverable reserves, I have prepared this Exhibit No. 7, which shows the deliverability, 1961 deliverability in thousands of cubic feet per day on the left vertical scale; and on the horizontal scale at the base I have shown the remaining gas reserves in millions of cubic feet. Now for each of these 33 wells I have plotted deliverability versus the remaining gas reserves, and I get this relationship in here, the average relationship between deliverability and the remaining gas reserves was determined very simply by taking the well's line from zero to a billion and arithmetically average those reserves from those wells lying

in that quadrant between zero and 1,000 MCF per day deliverability and zero and one billion cubic feet of gas; arithmetically average the reserves and the corresponding deliverability to arrive at an average point for that quarter.

Then, following right on down the line between one and two million -- excuse me, one billion and two billion, two and three, and so forth, I have arrived or derived this average relationship between deliverability and the gas reserves.

Now, to give you an idea of the number of wells that I've used in each of these ranges, between zero and a billion cubic feet, I have 13 wells, which is about 39 percent -- I'm being rough here in my percentages because I just want to give you an idea of what percentages of these wells I have used in each group. Between one and two billion I have used around 21 percent, or seven wells. Between two and three I've used 9.2 percent for three wells. Between three and four I have used five wells or about 15.2 percent; between four and five I have used three wells or about nine percent; and then out here in this range I have two wells, which represents about six percent.

Now, these 33 wells, which represents a pretty fair sampling across the field, I think, has allowed me to construct this curve, and in my opinion this shows fairly well that deliverability is proportional to the remaining gas reserves. Of course, we only have a couple of points out here. I'm not so fortunate as to have more points out there, but I think that the reason that

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this curve is tending to slope over out here may be due to two things: One, that we only had a couple of wells out here at this point, or it could mean that the lower deliverability wells are already receiving more than their fair share of the current market --

MR. STOCKMAR: May I ask that the witness repeat that last statement? I didn't quite hear it.

MR. PORTER: Would you repeat the statement?

A I was saying that I wanted to point out to you -- I'm saying that deliverability is directly proportional to remaining gas reserves. Now then, based on the data that I have here, this is the average relationship that I have, that I've found, I'm saying that by looking at the curve you can tell that it tends to drop off out here slightly. Now I'm saying that this could be as a result of two things. We've only got two wells out here, this is obvious, but it also could be as a result of the lower deliverability wells obtaining a larger portion or more, I should say more than their fair share of the current market. Does that answer your question?

MR. STOCKMAR: Yes, thank you.

A Now, the average deliverability for these 33 wells is about 1240 MCF per day, as compared to an overall field average of about 1407. I would like to state again that for this reason, or based upon this data, which I think is a pretty fair representation. It's a pretty good sampling. I realize it's a small percentage of the total wells in the field, but I think it is a pretty

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fair sampling of wells across the field where we have data that we can extrapolate and be fairly confident in.

This data, or an excise, I suppose, of the major portion of the field would be like this, and a larger majority of the points are falling in this area right here. I do have a few of them in here.

For this reason, a proration formula based primarily on deliverability is believed to be just and equitable, because by such a formula a well is given its fair share of the current market in proportion to its remaining reserves. Deliverability is the best tool to combine all factors that are pertinent to the volume of recoverable gas under a tract, those factors defining this gas, such as pressure, porosity, permeability, net thickness, and water saturation.

Q In your opinion, then, allocation on the basis of 75 percent acreage and deliverability plus 25 percent acreage does not violate correlative rights?

A No, sir, it does not violate correlative rights, except to the extent that instead of 75 percent acreage times deliverability plus 25 percent acreage, a more equitable formula should be based on 100 percent deliverability. However, the 75-25 formula is one which in my opinion provides a minimum allowable and by so doing adequately prevents waste.

Q Then in your opinion a minimum allowable is already accounted for in the present formula; should there be an additional

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minimum allowable set, in your opinion?

A Well, an additional minimum allowable I feel will in effect change the current formula and will be more serious as time goes along, and before long there will be no proration in the field except on an acreage basis, because the current formula provides more than sufficient operating profit; there is no need for a minimum allowable.

Assuming future allocations to be about the same as the 1961 nominations, or about 56,650,000,000 cubic feet, and using the participating number of wells as shown in the April, 1962 schedule, I believe they used 530.55, but for my purpose here I'm going to use just 530 -- the current formula will provide an acreage allowable of 2,227 MCF per month per well, or 1,462 MCF per month per well over and above a reasonable economic limit.

Now this margin of profit that I've figured here, which is an average on a per month basis, based on prediction for an entire year, is equivalent to a profit of about $2,160.00 per year. By a projection of additional wells to be drilled for a total of about 745 participating wells in 1964, the acreage portion of the formula provides an allowable of about 1,585 MCF per month, or 820 MCF per month above a reasonable operating economic limit.

This is equivalent to an additional profit of about $1200.00 per year.

So it is obvious that an operator can afford to operate his well on the basis of the current formula, that is, if the well

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is capable of producing that assigned allowable. Payout of the well is a risk that each operator takes in drilling that well, and should not be a responsibility of those other operators having wells of higher deliverability and higher reserves in a choice portion of the reservoir.

Q Mr. Cleveland, from a broad viewpoint, by the proposed change in the formula, have you made any calculation as to how many dollars a year will be taken from those operators having the higher deliverability wells and given to those having the lower deliverability wells?

A Yes, sir. I have estimated that on the basis of existing wells, that roughly a half a million dollars annually would be taken from 17 different operators and distributed to about 33 other operators in the pool, which in my opinion would be a flagrant violation of correlative rights.

Q How and in what manner will the future operations in the San Juan Basin Dakota Field be affected?

A Well, assuming a continuance of even a modest development program in the Basin-Dakota, any change in the existing formula in favor of acreage as opposed to deliverability, in my opinion will be highly prejudicial against those operators having higher deliverability wells with correspondingly higher reserves and will be unjustly in favor of those operators having lower deliverability wells and correspondingly lower reserves.

MR. KELLAHIN: I believe that's all this witness will

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testify to on direct examination.

MR. PORTER: Anyone have a question of the witness?

MR. STOCKMAR: Ted Stockmar.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Appearing for Consolidated.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Cleveland, you heard Mr. Street's testimony?

A Yes, sir.

Q Do you subscribe to and adopt his testimony?

MR. KELEHER: Well, we object to that on the ground that a great deal of testimony was given. To ask this witness whether he adopts it is unfair and irrelevant; it is immaterial to this case. He can ask him specifically as regards some phases of it, but to ask a question which calls for such a sweeping area, we object to it.

Q (By Mr. Stockmar) Do you agree with his testimony that Dakota sand with six percent porosity and high permeability will not produce gas?

A Well, in the entirety of the scope of that question, I think we have got to consider that when you are working with logs and a very relatively few number of core analyses, in some way or another you have to correlate this core analysis to your logging data in order to get the best coverage over your field. Now, in doing this, the logging industry has provided tools, or

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they have made a considerable amount of research in being able to correlate core data with logging data. Now then, this six percent that Mr. Street is referring to, I'm not so sure that I have the best understanding of what he is referring to there, because he's trying to apply these rules to a large number of wells with a limited number of core analyses.

I think basically, in my own mind, that looking strictly at the core analyses, that I think that a three and a half percent porosity cutoff would generally correspond, now on the well log maybe what Mr. Street is calling a six percent, whether it would compare I'm not for sure. I haven't worked with him that closely on the preparation of these exhibits.

Q Based on your own experience and views, will a sand section which has a six percent porosity and a high permeability produce gas?

A If it has a high permeability?

Q That's what I said.

A Right.

Q It will?

A That's right, yes, sir. I think it will. Now of course, here again -- and you prefaced your question by "if" it has a high permeability. Also I would like to point out that it does have to contain gas. Now the water saturation may be high enough that you are pulling water in and you might not be able to produce much recoverable gas. Now I have tried to answer your

question as directly as I can.

Q Let's say that the water saturation is the average in the Basin-Dakota reservoir; I believe you said it was 35 percent?

A 34 percent, I believe.

Q 34 percent. At that average, then, you do believe that gas will be produced from six percent porosity sand with high permeabilities?

A I think it could be.

Q Mr. Street also testified that sand with over six percent porosity and with zero permeability will produce gas. Is that also your opinion?

A Over six percent?

Q Porosity.

A And zero permeability?

Q He testified that that kind of sand will produce gas. Do you subscribe to that view?

A I think it's rather obvious throughout the field that there could be cases that such a well has produced gas, or other instances where a well with similar characteristics would not produce gas. Now, I think it's entirely possible that on natural flow -- in other words, if you receive no flow, apparently you have no permeability or the gas is not there. Let's assume that it's no permeability. Now if you go in and frac that well and actually connect that well bore with the reserves which are lying away from the well bore, then you have increased your effective permeability

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from zero to some higher extent.

Q But you apparently do not believe that the gas can be produced through zero permeability sand, is that correct?

A No, if it's strictly zero permeability, I think it would have to be fracked.

Q In your determination of reserves on Pubco Exhibit No. 7, did you take into account some of the factors which have been referred to as measurements of reserves such as acreage?

A No, sir. The acreage that can be considered as assigned to a well, in this case I think, though, could be 320 acres. Now then, the reason for this is that in initial hearings the spacing in the Dakota was established at 320 acres. Now then, as far as I can tell in my working with the production out there in the San Juan Dakota, I think 320 acres is a good spacing. Now --

Q The determinations you made, however, separately with respect to each well, were based on a pressure decline method, were they not?

A Yes, sir, that's right.

Q Therefore there was no occasion for you to consider acreage, was there?

A And neither was there an occasion to consider what the actual porosity, the permeability, the thickness, the water saturation and so forth is concerned. Now this procedure in calculating reserves is an acceptable procedure in the industry where the other method is by volumetric. Now then, this is a method of

measuring how much recoverable reserves that you have in place, recoverable reserves which can also be defined by the various rock characteristics such as porosity, permeability, thickness, water saturation, pressure.

Q Let us analyze more closely what you mean by reserves. I think you said that on this chart you have determined the remaining recoverable reserves for each well.

A Yes, sir.

Q Is that correct?

A Yes, sir.

Q That means, I assume, the reserves that are recoverable through that well bore?

A They are the reserves that are recoverable that are surrounding that well, and through that well bore.

Q What is it that controls the amount of gas that will flow through that well bore?

A Well --

Q Let me summarize. Is it not the order of this Commission that determines how much gas will flow through that well bore, the allowable order?

A Well, yes, in that sense it is -- well, not altogether. I mean it depends, first of all it depends on how much gas you have got there to start with, or the recoverable reserves that you are looking at. Now then, to the extent that the Commission's proration formula affects this, which at the present time on the

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basis of 75-25 allows gas to be produced from that well bore, in my opinion, proportional to the amount of recoverable gas reserves this well has.

Q Your studies are based on the gas produced to date, is that not correct?

A It is based upon the pressures that were taken in 1961. Now then, for the individual well, these wells as you well know have their pressures taken from January through December, but the pressures corresponding to these deliverabilities measured through 1961 were used, and the corresponding production for the individual well up to the time that that pressure measurement and deliverability were made was used in the construction of this graph.

Q Did you make your projection of the recoverable reserves from each of these wells on the basis of the Commission's present allowable formula?

A I wouldn't say that to be true at all. You are looking -- you are concerned in this type of analysis with the amount of gas that has to come out of the ground, and this is what I have determined and used in my exhibit.

Q Well, I'm having trouble following you. Are you saying that each one of these wells could produce the gas reserve that you show for it, let us say in the absence of any proration order, any allowable order, is that what you are saying, or without respect to the order?

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A No. I prefaced my statement there that on the basis of the 75-25 formula as we have it right now, the wells are being drained in proportion to the recoverable reserves in place. Now, the gas that has been produced from that well has been used in the construction of this exhibit. Now I think, and of course I have no proof of this, if we had started back some time ago on the formula that your group is proposing, I don't think that we would be able to see this type of correlation.

Q Mr. Cleveland, on Wednesday in my opening statement, I made some fairly blunt remarks about statistical manipulation or something like that. I'm trying to find out from you if these producible reserves, as you have determined them, are based upon the present formula. If so, I'm not the least bit surprised that the resulting line might seem to support the existing formula.

MR. KELEHER: Now we object to that statement. That's practically insulting, and accusing the witness of having manipulated. We ask that question be stricken from the record and that counsel be prevented from pursuing it further.

MR. PORTER: The statement will be stricken.

Q (By Mr. Stockman) Well, Mr. Cleveland, will any given well in your opinion produce the remaining recoverable reserves you have assigned to it, under or in the absence of any allowable order? If that well were simply allowed to produce without restrictions, are those the reserves it would produce?

A I would say that if this field was to be produced on

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the basis, and prorated on the basis of 100 percent deliverability, then we would get even a better picture than what I've shown here. Now then, all I am saying is that it's -- you referred to mathematical gyrations, I think it can be shown mathematically, or I think it's even reasonable to say that when deliverability is proportional to reserves and it is withdrawn on a -- based on a parameter which is proportional to those reserves, then that we will recover the amount of gas that is underlying it.

Q Mr. Cleveland, I honestly have no intent to be insulting or anything, but I'm still trying to find out whether or not these producible reserves would be producible from these particular wells if we had no proration formula, no allowable formula whatsoever. Is this a valid prediction in the absence of consideration of any order?

A If we had no order whatsoever, then I think you can see that each well would then produce at a rate corresponding to its present deliverability, or its deliverability as time goes along. I didn't mean to say present deliverability, and in a sense, then, you would be producing that field based on a hundred percent deliverability.

Q And this is what you propose the Commission should adopt as an order?

A I'm saying that if there is to be a change made, that it should be in the direction of 100 percent. I have also indicated that because of this minimum allowable situation, that has

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brought up some question that the 25 percent acreage factor in the current formula provides a minimum allowable, and I don't know what the extent, but it's reasonable that it could eliminate some violation of correlative rights.

Q As I understand you, then, Mr. Cleveland, you say that eliminating all restrictions whatsoever would be the same as operating under a hundred percent deliverability formula, is that correct?

A Yes, that's right. It would be producing thirty days a month or 30.4 days a month instead of just a very limited number of days during the month as we had under the current market.

Q Then if I follow you, since you are recommending that a 100 percent deliverability formula be adopted --

MR. KELEHER: May it please the Commission, this witness has not recommended that to this Commission. I object to the form of the question.

MR. STOCKMAR: In the opening remarks of your company, was not that recommendation made by some spokesman?

A I believe, sir, we were saying that if there were a change to be made, it should be in the direction of 100 percent. Here I have never recommended straight-out 100 percent.

MR. PORTER: The recommendation was conditioned.

Q (By Mr. Stockmar) Let me pose the question this way. If I understand you, then, as we approach a formula which has 100 percent deliverability, we are, by your own statement, approaching

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no restriction by this Commission, is that correct?

A That's not right, no, sir. I'm not saying that at all. If the market were provided --

Q Yes.

A -- and we could produce every well as much as it would go, we have no restriction; but at the same time, since each well is producing at its capable rate, now then, we may be producing thirty days a month here in this instance; then each one of these wells then will recover its fair share of or its proportion of the gas that's being produced in the entire field, and it will also be proportionate to the recoverable gas under that well.

Q In the absence, then, of any limit on the market, a 100 percent deliverability formula would be without restriction by this Commission, is that correct, if there were no limit to the market?

A I think obviously if there were no limit to the market and we could all sell our gas, the Commission wouldn't have a problem.

Q Is not the production of gas wells at their full capacity, at their highest deliverability, is this not what used to take place under the pre-conservation days under the rule of capture? Everybody produced his well for all it could make?

A I think you can say that that's true; however, the problem that we've had or the question that has arisen insofar as this old rule of capture that you are talking about are those

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instances where a man has a well on a very small tract of land and obviously then he could be violating some of his neighbor's correlative rights over there, but now we don't have a situation like that here as severe as all that.

In April we had 572 wells, total. Now then, some of those wells were marginal wells and were classified so. I don't know exactly the number of 100 percent non-marginal wells, but on a participating basis there were 530.55, I think, which accounts for these smaller acreage tracts. Now in the pool you've only got one or two wells, I think you have got one well that has an acreage factor of .13. Well, in the present formula that's taken care of. He's knocked down proportionately because he has a small acreage factor there. Now most of the other wells, there are three other wells, as I recall, that have acreage factors of 50 percent, where all the rest of them are up in the neighborhood of around 90 percent to, oh, say 114 percent.

I'm shooting from the hip here on those values, and you can probably pick one out of there that's 120 or so, but roughly that's the range. We are looking, as far as proration on an acreage basis, when the majority of your wells or all your wells have the same common factor, then that factor really can't be entered into a proration formula, in my opinion, in order to be equitable.

Q Are you trying to tell the Commission that each of these 33 wells will produce their recoverable reserves from exactly

the same surface area?

A You are talking about areal extent now, out of 320 acres --

Q You have just testified at length that when all of the acreage is more or less identical for each well that it's not material to the rule of capture or something like that. I'm asking --

A No -- Excuse me.

Q I'm asking you if each of these 33 wells to which you have assigned different producible reserves each will produce those producible reserves from an identical 320-acre surface area?

A I'm not saying that. I'm --

Q I am asking you -- Go ahead.

A I am depicting here the amount of reserves that can be recovered from an assigned 320 acres to this well. Now then, out there on the boundary of this 320-acre circle, admittedly it's not a square which we are producing from, but whenever all your wells are a pattern, in essence you are producing from a circular 320 acres. In some of these wells there's going to be some gas out there away from that well that within an economic period of time -- now when I say that, it may be 20 years, it may be 30 years, it could depend on the individual -- there's going to be some of the gas out there that's not going to be recovered.

Now then, that unrecoverable gas, you may be able to

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crowd it all into say fifteen percent of the 320 acres, or twenty percent, I don't know. But there's one thing for sure, that in the proration formula we're starting off to see that the recoverable reserves that are going to be coming from that well is going to be drained from all of that 320 acres.

I think the Basin-Dakota is so, as tight as it is, and looking at what little geology we have of it, I think basically the formation is just very tight. Consequently, there's going to be some of those reserves out there that cannot be recovered through a low deliverability, and if they can't be recovered through that well to which it's closest, it certainly can be recovered from some adjoining well over there.

MR. PORTER: At this point we will recess the hearing until 1:15.

(Whereupon, the hearing was recessed at 12:00 o'clock.)

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AFTERNOON SESSION
April 20, 1962

MR. PORTER: The hearing will come to order, please. Before we get back into the case, Mr. Stockman, you may continue your cross examination after -- there have been a number of questions with regard to running the hearing and when we would recess. We are of the idea that we should run the hearing on if we could conclude the case by tomorrow noon. It seems pretty apparent right now that we would not be able to do it. If we should recess the hearing, we probably would recess it until Tuesday morning.

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MR. KELLAHIN: You are asking for suggestions, if we do continue it, as to what date we should continue it?

MR. KELEHER: We are almost through as far as our presentation is concerned. It might be advisable to consult some of the other counsel who will have witnesses about the extent of their testimony, and also what the Applicant proposes to do in the way of rebuttal. That might give the Commission some idea of the time. Adjourning it until Tuesday would not be very convenient for us because that's the day for the Annual Meeting, and most of us have to be there.

MR. STOCKMAR: Even though the rate of progess up to this point has not been rapid, I would recommend that we try to finish up by noon tomorrow. I think from our side at least we'll be able to move much faster, and just as fast as the opposition will permit.

MR. PORTER: I have been advised by Mr. Howell that he doesn't think their direct testimony will take very long. What about Aztec?

MR. SWANSON: We have one witness. I anticipate our direct testimony will probably take something in the neighborhood of 45 minutes. However, observing what has happened so far, I think an estimate of that type could have been made for most of the direct testimony that has been put on. I think it's running considerably longer than most of us would guess. It is our opinion we would not complete by noon tomorrow, and we would like to have

a recess.

MR. PORTER: Mr. Howell, how long do you think it would take El Paso to put on their direct testimony?

MR. HOWELL: Thirty to forty minutes.

MR. PORTER: Would you like for us to go ahead until noon tomorrow before we make this decision?

MR. HOWELL: Speaking for El Paso, we would like to go on, keep plowing. It's been my experience in these hearings that when you recess and reconvene that you plow a lot of the same ground over again.

MR. WALKER: Some of it has been plowed.

MR. KELEHER: That would be our preference, Mr. Chairman, that we continue.

MR. PORTER: We'll keep going. Mr. Stockmar.

CROSS EXAMINATION (Continued)

BY MR. STOCKMAR:

Q I am not certain exactly where we were, Mr. Cleveland, when we recessed, but I think we had reached agreement that an allowable order based on 100 percent deliverability, assuming such an order, in the absence of any restriction on the market was in a sense the application of the ancient rule of capture. I think we had reached that agreement, had we not?

A Mr. Stockmar, basically I would say that we had; however, I had qualified that concerning the smaller acreage tracts and that this situation on a general overall basis did not exist

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out here, with the exception of maybe two or three or four wells.

Q If we have again assumed 100 percent deliverability formula but a restricted market, is not the only difference -- since the permissible allowable of each well is proportional -- is not the only difference the time, the greatly extended time within which the rule of capture would apply?

A This rule of capture that you are mentioning here, as I'm taking it, is in the sense of capturing something which isn't yours.

Q No, under the rule of capture, whatever you could get was yours.

A I've already stipulated that in an instance such as this, your rule of capture where you are producing a well at its capability, then since it is in proportion to its capability, and I have said, I believe, that deliverability is proportional to remaining reserves, then the gas that this well recovers is the gas that's due that well to start with.

Q In other words, for this field you approve of the rule of capture, basically?

A Well, in the sense that the rule of capture here is not even.

Q Whatever the well will produce, it is entitled to?

A If I've understood your question correctly, we don't have that problem here. And I've said there may be two, three, or four wells where the tract acreage is small, or the fraction

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is small, of the 320 acres, and in those instances the formula that we now have cuts that particular tract back and all the others are based on 320 acres or thereabouts, so any time you start trying to throw something into the formula that is common to all wells, then you really have no need for that factor in your formula.

Q Well, I think we do understand each other that you are satsfied with an order which permits each well to produce all or some prorata part of all that it can make, its deliverability?

A Mr. Stockmar, I can't answer that question yes or no. It's not the type of question you can, and I'm not trying to evade you, but at the same time that this well is producing all that it's capable of making in your hypothetical situation here, all of the other wells are doing the same thing.

Q Yes.

A Now if all of the others were shut in and this one well were producing, then you would have a problem.

Q Well, I think you had also testified, or we were very near it, I've forgotten, that the drainage area for each of the 33 wells on your Exhibit 7 was approximately 320 acres?

A This has been the acreage which has been assigned to that well. Now then, on a tract to tract basis, the acreage factor might vary to some extent.

Q You mean there will be some variation from 320 acres, is that in a sense the average drainage area that we're speaking of or that the Commission has found to be a fair average drainage

area; isn't that what a spacing order is?

A Well, yes, spacing has been assigned to this field, basically.

Q Will some of these wells over a given period of time, say ten years, drain less than 320 acres?

A I would say that in this Basin-Dakota that there is a larger probability of one of these wells draining less than 320 acres than more than 320 acres.

Q Well,how about a well in the low deliverability range, in ten years will it drain more than 320 acres?

A In ten years?

Q Yes.

A I couldn't answer that question, if I was going to be shot the next minute.

Q Will it drain less -- well, let's use a comparison.

A There again I couldn't --

Q Will a low deliverability well during a ten-year period drain a smaller radius of drainage than a high deliverability well?

A I think the fact that the better well, as indicated by its higher deliverability, is an indication that more of that 320 acres will be drained than a lower deliverability well will drain.

Q Is there any possibility that one of the lower deliverability wells will drain gas from someone else's 320-acre drainage area, if it can't drain its own?

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A Yes, I think there is that possibility, particularly if withdrawals from that reservoir on an individual well basis is not proportional -- may I --

Q If a well cannot drain in a given period of time the 320-acre circle around it, how can it drain an area beyond that?

A Well, now, when we answer or when we consider these type of problems, we always have to also throw in an element of time. It just depends on -- This is why I couldn't answer your ten-year question a while ago.

Q You testified several times, Mr. Cleveland, that it is the low deliverability wells that are guilty of abusing correlative rights in this field. This must be because they are reaching out beyond their 320 acres. How else could they be abusing correlative rights?

A Well, here again we're having, we would have to determine how serious this is. We would have to consider an economic time. Now then, all I've said was that on the basis of this data right here, and I didn't say that it was a fact, I just said it looked like it might be this is what's happening, that there is more credit being given to the lower deliverability wells than they should get. Now then, I may be corrected on this, I don't think I have ever said that a low deliverability well could not extend out and drain more than its 320 acres.

Q No, you did not say that.

A I think that under a proration formula such as is being

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proposed, this type of situation could become more serious and we would certainly be able to detect it in a shorter amount of time than we will be under the 75-25, because I think under the 75-25 some of that is going on right now; but because of the short amount of time, I can't really definitely prove it. I'm saying that it would not exist if we went further in the direction towards 100 percent deliverability factor.

Q Mr. Cleveland, on your chart you show two wells having gas reserves of approximately three and one-half million cubic feet. Have you found those --

A Having reserves of three and a half?

Q Yes, sir.

A All right.

Q One of which has a deliverability of, what is it, a million and a half? The other has a deliverability of 3.8 million.

A 3.9 million, I believe.

Q Approaching three times as large a deliverability, is that correct? Two and a half to three times, as the first well?

A Now which are you calling the first well, with the 3.15 million?

Q No, 3.5.

A 3.5, okay.

Q The other one also having 3.5 million reserves and a 3.8 or 3.9 million deliverability. Have you discovered those?

A Yes, I see the ones that you are talking about.

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Q In a given period of time, with these wells producing at their full capacity, which well will produce the most gas, the largest part of its three and a half million reserves?

A Based strictly on the individual data point which in my correlation here I have not elected to do, I have used a trend through all of the points to represent an overall average, certainly within this data there can be points which can be picked out which if I'd so desired I could have left them out, that would not be consistent with the overall general trend of data. Now then, the top point up there, in fact, I've got two, those are individual cases and I think certainly over the field that you can pick out individual cases, individual problems that you have, for some reason or other. If one had the time to check back into each one of these wells and see if there had been a new set of perforations or if the well had been fracked additionally, in order to extend out and connect the well bore with additional reserves, then points like this I think could be better explained.

Q Mr. Cleveland, I'm not trying to place any weight on this line whatsoever. As I understand what you have done, these points represent two individual wells, do they not?

A Yes, that's right.

Q And as to each one you have taken the calculated deliverability in accordance with the formula adopted by this Commission?

A Yes.

Q That gives you one of your axes, does it not, or altitude

on the axis here, deliverability?

A Okay.

Q Then as to each of those wells separately, you have, through a pressure decline method, computed the reserves that each of those wells is capable of producing, have you not?

A That's right.

Q Well, then, ignore the line in the middle, we have two wells with equal producible reserves at this point, one having almost three times the deliverability of the other. My question was, during any given period of time, if these wells operate at their capacity or at their deliverability or any prorata part of it, which well will produce its producible reserves first?

A If this well, the higher well, were to maintain the high deliverability that it has right now, which I'm fairly sure that it wouldn't, then in picking out those two data points, the top point may or it may not, or the top well may or it may not produce those reserves first.

Now, in saying this, one has to consider that in the decline of deliverability or in the decline of capability of a well, there are a lot of factors which have to be considered. I am analyzing from strictly what happens, and that is the pressure differential from the exterior radius of your drainage area to the well bore, the permeability that's involved, the viscosity of the gas, which I would presume to be about the same for both wells, and then --

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Q Well, possibly my question --

A I think that pretty well covers it.

Q -- is too broad, Mr. Cleveland. I said in any given period of time, what would be the situation; which of these wells will produce the largest share of its producible gas in the period from now until the next deliverability test is taken under the existing allocation formula?

A If we say that this well maintains the same deliverability, then certainly this top well will produce its reserves first. However --

Q Well, this is the answer that I have been seeking. Were you here during Mr. Trueblood's testimony?

A Yes, I was.

Q Did you see -- it's buried in the exhibits up there -- but a cube that he used as an illustration?

A I saw it. I have my own opinions about it.

Q As I remember, there were two side-by-side tracts wit' equal reserves such as we have with these two wells with different deliverabilities, different orifices, more gas coming out of one than the other.

A I believe he testified that if one were to be voided earlier than the other, that since there was no guard-all shield between them, some kind of a redistribution of the gas in the reservoir would take place, and that the high deliverability well with equal reserves would produce substantially more of the total gas

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than the other. I think he further stated that in his judgment this was an abuse of correlative rights.

Q Do you disagree with that?

A Yes, I certainly --

Q With those premises?

A I certainly do. Certainly you can get up here and make a very basic diagram and say real easily, "This is what happens." Now first of all, under the two tracts of land, I've already indicated the variation in reserves from tract to tract, or the possible variation. I think it's very unlikely that the two tracts would have the reserves to start with, much less of the same slope characteristic on a back pressure type plot.

Now then, I bring this into it because it's very important. The slope of your curve on your standard back pressure plot or in your back pressure equation is a function of permeability, thickness, pressure differential, radiuses of drainage, temperature, gas viscosity, so forth. Now then, this was not even brought into this exhibit; it was not explained at all. The problem out there is not as simple as this.

Q Well, are you saying in essence that if there is a void space in one part of the reservoir and gas in the other, that there will be no migration from one to the other; the gas will not move to fill up the void space?

A Well, first of all, if the two wells have the same reserves, if they have the same permeability, and by reason of having

the same reserves, they have the same combination of porosity, water saturation, thickness and so forth; then those two wells are going to have about the same deliverability.

Q Certainly.

A Okay. Consequently, you don't have this problem if the two tracts are the same identically all the way through.

Q Then I'm forced to conclude, since I would not criticize the method of determining deliverability, that there must be a substantial error in your method of calculating reserves. Is it possible that you have too limited a pressure history for the pressure decline method to be valid?

A Well, engineers in most cases, or a lot of cases, are in the unfortunate position of having to work with very limited data. We're unfortunate also that we have a limited amount of time that we have produced this Basin-Dakota, in order to have more wells, a larger number than I've shown here, to demonstrate the thing that I'm trying to demonstrate.

Q If you had substantially more decline information, production history, you feel that you could make a more accurate estimate of reserves?

A These things always have to be revised as time goes along. Now two years ago there was only one point on these wells. Some of them have more than three points, but say two years ago you would not have been able to make as good an estimate as I feel I have made on these.

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Q I think you testified -- Well, excuse me, do you have any idea what percentage of the producible reserves under these 33 tracts has been produced today?

A Well, I haven't, from my graph, I haven't averaged the reserves up and, against the cumulative production or anything like that. I don't think I have. Wait a minute. I don't recall doing it, but I may have. I can't seem to find it, Mr. Stockmar. I may have played around with it a little bit, but I don't have it right here handy.

Q Are you in a position to make available to us for inspection your pressure decline curves on each of these wells that you created in connection with these exhibits?

A No, sir, I'm not prepared with the curves. I have located the wells on the map and the data is available.

Q You don't have pressure decline curves?

A Yes, I have pressure decline curves, but I'm not prepared to show them.

Q This is basic data to this exhibit. Are you saying that you are unwilling that we see these?

A No, I'm not unwilling at all; I'm just saying that with the rough copy that I have here with me, I have not prepared additional copies for distribution for the Commission so they can inspect them closely and so forth. Now that's the reason --

MR. STOCKMAR: I would like to request the Commission to direct the witness to make available to us even these rough copies

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for inspection. There is no use to take an extended time at this moment for that inspection. We can be looking at them in the course of the next few hours and possibly recall this witness for a question or two, but if the witness has basic data in support of his work here, we should be entitled to see it.

MR. KELEHER: If the Commission please, we object to that procedure. The witness is on the stand. He states under oath what he has done. He has prepared this exhibit and we believe that counsel is limited to the scope of the exhibit as it's submitted here.

MR. KELLAHIN: We join in the motion made by Mr. Stockmar that these be made available for inspection, because they are basic to the Exhibit No. 7. We have no way of testing the accuracy of the witness' work or conducting an intelligent cross examination of that exhibit, absent taking well-by-well, having him identify it and give the production history and the pressure point and the other information used. To make these documents available, even though they are in rough form, would certainly be in the interest of saving time. We submit it is a proper request.

MR. HOWELL: If the Commission please, might I suggest that the basic data is data which is available in the files of the Commission; that this represents only the witness' work, and the basic data is a matter of public record; and I question whether this would come within the category of basic data.

MR. PORTER: The Commission rules that if the witness

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has the testimony available but does not choose to enter it into the record or make it available, then the Commission will not force him to do so; therefore, we sustain the objection.

MR. STOCKMAR: I would like to note an exception.

MR. KELEHER: If the Commission please, it is not on the ground we are unwilling to do it. It is the materiality. What they want to do is to get his study papers. The witness has testified that the exhibit reflects 33 wells, that the data was obtained from the official Commission records. Those records are available to the Applicant here in this petition. Let them make their own study. Let them produce a witness who will testify directly opposite, if they wish, to what the witness Cleveland has testified to. But to ask us to make available all of our work papers is something I have never heard of before.

MR. KELLAHIN: If the Commission please, since we seem to still be arguing the same motion, I would like to point out that the material part of the information used in this exhibit is his interpretation of it, which is admittedly available. That is the information we want to obtain in order to test his determination from an engineering point of view.

MR. KELEHER: As him any questions you want on the record.

MR. STOCKMAR: Does the record show that the Applicant takes an exception?

MR. PORTER: Yes.

Q (By Mr. Stockmar) Did you exercise any individual

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judgment in preparing these curves?

A Certainly. In a matter like this, there is always a matter of engineering judgment that is required.

Q Is there a full copy of that in the records of this Commission?

A A full copy of the data?

Q No, of your judgment.

MR. KELEHER: If the Commission please, I object to the form of that question. Judgment is something intangible. It can't be placed in the record. It's a matter of opinion.

MR. PORTER: You contend that judgment can't be copied?

MR. STOCKMAR: Well, the Applicant contends there is a picture that needs judgment up there on the board.

MR. PORTER: Objection sustained. Let the record show that the objection has been sustained.

Q (By Mr. Stockmar) One more question only on that vein, Mr. Cleveland. I think you testified that you took your pressure data from the deliverability reports of these 33 wells, is that correct?

A Yes, sir, that's right, from the Commission records.

Q That pressure data was taken at three different times on three different reports?

A Yes, sir. The data in 1961 was read directly from the Commission reports. The statistics for the other two years and beyond that, which were taken from the official records of the

Commission and published in the New Mexico Oil and Gas Engineering Committee Statistical Book, data which was compiled from the Commission records.

Q Was there individual pressure data for each of these 33 wells for each of those three periods?

A Yes.

Q And that is available in the records of the Commission?

A Yes, sir. Now there might be a few wells in there that would have three or four, maybe five points; but all of them would have at least three points.

Q What is the required time for shutting in a well prior to the taking of a deliverability pressure measurement?

A Seven days.

Q Is seven days ample time for all wells to --

MR. HOWELL: If the Commission please, that's a rule of the Commission, and I for one hope that we can get through with this. I ordinarily don't intervene in anybody, except my own witness, but that's the rule of the Commission. I assume by this that the Commission considers it adequate, and for this question, it seems to me it's utterly improper and extraneous to any issue in this case.

MR. KELLAHIN: It's a question of adequacy of the test, for one purpose as contrasted to another. This has been used for extrapolating a pressure decline curve, and that is one thing, in determining a deliverability of a well, and using a pressure in the

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formula is something different. The Commission's order has nothing to do with the testimony of this witness.

MR. EVERETT: Could I suggest to counsel, ask him whether he used the Commission figure for that seven-day period, in the interest of saving time, which comes first.

MR. PORTER: Objection overruled.

Q (By Mr. Stockmar) Mr. Cleveland, if a low deliverability well is shut in for over seven days, will it reach its maximum shut-in pressure during that period?

A On some of the wells it will. Some of the wells it won't.

Q Is it more likely to reach its shut-in pressure if it is a high deliverability well?

A Yes, sir, that is correct.

Q Therefore --

A Now the pressure that you are speaking of -- excuse me, sir. The pressure that you are speaking of is that pressure which is closest to the static reservoir pressure.

Q But there may be a difference in the validity of the data as between low and high deliverability wells?

A As far as the accuracy of static shut-in pressures; however, in the interpretation of this data, in a low deliverability well from the initial pressure to, say the point at the time when the second, third, and fourth pressures are taken, this pressure that you see after the first point or that initial point, the slope in those later points is such, in my opinion, such that you can

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extrapolate those three points and arrive at about the same point that you would at abandonment pressure, as you would by extrapolating those three points had it been allowed to shut in, or if the well had been shut in and allowed to build up completely to a static reservoir pressure.

Q This assumes that the well was shut in for seven days only during each period, is that correct, so that there is a comparison that can be made?

A In the previous sense or the later sense of static reservoir pressure, or the seven-day shut-in as it stands right now?

Q The seven-day shut-in.

A Yes, that's right.

Q If some low deliverability well happens to be shut in for some extended period of time just prior to deliverability test, then this would not be a fair comparison, is that correct?

A Well, sir, I believe as the rules are set up right now, before the deliverability test is taken the well is tested for about thirty days, is flowed for about thirty days. Now this has been established by the Commission as a conditioning period, and I would assume that their judgment is that it is adequate.

Q To change the scenery quite a bit, Mr. Cleveland, I think you've testified that one of the reasons that you favor the large weighting of deliverability in the allocation formula is because it is the one thing that's known about all of these wells

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that's precise. Was that not your statement?

A Well, it's the one factor which is, that has been calculated or has been determined for each individual well, and I feel like that since this data is taken regularly on an annual basis, that from time to time you are checking and rechecking yourself as you go along on this factor.

Q That is what you did say?

A No, I didn't say it. I'm just saying it right now. I'm explaining it to you.

Q I submit, Mr. Cleveland, that under the Commission's spacing order that the acreage attributable to each producing well is also known with great precision, is that correct?

A That's right. And it's also about the same for every well in the field. This is why it's not particularly an important factor.

Q It's equally precise as far as deliverability is concerned?

A It's precise. If we have two apples and you have one and I have one, and we want to split the two apples up, the only logical approach is for you to take one apple and me take the other one.

Q As Mr. Truebleod tried to say on the witness stand, that's why we are here. I submit to you, Mr. Cleveland, that if those two factors and those two alone, both of which seem to have a direct relationship to reserves, are there, that we should have

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at least reached the fifty-fifty weighting at this time, do you agree or disagree?

A No, sir, I certainly don't.

Q Do you agree that the surface acres does not bear a direct relationship to the reserves?

A The size of the surface acres, as I have already stated, is about 320 acres per well. Now then, the scenery that you have on the surface over that 320 acres doesn't really count.

Q Well, is it fair to say that if we have a chart like yours, with reserves here, acreage here, we start with zero -- our first point is 160 acres, our second point is 320, 480, and 640; and I say to you the reserves under a particular 320, according to your chart, average two billion cubic feet?

A Is that a weighted average or just an arithmetic average from one end of the scale to the other? Is that what you are --

Q Why don't you give me the average reserves of these 33 wells and we'll use that. Will that have to be computed, Mr. Cleveland?

A Yes, sir, I don't have it handy.

Q I thought you testified that the average deliverability was 1240.

A Well, that's right.

Q Well, I submit to you, Mr. Cleveland, that if this chart has any validity, that if you can find 1240 on the curve, the average reserves of an average well will be directly beneath it.

A Mr. Stockmar, the sense in which you asked the question was an average on an individual well basis. Now the average relationship that I have shown through here, I would say that it is reasonable to say then that the 1240 does compare with an average of about two million.

Q Let's get back to my hypothetical chart here of acreage versus reserves. Using your average two billion, I'll put that at the 320 point. What should be the average reserves under a 160 tract, half of that, I submit, one billion?

A Yes, on a proportional basis, yes.

Q So we'll put that point. What should be the reserves in a 640-acre tract?

A Twice that amount. Now this is the amount of gas.

Q Should I connect those lines, will I have a nice straight line?

A In that sense you will, but you are working with one individual well as an example. Now then, the reserves in proportion to my curve here, if all of the wells were producing in the field on a 160-acre basis, or if all the wells were producing on 640 acres, then the relationship that you are talking about would be true for the entire field. In other words, the --

Q Mr. Cleveland --

MR. KELEHER: Let him finish.

A -- the 320, for an average of 1240, the reserve is two billion. For 640, if it would drain 640, could be in proportion

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to that number and be twice that amount. Now then, this is provided that the drainage characteristics to that well bore over 640 acres will be in proportion to the data that is represented here by this chart.

Q (By Mr. Stockmar) I admit, Mr. Cleveland, that I am engaging in some mathematical gymnastics, as I called it here. I think you said that this might be valid as to a given well, this kind of thinking.

A Well, I think it could be valid to the extent that you are not looking at a large amount of area there; of course, as you go from 160 and you have one well draining 160 acres, the chances are you are going to be able to recover a slightly smaller fraction of gas from that 160 acres, as compared to the fraction of gas that is recovered from 640 acres by that same well.

Now, from that standpoint, your curve wouldn't be exactly correct.

Q But fairly --

A I can't say what there would be.

Q -- fairly good relationship, general relationship, would you say?

A Well, it's just an arithmetic proportion.

Q For a given well only, or is it true of groups of wells? I may have misunderstood you.

A No, I didn't say it, you did. It could be proportional. I've already said it could be proportional. Now the area that is

involved, I couldn't say. I am saying a larger percentage of gas could be recovered from the 160 acres; as you go out to the ranges of 640, well, the overall fraction or percentage of the gas that was there to start with would decrease as you go out. I think --

Q Well, if we worked with all kinds of varying acreage sizes and varying reserves under them, we could make a scattering of points, could we not?

A Well, to me it wouldn't mean anything. What would it mean?

Q Well, it would show that there's a very definite relationship between acreage and deliverability or acreage and reserves. If we are able to determine, as you have many times here, that this particular well has these reserves and it drains this many acres, some more, some less than 320, we can get a scattering of points, can we not? Can we not draw just the kind of a line that you have drawn on Exhibit 7?

A Mr. Stockman, we have, in approaching a problem like this, we have to stay in the realm of all reason. Now in my opinion, such a thing like that in a field here where I've already indicated to you that we've only got a few wells which are not exactly 320, and they fall some below that and some above that, so this is not the major problem that we're concerned with here.

Q Then you are assuming that each well will drain its 320 acres and no more and no less, is that correct?

A This drainage area I think is a pretty reasonable spacing

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assignment, and apparently the Commission has assigned this acreage to the well or to the field, and I'm just saying that I don't have any reason to quarrel with it. In my opinion, I think that 320 acres will be or is the maximum unit that could be assigned.

Q Does a spacing order protect the operator's general drainage?

A Well, sir, as tied in with the present proration formula it certainly does.

Q Yes. Yes. Does a spacing order standing by itself, is that any measure of the amount of gas that might be produced through a particular well? Because the Commission says that 320 acres is the proper spacing unit, how does an individual well know that it must drain only that and no more?

A Well --

Q Is it not necessary to implement a spacing order with a proper allocation formula?

A Well, the spacing order itself, by the mere fact of having the spacing order, the Commission has from an acreage standpoint made that step which will prevent the violation of correlative rights.. Now then, if it were not, if it were, if they had a random spacing out there and you had one well assigned 320 acres, the other well assigned 160 acres, then there, that is an instance where the rule of capture point that you have made would certainly be applicable. Now then, this is not the case. The spacing is 320 acres and by far a large majority of the wells are on 320 acres.

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Q If spacing orders alone will protect correlative rights, why do we need allocation formulas at all?

A Because under those, under that acreage which I'm saying for all practical purposes is constant here, under those 320-acre units you don't have the same reservoir characteristics, the same amount of gas in place, the same recoverable reserves. Now then, I mean that to me should be, should answer the question.

Q I think I will ask one more time, Mr. Cleveland, is it possible that a high deliverability well will drain gas from an area larger than 320 acres?

A Are you asking will it --

Q Yes. Will any high deliverability well drain gas from more than 320 acres?

A Well, sir, I've already stated that I think 320 acres is an appropriate spacing unit.

Q Yes, sir, you have.

A Now that in itself should answer the question that a large deliverability well is draining its 320 acres. Now, I have right here with me, I have no more definite proof that a large deliverability well will be draining more than 320 acres, than I have a low deliverability well would drain less than 320 acres; but I'm saying that the Commission has considered data and apparently testimony, and has assigned 320 acres to this field, and for me, I'm saying that it looks like a good assignment.

Q Mr. Cleveland, indulge in one hypothetical thing with

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me. Suppose that one operator -- let's make it Consolidated, that would be more fun -- drilled one well right in the middle of this big red patch, and no other wells were drilled, would that well in the course of time drain more than 320 acres?

A Now the course of time that you are speaking of here, just any length of time; it would certainly take, I think, a relatively large period of time for it to do that.

Q Let's start with an infinite amount of time. Would it drain more than 320 acres then?

A For an infinite length of time?

Q Might drain the whole reservoir, in a sense?

A That's right. I think it would be a mighty long time.

MR. PORTER: I was hoping you would qualify that.

Q (By Mr. Stockmar) It is a high capacity well because it's right there in the high deliverability part of the field. Let's give it ten years. Will it drain more than 320 acres? Will gas from outside a 320-acre circle move across the edge of that circle?

A In ten years?

Q Yes, sir.

A Nobody can answer that question definitely.

Q Will there be --

A Unless you can consider all the factors and calculate through radial flow calculations or at least have a better estimate than just the facts that you have presented here, I can't

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say yes or no.

Q You have a strong background in connection with this field and its information. Do you have any opinion without looking at specific factors for this well?

A I would say that within ten years -- Mr. Stockmar, rephrase your question and let me get my train of thought back here, if you would please?

Q Consolidated Oil and Gas drills a Basin-Dakota well right in the heart of the -- I've forgotten what it is called, but in the very high deliverability area; is the only operator to do so. It produces without restriction from that well for a period of ten years. Will it or will it not, will that production cause gas to flow from outside of a 320-acre circle around the well into that 320-acre circle?

A What size well is it? Would it be considered a very high deliverability?

MR. KELEHER: If the Commission please, I believe we're wandering far afield on this hypothetical question. There's no testimony before this Commission on such a well. We object to that line of questioning.

Q (By Mr. Stockmar) I gather that your answer is that you do not know?

A Yes, sir, it is impossible to know; I mean, to give you a specific answer.

MR. STOCKMAR: Gentlemen of the Commission, that termi-

nates my examination of this witness.

MR. PORTER: Does anyone else have a question?

MR. STOCKMAR: I would like the record to show whether or not the objection is sustained or overruled.

MR. PORTER: Have you changed your line of questioning, or did you just terminate your questioning? I didn't hear the last question that you asked after the objection was lodged. Did you ask another question after that time?

MR. STOCKMAR: No, sir.

MR. PORTER: The Commission will sustain the objection.

MR. KELLAHIN: If the Commission please, may I examine the witness?

MR. PORTER: Yes, sir.

BY MR. KELLAHIN:

Q Mr. Cleveland, to get back to the issue which was just dropped, earlier on cross examination by Mr. Stockmar, you very readily said that there was more chance that a well would drain less than 320 acres than more. Do you recall that testimony?

A Yes, sir, I think that's a fair statement.

Q And yet you say 320-acre spacing is good spacing.

A Well, your next proration unit would be logically 160 acres, and certainly I think 160 acres would be drained. Now then, I'm saying that 320 acres is the largest proration unit that I think is valid for this field. I think if it were on 640 acres, I think it would be a mistake.

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Q You gave as your judgment that one well would have more chance of draining less than 320 than more. Will you give us your judgment as to whether a well in the Basin-Dakota Pool can drain in excess of 320 acres?

MR. KELEHER: May it please the Commission --

MR. PORTER: Just a minute, Mr. Keleher. I didn't hear that. I was in conference with Mr. Walker. What was that question?

MR. KELLAHIN: The question was that the witness testified that in his opinion there's more chance that one well will drain less than 320 acres. My question is, in his judgment, based on the same factor, is there a chance that one well will drain more than 320 acres in this Pool?

MR. KELEHER: We object to the question on the ground this is not a spacing hearing. It is incompetent, irrelevant, and immaterial.

MR. KELLAHIN: If the Commission please, the question pertains to the extrapolation of a production decline curve, which is a factor in this case.

MR. PORTER: The objection is overruled, and we would like the witness to answer the question if he can.

MR. KELEHER: An exception to it.

A If I understood your question correctly, you asked me if there is a chance, and there certainly is a chance. I have already stated before that there was more of a chance for less than

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320 acres to be drained by one well. Now certainly there is a chance that a well can drain more than 320 acres.

Q Well, actually it would be your testimony, would it not, Mr. Cleveland, that you don't know in each instance whether a well is draining more or less than 320, do you?

A To actually pick out an individual well?

Q I'm asking you, isn't --

A Just to look at an individual well -- no, you can't say that.

Q You just don't know, do you, and nobody else knows, do they?

A That's right, but we all have opinions and I have already stated my opinion.

Q Now, again, just to be sure we're all talking about the same thing, Mr. Cleveland, what is your definition of reserves?

A My definition of reserve is a remaining reserve. When I refer to initial reserve, this means the amount of gas that was there to start with.

Q Now you say the amount of gas that was there, the amount of gas that was where?

A That was under the well, or that is applicable to the 320 acres.

Q In other words, you are saying the reserves you are talking about initially are the reserves under a 320-acre tract dedicated to a producing well?

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A The initial reserves, that's what I'm referring to now. As far as any exhibit is concerned, I am talking about remaining reserves that are to be recovered from the date that the 1961 deliverability was measured.

Q Now we have two kinds of reserves, don't we? Let's get back, what are the initial reserves you are talking about?

A The initial reserve is the amount of gas that can be recovered from that well down to an economic limit, prior to the time that well has produced any gas.

Q That is without any regard to the area dedicated to the well, is that correct?

A Well, when I speak of initial reserves, I speak of the reserves or initial reserve or the remaining reserve that is applicable to that 320 acres. I have already stated it.

Q That's what I have been trying to get you to state. I didn't know you had stated it, I am sorry.

A I had said that these are the reserves applicable to 320 acres.

Q Applicable to the 320, does that mean they are underlying the 320 acres we are talking about, when you say applicable, are you talking about something else?

A No, I'm saying that to the best of our ability, best of our knowledge, these reserves are lying under that 320 acres. Those reserves -- the principle of drainage of that area to the well bore will be in a circular fashion. It certainly wouldn't be a square.

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Q I understand that, Mr. Cleveland, but what you are talking about then is the reserves the Commission is empowered to allocate, which are the reserves underlying the tract dedicated to the well. Are we agreed on that?

A Yes, sir, that's right.

Q Now, you say that deliverability is directly proportional to these recoverable gas reserves, I believe you qualified it by saying that?

A Remaining recoverable.

Q But you are still talking about the remaining recoverable reserves under this single tract we are talking about?

A That's right.

Q You said, I believe, and if I misunderstood you would you correct me, that deliverability gives weight to unknown reservoir factors which aren't available to you, such as the porosity, permeability, water saturation, and other factors. Did you say that?

A Yes, sir, that's right.

Q Would you tell me how deliverability is related to porosity?

A Well, the deliverability, as far as an actual mathematical relationship, I played around with it a little bit, enough in my own mind to feel confident, but the deliverability as correlated to the remaining reserves which I have shown here is the proof in my own mind that deliverability is a function of all these factors.

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Now then, it may not be a single parameter porosity, but I feel like it's a combination of porosity, water saturation, thickness, all of these factors which have to be combined together which actually define the amount of gas that is there; and, of course, permeability gives you some indication of that amount which can be recoverable, or the percentage that could be recovered.

Q Are you familiar with the work of Morris Muscat?

A Yes, sir.

Q Is he a respected and well recognized engineer?

A Yes, sir.

Q Are you familiar with his work on the radial flow formula?

A Yes, sir.

Q Does he use anything other than permeability as a rock characteristic in that formula?

A He always uses thickness.

Q Is that a rock characteristic?

A That's, I think, ordinarily accepted as one of those characteristics which defines how much of a reservoir you've got there.

Q That contributes to the amount of permeability available, does it not?

A Yes, sir.

Q That's the reason it's included, is it not?

A Yes, sir.

Q It has nothing to do with porosity, does it?

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A No, sir. There's no porosity function in that relation. However, I think that he has also done some work, maybe not, I can't recall exactly who has done this particular work, but they have done a considerable amount of research on correlation of porosity and permeability. Now then, I can't recall this equation just rea. readily.

Q Did you say who did the work?

A What?

Q Did you say who did this work?

A No, sir, I was trying to think. I can't recall exactly. It can be found in the text of Petroleum Reservoir Engineering by Amicks, Bass, and Whiting, which is a text which was published last year or the year before that. This work on the correlation of porosity and permeability has been a continuing thing for some time. They have tried to relate porosity and permeability through the porosity constant, which is, in simple words, just a manner in which the little capillary weaves in and out through the rock, if that is adequate enough.

Q Have you applied that information to your study of this reservoir?

A No, sir, but that type of thing has contributed, certainly not in this graph, but that type of thing has contributed to my analysis and my --

Q Actually, as of --

A -- It has contributed to my thoughts in my effort to

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delve back into a mathematical reason for this thing.

Q Admitting that this work is under way, actually, today, it is rather generalized, is it not? You can't come up with a precise formula?

A No, sir, I haven't been able to develop a precise formula. I have been doing some work on it, and I may not ever be able to develop it, I don't know, but it is an interesting thing and it has been enough so far to at least lend a considerable amount of confidence to me in my feeling that deliverability is proportional to remaining reserves.

Q Now to get to these pressure production curves that you've used, was it my understanding that you had not less than three shut-in pressures on any one well, and some of them more?

A Some of them could be more, yes.

Q But you did have a minimum of three, did you not?

A I'm fairly certain in every case I did. In other words, I selected those wells for that very reason, so that they would have at least three.

Q I don't want to belabor the point, which is already covered somewhat by Mr. Stockman, but is a single pressure point on a seven-day shut-in an accurate measure of the reservoir pressure? I assume you extrapolated that down to the reservoir pressure?

A Is it an accurate measure of the reservoir pressure?

Q Yes, sir, on a seven-day shut-in.

A Well, of course, this would depend upon how severe or

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how low your permeability or your flow capacity to your well is. I'd say, as I answered before, that in some cases it would be adequate; other cases it wouldn't. However, the seven-day shut-in period has been established by the Commission, and the fact that it is consistent, it is a consistent measurement, it is a rule that's followed each time and they have a thirty-day flow period to condition a well, I feel that it allows the pressure points that are taken on that well to be extrapolated to an economic limit and determine the ultimate recoverable reserves.

Now then, the actual static reservoir pressure in a lot of cases, you are not looking at actual static reservoir pressure. First of all, you are taking the pressure from surface, which should be corrected down to reservoir pressure, but if each pressure from one time period to the next is taken under the same conditions, then an extrapolation of this data should be adequate.

Q Well, actually --

A And you should arrive at the same point as if you were to allow this well to be shut in from now until doom's day to make certain you have a real good static reservoir pressure. The slope of those pressure points would not be the same, but they would arrive at the same end point.

Q You couldn't actually make an extrapolation of that curve without knowing the characteristics of the pressure times buildup curve, could you?

A An extrapolation of the pressure cumulative data?

Q Yes, sir.

A I don't see why I couldn't. It has been pretty well established in the text and everything that the pressure volume relationship indeed, with a gas reservoir, will be essentially a straight line, except when you are dealing with pressures say over 2,000 pounds; and then you have a gas compressibility problem there which, in order to achieve a straight line through these points, you have to take into consideration gas compressibility.

Now then, in the lower ranges of pressure that we're dealing with here, it's ordinarily accepted, I think, that you do not have to correct this pressure for gas compressibility, and therefore you can consider a straight line extrapolation through these data points is a reasonable approach and is an acceptable method of determining gas reserves.

Q Well, that would be admitted, of course, if your pressure were right in the first instance, but without the buildup time on the pressure, how do you know your pressure is right?

A Well, you may find some relationship there to quarrel with, but I think generally it's accepted that you can extrapolate these pressure points.

Q On one pressure?

A No, no.

Q What pressures are you using to extrapolate then?

A On the two pressure points.

Q They are a year apart, aren't they?

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A What?

Q Aren't they a year apart, or how long?

A They're a year apart.

Q That doesn't give you any buildup time, then, does it?

A Well, the buildup time that you have is a seven-day buildup in each case, each year.

Q Do you have any knowledge of any liquids in the hole in the Basin-Dakota reservoir which would affect those pressures?

A The liquid content of the gas vary over the field, it does vary; the extremes I don't think are too severe. You do have distillate production in, I would say, a majority of the wells. Now there are other wells where you do not have liquid production.

Q Did you take that factor into consideration on your pressure decline curves?

A No, sir, this would be another one of those factors which I think could be considered very similar or analogous to the time of buildup and conditioning before the well is shut in and everything.

Q It could have a very profound effect on your reserve calculation, couldn't it?

A No, sir, if the well is continuing to produce at the same liquid content ratio for these points, then you are extrapolating consistent data, you are not jumping from one point to the next.

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Q Maybe you don't understand me. I'm talking about liquid in the hole at the time the test is made. I'm not talking about your production.

A Well, I think it would be possible to have liquid in your hole, but here again you are flowing this well and conditioning this well for thirty days prior to the time that well is shut in. Now then,if--this well is more than likely producing at the same liquid ratio; consequently, with the conditions existing prior to the test being the same, prior to each pressure measurement, then I'm saying that the liquid that you may have in the hole is consistent with all the other points and you are extrapolating on consistent points.

Q That's your interpretation of it?

A Well, that's my feeling. Now I don't have any definite proof to back it up, but it's my understanding that over the field in general that you don't have much of a problem in this regard. There's not a terrific amount of difference between the shut-in tubing pressure and the bottom hole pressure. Certainly you might have some liquid down there because I think the majority of the wells do produce liquid, and they might vary from well to well; but the conditions for this well, the conditions under which the pressure measurement is taken, they're the same each time.

Q Well, now, will the liquids vary in direct proportion to the reserves in place under the tract dedicated to the well: I'll say the gas reserves?

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A Well, no, sir, I don't think you can say that entirely, for one reason.

Q Well, would they vary in direct proportion to the deliverability of the well?

A No, I don't think you can say that, either, because you are dealing with a reservoir here that I don't really feel -- well, it's, you've got so many drastic changes across that field.

Q Yet, Mr. Cleveland, they will affect your reserve calculation, based on a pressure production decline curve, won't they?

A With the liquid in the hole you are always subject to a certain amount of air, but if your measurements, the conditions prior to each measurement are consistent each time, then your air is not cumulative.

Q Your air would not be cumulative to any single individual well, but putting wells on the comparative basis, from one well to the next, it would affect it, would it not?

A No, I don't think so, because if that liquid were not in the hole and you had exactly the static reservoir pressure that exists out there, and you let it shut in just a real long time and you got a pressure decline like that, now then, for some reason or other, because of liquids in the hole each time that you take this pressure measurement, or because of insufficient shut-in time, insufficient buildup time, the points after your initial measurement or after you initially complete the well and it has

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flowed some, these points will drop down. If you will use your imagination here, that this is another statistic extrapolating up here, and it represents another static reservoir pressure, then this is the true curve. This is the one that you would really like to have.

We are not that fortunate. We don't have but this other curve up here; the lower one has been subject to perhaps an insufficient amount of shut-in time, if the seven days is not adequate. Also it might have certain liquid in the hole, but then I think it's logical to say that you can expect that this curve will decline in a straight line fashion to about the same point that you would have arrived at out here if you had been able to extrapolate a true static reservoir pressure and actually had a bottom hole pressure bomb in the hole and measured what the pressure was.

Q You didn't have any pressure bombs in any of these holes, did you?

A No, sir, I didn't.

Q Mr. Cleveland, what does a production pressure decline curve measure --

A Pressure production decline curve --

Q -- if extrapolated on the basis of your Exhibit No. 7?

A Yes.

Q What were you measuring there?

A Well, I was determining to the best of my ability, and

based on the engineering background that I have, I was measuring the recoverable reserves that could be expected from this well.

Q Now the recoverable reserves are the reserves that would reach that well bore, are they not?

A The reserves that would reach that well bore over an economic period of time, the end of which would be your economic rate of flow.

Q That has no regard to the area from which the gas came, does it?

A Well, sir, if there was just one well out there producing, I'd say it wouldn't have any. In other words, the entire reservoir would be in a direction, would be flowing in a direction of that one well bore. However, in our development pattern out there where every well is on 320-acre spacing, then the pressure wave as it reaches out there so far, and the fact that each of the wells has been given 320 acres, when the pressure wave reaches the mid-way point between that well and the next well, then you aren't looking at reserves in that particular well bore, that is coming from beyond this 320 acres.

Q Mr. Cleveland, assume we have a six million well directly offset by a hundred thousand well; isn't the chance that a six million well is going to reach that pressure point well inside the tract of the one hundred thousand well?

A Well, I rather doubt it because under this six thousand well you have a considerably larger amount of reserve.

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Q I'm talking about the six million well, of which we have one up there.

A Yes, I am sure we can find one.

Q We have a thirty million well up there, don't we?

A Yes.

Q Do you think there's any tract in this pool that has 180 times the reserves of any other tract? Do you believe that?

A Mr. Kellahin, I think you can pick out in a field this large which encompasses 183,000 acres and some 572 wells, you can certainly pick out certain wells which they may seem to be freaks to you. This doesn't say that it's been disproven that those wells do not have a proportional amount of reserves.

Q You didn't answer my question. Would you please answer it? Do you believe that reserves are in proportion to deliverability on those two wells?

A Yes, I do. I have no reason to doubt it.

Q You do believe it?

A I have just stated to you that on the evidence I have right here, my opinion is certainly that the well is, or does have a large reserve.

MR. KELLAHIN: That's all the questions I have.

MR. PORTER: Does anyone else have a question of this witness?

MR. MORRIS: Yes, sir.

MR. PORTER: Mr. Morris.

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MR. KELEHER: May the Commission at this time accept the qualifications of Mr. Cleveland? Nobody seems to have objected.

MR. PORTER: His qualifications were noted at the beginning and his qualifications will be accepted.

MR. KELEHER: At this time I would like to introduce Pubco's Exhibits 6 and 7 and offer them in evidence.

MR. PORTER: Without objection the exhibits will be admitted.

MR. KELLAHIN: I would like to make an objection, for the record, to the admission of Exhibit 7, for the reason that the basic underlying information from which the exhibit was made has been denied to us.

MR. KELEHER: To which Pubco states that the basic information from which the witness prepared that exhibit is the official records of this Commission and available to counsel and his assistants.

MR. PORTER: The exhibit will be admitted to the record.

MR. KELLAHIN: Exception.

MR. PORTER: You take exception to the Commission's action on that ruling?

MR. KELLAHIN: Yes, sir.

MR. STOCKMAR: I would like to ask three quick questions and then ask for a recess.

MR. MORRIS: I will defer to Mr. Stockmar.

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BY MR. STOCKMAR:

Q I believe you stated that a great deal of your belief, or that your belief was greatly encouraged by the work that Bass and somebody had done, that you read recently?

A No, sir, I haven't read it recently.

Q Or that you have read?

A Yes, sir.

Q You did say that?

A Yes. Let me correct that. I said that the work of men who have worked on this porosity-permeability problem or correlation was published in this text by Amicks, Bass and Whiting last year, year before last. I think it was 1960. Those men did not do the work themselves, but it was reported in that text, and that's where I became acquainted with it.

Q Would their opinions be influential on your thinking, the opinions of somebody, Bass and somebody?

A No, they didn't say anything on the -- they certainly didn't say anything about deliverability as to whether it was related to reserves or not. Most of these things you have to consider --

Q Is the Bass --

A You have to consider the relationship that they demonstrate and determine what value they have to your particular work.

Q Is the Mr. Bass that we have been referring to Mr. Daniel Bass of Texas A & M Petroleum Production Department?

A Yes, sir, that's right.

MR. STOCKMAR: I defer to Mr. Morris.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q Mr. Cleveland, I believe you stated at the beginning of your direct testimony some time ago that the 25 percent acreage factor that's presently included in the allocation formula allows production well above an economic rate, and that in itself provides an adequate minimum allowable, is that correct?

A Yes, sir, that's the way I feel about it.

Q And according to your calculations, that 25 percent acreage factor at the present time provides in itself 2227 MCF per month of gas.

A Yes, sir. This is based on an overall monthly, or monthly average; in other words, based upon a prediction of annual nominations of 56,650,000 MCF, which was approximately the amount of nominations that we had for the year of 1961. Now it may, it may be more. I don't know.

Q I believe you furtner stated that that would be some 1462 MCF per month over what you would consider to be reasonable operating expenses, is that correct?

A Yes, sir, approximately.

Q By a process of simple subtraction, 1462 from 2227, you arrive at the figure of 765 MCF per month, which I assume by your statement you must consider to provide minimum, a suffi-

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cient amount of revenue to cover minimum operating expenses?

A Yes, that's true. Yes, sir.

Q Looking at that 765 MCF per month, what sort of a calculation did you run through to see how much monthly income that would provide for a well for operating costs? How much was the value of the gas that you used in your computation? How much royalty did you take into consideration; how much in well costs did you consider, I mean in operating costs?

A All right, the operating costs that I used was based upon Pubco's experience. We have nine wells in the field, but we have only five there that had been produced for at least a year and which I felt like would give me a better idea of what our operating costs are. That average was $1,130.00 per year, or about $94.00 per month per well. The gas value which I have used is thirteen cents per MCF, and I have considered a value for distillate of about $2.50 per barrel after trucking.

Q How much of that would you attribute to each MCF of gas?

A Well, my actual calculations show here 1.65 cents, but I have just used two cents to round it off. The royalty that I have used is 12 1/2 percent, and production taxes of six percent, considered in the six percent production taxes is the State's two percent school tax, two and one-half percent severance tax, and fourteen-hundredths of one percent conservation tax, for a total of 4.64 percent, plus 1.36 percent for ad valorem tax on the production, which is the rate established for last year and changes

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about every September 1st, I think somewhere along there, for a total of six percent production taxes.

There is another tax which I have not included in this six percent; however, I felt like that six percent would be applicable, and that would be a two percent tax on liquids which are sold outside the State of New Mexico, but I haven't included those.

Q Using those figures, then, you arrived at the basic figure of 765 MCF per month to just cover those expenses?

A Yes, sir, that's correct. That would be considered the normal operating expense. This expense also covers ad valorem tax which is paid on the equipment at the well.

Q Now, in order to keep a well on the line, certainly I think you would agree that an operator would have to have something in excess of that 765 MCF in order to get reasonable profit. In your duties, do you make recommendation to your company concerning the point where a well is no longer economical?

A Yes, sir.

Q What would that point be in terms of something above 765 MCF per month?

A We'd still be producing the well if it was producing anything over this 765 MCF per month. I mean, this is your economic limit. Anything above that is a profit, and since it is in excess of the economic limit -- by some standards it might not be considered reasonable enough, but I am saying that as far as we

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are concerned we'd still be producing it and trying to get the last drop out of it if we could, down to the point where it was costing you money.

Q Does Pubco have any wells that are presently producing with an allowable of between 765 and, say, 2,000 or 2,500 MCF per month?

A No, sir, I believe that in every case of our wells we are above that. The average deliverability of our wells is about 1720 MCF per day. So I think you'd find that the monthly allowable there would fall considerably above this economic rate that I have shown you here. Now from a month to month basis and during the summer months, when you have a relatively small demand, admittedly our wells will come closer to this rate. However, in the real fat months of January, February, March, and December, I think those would be the heavier months, we have been able to stack up a considerable profit during those months because the rate has been higher. I've tried to apply this to overall annual basis.

Q I believe you testified that if drilling continues at the present rate, we will probably have something in the order of 700 wells in the pool by the end of 1962; and that absent any increase in the market the 25 percent acreage factor would provide an allowable of something in the neighborhood of 1585 MCF per month, on an average, is that correct?

A No, sir, not in its entirety. I said that a projection

of additional wells to about 745 participating wells, instead of 700.

Q 745?

A Yes, sir. In, oh, say the period 1963 to '64, extrapolation of the number of wells that we're going to have out there is, it's difficult to do. We just can't predict what the operators are going to do, but based upon the trend which has been established since the time of first drilling out there, I've estimated that we would have 745 participating wells by 1963 to 1964.

Q Mr. Cleveland, if wells continue to be drilled in the Basin-Dakota Pool, and if there is no increase in the market demand, both of which I believe are fairly logical assumptions for the next few years, we'll eventually arrive at some point where without a minimum allowable, wells will fall below your point of 765 MCF per month; would that be correct? Can you give me a yes or no answer?

A Well, certainly this is true.

Q And if a well falls below the point at which it is economic, it may still have recoverable reserves in the ground available to it, is that not correct?

A Yes, sir, at that time we would have to take steps in order to alleviate the problem, but this is some time in the future.

Q But that would cause what we might refer to as premature abandonment, if that point ever were reached?

A Yes, sir.

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MR. MORRIS: Thank you.

MR. PORTER: Anyone else have a question of the witness?

MR. KELEHER: If there are no further questions of this witness, I wonder if he could be excused permanently. Mr. Cleveland has an important engagement in Texas. I would like to have him excused.

MR. PORTER: The witness may be excused.

(Witness excused.)

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

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order.

(Whereupon, El Paso's Exhibit 1 marked for identification.)

MR. PORTER: The Commission will recognize Mr. Howell. Before we go ahead with this witness, I want to announce first, Mr. Howell, that there will be a night session. We will break this one off around 5:00 or 5:30, wherever we can reach a breaking point, and come back at 7:00 o'clock.

MR. HOWELL: We have one witness, Mr. Rainey, who has been sworn.

DAVID F. RAINEY

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. HOWELL:

Will you please state for the record your name, by whom

employed, and in what capacity?

A I am David H. Rainey. I am employed by El Paso Natural Gas Company as an administrative assistant in the Proration Department.

Q Is your professional education and your qualifications a matter of record with the New Mexico Commission?

A Yes, sir.

MR. HOWELL: I will ask if Mr. Rainey is acceptable to the Commission as an expert witness?

MR. PORTER: Yes, sir, he is.

Q (By Mr. Howell) In your position with El Paso Natural Gas Company, will you please tell the Commission what studies have been conducted under your general supervision relating to the Basin-Dakota Pool?

A Yes, sir. Our Reservoir Department, when this hearing was called, has made a detailed study of the reserves and deliverabilities, particularly reserves, of the wells in the Basin-Dakota Gas Pool on which we had both logs to determine net effective pay, and deliverability data.

I might add at this point that this was a part of a continuing and continuous study that our Reservoir Department makes, and was not done solely for the purpose of this hearing. In other words, the data has been gathered over a long period of time.

We determined that we had both log information and could

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consequently calculate reserves, and had deliverability data on 457 wells in the Basin-Dakota Gas Pool; at the time we cut off there were approximately 550 wells in the pool. In making that determination we did exactly the same thing that was done at the October, 1960 hearing in which we presented an exhibit using the same data on 160 wells, which is what we had data on at that time. For the convenience of the Commission and other parties interested, we have duplicated that curve on El Paso's Exhibit 1. The only difference being that because the range of this study did not go as high in reserve data as the range on the study in 1960, we left off that one odd well over there on the end that so much was made of Wednesday, I think. Those are the studies that have been made, specifically. Now I can go into a discussion of that exhibit or we can take another point.

Q I wish you would go ahead and discuss the core data that was available, and the manner in which the core data was used.

A All right. Our reservoir people had approximately 65 to 68 core analyses from various Dakota wells scattered over the San Juan Basin area. Upon the basis of the comparison and correlation of that core analyses, those core analyses to well logs associated with them, they then made determination based on correlation then of other well logs with those upon which we had core data, to determine a net effective pay pick on every well in which, as I say, we had a log and corresponding deliverability information.

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Then as a part of this continuing study of Dakota reserves, they had compiled and revised periodically parameters of porosity, interstitial water, pressure, temperature, gas gravity, and various other things that go into the makeup of calculation of reserves; and had compiled that on an average per township -- in other words, we did not calculate reserves in this study on the basis of any average factors for the Basin-Dakota Pool as a whole. It was done on an average for each township.

Those parameters, there has been much discussion about the variation there. Our figures indicate that the porosity varies from approximately six percent up to something slightly in excess of 15 percent. I might add at this point that our reservoir people arbitrarily use six percent porosity as a cutoff point, just as Pubco's people do, not because Pubco's people did but just coincidentally.

We found that the residual gas percentage -- and I'm using that term rather than interstitial water percentage, because in cases where we are attempting to determine gas reservoirs, there may have been some liquid hydrocarbons in the reservoir, and we lumped that percentage, that is, residual oil saturation, we lumped that with the interstitial water percentage; consequently, we came up with what we call a residual gas saturation which varied from about 77 percent down to 49 percent.

The pressures that we encountered, bottom hole pressures and as near as we could determine, initial bottom hole pressures,

in the various townships varied from 2200 pounds up to about 3400 pounds. The temperature varied from around 140 to 150 degrees up to over 200 degrees in some townships.

Q Did you discuss permeability?

A Permeability does not come into a calculation of reserves. Of course, it is a factor in a parameter in the determination of deliverability. Gas gravity varied from, oh, around six and a half percent up to around seven and a half percent. It was fairly constant -- I don't mean percent, I mean .65 to .75, excuse me.

I believe those are all the parameters that were used. In this study here, for purposes of this graph which is Exhibit 1, we arbitrarily assigned 320 acres to every well, recognizing that there are some wells that vary somewhat from that, but for purposes of this study, rather than attempting to delve into individual well acreage, we assigned 320 arbitrarily.

Q Mr. Rainey, did you establish, as I understand, for each township consisting of 36 sections an average, based upon the available core information in that area?

A Yes, sir. How it will be recognized quite immediately that we did not necessarily have cores for every township. If we didn't, if we had cores surrounding a particular township, we probably took averages of the surrounding cores for that township. It's a much more accurate means of determining an average than attempting to take a field-wide average. The point I wanted to

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make, that we varied the reservoir parameters in these calculations on a township basis.

Q For example, to illustrate the difference, let's look up here at the extreme northwest portion up in Township -- let's say 31 North, 13 West.

A Yes, sir.

Q Would you compare the factors here at this extreme edge of the pool with the factors which were used in an area such as has been described as the Angel Peak area, which I think has been testified as being the best area in the pool?

A All right. According to our reservoir parameters, although the Angel Peak area is the best area because it's one of the thickest areas, it does not necessarily conform in the calculations that we arrived at on the basis of MCF per acre foot, which is the factor that we used before determining net pay to calculate reserves. It is not the best reserve area. Nevertheless, as an example, the porosity that we used in the first township mentioned, 31, 13 --

Q That's the extreme northwest portion?

A Yes, sir. -- was 8.3 percent, which incidentally is approximately the field average. 51 percent interstitial water, and residual oil saturation, which means there was a 49 percent residual gas saturation; seven-tenths gas gravity; 152 degrees bottom hole temperature; original bottom hole pressure of 2457; and the factor of MCF per acre foot is 246.5.

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Now in say 28 and 10, the Angel Peak area, the porosity was essentially the same 8.2 percent; however, the residual gas saturation was 65.3 percent; gas gravity was .76; bottom hole temperature, 142; bottom hole pressure, 2545; which gives us an average MCF per acre foot of 365.1, which is approximately 50 percent more in that area per MCF per acre foot than you find in this extreme northwest area.

The variation in the actual MCF per acre foot factor which we arrived at varies as low as 201 MCF per acre foot up in the Rosa Unit Area, which is up in about 32 and 5 --

Q Over in the extreme northeast portion?

A Yes. -- to a high which incidentally was based on a specific core in the 23, 5 area, which is the big red area to the east edge of the map, in which the high was 537.7 MCF per acre foot. Let me say at the outset, I did not specifically calculate these factors. They were done by our Reservoir Department and furnished to me for purposes of discussing at this hearing today, but they are continually being revised and are continually kept up to date as we obtain new information, new cores, and new logs and what have you in regard to the Dakota Pool.

Q Have you satisfied yourself as to the correctness of these studies?

A Yes, sir. I have checked some of the data that they have used in working out these factors, and see no reason to argue with them.

Q Then as I understand, having established this acre foot gas reserve, you then determined the area under a tract by multiplying by the net effective pay?

A Yes, sir. We determined, we assigned arbitrarily 320 acres to every well. We then multiplied that by the net effective pay picked on specific logs to arrive at an acre foot figure, and multiplied that by those factors that I have referred to previously.

Q Mr. Rainey, just to demonstrate the method that was used, would you look over here at Pubco's cross section on C-C^1 which has an O'Shea well, I believe it is, and point out on the map here where that is located and then comment on the method that we used in determining the net effective pay in that well?

A Yes, sir. I would like to state at the outset here, to relieve some argument later, I have not examined all the logs on all these wells. I have specifically looked at a couple of logs I have with me in this particular area. The determination of net pay thickness was made on exactly the same basis on every well throughout the Basin, recognizing the fact that on some wells we had logs that were more adequate to determine more effective net pay than other wells. But by attempting to correlate from one type of log to the other, we have arrived at what we think is a relatively good pick of net effective pay in the net affected wells. If we erred in picking that net effective pay, or differed from somebody else's pick, it should be a consistent basis because it was all done on exactly the same basis. This O'Shea well, as

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you can see, picks a great number of sandstone lenses from induction electric log, and it's located in Section 3 of 31 and 13, I believe it's the Southwest -- yes, it's the Southwest Quarter of Section 3 of 31, 13.

Now one of the best tools that the logging industry has come up with for picking porosity is what we called, Welex calls it an acoustic velocity log, I think Schlumber-J calls it a sonic log. What I would like to illustrate is the difference in characteristics on some logs compared to other logs in picking pay, and the reason that there may be sometimes very wide discrepancy between the picks that one geologist will make and another will make.

It has been my experience, and I do not do the specific picking on these logs and it was done in the Reservoir Department, and it conforms to the way the others have been done, if you get four or five different geologists attempting to pick net pay, you are liable to get five different picks because of the different parameters one may use to the parameters the other one would use.

To illustrate what I'm talking about, this is a log of the Landour No. 1, which is the well in the Northeast Quarter of the same section. If you will notice, this is the Dakota interval here -- incidentally, I see Consolidated wells in those, these are a couple of Consolidated wells, but there is, apparently, these red marks at the perforated intervals which Consolidated

chose to perforate. Now you will notice that there is apparently good sand development, because you have got a wide separation on your -- this is gamma ray neutron log. You can see that there are good sand intervals, apparently, in this. If I were looking at this log, I think Consolidated perforated good intervals. I agree with them completely.

On the other side, as I mentioned, this sonic log or acoustic velocity log indicates specific porosity. There's a scale on the bottom of it on which, knowing the velocity at which the log was taken, you can specifically determine by running up from this scale what the porosity is. It's becoming a generally accepted tool in the industry for determining porosity.

Porosity increases to the left. You'll note that this red line is the six percent porosity interval at 17,000 feet per second velocity. Excuse me, that's micro-seconds per foot is the way they put the scale on the log. But anything to the left of that, a kick to the left of that indicates more than six percent porosity.

With the arbitrary cutoff of six percent porosity that our reservoir people used, they picked -- and I'll leave the logs up for examination -- intervals that corresponded to sandstone intervals on the gamma ray side of effective porosity. We get for this well, although there's 101 feet of gross sand in that well, we picked only 31 feet of net sand in that well -- excuse me, of net productive sand in that well. That's just an illustra-

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tion of the manner in which this was done, taking into account all knowledge that we had of core data, log characteristics, and quality of sand.

Q How does the quality of sand that exists as shown in that log compare with other areas in what has been referred to as the better part of the field?

A In general, it's a much poorer quality sand. As I read the reservoir parameters, apparently there's a high water saturation in that general area, residual water and/or oil saturation in that area, in comparison to, say, the Angel Peak area.

Q Is there any evidence of shaly sand or sandy shales in there?

A Yes, sir. The log on the left indicates a considerable amount of shaliness where the log is particularly fuzzy in areas indicates a shaliness on that type of log.

Q Did you use, as I believe you have already testified, the same standards in screening the areas all over the Basin Pool?

A Yes, sir. That's the specific point that I wanted to make clear, that if we pick net pay different from the manner in which someone else may do it, or if we determine a net pay interval in a particular well different than what some other geologist may do, we have at least done it on a consistent basis on each one of the 457 wells that we have got on this Exhibit No. 1.

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Q Now having determined and allocated to each of 457 wells an estimated recoverable gas reserve, what did you do then?

A We then tabulated that information by reserve groups, which is exactly the same thing that we did on the curve in 1960. We took all the reserves -- all the wells, excuse me, which fell between zero and one billion cubic feet of recoverable reserves, and tabulated them with their accompanying deliverability; and then, for the sake of simplicity, because I think we will all recognize that if you plotted each individual well in addition to getting sort of a shotgun pattern on your graph, you get something that's a little difficult to see and understand, so for simplicity's sake we averaged these by reserves groups, as I say, just exactly as we did in the 1960 hearing on which the Commission based their existing order. The purple curve on the graph, which is represented by the --

Q One thing, before we get to the curve, then did you --

A Yes, sir.

Q -- then did you determine an average of deliverability?

A Average reserve and average deliverability for each group of wells in a reserve grouping.

Q Before you discuss the curves, would you just state how many wells there are in each group from which you plotted points on this Exhibit No. 1?

A Yes, sir. The green curve, which is as I say, is the duplication of the 1960 curve, the figures are on the graph on the

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board, but since it's covered up, the first point on the 1960 curve represented three wells; second point, 22 wells; the third point, 36 wells; the fourth point, 44 wells, that's in the range of reserves from three billion to four billion; the fifth point, 34 wells; the sixth point, 11 wells, that's the point that's down low in the range between five and six billion; the next point, five wells, which is the range between six billion and seven billion; and the last point, four wells. As I say, actually we only have, that only totaled to 159 wells because we left that last point off of this curve.

Now on the curves which we have drawn for this hearing, using 457 wells, and both the purple triangle and the orange square represent exactly the same number of wells; the purple triangle is on initial conditions of reserves and deliverabilities, and the orange or yellow squares are on current conditions of reserves and deliverabilities.

Now the deliverabilities used are the deliverabilities taken from the 1961 annual test. The reserves are calculated as of December 31, 1961 on the current ones, recognizing that there may be a number of wells -- and I don't specifically know offhand how many, but there may be a number of wells represented on those yellow squares which still have initial conditions. In other words, there were a great number of wells drilling and completed in the pool in '61, so the yellow squares may represent a great number of wells with still initial conditions on them.

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The first point represents 12 wells; the next point 83 wells; the next point, between two billion and three billion, 150 wells; the next point, 100 wells; the next point, 65 wells; the next point, which is the range between five billion and six billion, 28 wells, and you will notice that the current point for that curve has fallen back to less than five billion reserves; the last point represents 19 wells.

Now I might add at this time that for purposes of that last point, there is a range of reserves up through nine or ten billion cubic feet, but they were individual isolated wells, so we took everything above six billion cubic feet and lumped them into a group and averaged them altogether to get that point. I believe that's the description of what the curves are.

Q That's the way in which the points are plotted on Exhibit 1?

A Yes, sir.

Q Now will you comment as to the conclusions which you draw from the facts which this Exhibit 1 reveals?

A Yes, sir. As can be seen, because we have got a great number more wells that we have data on than we had in 1960, the curves do not exactly coincide with the 1960 curve, which is the green curve. However, I think it is significant that in the ranges of deliverabilities, the ranges of reserves up through the three billion to four billion range, the curve falls in exactly the same place for both initial conditions and current conditions.

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You see, they overlie one another, all we show actually is the purple curve. You can see the points on the yellow curve or the orange squares are very close to the purple triangles, and the same curve could very logically be drawn coinciding.

Now, after we get above the averages for three to four billion reserves, you notice that the curve begins to pretty abruptly flatten out, and that the curve for current conditions seems to fall somewhat below or does fall somewhat below the curve for initial conditions. First off, to me this indicates even more strongly than Mr. Cleveland's exhibit, which was much discussed, that the low reserve wells are receiving more allowable by virtue of a deliverability formula than the high reserve wells, because the curve flattens out; if it were, the relationship between the deliverability and reserves were a one to one relationship -- in other words, were reserves double, deliverability double, this would be a straight line off up the middle of the page at the slope that begins down in the lower ranges. It doesn't do that, it flattens out. Consequently, the higher reserve wells are not receiving allowables based on their deliverability commensurate with the allowables that are being assigned to the lower reserve wells.

Q What conclusion do you draw from the studies in this exhibit, with reference to the reasonable correlation, if any, between reserves and deliverability, between recoverable gas reserves and deliverability?

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A I think this curve shows a very, very close correlation between deliverability and recoverable reserves, and I might add this, that the reserves shown at the bottom of the page is recoverable reserves calculated to an abandonment pressure in all cases of 500 pounds, just to get them on a comparable basis. I also think that even though it does not show a one to one, or what we call a one to one relationship as deliverability doubles reserves double, or vice versa, that it does show a very constant and consistent relationship, as evidenced by the close relationship of the points, particularly in the low deliverability and low reserve ranges on this, the first four points on this curve.

I think it's significant that the yellow curve in the higher ranges of reserves falls below the purple curve; in other words, the curve for current conditions falls pretty markedly below the curve for initial conditions, and the only explanation that I can think of for that, if you realize that it means that deliverability has decreased on those wells more rapidly than reserves has decreased; and with the close correlation of reserves and deliverabilities evidenced in the low ranges of the curve, I think I must draw the conclusion that there is that same relationship throughout.

It would appear that these wells had not received sufficient allowable, these high deliverability wells, high reserve wells had not received sufficient allowable so that they were depleting their reserves at the same rate at which the low

deliverability wells were.

Q Mr. Rainey, am I correct in assuming that the distance to the left, the horizontal distance in which we note that each yellow square is moved to the left from the purple triangle, represents the amount of reserves which have been produced from that group?

A That's correct. That's the total reserves -- excuse me, the average reserves that have been produced from the wells in that group; and the vertical distance is the average deliverability decrease in each group.

Q The drop in the orange line below the purple line at each of the points reflects the decrease in average deliverability which has taken place between the same identical wells?

A Yes, sir, that's exactly right.

Q Do you have any further comments you would like to make with reference to El Paso's Exhibit No. 12

A I might point out one or two other things about that, Mr. Howell. For one thing, our average, the average for all the wells that we had data on, the whole 457 wells had initial conditions, the reserves were 3,140,000 cubic feet; in other words, 3.14 billion on this scale, with an average deliverability for the whole 457 wells of 1421 MCF. I meant to put those on the curve and I just neglected to do so.

If you will plot those points on the curve, you will find that they fall right on the line. The average reserves under

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current conditions are 2,878,000, or 2.9 billion on this scale here, with an average deliverability of 1290 for the whole 457 wells that we had. Again, those points fall very closely on the curve,which leads.me to believe even more emphatically that our curves are approximately correct; and I might add that we plotted the curves from the individual reserve range averages before we even calculated the averages on the whole pool, and the points fall so closely on the curve that I am more firmly convinced that our curve is approximately correct and that there is a very definite and close relationship between deliverability and recoverable reserves.

Q Does that conclude your comments with reference to Exhibit No. 1?

A Yes, sir.

(Whereupon, El Paso's Exhibit No. 2 marked for identification.)

Q Will you now refer to El Paso's Exhibit No. 2 and state the manner in which that was compiled and what this exhibit reflects, the studies that go into this?

A Yes, sir. In working with some other engineers, we came upon a possibility of showing even more clearly what the relationship is of reserve and deliverability breakdowns under the present 75 percent acreage times deliverability, 25 percent acreage formula, and the 40 percent acreage times deliverability, 60 percent acreage formula as proposed by this application.

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It was determined on the basis of some figures that had been discussed prior to this hearing, those figures being that the estimated take in the next year or so from the Dakota Pool should be 60 billion cubic feet.

Q That compares with approximately 55 that Mr. Cleveland used, I believe?

A Yes, sir. I don't mean to commit the purchasing companies to taking any 60 billion out of there, but for the purposes of this study, we merely used that as a good round figure. Also used 600 wells as the average number of wells upon which to base this particular study. There are at the present time considerably more wells drilled in the Basin-Dakota Pool than that. For purposes of this study, the intent will be fulfilled by using 60 billion cubic feet annual production and 600 wells.

Now, extrapolating the data on the number of acreage factors and acreage times deliverability factors that appeared in the February, March, and April, 1962 schedules, we arrived at an acreage factor of 559.67 for those 600 wells; in other words, there are enough wells with short acreage that the acreage factors are less than 600.

Using the same type of extrapolation, in other words, what we did was we took the number of wells that were added to the pool between the February schedule and the March schedule and determined how many acreage factors were added, at the same

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time determined how much deliverability factor was added, and then we took the same thing from the March to the April and determined how many acreage factors were added for the number of wells that were added to the pool and the same increase in deliverability, and just extrapolated that; on the April schedule there are 572 participating wells. We merely extrapolated those factors up to 600 on the basis on which they had come into the pool in the last couple or three months.

Any other figures of total estimated annual take or total number of wells or what have you will give the same answer in the calculations. It merely changes the numbers somewhat.

Now, taking the points from this curve of Exhibit No. 1 for original reserves, which is the second column, you'll note the number of wells shown there is the number of wells given on the exhibit. The column labeled "Reserves in MCF" is the original reserves for each of those seven points on that curve. The deliverability now is the current average deliverability for those same wells.

Comment on that third column, if you please; explain that.

A. That's what I was going to get into, is how we arrived at that. Although El Paso does not have too many contracts in the San Juan Basin which provide for a one million for each ten billion cubic feet of reserves take, it is becoming much more common practice in the industry to make contracts of that type.

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In determining approximately the reserves in the field on developed acreage, we arrived at about 1.9 trillion, and divided that by the daily take based on 60 billion cubic feet per year, which is 167 million cubic feet per day; that comes up with a factor of 11.46. That is a take for each 11.46 billion reserves, so it seemed that in this case a ratio of one million for each ten billion reserves was a reasonable figure to pick as a depletion rate if there was no proration in the pool and it was being completed under a contractual arrangement.

Q In other words, this column reflects the rate at which these wells would be produced if they were produced daily at the basis of one million cubic feet for each ten billion of reserves attributable to that well?

A Right, original recoverable reserves. You can see the numbers that we came up with there, the first,130 million cubic feet per year; 56 million cubic feet per year, the second figure, and on down the line. We then,based on these acreage factors and acreage times deliverability factors shown at the bottom of the sheet, in other words, the 559.67 for acreage factors and 790,487 for acreage times deliverability factors, we calculated the reserves under the current 75-25 formula and under the proposed 40-60 formula. You will notice that the low ranges of deliverabilities and reserves are receiving allowables even under --

Q Did you calculate the allowables, also, that would be

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applied to that group?

A Yes, sir, that's what I mean, we calculated the allowables for each group.

Q You had said reserves, I wanted to correct you.

A Excuse me, calculated the allowables for each group that they would receive under these assumptions that we used, under the current formula and the proposed formula. You'll note that even the low deliverability, particularly the low deliverability wells received fairly substantial percentages under the existing formula in excess of what a one million per day for each ten billion cubic feet of reserve depletion rate would be.

You can compare, then, the percentages, which is what the column after the allowable column in each case is, the percentage increase that the low deliverability wells will receive under the proposed formula at the expense of the higher deliverability wells.

Granted the change in percentage is not too great on the high deliverability wells from the current formula to the proposed formula, but they're still penalized considerably below what they would receive under a one for ten fixed depletion rate. I believe that's all.

Q Now, Mr. Rainey, have you determined the number of wells which have been completed in the Basin-Dakota Pool in recent years?

A Yes, sir.

Q What is that number?

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A There was some testimony that there was not going to be any continuation of drilling in the San Juan Basin-Dakota Pools because of the current formula. We checked statistically just to see what the drilling rate has been in the Basin. As of 1-1-58 -- now the first four figures that I have are taken from the New Mexico Oil Conservation Commission Gas Engineering Committee Annual Reports. The figure for the drilling during the year 1961, in other words, the figure as of 1-1-62, was obtained from our people in Farmington as to the number of wells that we actually connected to our system, the wells that were pending connection to our system, and we checked with Southern Union and obtained the same information from them, the number of wells they had actually connected to their system and those they estimated pending connection, to determine the number of Dakota wells in the Pool.

As of January 1st, 1958 there were 20 Dakota wells in the San Juan Basin. As of January 1st, 1959, there were 45 Dakota wells; in other words, there were 25 wells drilled during the year 1958. As of January 1st, 1960, there were 146 Dakota wells in the Basin, or there were 101 wells drilled during the year 1959. As of January 1st, 1961, there were 301 Dakota wells in the Basin, or in other words there were 155 Dakota wells drilled during 1960.

According to the best tabulation we can obtain, at the moment there are 673 Dakota wells in the Basin, which means that

there were 300 -- excuse me, that's as of January 1st, 1962, there may be more than that now; as of that time, which means that there were 372 wells drilled in the Dakota Pool during 1961, which is the year that proration has been in effect. There were more wells drilled during 1961 in the Dakota than had been drilled cumulatively to date prior to that time.

Q Do you recall the month in which the existing order was issued by the Commission?

A Mr. Howell, the hearing was held in October of 1960, and I believe the order came out sometime in November of 1960.

Q It was either November or December?

A Yes, sir.

Q So that with knowledge of this order, there have been more wells drilled to the Dakota in 1961 than in all the prior years of drilling?

A Yes, sir.

Q I wish you would refer, Mr. Rainey, to the April, 1962 proration schedule, this testimony is offered in rebuttal to some direct testimony, and observe the deliverability as shown on the Consolidated Oil and Gas Company wells in which they were operators; since the testimony shows, I believe, that in the wells in which they owned the larger interest they are the operator.

A Yes, sir.

Q See if you have tabulated and averaged the deliverabilities of the several groups of wells.

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A Yes, sir.

Q With the system to which they are connected?

A Excuse me. According to the April, 1961 proration schedule, there are six Consolidated Oil and Gas Company wells connected to El Paso's pipeline system-- I don't know the reason why, but there are only three of those wells with deliverabilities shown on the schedule -- for an average of 157 MCF per well. the three wells have an average of 157 MCF.

Connected to Southern Union Gas Company, there are 28 wells and one well is connected to Southern Union Gathering Company. Of those 29 wells, I didn't take a specific average of those 29, but I averaged in the three El Paso connected wells and the 29 Southern Union connected wells which had deliverabilities on them for a total of 32 wells, and an average deliverability of 660 MCF per day, as reported on the schedule, which, as I say, was indicated by Consolidated to be the wells on which they had the greatest percentage of interest.

Q Now, in conclusion, will you please state to the Commission your opinion and recommendations with reference to the adoption of a minimum allowable, or the consideration that should be given to a minimum allowable for the Basin-Dakota Pool at this time?

A All right. In the first place, it was testified to as I recall by Mr. Utz yesterday that the average acreage allocation factor gave each Basin-Dakota well during, as I recall,

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the ten-month period on which he had tabulated allowables, and I believe he extrapolated for two additional months to get a full year of allowables, had given those wells an average of 2800 MCF per month.

Based on just the thirteen cent per MCF figure, that's somewhere in the neighborhood of about $360.00 a month income to those wells. So it would appear that there's an adequate minimum solely on the basis of the acreage factor, recognizing that even a well with 100 MCF deliverability is going to get some additional allowable because of its deliverability and being in the Pool.

It has been testified to at some length that operating costs on wells range anywhere from 50 to 150 to 175 dollars. Even if the range is as high as $175.00, which from information that I have available, the tending of those wells and the production on those wells can be farmed out to consultants and engineers in the San Juan Basin area for $50.00 a month, so it seems like those people are spending a lot of money unnecessarily. That is the actual field operation. I realize that the figures that have been testified to include certain office expense and overhead and things of that kind. Nevertheless, the money that will be derived from the acreage factor alone in this Pool at the present time is considerably in excess of actual operating expenses on wells.

As Mr. Cleveland testified, I think nearly any operator, if he's making some profit, no matter how small, is going to

attempt to keep his well on the line and keep it producing. I can't say that I agree with Mr. Utz that he should have some incentive compensation to be sure he's going to work his well over or something like that.

So to my way of thinking, a minimum at this time is completely inappropriate in this Pool. The Pool is not sick, and I am a little bit dubious of writing a prescription until we get some ailments here.

Q Is it possible that the imposition of minimum allowables in this Pool at a rate of three million a month could result in diverting some of the market from some of the pools with lower deliverabilities?

A That's a possibility, Mr. Howell. I'm not sure exactly that I follow what your question is. In other pools which have a three million minimum, would have very drastic effects at the present time in the Basin-Dakota Pool -- it wouldn't have any drastic effect, if that's what you are getting at.

Q Well, I'll not testify, I'll let you do the testifying. Mr. Rainey, do you consider the present formula a fair one that prevents waste in the Basin-Dakota Pool and protects correlative rights, and one that will continue to do so for a reasonable period in the future without the necessity of any change whatsoever?

A Yes, sir. That's my firm opinion, and I think the curves on Exhibit 1 bear out the fact that the high deliverability

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wells are being assigned allowables less than commensurate with their reserves in relation to the low deliverability, low reserve wells, and that any move to assign more allowable by virtue of increasing the acreage factor to low deliverability wells is a move 180 degrees in the wrong direction.

Q Were these exhibits, El Paso's Exhibits 1 and 2, prepared under your general supervision, and do they correctly reflect the matters to which they relate?

A Yes, sir, they do.

MR. HOWELL: We offer El Paso's Exhibits 1 and 2 in evidence.

MR. PORTER: Are there any objections to the admission of these? The exhibits will be admitted in evidence.

MR. HOWELL: That concludes our direct examination of this witness.

MR. PORTER: Mr. Rainey, you said that you wouldn't recommend, I believe you testified that you didn't think that a minimum allowable was needed for this pool because it wasn't a sick pool. Would you recommend a minimum allowable for sick pools?

A I think that situation should be taken into consideration in the case of each individual pool. There's a mechanism within the field rules, the prorated gas field rules at the present time for taking care of wells which are in danger of premature abandonment, and we certainly would not go on record as favoring premature abandonment of gas wells.

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MR. PORTER: Any questions? Mr. Stockmar.

MR. STOCKMAR: If the Commission please, our cross examination of this witness will have to be based on some calculations that we will necessarily have to do. I could in a sense do this through the witness at great length. I think a fifteen minute recess will greatly shorten the total time that would be needed to interrogate the witness.

MR. PORTER: We will take a short recess.

(Whereupon, a short recess was taken.)

MR. PORTER: The meeting will come to order, please. We will recess the hearing at 5:30. Mr. Stockmar.

MR. STOCKMAR: Ted Stockmar for Consolidated.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Rainey, I believe that you testified that the fact or deduction, or whatever it is, that this purple line is curved, is because there has been an excessive allocation of allowable to the lower deliverability range?

A No, sir. I testified that by virtue of the allocation formula, that the lower deliverability wells received more allowable commensurate with their reserves, in relation to their reserves, than the high deliverability wells. I didn't say the curve was because of that. I said the curve indicates that's what has happened, that is what is happening. What I'm getting at, Mr. Stockmar, is that the magnitude of deliverability on low

reserve wells, relatively low reserve wells, is greater in relation to their reserves than the magnitude of the deliverability on the high reserves wells is, in relation to their reserves. Consequently, the lower reserve wells are receiving a greater percentage annually of their recoverable reserves than the high reserve wells are, and that will be shown by a subsequent exhibit.

Q Well, under some other allocation formula, then, I would understand that this purple line would have some other location on this chart?

A No, sir, I don't think necessarily. I don't know. I haven't plotted it under any other allocation and I couldn't state specifically; and we have not produced under another allocation, although there are a number of the wells that have been producing for some years prior to the allocation formula.

Q Is it the location of the line now, or the fact that it is curved, that has permitted you to conclude that the lower deliverability wells are getting more than their fair share of the allowable?

A I don't know that I follow you exactly, Mr. Stockman. May I go from Exhibit 1 to Exhibit 2 and call your attention to the fact that on the basis of a reserve ratio one million for each ten billion cubic feet of reserves, under a 75-25 allocation formula the low deliverability wells do receive more allowable than the high deliverability wells do, commensurate with their reserves; and it's an even greater disparity under the formula

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proposed by you, or by your company, excuse me.

Q I hate to be obtuse, Mr. Rainey, but there's something about this curve or line that is the basis of your testimony, or confirms your opinion from some other source, that the low deliverability wells are getting a break.

A Yes, sir.

Q This is what I would like to have you explain to me.

A I see what you are getting at. Let me put it this way then. If all of the wells were receiving or had deliverabilities in the same relationship to their allowables, this would be a straight line on the, approximately on the slope at the lower range because the points --

MR. HOWELL: May I interrupt just a minute? You said in relationship to their allowables. Did you mean in relationship to their reserves?

A I mean reserves; if I said allowables, I am sorry. Let me back up and start over.

Q (By Mr. Stockman) I think if you will start the entire answer again.

A Let me back up and start over. If all of the wells in the various ranges of reserves had deliverabilities in relation to their reserves in the same fashion, in other words, if the deliverabilities of low reserve wells had the same relation to the reserves as the deliverabilities of high reserve wells do, this line would be a straight line and would be just extrapolating from

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the first four or five points. When you get out in the range of the six to seven billion cubic foot reserve range, the deliverability of a well in that range, if it were in relation, the same relation to its reserves as the deliverability of the low deliverability and reserve wells are, the average would be approximately three million a day, whereas in fact it's 2200 MCF a day.

Q Would you mind, on my copy of your Exhibit 1, making the extrapolation that you just testified about? Please use a red pencil.

A Yes, sir, I'm using the pencil handed to me by you.

Q For the record, Mr. Rainey, --

A Yes, sir.

Q -- can you state that this straight line now runs from the common zero point to the intersection of the three million deliverability?

A Three million deliverability and the seven billion reserves.

Q The intersection of the three billion line, the horizontal line, and the seven billion reserve line, is that correct?

A Yes, sir, that's correct.

Q Did I understand you to say that the net change in the deliverabilities is a measure of the net change in the reserves, in the remaining producible reserves?

A I think it should be. It is not in the ranges of the high deliverability and high reserve wells. It is very closely

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in the low deliverability wells, as can be evidenced by the fact that the curves in the lower ranges lie one on top of another.

Q Had we been operating, since the time of the preparation of the 160-well exhibit as represented by this green line, had we been operating under a 100 percent deliverability formula, would the curve or line be a straight line at this time?

A No, sir. I doubt it.

Q As I recall --

A If I may elaborate a moment, the point being that I don't think the high reserve wells have deliverabilities high enough in relation to their reserves, in comparison to the low reserve wells.

Q Under what conditions of production, Mr. Rainey, would your idea of the relationship between deliverability and reserves fall along a straight line?

A Mr. Stockmar, if the high reserve wells had high enough deliverabilities it's possible that there would be a straight line in this relationship. I think another thing that this curve evidences pretty clearly to me is that there is a possibility, because the deliverabilities of these high reserve wells had declined at a more rapid rate in relationship to their reserves than have the deliverabilities of the low reserves wells, there is a strong possibility that there is drainage at the present time from the high reserve area to the low reserve area.

Q Is it the fault of an owner of a low deliverability well

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that your high reserve well does not have the high deliverability which you believe it should have?

A No, sir. I think he's just lucky, but at the same time I think it would be a step in the completely wrong direction to attempt to further penalize those high reserve wells because they don't have enough deliverability right now, and your proposal is to give more credit to acreage in the allocation formula.

Q Well, then, you are saying that in the high deliverability ranges, the comparison between deliverabilities and reserves does seem to fail for some cause, is that your statement?

A I think you've turned it around. In the high reserve ranges, the relationship is not as true as it is in the low reserve ranges because the high reserve wells do not have sufficient deliverability. They don't have sufficient producing capacity.

Q Why not?

A Any number of factors. There's a possibility that--the reserves calculated are based on various parameters, many of which have to be estimated; even though we have attempted to estimate them as accurately as we can on a township average basis, many of those parameters must be estimated. There is a possibility, and I'm a little disturbed about this myself, because of the very close correlation in the lower ranges, there is a possibility that we may have attributed a little bit too much reserve to some of the high reserve wells.

Q You are very candid to anticipate my next question. Is

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there also the possibility, Mr. Rainey, that in conditions of high productive capacity, there might be a substantial change in the impact of some given factor that contributes to productivity?

A You are talking about fracking, yes, sir, that's quite possible.

Q No, I'm talking about -- well, let me, I have to be educated first and then we will go from there. What are the factors which enter into the productivity of a well?

A Pressure, porosity, permeability, temperature, net pay thickness, all the parameters that go into the determination of reserves, plus the parameter of permeability.

Q You mentioned that one of those factors that goes into determining the productive ability of the well is permeability?

A Yes, sir.

Q As I understand the definition of deliverability, it is a measure of the productive capacity of a well, is that correct?

A That's essentially correct, yes, sir, at a given set of conditions.

Q Well, then, permeability equating those, permeability seems to be some kind of a factor in deliverability?

A It is a factor, yes, sir. It's not the sole factor by any means.

Q Well, is acreage or area a factor in deliverability?

A No, sir.

Q Is porosity a factor in deliverability?

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A There is no, to my knowledge, no direct mathematical relationship between porosity and deliverability. On the other hand, without porosity, you don't have any deliverability.

Q I understand you would have no gas?

A Right.

Q That is the reason?

A I don't know of any direct mathematical relationship between porosity and deliverability.

Q Have you made any studies to see if there is a relationship between porosities in the various wells in this field, and the deliverabilities of the wells?

A No, sir, not as such.

Q I believe you testified that the range of porosities was from something rather small to, or from zero to fifteen percent?

A Well, the range that we used in arriving at our reserve calculations for this study and for all of our purposes in the Dakota is from six percent to approximately fifteen, because we arbitrarily cut it off at six percent.

Q So actually the range of variation of porosity is rather small?

A Well, it's a hundred percent, 150 percent.

Q How does that compare with the range in the measured deliverabilities?

A Oh, the range in the measured deliverabilities, Mr.

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Stockmar, range anywhere from something less than 100 MCF to, I think there's been considerable testimony and discussion today about a 30 million deliverability well.

Q You see no relationship between porosity and deliverability?

A Not directly, I don't. No, sir.

Q Excuse me, Mr. Rainey, but what were some of the other factors that you mentioned?

A Mr. Stockmar, to save a lot of time, if we are going to go one by one of the various parameters that are in reserves and discuss whether they are directly related to deliverability, I will say I don't think there's a specific direct relationship in any of them. Pressure bears a direct relationship to it. Your permeability admittedly bears a direct relationship, which is not in reserves. The point, if I may, just a moment and maybe save some more questions -- the point I would like to make is that deliverability, because it does have pressure, temperature, various other factors upon which it is dependent, maybe not directly, mathematically, but upon which it is dependent to be there, certainly bears a much greater relationship to recoverable reserves than straight acreage. Now has that saved us a lot of time?

Q Well, if I understood you, it was that of those parameters, permeability is the one, permeability and pressure do seem to bear together some direct relationship to reserves, is that correct?

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A No, to deliverability. Permeability has no direct bearing on reserves.

Q Well, if deliverability -- Pardon?

A Permeability has no direct relationship on reserves other than the fact that if you don't have permeability you have no recoverable reserves; but pressures and permeability do reflect on deliverability.

Q I think that is what I said.

A You said reserves.

Q I'm sorry. I meant to ask, is there a direct relationship between pressure and deliverability?

A Yes.

Q And permeability and deliverability?

A Yes, sir.

Q If I may elaborate --

A Each of them.

Q -- is there a direct relationship between each of those items and deliverability?

A There is a mathematical relationship. I don't know exactly what you mean by "direct relationship".

Q You have testified that there is a direct relationship, or many of your people have, between permeability and reserves. Maybe we should clarify what is meant by a direct relationship.

A That's something at which I have been to some length to determine myself. Some people say that a direct relationship

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is a straight line relationship. My feeling is that a direct relationship is any constant relationship which can be related to a mathematical formula. Now what that specific mathematical formula is in the relationship between deliverability and reserves in this specific pool and in this specific instance --

Q It is a direct relationship, but you would hate to be more specific?

A It's a relationship that can be determined mathematically.

Q It is? A Yes, sir.

Q It is either a straight line function or curve function?

A Yes, that's my interpretation or understanding of what a direct relationship is, yes, sir.

Q And this is true both as to pressure and permeability?

A In relation to reserves?

Q In relation to deliverability.

A In relation to deliverability; yes, sir, that's my understanding of the situation.

Q What is the relationship between permeability and reserves?

A You mean mathematically?

Q I mean -- yes, if you will.

A Between permeability and reserves -- excuse me.

Q And reserves as you have used it.

A There's no direct mathematical relationship that I know

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of offhand, other than this fact that without permeability you don't have recoverable reserves.

Q It is your testimony that there is no direct, in the broad sense, no direct mathematical relationship between the two, is that it?

MR. HOWELL: That is the third time that the witness has answered the same question. I suggest that counsel adopt another line.

MR. STOCKMAR: Is it clear that his answer is no?

A It's no, that I don't know of any specific relationship between permeability and reserves.

MR. HOWELL: He has answered that three times.

Q (By Mr. Stockmar) The reason for my confusion is that you have just testified that there is a direct relationship between deliverability and reserves.

A Yes, sir.

Q And a direct relationship between the deliverability and permeability.

A That's correct.

Q The little arithmetic that I know, if there are two items that have a direct relationship to a third, then they have a direct relationship to each other. I am very anxious to determine what that relationship is.

A Mr. Stockmar, there may be a mathematical relationship that can be determined between permeability and reserves. I'm not

saying there is not such a mathematical relationship. I'm saying that I do not know what it is, if there is such a relationship. I merely say that there can be no recoverable reserves without permeability. Consequently, there is some relationship between permeability and reserves. Now again, I'm not trying to avoid the question. I flat don't know if there is a specific mathematical relationship between permeability and recoverable reserves.

Q Or you don't know what it is, that is a more accurate statement?

A Right. In the calculation of the deliverability formula -- in response to no question at all -- the slope of that curve, we were discussing the various parameters in reserve calculations that are not directly related to deliverability. The slope that is used in the calculation of deliverability to a specific set of conditions takes into account those other various paremeters, and it's a characteristic of a particular well.

Q You mean the slope of this line?

A No, the slope of what the deliverability curve on an individual well.

Q Is there any significance in the slope of this line?

A No, sir, only the fact that it curves and the high reserve wells don't have enough deliverability.

Q Mr. Rainey, in your last group on Exhibit 1 of the 19 wells --

A Yes, sir.

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Q --were there any low deliverability wells in that group?

A Just a minute, I'll check and see. I imagine there probably were. There were ranges of deliverability, high, low and in the middle throughout all of these. El Paso's position always has been that the pool must be prorated on the basis of averages and not on the basis of the few freaks, that they should be treated as special exceptions in special cases.

Q Is this an indication that you agree with Mr. Trueblood's testimony to the same effect?

A Yes, sir. I think those freaks ought to be treated as special exceptions, and I see no reason whatever for disturbing the whole pool allocation formula for the few freaks we are talking about. I think the overall pool allocation formula is applicable, and as I testified, I think it ought to be a little more toward deliverability. I think the high deliverability wells in the low ranges of reserves, or low deliverability wells in high ranges of reserves should be treated as special exceptions and special cases. The lowest deliverability well that is in that last group is 1,040 MCF, in the eight to nine billion range.

Q 1,040?

A Yes.

Q What was the highest deliverability well in that group?

A In that group?

Q Yes.

A Appears to be about -- well, there's one oddball in

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there, there's 12 million deliverability, 12,063.

Q It's off the chart?

A Yes, well, it's averaged into that group is what I'm getting at. Yes, it would be off of this chart completely. I might point out that's the initial deliverability on that well. The current deliverability is only 4700, that same well.

Q One more question, how many of the wells in that group of 19 are above this average, and how many below?

A Let me get this stuff out, if we're going to go into that. That's from six billion up, isn't it? Do you want it on a current basis or on an initial basis?

Q Initial basis, please.

A All right. The average shown there is 2200. And I will stand corrected on that 1040 MCF I gave you a moment ago, because I hadn't gone far enough back. There's one 386 deliverability well in that group. There are eleven of the wells are below the average, and eight of them are above the average.

Q This is initial?

A Yes, sir.

Q Now, of those eight wells in the below average --

A Above average on the eight.

Q Excuse me, in the eleven wells on the below average group --

A Yes, sir.

Q -- was there any noticeable drop in the deliverabilities

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of those wells during the period reflected here, down to current deliverability?

A That twelve million one that I mentioned is down to 4700.

Q I'm asking about the wells in the below group.

A Excuse me, the below. I'm sorry. No, sir, they seem to be relatively in line. There is a small decline in all but one of them, and it went up from 814 to 900.

Q The higher deliverability wells, then, the eight wells up there, they do exhibit a sizeable percentage drop?

A Well, now, that twelve million well, as I mentioned, is a real oddball. The next one is only 4200 and other than the twelve million, the others exhibited a normal decline, some of them were initial, no decline whatever, it's the same figure. The twelve million dropped down to 4700.

Q Maybe we'll have to get -- did the wells in the higher deliverability group exhibit a larger percentage drop, percentage of their original deliverability than did the wells in the lower group?

A Without running any detailed calculations, Mr. Stockman, and just sort of eyeballing the figures, I would say probably a lesser percentage drop than the small ones.

Q Would it be possible, Mr. Rainey, over the dinner hour for you to actually calculate the percentage drop on each of those eight wells in the group above, and the percentage drop of each of

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the eleven wells in the group below?

A You are going to be eating dinner.

Q I'll be glad to help you.

A No, I'll be happy to.

Q Can you also do that for us to calculate the average of the wells above, that is, the average percentage drop? This is the only way we can get at it, Mr. Rainey.

A I don't know how to figure an average percentage, unless you want me to take the total of the wells that were low and the total of their current deliverabilities, and then figure percentage there. You can't average percentages.

Q Here is what I would like to have you do, is to calculate the percentage drop of the average well.

A All right.

Q Weighted average.

A I'll tell you what I'll do, I'll be happy to give you the figures and let you do it, because I don't know what you want, frankly.

Q If you will produce for us --

A Here's the tabulation of the 19 wells in the high group.

Q Thank you, sir, we'll return it.

A If I knew what you wanted, I'd be happy to do it.

Q If, Mr. Rainey, we discover -- and apparently none of us will know until after dinner, that the percentage drop was

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greater in the higher deliverability range than it was in the lower, can not we say that this is directly attributable to an overproduction by those wells? We're sort of gambling with each other.

A I couldn't say until I knew what their allowables were, based on their deliverabilities, and their production in relation thereto. It would appear to me it would indicate drainage more than anything else. If the high deliverability wells had declined more rapidly in this high reserve group, it would indicate to me a possible indication of drainage to some low reserve, low deliverability well that has a lower pressure.

Q If my recollection of the record is correct, you have just testified to the reverse by eyeballing, you said?

A I said it appears that --

MR. HOWELL: If the Commission please, this is entirely speculation. If the gentleman wishes to go ahead and compute his figures, Mr. Rainey will be glad to accept his computation, but we are in the realm of guesswork, and if we continue in this realm of guesswork, I don't know when we'll finish. We will be here on Easter morning. We object to that line of questioning.

Q (By Mr. Stockman) We're getting very near the announced hour, Mr. Rainey --

MR. HOWELL: I might inquire of counsel if it's his determination to keep Mr. Rainey on until the recess, until he can do some more studying?

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MR. STOCKMAR: It certainly is.

MR. PORTER: The hearing will recess until 7:00 o'clock.

(Whereupon, the hearing was recessed at 5:30 o'clock.)

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NIGHT SESSION
April 20, 1962

MR. PORTER: The hearing will come to order, please. Mr. Stockmar, will you continue with your cross examination?

MR. STOCKMAR: I would like the record to show that I'm returning to Mr. Rainey the data sheet which he loaned us.

MR. RAINEY: Thank you, sir.

CROSS EXAMINATION (Continued)

BY MR. STOCKMAR:

Q Mr. Rainey --

A Yes, sir.

Q On your calculations with respect to the well which dropped so drastically in deliverability, in the 19 well group on the right-hand side of your Exhibit 1, would that indicate that the drop in that single well's deliverability amounted to an average drop for all of those 19 wells of 386?

A MCF?

Q 386 MCF deliverability for each of those 19 wells, is that correct?

A I have not made the calculation, but I'll accept your figures. I'm sure it is.

Q In terms of the deviation that you testified as having

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occurred between the purple line, the initial deliverability and reserves line, and the gold line, the current deliverability and reserves, we believe this amounts to at least one-third of that deviation?

A Yes, sir, that's correct.

Q Do you agree with this?

A That's probably correct, right.

Q This then substantially brings closer together the purple lines and the gold lines?

A Yes, sir, exactly.

Q Mr. Rainey, would you refer please to your Exhibit 2?

A Yes, sir.

Q As I understand the substance or the import of your testimony here, it was that the projected yearly allowable rates for wells under the existing formula is superior to the sort of national approach of allotting one million a day take to each ten million of reserves, and therefore that the existing formula is,in some of the, with respect to some of the wells in the top two brackets here doing better for those wells than the national average, you might say?

A Yes, sir, that's correct. The purpose and intent of any allocation formula is to, as nearly as possible, allocate the production between wells in the ratio that the reserves of those wells bear to the total reserves of the field. This formula, the present 75-25 formula, does not in perfection achieve that, but

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it much more nearly achieves that than the proposal that we have before us of a 40 percent AD plus 60 percent acreage.

Q Do you feel that this does achieve it for these low deliverability wells?

A No, sir, it doesn't immediately, they are getting more. Since the fixed depletion rate is a direct ratio of reserves, it's obvious those lower deliverability wells are getting a little more than they should get in a direct ratio of reserves.

Q Your statement is the low deliverability wells in these fields are getting more under the present formula than they are under the fixed depletion rate?

A Yes, sir, that's obvious.

Q Well, Mr. Rainey, in looking at your data sheet, we find on that five wells at very low deliverabilities. Would you refer to it?

A In that high range of reserves, is that the sheet you are talking about?

Q The data sheet we borrowed over the candy bar hour. We found there was one well that had a deliverability of 332 MCF per day.

A I fail to see that one. Excuse me, you are talking about current deliverability?

Q Yes.

A Right.

Q And an 8.1 billion reserve, is that correct?

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A Well, a current reserve of 7.3 billion, based on our calculations.

Q I'll accept that. Another well with a deliverability of 147, a reserve of 6.6 billion --

A 6.4, yes, sir.

Q I'll accept that. A well with a deliverability of 337 --

A Yes, sir.

Q -- and what was the reserve for that?

A Reserve is 6.1 billion, 6.06.

Q Well with a deliverability of 402, a reserve of what?

A 6.2 billion.

Q A well with a deliverability of 386, and a reserve of what?

A 6.4 billion.

Q Now as I understood your testimony and the purport of this exhibit, if we have, say, 6 billion, then under the fixed depletion rate that well should be entitled to point six-tenths of a million cubic feet a day take, is that correct?

A Yes, sir, approximately; in round figures that's correct, yes, sir.

Q Under the existing allowable formula, what does a well in that low deliverability range, say 397, to be consistent with your top column --

A Yes, sir.

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Q -- what is the comparison then between the fixed depletion rate and the allowable?

A The allowable is 164 percent of the rate, based on a fixed depletion. I don't know the exact figure per day. These are annual figures on this --

Q Yes, sir.

A -- this report.

Q We had selected one of these low deliverability wells and under the fixed depletion rate it should receive 600,000 cubic feet a day, is that correct?

A Yes, sir, if it's got six billion reserves -- is that correct?

Q Now this was --

A Wait a minute.

Q This was your tabulation.

A Right, right. That's right. That's a one for ten depletion rate.

Q Multiplying that times 365, or the number of days in a year, we find that that well should receive 200 million plus MCF on the projected -- excuse me, on the fixed depletion rate; this would seem to be seven times higher, it should be entitled to seven times more than you have shown for a more or less similar low deliverability well on the first line of your table.

A Mr. Stockmar, there's one apparent fallacy in that statement at the outset, in that that well is not capable of

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producing but 386 a day, but whatever the deliverability a day you picked, I believe it was 86, obviously under any type of depletion rate it won't produce 600,000 a day.

MR. HOWELL: I would like to call Mr. Stockmar's attention to this fact, that he's mixing apples and oranges, because this exhibit will include the high deliverability well, the high reserve well, since the group that he has included is in the last line and not the first line of this exhibit. Therefore he's using a wrong assumption in his question, that the figures which were given him include the 19 wells that appear in this last line and he's questioning in regard to the group of low delivery wells that appear in the first line.

MR. STOCKMAR: I am trying to get some of the apples out of the orange barrel here and get them back into the apple barrel.

A May I make a statement at this point which may save some of this?

Q (By Mr. Stockmar) Yes, sir.

A Admittedly, these 19 wells in this last group are oddballs. We have all talked about these so-called freaks within this field. These are wells which, according to the best data available, and admittedly some of it is to some extent guesswork, but nevertheless, on the basis of the best data available indicate very high reserves, many of them, as you pointed out, have very low deliverabilities, some of these wells; and I cannot say which

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ones, but you recall from some original tabulations, some of these wells have been in the field for quite some time and are old shot wells, have not been fracked and are, because of that fact have low deliverabilities. I know one well in particular is an El Paso well, one with eight billion cubic feet of reserves on it. It was completed some time ago and was shot, and I don't know why, we have never gone back in and re-opened and fracked it, but it has a million deliverability. I think in this group of wells you can pick out and prove most anything you want to by picking the isolated wells in this pool. Admittedly, they are freaks.

Q Well, let's pick one.

A Okay, sir.

Q You just stated before the conversation that one of these low deliverability wells of 397, something like that, wouldn't make its allowable anyway?

A That's right. If it's got six billion feet of reserves, it won't produce 600 MCF a day.

Q That is not what I asked you. Will a well with a deliverability of 397 make its allowable?

A Yes, sir. In the Dakota Pool it will make it. You were predicating it on the fact it was going to have six billion feet of reserves and get 600 MCF a day, in a fixed depletion ratio.

Q You testified because of its very large reserves, on the fixed depletion rate which we seem to be trying to achieve or beat here, that well should be entitled to 200 million MCF per

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year?

A 200 cubic feet, wouldn't it be?

Q Excuse me, I'm sorry.

A Yes, sir, that's correct.

Q And yet its allowable would be what, Mr. Rainey?

A Approximately 49 million cubic feet a year.

Q Then its allowable is only one-fourth of what it should be if it were to reach the fixed depletion rate?

A That's right. But back to my original point, it cannot produce its fixed depletion rate at the outset; consequently, it's not entitled to that type of allowable.

Q Well, how much can it make?

A Well, it can make 397 MCF a day times 365, which is roughly 120 million, it seems like.

Q Would you accept 146 million?

A All right, sir, I guess we are doing that.

Q Which is three-fourths of the fixed depletion rate to which its entitled?

A Yes, sir.

Q And which is three times the allowable permitted to it at the present time?

A That's correct.

Q Is it still your contention this arises only because these wells are freaks?

A Yes, sir, because I seriously have doubts as to the

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accuracy of either the reserves or the deliverability on that particular, on a particular well of that type, because of the very close proximation in averages throughout the range of the field.

Q Do you have the same doubt as to the relationship between the deliverability and reserves as to the next category of 28 wells in the five billion reserve range?

A Mr. Stockmar, I am sure that you will find wells within any range which has a deliverability that does not correspond to the reserves which we have determined for it. The averages correspond very closely. We can go through the whole 457 wells, and I'm sure you can find a number of them that will not correspond at all. But the great bulk of them and the overall averages correspond very closely.

Q I hand you Consolidated's Exhibit 3 --

A Yes, sir.

Q In the deliverability range -- excuse me -- do you recall Mr. Trueblood's testimony that these figures, that this data was derived from the February, 1962 proration schedule?

A Yes, sir.

Q In the zero to one thousand deliverability range we find 278 wells?

A Yes, sir.

Q Are all of these wells freaks?

A No, sir.

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Q Are these wells generally scattered throughout the entire reserve range?

A There may be some that are scattered, Mr. Stockmar. If you'll notice the percentages through the first one, two, three, four categories of the wells on my graph, Exhibit 1, there are 75 percent of the wells in the pool in these first four categories, and the --

Q Let's look at these 278 wells on your Exhibit No. 1.

A Yes, sir.

Q Mr. Rainey, all of these 278 wells, if plotted individually --

A Yes, sir.

Q -- would be scattered throughout the entire reserve range shown on your exhibit, would it not?

A It's possible, yes, sir.

Q Is it possible, or is it absolutely true?

A I said at the outset, Mr. Stockmar, that there were ranges of deliverability from very low ones to very high ones in each reserve category.

Q Well, are all of these freaks, or just the ones in the end out here?

A I think basically nearly all of the ones on the end are probably freaks. There are individual cases because of specific reservoir characteristics that the deliverability is not, in a specific well, and I admitted it on several occasions, not

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specifically related to the reserves; but in general, and on the broad average basis as shown very clearly by this curve, I think they are.

Q I submit to you, Mr. Rainey, that if we revised your Exhibit 2 so that this same tabulation was made, instead of taking the points as we have them --

A Yes, sir.

Q -- but if we refer back to Consolidated's Exhibit 3 --

A Yes, sir.

Q -- and work these up by the deliverability ranges of the wells --

A Yes, sir.

Q -- individually, each with respect to its individual reserves as determined by you, --

A Yes, sir.

Q -- that we would find that those 278 wells, each should receive a fixed depletion rate somewhere in the area of 10%,000 MCF, as against a projected yearly allowable for wells in that -- take the two top categories so we'll be fair to you -- under 1,000, excuse me, under one million deliverability, you have a projected yearly allowable for those wells which would probably average 55 million, is that correct?

A I'm not sure that I follow you, Mr. Stockman. I lost you somewhere in the middle. Would you repeat that, please, sir?

Q I asked you, Mr. Rainey, that if we made a statistical

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presentation similar to your Exhibit No. 2 --

A Yes, sir.

Q -- except that instead of using the categories represented by your seven average points,--

A Yes, sir.

Q -- that we usedthe deliverability ranges for our groupings that as to each well we found its reserves according to our own method of determining them,--

A Yes, sir.

Q -- I submit to you that the fixed depletion rate to which all wells, or let's say the average wells --

A Now let me interrupt just a moment to be sure I understand. You are talking about the first two groups on my Exhibit 2 or Consolidated's Exhibit 3?

Q I'm talking about setting up one group containing 278 wells.

A All right, sir. Which are the wells on Consolidated's Exhibit 3.

Q Which are all of the wells in the field in the zero to one billion deliverability range.

A Yes.

Q I suggest then that for column two we determine the reserves --

A For each of those wells?

Q -- for each of those wells, independently.

A Yes, sir.

Q I suggest then that we, if you wish, average all those reserves, average those 278 wells to give us a deliverability average of, what would it be, 500?

A Five, 600, I don't know, I would imagine.

Q More likely about 660?

A I imagine it would be on the high side, six or 700, I would guess, but it's just a pure guess.

Q But if it is as high as 700 then --

A Yes, sir.

Q -- by your own table here it should be entitled to a yearly allowable of 61 million, is that correct, or 70?

A I don't follow that at all, Mr. Stockmar. We don't know what it will be until we determine what reserve ranges they will fall into.

Q We have simply averaged the reserves of all --

A Average them and average the deliverability.

Q Pardon me?

A As I understood your problem, we were then going to average all those reserves and then average all the deliverabilities, then determine the ratio between the fixed depletion rate and the allocated allowable; and I have no concept of what that average reserve might be.

Q I was trying to simplify the matter, but instead we create a very long table. Treating each well independently, we

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set forth its particular reserve, its particular deliverability. Then we compare, we take the appropriate fraction of its reserve for a fixed depletion rate --

A Daily depletion rate.

Q -- and compare that with the projected yearly allowable for that well.

A Yes, sir.

Q I submit to you, Mr. Rainey, that we will find on the average of those 278 wells, and they will vary, that the fixed depletion rate should be in the neighborhood of 75 to 80 percent higher than the allowable permitted under this formula.

A Mr. Stockmar, without making some detailed calculations I won't -- if you made the calculations and say that's right, okay, but I haven't, I don't know.

MR. HOWELL: You wish to be put under oath, Mr. Stockmar, and testify to that?

A I don't know, Mr. Stockmar.

MR. STOCKMAR: If we could have the data sheets for all of these categories that Mr. Rainey has, overnight, I'm quite certain we could find a witness that will testify to that, including myself.

MR. HOWELL: Well, I was just wondering if you are prepared to testify to it now, because the witness has stated several times he doesn't know the answer, and I submit it's argumentative and improper questioning to keep putting these

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hypothetical questions about calculations which have not been made. Object to that line of questioning.

MR. PORTER: The Commission will sustain the objection, since the witness has not made the calculations.

Q (By Mr. Stockmar) Mr. Rainey, may we overnight have all those data sheets for these eight points?

A Yes, sir. I have no objection to your having them, borrowing them. These are grouped, for your information, these are grouped by reserve groups. You'll have to completely rearrange them by deliverability groups to achieve what you are after.

Q Mr. Rainey, returning to your Exhibit 1, please, --

A Yes, sir.

Q -- what is the average deliverability of all of these 473 wells?

A I have 457 on my exhibit. The average original --

Q Excuse me.

A -- deliverability was 1421 MCF per day. The average current deliverability, or 1961, based on 1961 deliverability tests, is 1290 MCF per day, bearing in mind that a number of the wells, the initial conditions are the current conditions.

Q Well, based on those initial deliverabilities, what would be the, you might say the reserve of the average well?

A 3,140,000,000 cubic feet, which as I -- I gave these on direct, Mr. Stockmar, and pointed out that those points fall

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right on the curves.

Q Thank you, sir. Of these 457 wells, how many of them have a below the average deliverability?

A Below average deliverability?

Q Below the average of 1400 that you testified to.

A Mr. Stockmar, I haven't the slightest idea. I haven't made a deliverability grouping of these wells.

Q I submit to you, Mr. Rainey, that it will be in the neighborhood of --

MR. HOWELL: If the Commission please, we are getting back to Mr. Stockmar's testifying about some calculations that haven't been made. The witness has testified he doesn't know. I would like to get home sometime before Easter morning.

Q (By Mr. Stockmar) Mr. Rainey --

MR. PORTER: Mr. Stockmar, please refrain from having the witness testify to calculations which he hasn't had an opportunity to make.

A I might point out, Mr. Stockmar, the data sheets I gave you will enable you to make such calculations and you can present them tomorrow.

Q (By Mr. Stockmar) Mr. Rainey, did you hear Mr. Truebloud's testimony with respect to his Exhibit 4, maybe others?

A Is this Exhibit 4?

Q Yes, sir.

A Yes, sir, I heard it.

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Q That of the 473 wells in the field subjected to his study, that 70 percent, or something near 70 percent of those wells were below average deliverability?

A Yes, sir.

Q Do you agree or disagree with his testimony.

A I haven't made those calculations. I would venture to say that he's probably right. I have no reason to dispute them. I haven't determined those on my own. I might point out that a great number of the wells in the field are below average reserves, too.

Q Mr. Rainey, can you tell us the average reserve -- well, assuming that 70 percent of these 457 wells are below the average deliverability --

A Yes, sir.

Q -- can you tell me the average reserve attributable to --

MR. HOWELL: If the Commission please, Mr. Rainey has answered that question that he has not computed on deliverability groups. Mr. Stockmar, may I inquire if it is your intention to continue questioning Mr. Rainey until midnight to make further attempts to impeach his testimony? Are you going to keep him on the stand with the same line of questioning until the Commission recesses for the night, because that's exactly the same question that he's told you he hasn't computed, and we object to that line of questioning.

MR. STOCKMAR: In answer to your question, I'm very

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anxious to be done, Mr. Howell.

Q (By Mr. Stockmar) Mr. Rainey, if the average deliverability of the field wells is 1400 --

A Yes, sir.

Q -- and we have one well of a deliverability of 2,000, you will admit that there can be such a well?

A Yes, sir.

Q Can one single well of the below average deliverability group -- I'll withdraw the question.

MR. STOCKMAR: Thank you, Mr. Rainey, very much.

A Yes, sir.

MR. PORTER: Does that conclude your questions?

MR. STOCKMAR: Yes, sir.

MR. PORTER: Anyone else have a question of the witness? Mr. Kellahin.

BY MR. KELLAHIN:

Q Mr. Rainey, as I understand, in your reservoir study you did this on an average township basis, is that correct?

A Yes, sir.

Q Now in arriving at the calculations, what core information did you use on each township, was it the same or what?

A Mr. Kellahin, I testified at great length that I did not do it, our reservoir people did it in a continuous study of deliverabilities, of reserves, in the Dakota Pool. We used some 65 to 68 cores in arriving at those parameters, and as I mentioned,

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if we did not have a core in a particular township and had cores in townships around it, we probably used the average of those four cores, the data on those four cores for the parameters to be used for the determination of reserves in that one township.

Q You say probably, you don't know?

A That's what was done. I'm just saying if we didn't have it in one township, we averaged what we had around it. What I'm saying, we did not necessarily have cores in every township.

Q But where you had cores in one township, you used those cores, is that correct?

A Yes.

Q Then you made the assumption that as far as the rock characteristics are concerned, they were uniform through the township?

A As near as we can determine. Of course, I made the further statement, which I hoped was clear, that we compared the logs on the wells on which we had core analyses. We then compared those logs with other logs of the same character in that township in an effort to determine an accurate count of net pay thickness.

Q That again assumes a degree of uniformity, doesn't it, Mr. Rainey?

A Uniformity or non-uniformity, there may have been great non-uniformity between logs; and if in correlating we couldn't find the same sands that had good core characteristics, and some logs in the township we probably didn't give any credit to that sand

as being net pay.

Q But on the average, for the whole township, you had to treat it as a fairly uniform --

A Basic as to your porosity and water and parameters, and things of that nature.

Q On your Exhibit No. 1 --

A Yes, sir.

Q -- it's my understanding that each one, while you did not group these by deliverability, your point there, for example, you have five wells between six and seven there; that is the average deliverability for those five wells, is that right?

A On that old original curve, yes, that 1960 curve.

Q Yes, sir.

A That's correct.

Q And on the 19 wells it would be the same, that's the average deliverability for those 19 wells?

A Well, except that on the curves for the new curves, those 19 wells on that last point, Mr. Kellahin, are a great number of these oddball wells we discussed at some length. They range in reserves up through nine billion.

Q I don't want to belabor that point, Mr. Kainey, but would you tell me what percentage, what number of the 19 wells had deliverabilities in excess of three million, do you know?

A Mr. Parmar has my data sheets. I don't know. Deliverabilities in excess of three million?

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Q Yes, sir.

A You talking about current deliverabilities or initial deliverabilities?

Q Well, current deliverabilities, I would say.

A All right. Four of the 19, which is roughly 22 percent.

Q Would you accept the figure that the current April proration schedule showed some 61 wells with deliverabilities in excess of three million?

A If you say so, I'm sure there are, yes, sir.

Q Had you projected your curve on outward, then, you would have arrived at a reserve figure of some twelve billion, if you included those wells, would you not?

A Now wait a minute -- I fail to follow you there, Mr. Kellahin.

Q You are relating deliverabilities to reserves, aren't you? Projecting that curve, would you be able to come to a figure showing some reserve for those wells, if you included them on a deliverability basis?

A I see what you mean. Yes, sir.

Q It comes somewhere close to twelve million?

A That's right.

Q Twelve billion, I should say.

A Yes.

Q Have you made any calculation, Mr. Rainey, on your exhibit here as to the extent the reserves you show as the initial

reserves have been depleted, as shown by your current reserves?

A You mean percentage-wise?

Q Yes, sir.

A No, sir. I have the -- on the data sheets that Mr. Farmar has, I have the current, current reserves versus the initial reserves. It can be determined from those.

Q You also have them on your exhibit, don't you? Isn't that what your purple line and your --

A Oh, I see what you mean, the difference there. I have not calculated the specific percentage. I'll be happy to do so for you. As I recall, Mr. Kellahin, I believe we looked at them, I do not have the calculations with me; my recollection is that they are essentially the same. There may be a variation at one point from some other point, but --

Q Actually there's a substantial variation, is there not?

A Percentage decline in reserves?

Q Could you, for example, make the calculation for us on the depletion of the reserves between the five and six million figure?

A All right, sir.

Q That's 38 wells, is it not?

A Yes, sir. That's declined from 5474 to 4974, which is 500,000,000 over 5474, it's approximately 9.2 percent.

Q Now --

A I have got a small slide rule so I'm having to guess

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pretty widely.

Q Now would you do the same, then, for the group just below that, the four and five billion group?

A All right, sir. That's from 4474 down to 4,009, which is 465 and 465 over 4474, that's 10.1 percent.

Q We don't quite agree on that. Would you please repeat the coordinates on the two points?

A I show 4474 on the initial conditions; that's 4,474,000,000, and 4,009,000,000 for the second point.

Q How does that then compare to the group between one and two?

A Between where? Excuse me.

Q One and two.

A Well, that's 825 and 768, that's 57 over 825. I get about seven percent.

Q What were your coordinates on that?

A 825 for initial and 768 for current.

Q Be closer to five percent, wouldn't it, Mr. Rainey?

A I get 57, didn't I subtract right? I get 57 over 825, which calculates to approximately seven percent. It's about 6.9 something. I can't read it on this slide rule.

Q Now under a proration formula such as you have shown on your Exhibit No. 2 -- I don't mean proration formula, I mean your depletion rate --

A Depletion.

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Q Depletion rate.

A Yes, sir.

Q Your goal would actually be to deplete your reserves percentage-wise on an equal basis?

A Yes, sir, that's the hope of all proration formulae.

Q The other calculations here are solely hypothetical situations, aren't they?

A You mean the calculations as to the allowable under the -- yes, sir, with the assumptions as set out at the bottom of the page.

Q But this Exhibit No. 1 reflects actually what happened, doesn't it?

A That reflects what happened for one year of proration. There are a number of wells in this pool been here for some time.

Q This does reflect what happened in one year of proration?

A Yes.

Q And the withdrawals aren't equal?

A No, sir.

Q And the wells in the middle range are the ones who have received the greatest allowable, aren't they?

A They are the ones whose reserves have been depleted a slight percentage more than, than the averages in the lower range.

Q Those are actually the above average wells, aren't they,

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Mr. Rainey?

A The ones in that middle range?

Q Yes, sir.

A I would say they are probably the above average wells in reserves. If you are going to talk about the averages that we have discussed previously, and being 1422 deliverability average, their average deliverability ranges are higher.

Q Well, the range of 10.2 as against seven, your calculation is about a 40 percent difference, isn't it?

A Well, I figure 30, but if you want to call it 40, okay. It would be 40 percent on seven -- excuse me, right.

Q Yes, sir. You gave us a figure of seven?

A Yes, right, if you are using seven as a basis.

Q You gave us 10.2 as the highest?

A That's correct.

Q We are still not talking about the wells with the greatest reserves or the highest deliverability, are we?

A We may be talking about some wells with high deliverabilities, not in these averages --

Q We are not talking about the wells with higher reserves?

A No, sir, however, the reserves are much higher than average.

Q It's your position that the wells with the highest deliverabilities are being penalized?

A On the basis of these curves, it would appear to be.

MR. HOWELL: That's a mis-statement of his testimony. His testimony was that the wells with the highest reserves were being penalized.

A That's correct.

Q (By Mr. Kellahin) Is that correct, Mr. Rainey?

A Yes, sir, that's what I testified. That's what this curve would seem to indicate.

Q The highest reserve wells are being penalized?

A Yes, sir. By the fact that this curve is, the slope of this curve changes relatively abruptly at about the three to four billion range.

Q Well, you group these wells on an average deliverability basis, have you not?

A No, sir. I have grouped them on an average reserve basis.

Q Well, what does this deliverability column on the left-hand side mean, then?

A That is the average deliverability of the wells within the reserve group shown on the bottom.

Q Well, I'd say then you have grouped them by deliverability.

A No, sir. I have averaged the deliverabilities in the reserve groups. I have not -- that's the whole point that Mr. Stockmar was taking these data sheets for.

Q In each instance you could have extremely wide variation

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of deliverabilities?

A I testified to that, yes.

Q There's no relation between deliverability and reserves?

A No, sir, --

Q Thank you.

A Your statement is not correct. There is a very correlated relationship between the reserves and deliverabilities, as evidenced by this curve.

MR. KELLAHIN: That's all the questions I have. Thank you.

MR. PORTER: Does anyone else have a question?

MR. MORRIS: I have one or two questions, please.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q Mr. Rainey, I believe at the outset of your testimony you stated that as many wells have been drilled during the year 1961 as have been drilled in previous years in the Basin-Dakota Pool, isn't that right?

A Cumulated, there have been 301 wells drilled prior to 1961 -- excuse me, 372 drilled in '61.

Q Do you have any reason to believe that that rate of drilling will not continue over the next few years?

A I doubt seriously that it will, Mr. Morris, for several reasons. In the first place, a great number of the locations in what we call the good area of the field have now been drilled up.

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Based on what we know of the market demand situation, what the Commission is very well aware of in regard to our problems and other companies' problems with the Federal Power Commission, there does not appear to be any immediate relief in the market demand situation, and I don't believe that operators are going to drill that many wells, I mean at that rate, until such time as the market demand picks up to justify it. Mr. Trueblood testified that he didn't intend to.

Q Would you say that a substantial number of wells would be drilled in the next few years, and probably at a greater rate than the 1960, 1959, or 1958 range?

A That's possible, Mr.Morris, that would just be pure guess on my part, though. I have no knowledge whatever of any company's drilling program, including El Paso's.

Q If 1962 and '3 prove to be heavy drilling years, the Basin-Dakota Pool would more rapidly approach the point, and if there were no increase in market demand --

A Yes, sir.

Q -- then the pool would reach the point where you would need to have minimum allowables assigned in order to prevent the premature abandonment of wells, would you not?

A No, sir. You could double the pool wells in the Basin-Dakota Pool and still have over a million and a half a month, based on the statistics from last year for an acreage allocation factor, which is in my opinion more than adequate to pay for

operating expenses and a reasonable profit.

Q Mr. Rainey, there's been a lot of discussion about freak wells on your exhibits.

A Yes, sir.

Q And in some categories you had very high deliverability wells, and I believe you have said that they might well have low reserves, and vice versa; you had low deliverability wells that might have high reserves available to them?

A Yes, sir.

Q Do you believe that a minimum or even a maximum allowable would be a reasonable way of handling those wells which you have described as freak wells?

A Mr. Morris, as to a maximum allowable, I made no specific calculations in that regard, and I don't know.

Q We are making no --

A As to minimum --

Q We are making no recommendation here in this hearing, either, for a maximum allowable. My question, you might consider it just with respect to the minimum.

A Yes, as to a minimum, I think any well in this pool is receiving an allowable if it is capable of producing it, and granting minimum allowables is not going to help a well that's not capable of producing that minimum anyway; that any well in this pool under present market demand conditions and situations, even if you doubled the number of wells in the pool and maintained

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the same market demand, there would be enough allowable assigned on acreage only to take care of these small wells if they are capable of producing. If they are not capable of producing, the minimum won't help any.

Q You think the present formula even takes care of freak wells?

A Yes. We would recommend no change in the formula and no change in the pool rules.

MR. MORRIS: That's all.

MR. PORTER: Mr. Nutter.

BY MR. NUTTER:

Q Mr. Rainey, you gave the number of wells that have been completed in the pool at the first of the year for 1958, 1959, 1960, '61, and '62. Now what was the source of the information for the first year?

A The source of the information for all the years, other than those wells that were drilled in 1961, was the Report as to Dakota Pools, when they were still carried as individual Dakota Pools, in the New Mexico Oil and Gas Engineering Committee Annual Report.

Q Does that Annual Report list wells which do not as yet have pipeline connections?

A It's my understanding that that report lists all wells that have been completed, Mr. Nutter.

Q Does it list wells that haven't had production?

A Yes, sir, as to those pools. Now you recall that until the last year or so, when the Annual Report has been taking the statistical data solely from the Commission files, that prior to that they compiled by pools, the development in those pools each year; and that's the source of this earlier data.

Q Well, until what time was that type of information --

A It all came from the Annual Report, Mr. Nutter, and we took the figures that were shown in there. If there is any deviation, there may be a few more.

Q Well, I just wondered at what point during the development of the Basin-Dakota Pool that wells which were completed but did not have pipeline connections were included in the list of completions in the pool.

A I don't know, specifically, Mr. Nutter. I know that through the year 1959 that Annual Report carried wells by fields, and it was wells that had been drilled. Now as to the year 1960, which was the Annual Report for '61, I think there was the information in there as to completed wells. This information was gathered for me from our files, from files elsewhere, and I did not personally gather the information. I'm merely using the statistics furnished to me.

Q At any rate, the last figure you gave, the 673 --

A Does include wells that are not connected to a pipeline.

Q And some of the previous years may not?

A That's possible. As I say, I think for '57, '58, and

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'59 it did. Now the year 1960 may not have.

MR. NUTTER: Thank you. That's all.

MR. PORTER: Anyone else have a question? Mr. Stockmar.

MR. STOCKMAR: One more question, if I may.

BY MR. STOCKMAR:

Q Mr. Rainey,in the exchange between you and Mr. Howell just now, was the final result that you testified that under the existing formula wells with the higher reserves are being penalized?

A Yes, sir, in relation to --

Q But not --

A -- in relation to the wells with low reserves.

Q But not the wells with high deliverabilities? I think that was --

A Not necessarily; yes, sir, that's generally it.

Q By subtraction, then, does that mean that all of the penalties are being borne by the low deliverability wells with high reserves?

A That's a pretty broad generality, Mr. Stockmar. I don't believe I can answer that question without checking it out.

MR. PORTER: Does that conclude your questioning?

MR. STOCKMAR: I will have to calculate this, I'm afraid.

MR. PORTER: Any questions --

MR. [illegible]: I have a couple of questions on redirect.

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REDIRECT EXAMINATION

BY MR. HOWELL:

Q Mr. Rainey, as I recall your testimony, you stated that in compiling Exhibit No. 1, you included in the initial reserves some wells which had been completed in 1958, some 1959, 1960, 1961, all different dates?

A Yes, sir.

Q And in the current reserves you took just the 1961 reserves?

A That's correct.

Q So that in any group there might be some wells which had produced for as much as three or four years, and some wells in which no production had taken place?

A That's correct. If I may correct one point on that, Mr. Howell, it's the reserves as of December 31, 1961.

Q As of December 31st?

A Yes, sir.

Q So it would not necessarily reflect an even rate of withdrawal of reserves on this graph, since you are using initial wells covering a period -- I mean initial reserves covering a period of three or four years and comparing with the current?

A Yes, sir, that's correct.

MR. HOWELL: That's all the questions I have.

MR. PORTER: Does anyone else have a question of Mr. Rainey? The witness may be excused.

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(Witness excused.)

MR. HOWELL: That completes El Paso Natural Gas --

MR. PORTER: Does that conclude for El Paso Natural Gas?

MR. HOWELL: That concludes El Paso Natural's testimony.

MR. PORTER: Mr. Swanson, you indicated that Aztec had one witness?

MR. SWANSON: Yes, that's correct.

MR. PORTER: Has your witness been sworn?

MR. SWANSON: Yes, he has.

L. M. STEVENS

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. SWANSON:

Q Would you please state your name and the company by whom you are employed, and the position you hold with the company?

A I'm L. M. Stevens, employed by Aztec Oil and Gas Company in the capacity of Petroleum Engineer.

Q Has the work you have done with Aztec Oil and Gas familiarized you with the Basin-Dakota Pool?

A Yes.

Q Have you testified before this Commission previously?

A Yes, I have.

MR. SWANSON: Are the witness' qualifications acceptable?

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MR. PORTER: Yes, they are.

Q (By Mr. Swanson) Mr. Stevens, you are familiar generally with the application in this case?

A Yes, sir, I'm familiar with it.

Q Have you made a study of the facts which you believe pertinent to the formation of an opinion --

A Yes.

Q -- as to whether the Basin-Dakota Pool allowable formula should be changed as Consolidated has requested?

A Yes, sir, I have.

Q Before going into the details of that study, will you tell the Commission your conclusion, if you have reached a conclusion from that study?

A My conclusions are that there is a general correlation between deliverability and reserves, and that an allowable formula with a larger weight given to deliverability would probably more nearly completely protect correlative rights; but the present formula affords a high degree of correlative rights protection, and in addition it also provides for a minimum allowable which is adequate at this time to prevent waste by premature abandonment.

My conclusion is that a 60-40 formula as proposed by Consolidated would seriously impair correlative rights.

Q Mr. Stevens, would you tell the Commission how your study was undertaken and what it developed?

A Well, the first step was the construction of gross pay,

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isopach map. Gross pay was determined for every well west of the San Juan-Rio Arriba County line by counting every foot of Dakota pay which fell above base lines on available induction electric logs.

This map, which was prepared independently, was for all practical purposes identical to Pubco's Exhibit No. 1. This gross pay isopach map was constructed primarily to show the distribution and the magnitude of the reservoir's capacity to contain in-place gas reserves.

The second step involved the construction of an iso-deliverability map. It also was constructed independently, and I used current deliverabilities to construct that map, the same that Pubco uses, and our map is essentially identical to their iso-deliverability map.

Now we concur in Pubco's testimony that correlated areas of high deliverability with areas of thick gross pay. This relationship actually correlates high deliverability areas with areas of the reservoir which are capable of containing more in-place gas reserves than areas of thinner gross pay. Therefore it indicates to me that there is a general correlation between deliverability and recoverable reserves.

Q Are you familiar with any other parameter that approximates recoverable reserves as closely as deliverability does?

A One that is so easily figured that approximates it so closely, no, I am familiar with no other one.

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Q Is it your opinion that recoverable reserves of the wells in the Basin-Dakota Pool can be estimated with reasonable accuracy from the information that is available?

A Yes, sir, with reasonable accuracy.

Q Is the reasonably accurate estimation of recoverable reserves important to any gas producing company?

A Yes, sir, it is. It lets you know how you stand, how much your company is worth, and other economic factors that would be important.

Q Has Aztec determined the recoverable reserves for each of its Dakota wells?

A Yes.

Q How many wells are operated by Aztec in the Basin-Dakota Pool?

A As of January this year, we were operating 61.

Q And how many wells does Aztec own an interest in in the Basin-Dakota Pool?

A As of January this year, we had an interest in 101 Dakota gas wells.

Q In the reserve study that Aztec undertook, what was the general range of reserves disclosed by Aztec's calculation of its own wells?

A The reserves ranged generally from a billion and a half up to about nine billion, or at a ratio of about eight to one.

MR. PORTER: Is that in this 101 wells?

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A Yes, sir.

Q (By Mr. Swanson) Is the determination of recoverable reserves equally important to a gas purchasing or transmission company?

A Yes, sir, I believe it is. However, they usually figure reserves for a total pool or total area within a pool for their uses.

Q Did the computation of Aztec's reserves on an individual well basis compare favorably with the study of reserves made by El Paso as represented on El Paso's Exhibit No. 1?

A Yes, sir, they compared very favorably.

Q Do you have an opinion as to El Paso's reserves study and its value in showing the distribution of recoverable reserves in the Basin-Dakota Pool?

A I have a very firm conviction that they are very correct according to Mr. Rainey's testimony to the way that he supported them in his testimony, and also because our own reserve and deliverability calculations and investigation compared so favorably with them; and I think that I'm satisfied that our reserve calculations are correct.

Q What is your feeling as to the appropriateness of the El Paso study of 457 wells in this study?

A Well, I think it's the most appropriate thing that we have seen at this hearing, because it contains 457 wells, which was just about every existing Dakota well completion around

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December of last year or January of this year.

Q Have you prepared any exhibits which are designed to show the effect on correlative rights in changing the present allocation formula to that proposed by Consolidated?

A Yes, sir.

(Whereupon, Aztec's Exhibit No. 1 marked for identification.)

Q Do you have a copy of Exhibit 1 which I have passed out to the Commission?

A Yes, sir.

Q Would you explain it to the Commission, please?

A Exhibit 1 is based on El Paso's purple curve of their Exhibit No. 1. This exhibit considers a complete Dakota pool comprised of these 467 wells with allocation based on the present formula and allocation, being 47 billion cubic feet of gas a year, which was just about what was allocated in 1961.

This exhibit is a curve which is determined by a plot of the percent of the average well's recoverable reserves it would be allowed to produce in one year plotted against that average well's deliverability.

Q Mr. Graves, this exhibit is based on the present proration formula, is it not?

A Yes, the present formula. But if you'll notice the point down at the lower end of the curve, you'll notice that this average well with a deliverability of less than 500 would be allowed to produce about six percent of its recoverable gas

reserve in a year; and up at the top of the curve you'll notice that a well with a deliverability of over 2,000 would be allowed to produce in the same period just slightly less than two percent of its recoverable reserve. Now the distribution of the points between these two extremes indicates that the present formula favors the lower reserve wells with allowable at the expense of the high reserve wells.

Q Mr. Stevens, I note a pencilled circle above one that has a pencilled point next to it. Would you explain the significance of that, please?

A That pencilled point, I discovered the printed point is in error. The pencilled point is the correct one.

Q Have you any other comments to make in regard to this exhibit?

A No, sir, not at this time.

Q Have you another exhibit prepared that you would like to present to the Commission?

A Yes, sir.

(Whereupon, Aztec's Exhibit No. 2 marked for identification.)

Q Mr. Stevens, would you explain this exhibit to the Commission, please?

A Exhibit No. 2 has the same basis as Exhibit No. 1; in fact, it's practically identical, in fact identical to Exhibit No. 1, with the exception that allocation is based on a 50-50 formula for this exhibit here instead of the present formula of 75-25.

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You will note the performance of such a field under a 60-40 allocation formula. The average well with less than 500 deliverability would now have nine percent of its recoverable reserves allocated to it in a year. It would be allowed to produce nine percent of its recoverable reserve. During the same period of time, under this 60-40 formula, the average well with a deliverability in excess of 2,000 would be allowed to produce less than two percent of its recoverable reserves during the same period of time.

Now this average well with less than 500 deliverability would almost completely deplete its recoverable reserves in eleven years. During this same eleven-year period, the well with over 2,000 deliverability would deplete less than one-fourth of its recoverable reserves. This low deliverability, low reserve well probably would not cease to produce at the end of these eleven years, but it would probably impair correlative rights, drain the gas, the reserve from some other tract and produce it into the pipeline.

Q Mr. Stevens, you have demonstrated the relationship between the extremes on this curve and this group of wells. What is the relation between, what are the values between those two?

A The distribution of the points between the two extremes indicate that the higher a well's deliverability, the less percent of its recoverable reserve it would be allowed to produce each year under a 60-40 allocation formula.

Q Based on the results of your study, Mr. Stevens, have you a recommendation to make in summary to the Commission?

A Yes, sir. Aztec would recommend that the present formula be continued, that we see no need for a minimum allowable at this time. We think that the present formula is equitable in that it grants this minimum allowable, it protects correlative rights, and it prevents waste due to premature abandonment; and we seriously recommend that the 60-40 formula not be adopted, as it would seriously impair correlative rights.

Q Mr. Stevens, were Aztec's Exhibits 1 and 2 prepared by you or under your supervision?

A Yes, sir, they were.

MR. SWANSON: We wish to offer Exhibits 1 and 2 in evidence at this time.

MR. PORTER: Any objection to these exhibits? They will be admitted.

MR. SWANSON: This concludes Aztec's direct examination.

MR. PORTER: Any questions? Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q I don't quite understand the source of information on the two exhibits involved. It is taken from El Paso's Exhibit No. 1, is that correct?

A Yes, sir, that is correct.

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Q Do these points on here represent the yellow points?

A No, sir.

Q What do they represent?

A The points on this curve represent a plot of the percent of an average well's recoverable reserves that it would be allowed to produce in one year under the present formula, on my Exhibit No. 1.

Q A plot of a percent of what?

A The percent of an average well's recoverable reserve that this average well would be allowed to produce in a year under the present formula.

Q Are these average wells for each point that you have here?

A Yes, sir.

Q How many wells are average?

A In the first point -- we'll start at the bottom and go towards the top.

Q This is on Exhibit No. 1?

A Yes, sir. In the first point there are 12 wells; the next one there are 33; the next one there are 150; and the next one there are 100; the next one there are 65; and the next one there are 28; and in the last one there are 19.

Q That is the same wells that were used by Mr. Rainey on his Exhibit No. 1?

A Yes, sir, exactly.

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Q Are they the same wells?

A Yes, they are the same wells. This exhibit is based on the purple curve appearing on his exhibit. I asked him for the numerical values of these points and he supplied them to me.

Q But it is based on the same identical wells?

A Yes, sir.

Q You heard his testimony that he did not group those wells by deliverability?

A Yes, I did.

Q You have done so?

A No, I did not.

Q How did you get them on the deliverability scale on this exhibit?

A The deliverability is read from this scale here on this exhibit. I was supplied with the deliverability values for the particular reserve group of wells by Mr. Rainey.

Q Well, according to my understanding of Mr. Rainey's testimony, is it not correct that, for example on your 19 wells, your deliverability figure would be the average for just those 19 wells?

A Yes, sir, that is correct.

Q And they could range from an extremely low deliverability to an extremely high deliverability?

A That's right.

Q And yet you relate that then to the reserves in place

under that tract,--

A Yes, sir.

Q -- is that right?

A Yes.

Q On what basis do you justify that?

A Because I believe there's a general correlation between deliverability and reserves.

Q What do you mean by a "general correlation"?

A I believe that a well's deliverability indicates generally the amount of recoverable reserves that lie beneath the tract which it produces.

Q Can you say generally, can you say with what degree of accuracy it relates?

A No, I haven't made a detailed study concerning the accuracy.

Q Does it relate to it to ten percent?

A I wouldn't have the slightest idea.

Q You are talking about reserves, Mr. Stevens, what do you mean by reserves?

A Recoverable reserves.

Q Recoverable reserves from what place?

A Dakota, recoverable Dakota reserves.

Q Are you talking about recoverable reserves to an individual well bore?

A Yes, sir.

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Q How do you define reserves as to an individual well?

A I would define it as reserves calculated or estimated for that well on the basis of 320-acre spacing.

Q Are we in agreement that what this Commission is concerned with allocating are those reserves beneath a given tract of land?

A Yes.

Q That is correct?

A Yes.

Q And that's what you mean by reserves?

A Yes.

Q And you say there's a general correlation between that figure and the deliverability of the well?

A Yes, sir.

Q But you don't know to what extent that general correlation is accurate?

A No, sir, I don't, and I have never seen it explained.

MR. KELLAHIN: That's all the questions.

MR. PORTER: Anyone else have a question of this witness?

MR. SWANSON: I have one more question on redirect.

MR. PORTER: Mr. Swanson.

REDIRECT EXAMINATION

BY MR. SWANSON:

Q With respect to comparison of individual wells throughout the Basin-Dakota Pool, there will be some situations where the

relationship between deliverability and recoverable reserves of the well are not identical?

A Yes.

Q When you take the values of recoverable reserves within given ranges and average the deliverabilities values within those ranges, the correlation is really quite close, is it not?

A Yes, sir, and I believe with Mr. Rainey and with Mr. Trueblood that this pool must be allocated on the basis of the average well.

MR. SWANSON: That's all.

MR. PORTER: Mr. Kellahin.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q On the basis of the answer just given, how close is this relation, on the average?

A Between --

Q Deliverability and reserves. I'm talking about reserves in place under the tract dedicated to the well. I'm not talking about the drainage area of the well.

A How close is this correlation?

Q Yes, sir. You said it was very close, in response to a question.

A It was a general correlation.

Q What is it?

A On the average, it's very close.

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Q How close?

A How close -- close is all.

Q You don't know?

A I don't know how close.

Q There's no mathematical precision to it, is there?

A It's a general correlation.

Q It's a general correlation.

A I feel the same way about it, I'll go no further than the Oil Conservation Commission went when they wrote the order that instituted gas proration in the Basin-Dakota, and it is quoted in there, "There is a general correlation between reserves and deliverability," and that's as far as I want to go.

Q You don't want to define "general" either?

A No, sir.

MR. KELLAHIN: Thank you. That is all.

MR. PORTER: Does anyone else have a question of Mr. Stevens? He may be excused.

(Witness excused.)

MR. PORTER: My records are not complete. Who made the appearance for Sunset International, Mr. Seth? Mr. Seth, are you ready to go?

MR. SETH: Ready to go.

THOMAS F. POPP

called as a witness, having been first duly sworn on oath, testified as follows:

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DIRECT EXAMINATION

BY MR. SETH:

Q Will you state your name, please?

A Thomas F. Popp.

Q By whom are you employed, Mr. Popp?

A Sunset International Petroleum Corporation.

Q What are your duties, and your title?

A Chief Production and Drilling Engineer.

Q In that capacity have you had experience in the San Juan Basin?

A Yes, sir, I have been in, worked in the San Juan Basin and been familiar with it since November, 1958.

Q What particularly have been your duties in the Dakota Pool we're considering in this hearing?

A Drilling and developing Dakota well.

Q About how many wells does Sunset have in the Dakota Basin, Dakota Pool?

A We own and operate 13 wells and have an interest in two other wells.

Q What is your educational background, Mr. Popp?

A University of Wyoming, a Bachelor of Science in General Engineering in 1958.

Q And your experience when you left school?

A Drilling and pushing tools until I went to work for Sunset International in 1958.

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MR. SETH: May he testify as an expert?

MR. PORTER: Yes, sir.

Q (By Mr. Seth) Have you prepared some data that pertains to the Dakota Pool which shows some relationship between recoverability to deliverability?

A Yes, sir, I have.

(Whereupon, Sunset's Exhibits Nos. 1 and 2 marked for identification.)

Q Now referring first to what you have indicated as your Curve No. 1, would you tell the Commission what that represents?

A Curve No. 1 is the initial or the first deliverability assigned to these wells, against the ultimate recoverable gas. These are ten wells that we have production history of one year or more, production history on.

Q Why did you select these particular wells?

A We don't like to run too many reservoir calculations on wells with less than a year's production.

Q These are all over one year?

A These are all over one year.

Q Tell us a little bit about the data that you used to prepare this curve?

A I used the reservoir reserve figures from the company files; the deliverability data is that deliverability as taken by the New Mexico Oil Conservation Commission, and is on record.

Q What about the shut-in pressure tests and other similar

data, is that taken in accordance with the rules and regulations?

A Yes, sir, in accordance with the rules and regulations of the deliverability requirements.

Q How are your curves calculated on your Exhibit No. 1?

A They're calculated on two or more pressure points versus production history with bottom hole pressure data, core analyses, and electric logs.

Q You used the pressure decline method rather than the volumetric method?

A The reservoir section of our company calculated them; it is my understanding that they used the pressure decline method.

Q Would you tell us, please, what this Curve No. 1 shows, what conclusions would you draw from this curve?

MR. KELLAHIN: If the Commission please, I would like to make an objection to this line of testimony on the grounds that the witness has testified that he took the reserve figures from the company files; someone other than himself made them and he apparently would not be available for cross examination on the validity of his calculations.

MR. SEIH: If the Commission please, the witness has testified that he used company figures, as all the witness have testified during this hearing. I don't think we can expect any witness to have done all the work that goes into the preparation of any of these exhibits. It's bound to take a group of people who work up the exhibits. I think that's always been the practice

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of the Commission.

MR. PORTER: Objection overruled.

MR. KELLAHIN: Exception.

MR. PORTER: The record will note that Mr. Kellahin has made an exception.

Q (By Mr. Seth) Would you tell us what conclusion you would draw from this Curve No. 1?

A I plotted the deliverabilities versus ultimate recoverable gas reserves, and because I couldn't draw or I couldn't determine what I could say was an accurate curve, I merely drew a straight line through what I considered a more or less average, what could be considered as a more or less average curve. With a couple of exceptions, I find that recoverable reserves versus deliverability more or less follow a straight line.

Q Do you believe that this line fairly represents this relationship between your deliverability and ultimate reserves the way you have prepared this exhibit?

A Yes, sir.

Q Have you prepared an exhibit which is entitled Curve No. 2? Would you tell us please what this curve shows?

A Yes, sir. It is a plot of the same ten wells plotted on the same scale, deliverability versus remaining recoverable reserves, as of December of 1961, using the 1961 deliverability.

Q Does this line on Curve No. 2, does that fairly represent the relationship between the two factors?

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A Yes, sir.

Q What conclusions would you draw from this exhibit?

A That there is a relationship between deliverability and recoverable reserves.

Q Considering both of these exhibits and your study of the reservoir, in your opinion, under the present formula are these wells producing in proportion or at a rate that's in proportion to their recoverable reserves?

A Fairly much so. They seem to be declining about the same rate in proportion to their remaining reserves, except for the two lower-most wells which have recovered slightly more of their remaining reserves than the remainder of the wells.

Q You have heard the testimony during the course of this hearing relative to minimum allowables, have you not?

A Yes, sir.

Q What is your opinion or your conclusion relative to the present need for a minimum allowable?

A I believe right now it is unnecessary, as Mr. Utz pointed out.

Q Why do you say that? Why is it now unnecessary?

A Because of the built-in 25 percent acreage factor that gives every well a monthly allowable based on acreage alone, that is in excess of operating cost.

Q Could you give us some figures? On what do you base your opinion that it is above operating cost?

A Pardon me?

Q Upon what facts do you base your opinion that it is in excess of operating costs?

A Using approximately fifteen cents as a composite price for MCF, and using 1,000 MCF per month would be equivalent to approximately $150.00, which for future estimates we consider as the economic limit of a well. That is less than half of what the average figures would allow a well on 25 percent acreage factor alone.

Q Is it the experience of your company that the operating costs are in the area of $150.00 per well per month?

A That is an average cost that we use. It's not, well, it includes everything but the administrative overhead.

MR. PORTER: That figure you would estimate at $150.00?

A Yes, sir.

MR. PORTER: Per well?

A Per well, sir.

MR. PORTER: Thank you.

Q (By Mr. Seth) In your opinion or in your company's opinion, has the development of the field or pool ceased?

A Are you referring to the Pasin-Dakota Pool?

Q Yes.

A No.

Q Does your company contemplate any further drilling during, say, the next two years?

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A Yes, sir, we are constantly looking at submittals, and would very much like to do additional drilling in the San Juan Basin.

Q Do you have locations, do you own or lease locations now that you do not consider suitable for development?

A Yes, sir. I have one location in the Basin that we do not figure we can drill and recover our money on. In fact, we have set surface pipe on it but do not feel that we can recover our money on it.

Q Isn't this pretty much typical of any field; there are good parts and there are mediocre parts and poor parts of the field?

A Yes, sir, that's typical of my experience.

Q And it depends, how well, how successful the wells are?

A Yes, sir.

Q Do you have any further comments relative to the exhibit or to the application of Consolidated in this case?

A I might point out that there is a, on Curve No. 1, the initial deliverability of the well marked 1-C is actually 1857; and this well shows an abnormal behavior, as does the No. 1, the 1-F, and the 2-J.

Q Do you generally concur in the recommendation made by Pubco in this case, by El Paso?

A Yes, sir.

Q As to the continuation of the present formula?

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A As to the continuation of the present formula, our company very much advocates that it continue as such.

MR. SETH: That's all we have. We would like to offer Curve No. 1 as Exhibit No. 1, and Curve No. 2 as Exhibit No. 2.

MR. KELLAHIN: Would the Commission defer admission until after cross examination?

MR. PORTER: What was your motion?

MR. KELLAHIN: We would like you to defer admission of the exhibits until after cross examination.

MR. PORTER: Mr. Seth, the Commission will rule on the motion at the close of the cross examination.

MR. PORTER: Mr. Kellahin, do you have a question?

MR. KELLAHIN: Yes, I do.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Right at the last of your examination, Mr. Popp, you said something about the 1-F, 2-J, and the No. 1 well. I didn't get what your statement was.

A The No. 1 well has been refracked; the 1-F well, I am experiencing some difficulty in producing it, paraffin problems, in fact, it has plugged off completely several times with paraffin. The 2-J I have experienced, I haven't been able to identify the water, it's carrying a black organic material and I believe that has caused that well to be erratic.

Q But you saw fit to use those three wells in your calcu-

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lation here, is that right?

A I saw fit to put them in because I realized that everybody knew the wells were in there, and rather than explain them, without them in the curve, I thought it would be better to put them in the curve now.

Q Did the refrac job change the deliverability on your No. 1 well?

A Yes, sir, it did.

Q Did it change the reserves on that well?

A No, sir.

Q Now in making these calculations, Mr. Popp, do you know what pressure points were used?

A I'm assuming that our reservoir section --

Q Would you answer my question, do you know what pressure points were used, without any assumptions do you know?

A No.

Q Do you know whether they used more than one pressure point?

A Yes, sir.

Q Do you know if they used as many as five pressure points?

A On some wells, yes.

Q Which wells?

A I know on the No. 1 there was five points used.

Q How about on the 2-J?

A Without checking records or anything, I'm sure that

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there was three points used on it.

Q On the 1-A?

A Three or more.

Q And yet you just testified you didn't know what points were used, Mr. Popp; do you know or don't you?

A I don't know what points were used. I have an idea how many points were used.

Q But you don't know what they were? Do you know where they derived their pressure information?

A Yes, sir.

Q From where did it come?

A From shut-in, seven day shut-in buildups, buildups over extended periods of time, bottom hole pressure surveys run in conjunction with dead weighted pressure buildup curves.

Q Does that apply to all of them?

A I believe most of them were calculated that way. In fact, I'm sure they were all calculated that way.

Q Well, all calculated -- you named about four different ways they were calculated. Were they all calculated four different ways, three different ways?

A I don't believe I said they were calculated different ways. I said they were calculated the same way, using --

Q What did they use for your pressure information; was it the seven day shut-in test on each well?

A They used all the available data they had, including

seven day shut-in, bottom hole pressure, pressure buildup tests, and production history.

Q You mentioned what, seven day shut-in, bottom hole tests, what was the other?

A Pressure buildup tests run in conjunction with the bottom hole tests.

Q Was that run on each of the wells, used on each of the wells?

A I believe that there was bottom hole tests run on all of the wells.

Q You mean they ran a pressure bomb on them?

A Yes, sir.

Q Is that the information that you are now testifying they used on this exhibit?

A They're using reservoir figures calculated from that information.

Q From the bottom hole pressure tests?

A From all of those tests.

Q On each well?

A Each well is calculated on itself.

Q Mr. Popp, the truth is you don't know what pressure tests were available --

MR. SETH: He's arguing with the witness. It's strictly argumentative. It's not eliciting any information, he's just arguing. We object.

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Q (By Mr. Kellahin) Let's take the Well No. 2, and tell me what pressure information was available on that well for the purposes of this exhibit.

A For the purpose of this exhibit, there was pressure buildup tests taken.

Q When?

A Throughout the life of the well.

Q You have to shut a well in to get a pressure buildup test?

A Yes.

Q And you kept it shut in throughout its life?

A No, but it has had extended periods of being shut in.

Q You haven't had any pressure buildup tests throughout the life of the well --

MR. SETH: This is argumentative, also. I think it is obvious that the counsel is trying to testify himself.

MR. KELLAHIN: I'm not trying to testify. I am trying to find out what tests they did have. On the basis of the testimony given by this witness, he doesn't know.

MR. PORTER: Will you question the witness, but don't argue with him.

Q (By Mr. Kellahin) You say that you had pressure buildup tests throughout the life of the well, whatever that may mean. What other tests did you have, Mr. Kapp?

A The seven day shut-in tests, bottom hole bombs.

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Q How many seven day shut-in tests did you have?

A This particular well was drilled in 1958, and it would have to be at least three seven day shut-ins.

Q All right. How many bottom hole pressures did you make on it?

A I personally recall running two bottom hole pressure tests on that particular well.

Q Now, we have three seven day shut-in tests and two bottom hole pressure tests, plus a pressure buildup test over a period of time, is that right? Well, I think the question has been answered. Would the same situation then apply to your 1-E Well?

A Yes, sir.

Q Same number of tests?

A Maybe not the same number of tests. The No. 1-E is a newer well.

Q So you wouldn't have as many seven day shut-in tests, is that right?

A I'm sure that we have as much as a thirty day shut-in test on most of these wells.

Q I'm talking about your seven day shut-in test under the Commission's regulations.

A Under the Commission's regulations, I am positive we have at least three seven day shut-ins on the No. 1-E.

Q You are positive that those figures were used in these

instances in making your reserve calculation, is that right?

A As I stated, I got this data from the company files, substantially.

Q Mr. Popp, would you please answer my question?

MR. SETH: I don't think he finished his answer.

MR. KELLAHIN: He is not answering my question.

MR. SETH: I think he can answer, whether it's responsive or not. If it is not responsive, you can strike it.

A Would you repeat the question again?

Q (By Mr. Kellahin) My question is, are you positive that this information was used in compiling the reserve figures that show on your exhibit?

A It was used in compiling the reserve figures.

Q You are positive of that in your own mind, is that right?

A By stating that is part of the available data that our reservoir section had to calculate the reserve, I can do nothing but assume that they did use these seven day shut-in pressures.

Q That's based on assumption on your part, is that right? That's fair to say, is it not?

A I think that's fair to say.

Q You ran production decline curves on each of these wells, did you, or did your production department do that?

A Our reservoir section.

Q I mean your reservoir section, pardon me. They made

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that calculation?

A Yes, sir.

Q Are you familiar with the calculations they made?

A I'm familiar with it, but I'm not a reservoir engineer.

Q But those are the figures which were used to show the reserves here, are they not, on this Exhibit No. 1?

A These figures shown on these curves?

Q Yes, as to the reserves.

A As to the reserves, yes, sir.

Q Based on a production decline curve --

A Yes.

Q -- which you did not make?

A No, sir.

Q And you are not a reservoir engineer and are not familiar with them?

A No, sir.

Q What does a pressure production decline curve show, if you know? You said you are not a reservoir engineer, so if you don't care to answer it, please so state.

A A pressure decline curve?

Q Yes.

A They're used in the evaluation of recoverable reserves.

Q Are they used as a tool to calculate recoverable reserves, is that what you mean?

A Yes, sir.

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Q What reserves are you talking about when you say that?

A The recoverable reserves.

Q By recoverable reserves, do you mean reserves that will be recovered by an individual well?

A Yes, sir.

Q Without regard to the area that it may be draining?

A In regards to its dedicated acreage.

Q Well, does a pressure production decline curve show the gas to be coming from dedicated acreage, Mr. Popp, is that your testimony?

A I believe according to the spacing rules, the well is dedicated 320 acres, and the reserve calculations are made on that acreage.

Q By means of a pressure production decline curve, Mr. Popp?

A A pressure production decline curve is used in making the recoverable reserve calculations.

Q On the 320-acre unit?

A On that individual well.

Q Would you kindly tell me how you relate information gained from pressure production decline curves to 320-acre units?

A As I understand it, the 320 acres is used as the parameter, as one of the parameters.

Q One of the parameters of what?

A Of calculating the recoverable reserves.

Q On a decline curve, Mr. Popp?

MR. KELLAHIN: That's all the questions I have.

REDIRECT EXAMINATION

BY MR. SETH:

Q Do you have your well files available here?

A Yes, sir.

Q Do those show the pressure points on each well?

A Yes, sir.

Q Would you refer to those, please? Do these show the number of pressure points that are available in the company files, that are available to your reservoir section?

A Yes, sir.

Q Would you give us the number of points or types of pressures on a sampling of those wells?

A Such as the No. 1 Well, the original pressure point used was in February of 1958, some of this data was actually taken in 1957 when the well was first drilled; pressure data January 20, 1959; March, 1959; September, 1960; December, 1961.

Q Pick several other wells that are indicated on your two exhibits.

A The No. 2 Well, the original pressure points January, 1959; November, 1960; November, 1961.

MR. KELLAHIN: Which well was that, please?

A The No. 2.

MR. KELLAHIN: The No. 2. Thank you.

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A The 1-E, the original pressure March, '59; November, '60; November, '61. The 1-F, the original, March, '59; December, '60; November of '61.

Q I believe that's sufficient. Are there a number of points, pressure points as to each of those wells, or there are a sufficient number from which pressure decline curves could be properly constructed?

A Yes, sir. There is the shut-in wellhead pressure, bottom hole pressures, bottom hole temperatures, gas gravities.

Q All this material is available or was available in the company file?

A Yes, sir.

MR. SETH: We move the introduction of the exhibits.

MR. KELLAHIN: At this time we object to the admission of the exhibits and move to strike the testimony pertaining to reserves as presented by this witness, for the reason that he did not make the calculations and is unable to answer the questions pertaining to the manner in which those calculations were actually made except based on an assumption the truth of which he cannot verify.

MR. SETH: If the Commission please, as I mentioned the first time, I think this is pretty typical of any calculation that is made for these purposes. As I mentioned before, one witness cannot do, ordinarily does not draw calculations. The reliance has to be on other persons to assist in the preparation of these

exhibits. I think if we start requiring that all the people who participate in these calculations appear and testify, I think we are going to unduly complicate these matters. The reliance is on the company figures. There's no indication there's any error in them whatever.

There's a sufficient number of pressure points. If the person who makes the objection can show that there is some error, some mistake, some doubt, perhaps there is some basis, but as far as the construction of the curves is concerned, there's no indication of that whatsoever.

MR. STOCKMAR: The Applicant joins in the motion of Mr. Kellahin.

MR. KELLAHIN: If the Commission please, I would like to make this observation, that the company witnesses have to use company figures. In the previous testimony of Mr. Rainey, he testified that he examined the work and he was able to testify on how it was prepared. That is not the situation here.

MR. SETH: I am sure that the pressure decline curves can be made available to them, if they wish to have them. They're part of the company records, just as in all these cases we have the same problem. I don't see why it's any different.

MR. PORTER: We'll have a short recess.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, please. Mr. Kellahin, the Commission will overrule your objection and

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admit the exhibits.

MR. KELLAHIN: It was also a motion to strike the testimony pertaining to the two exhibits. I assume that's overruled, Mr. Porter?

MR. PORTER: Yes, sir.

MR. KELLAHIN: We have an exception to the motion.

MR. PORTER: The record will so show.

MR. SETH: We have no redirect. That's all we have.

MR. PORTER: Anyone else have a question of this witness? He may be excused.

(Witness excused.)

MR. PORTER: Is Caulkins Oil Company read to come forward?

MR. SETH: Yes.

MR. PORTER: Has your witness been sworn?

MR. SETH: Yes, he was sworn the first day.

A. F. HOLLAND

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SETH:

Q Would you state your name, please?

A A. F. Holland.

Q And by whom are you employed, Mr. Holland?

A I'm employed by Caulkins Oil Company.

Q And in what capacity?

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A I am an engineer in charge of the Production Department.

Q Are you familiar with the engineering conditions existing in the Basin-Dakota Pool, San Juan County?

A I am; and I am better informed and will principally confine my testimony to the areas in which we operate.

Q And how long have you had this practical experience in the Pool, did you say?

A A little less than ten years.

Q And would you tell the Commission your professional qualifications, please?

A I'm a petroleum engineer by profession. I have a BS degree in Petroleum Engineering.

Q And what has been your practical experience since you left school?

A I spent some time in the Navy. After I finished that service, I was employed by Skelly Oil Company and later Caulkins Oil Company. Since 1946 I have been continuously engaged in petroleum production and petroleum production engineering.

MR. SETH: May he testify as an engineer?

MR. PORTER: The witness is qualified, yes, sir.

Q (By Mr. Seth) Have you made a study of the engineering conditions and factors existing in the area of the Basin-Dakota Pool in which you operate?

A That I have, and during the drilling of the lease block which comprises some 15,000 acres located principally in Township

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26 North, 6 West, Rio Arriba County, New Mexico. We noticed or observed that mainly in the center of this block there were areas of better Dakota sand development. In this immediate area there are several sand lenses we treated principally as three different sand lenses. It's a little different, it's a different concept than the square boxed area that was presented here, we consider in simple terms, a rectangle, if you will, or more properly a lens arrangement that --

Q Would you show it to the Commission?

A -- that tapers on both ends.

Q And there's one or more of these, and one above the other, is that correct?

A Yes, that's right. And geometrically, if you would compare it with a square box, this would be a series of trapezoids.

Q How does that compare with this block theory of Mr. Trueblood?

A Well, the block theory is oversimplified. It's not true in this part of the Basin-Dakota.

Q Why is that, because you open up one or more of these zones in different wells, is that the reason?

A That's right. We have, our observation is that if you can make all three of these zones produce, you have a well with good reserves and good deliverability. For that reason, we consider deliverability to be a good barometer or a good, a proper factor in the proration formula.

Q Now if you did not complete -- if you had a well completed in each of these zones adjacent to a well completed in one, what would be the relationship of that with this block theory?

A If you had a well completed in three of these, as compared to one, if you were in comparable portions of the field I think you would expect probably three times the deliverability and in the magnitude of three times the reserves.

Q Does the Applicant in this case complete in the several zones, pretty much in accordance with your rectangular theory there?

A We have, and in some cases we haven't been able to make all three zones produce.

Q Does Consolidated follow a similar practice, as far as you know?

A We observed one of their wells, and they deviated from the block theory in that well.

Q Well, why don't you just tell us in general terms.

A Well, I have got a copy of this right here. I'll dig it up. Here are the three zones that --

Q Now tell us what you have placed on the board.

A Now I think this well demonstrates --

Q Tell us what it is, first.

A It's an electric log, or an electric induction log on Consolidated's Candido No. 1-15.

Q Where is this well located?

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A This well is about five miles west of our lease area.

Q You located on Exhibit 1 there up in the, I believe one is up in the upper left-hand corner.

A That would be in Section 15, 26, 7, I believe. It would be right here (indicating).

Q All right. Referring to this reproduction of the log, what does that show?

A I think it shows the trapezoidal situation that I mentioned. Number 1, the three zones, one, two, three, they have actually worked for. We consider this a third zone, maybe they have four, I don't know. But it shot in these three zones.

From the center part of the field, gradually, a gradual shading of the zone so that by inspection of the log we have termed this non-commercial. This is probably the only zone that we would have thought had limited commercial possibilities. I don't bring this up as any criticism on the well, but that's what we think happened.

It grades from good sands to poor sands in several different zones, and what they did, and why, is they recognize that it is not the square box. They perforated two of the zones, completed the frac job, and then they came up and they perforated this zone and they found out that they had communication. Then they perforated here and they completed another frac. Well, I think it's very highly improbable that they made this zone produce.

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The well has a deliverability of 183,000.

Q Now, Mr. Holland, have you prepared an exhibit that shows the application of the present formula to wells with different gas recovery?

A Yes. Continuing with the line of thought that we considered the center area of the field, grading both east and west and somewhat north and south into porous sands, we made an attempt to determine by bottom hole pressure means the reserve situation of two different wells. We operate some 12 Dakota wells in the area, and possibly have 20 additional locations in this area.

Now we chose these two wells because of the number of bottom hole pressure points available. There are two --

Q Excuse me for interrupting. Now you are referring to this sheet that's headed, "Caulkins Oil Company, Basin Dakota Pool, Rio Arriba County, New Mexico." Will you tell us first, before you get into the background, what it shows overall, what does this exhibit shows and then tell us how it was produced.

A This exhibit reflects the bottom hole pressure reserve estimate for two wells that we operate in this, in the area of Township 26 North, 6 West.

Q Now one column is labeled "Well A". Would you give us the name or location of that well?

A Well A is located in the Northwest Quarter of the Southeast Quarter of Section 5, Township 26 North, Range 6 West. Well B is located in the Southeast Quarter, Southeast Quarter of

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Section 9, the same township and range.

Q All right. Now go ahead with your background for the preparation of this exhibit.

A These two wells are two of the earliest wells we drilled. Well A was drilled in 1953, Well B was drilled and completed early in 1956.

Q You feel you have enough experience and production history in these wells to make them suitable for this purpose?

A We have taken pressures since 1956. The two wells were reworked, and by that I mean speed sand water fracked, in 1958. Since 1958 I believe we have six pressure points on one well and seven pressure points on the other. These are bottom hole pressures, they are not surface pressures.

Q Now let's start at the top there, and tell us what these figures represent, Mr. Holland.

A At the top, the top figure is the estimated ultimate gas recovery for Well A and Well B, using this bottom hole pressure information. Well A, the ultimate recovery was estimated at 4,600,000 MCF; the other one, 12,000,000 MCF.

The second item is the deliverability of each of these two wells, and these are 1961 deliverability figures.

Q Taken in accordance with the Commission's rules, I assume?

A These are the deliverabilities that are on the proration schedule.

Q And the third item?

A The third item shows the relationship between the ultimate gas recovery estimate for both wells. It's 2.6,. Well A, or Well B has an estimated recovery 2.6 times Well A.

Q Yes.

A The next item is the ratio of deliverabilities. Well B has 1.96 times the deliverability of Well A. The ratio of the assigned allowables from the April, 1962 schedule, Well B has 1.63 times the allowable of Well A.

What I would like to point out from this exhibit is that although the reserves of Well B are indicated at 2.6 times the reserves of Well A, the allowable as assigned by the Conservation Commission is only 1.6 times Well A.

Q Which shows what?

A It shows that Well B is receiving less proportionately of assigned allowable, commensurate with reserves, as compared to Wall A.

Q Now do you have available the data that you used to compile this?

A I do. I don't have my work curves, but this bottom hole pressure information is not a matter of public record. Therefore I propose to --

Q Would you want to read it in the record?

A -- read it. I'll start with Well A. The first bottom hole pressure we have, July the 8th, 1956, 2242. The next, this

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will be July 31, 1957, 2252; June the 2nd, 1958, 2196; January the 15th, 1959, 1943; May the 8th, 1959, 1645; March the 4th, 1960, 1438; July the 8th, 1960, 1495; July the 3rd, 1961, 1521; April the 1st, 1962, 1538.

For Well B, the first pressure, April the 17th, 1956, 2649; November the 15th, 1956; 2046; July the 31st, 1957, 1890; June the 2nd, 1958, 1761; February the 3rd, 1959, 2243; May the 24th, 1959, 2188; September the 1st, 1959, 2388; April the 18th, 1960, 2061.

MR. PORTER: What was that last figure?

A 2061. July the 8th, 1960, 2251; July the 3rd, 1961, 2392; April the 1st, 1962, 2441.

MR. KELLAHIN: Could I have the July, '61, again please?

A July, '61?

MR. KELLAHIN: Yes.

A 2392. The shut-in times on those wells varied from about seven to ten days. There was a slight variation. The shut-in time on Well B, about the same, seven to ten days.

Q (By Mr. Seth) Would you please mark your tabulation there as Caulkins Exhibit No. 1, Mr. Holland, and hand it to the reporter?

(Whereupon, Caulkins Exhibit No. 1 marked for identification.)

A I didn't make a tabulation. These are my --

Q I mean our exhibit here. Does the reporter have an exhibit?

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A She has a copy of this.

Q Was this prepared by you, Mr. Holland?

A Yes, it was.

Q And the data calculations were made by you?

A That's correct.

Q Do you have any recommendation to make to the Commission as to whether or not the present formula should be changed or not changed?

A Our recommendation would be that the formula be left as it presently stands, that is, essentially 25 percent acreage and 75 percent deliverability.

MR. SETH: We would like to offer Caulkins Exhibit No. 1, if the Commission please.

MR. PORTER: Are there any objections to the admission of this exhibit? The exhibit will be entered in the record.

MR. SETH: That's all the direct we have, Mr. Porter.

MR. PORTER: Any questions of Mr. Holland?

MR. STOCKMAR: Ted Stockmar for the Applicant.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Holland, did you hear Mr. Rainey's testimony that there was a direct relationship between pressure and reserves, producible reserves?

A Well, I think he qualified by what he said, direct. If you are asking me if you can take the deliverability of this

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well and plot it against reserves with another well on a straight 45-degree line, I don't think it will always work out that way.

Q Was the sense of his testimony that as the pressure goes down your remaining producible reserves also goes down?

A Well, I'll agree to that, yes, sir.

Q Is the reverse true, then, that if the pressure goes up your remaining producible reserves also go up?

A I think that's true.

Q You have just testified as to each of your wells that since this proration formula has been adopted, or at least the dates that you gave are consistent with that same time, the pressures in each of the wells has risen. Is it fair to assume from this that the proration formula is increasing your producible reserves even though you are producing great volumes of gas from your wells?

A Well, I don't necessarily attribute that to the proration formula.

Q To what do you attribute the increase in your producible reserves as time goes on?

A Well, there will be some scattering of data on a pressure production history, and some of the other formations, Pictured Cliff, for instance, I think as time continues that in your great number of cases there has been a gradual increase, perhaps. I don't mean that over a long period of time, but from year to year you may see a slight increase.

Q What do you mean, a long period of time?

A Oh, five, six, seven years, something like that.

Q Well, as an engineer can you tell me how the pressure in the reservoir can rise as you take gas out of it?

A I think one of the reasons here for an increase in pressure has been that the wells are gradually cleaning up after the large sand water fracture treatment. I think if you'll notice on Well B that for a time after the sand fracture treatment that the points were down quite a ways.

Q Has this caused you to revise your estimate of recoverable reserves?

A Not -- well, until a year or so ago, I didn't think we had enough points for this Well B. There has been some revision upward, and also Well A.

Q You say you have been carrying on studies of the reserves based on the pressure history?

A That's right.

Q Have you continued to plot the pressure points, is that it, and extrapolated them to economic abandonment?

A That's right.

Q In plotting these points you have found that they are going up, is that correct, over the last few years?

A They have been going up, and I don't doubt that maybe they will go up slightly some more, but I don't think it will materially change these reserve figures; and relatively, both wells

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have had slight increases in pressures.

Q And as you extrapolate these points on up to higher and higher pressures, where do you reach the economic abandonment that you speak of?

A I think I testified that there will be a decrease. I don't expect them to continue to go up and up and up.

Q Do you guess at the amount of the decrease and add that as another pressure point?

A Well, I'll guess that these wells will decrease to 500 pounds at the time we abandon them. That's what these calculations assume.

Q You made some rather vague references to Consolidated's box theory and were pointing up to the board. Mr. Holland, to what were you pointing, if I may ask?

A Well, I guess it's under here, the box -- I think that's the box that you had the different values on.

MR. SETH: What exhibit number, do you have it?

Q (By Mr. Stockman) Are you referring to the artistic cube Mr. Trueblood drew?

A That's it, yes, sir.

Q And you prefer some trapezoidal arrangement of your own, is that it?

A That's the way the reservoir appears to us in this particular area, right.

Q Just what is it that you understand to be Consolidated's

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box theory? You seem to disagree with it. What is your understanding of it?

A Well, I understood their testimony that it evidently related to two wells, and they presented the reservoir sections in those two wells as this box, and I said that wasn't the condition in this area.

Q You do not have straight 320-acre tracts of land in your area?

A We don't have the box principle on those 320 acres. We have this (indicating).

Q Trapezoids?

A Right.

Q How do you know this?

A What?

Q How do you know this?

A Well, I pointed out the different sections on the log. I used the Consolidated log because that was the section I had available.

Q Well, from looking at a log, can you tell anything about what's out in the rest of the 320 acres in terms of the thickness of a particular lens?

A Well, I guess exactly, I know pretty well what the gross thickness is right at that point.

Q And that's all, is it not?

A That's all, yes. But if you can correlate between wells,

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you have some idea of what's between.

Q You made some kind of an example of some Consolidated well. I'm sorry, but I did not hear the name of it. Would you mind repeating the name of the well that you have a little exhibit up on the board for?

A It's the Consolidated Oil and Gas Candido 1-15.

Q I think you stated that you would not have made an effort to complete the well in the top zone, is that correct?

A I think I said that the top zone looked non-productive to us.

Q I think you also stated that Consolidated did proceed to complete the well in that zone, none the less?

A Well, I am highly doubtful that they made the zone productive. I said that.

Q I thought you said that they had established communication between all those zones by fracking.

A Well, I did say that, but without a frack that zone would not produce.

Q And you would not have fracked that zone.

A I don't think so.

Q Is there gas in that zone?

A I'm not being critical of their doing it, but ...

Q I see. Is there gas in that zone?

A I don't believe there's recoverable gas at that point. Is that what you are asking?

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Q You just said there wasn't commercial gas, I thought.

A I said I thought that, I did not think there was recoverable gas, is what I said.

Q Well, then, if there is recoverable gas in the zone and if it is fracked, and if there is communication, then it will be produced, will it not?

A Well, are you saying that the frack entered the zone? Is that what you are saying?

Q I have no idea. I'm saying that if there was gas in that zone, and if the company fracked it, and if it established communication with the other zones open to the well bore, then gas will come from that zone; is that a poor assumption?

A I think the chances are that if they had communication that their frack probably went in one zone.

Q Is the substance of your testimony with respect to that well that you would not have fracked that zone, that if there had been gas there you would have left it there unrecovered?

A Well, I think my testimony was that I think there was recoverable gas in that. Mainly what I -- the purpose of that log was not to take, or oppose or condemn the idea of their trying to complete that zone.

Q Well, what was the purpose of the log?

A To show that the different zones in the field, that in the center of the field we had the three different zones, as I pointed out on that log; and out at that location, that that was

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the trapezoidal part of the figure, that the zone had shaled out.

Q What are those little trapezoids supposed to represent, little lenses of gas sand or something?

A Well, they are good lenses of -- they are not little lenses, they are good lenses; and in certain parts of the area in which we operate, certain of these lenses, at times we have not been able to make them produce, and when we don't it shows up in our deliverability.

Q Mr. Holland, on the list which I think is your Exhibit 1, the descriptive matter with respect to Wells A and B?

A Yes, sir.

Q You are making some kind of a comparison or relationship between your ultimate gas recovery and your deliverability, is that the purpose of this?

A That's right.

Q Do you believe that there is a direct relationship between your ultimate gas recovery and your deliverability as of 1961?

A Well, you would have to qualify what you mean by direct. There's a relationship.

Q There is a relationship?

A Between reserves, right.

Q Is it a mathematical relationship?

A The relationship is essentially this, that in the areas where you have good reserves, you also have good deliverabilities.

Now that, I don't say that will be a 45-degree line. It doesn't work out that way.

Q Are there any areas in which you have very good reserves and very low deliverabilities?

A In this particular area I think that the deliverability is very representative of reserves, recoverable reserves.

Q How about other areas? Are there areas where the deliverabilities are not representative of the reserves?

A Well, there's a freak situation, I think that has been pointed out many, many times here, and I subscribe to the theory that it is a freak and would not be representative of reserves; and I'm sure there are some others.

Q In your judgment are there a substantial number of freak wells in the pool?

A What I will point out is that if you did not, if you prorated, you can call it an acreage basis, but essentially in this proration formula Consolidated's wells and our wells enter this on a per we sis. If you did not consider deliverability and considered principally just prorating on a well basis, you can see the injustice that this Well B would suffer; it's penalized, on this comparison on a per well basis that would be even a greater penalty.

Q It would be a penalty, you consider it would be an injustice to you to be permitted to produce less gas from that well, is that the sense of your testimony?

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A Comparing, when you consider allowables based on reserves, yes, sir.

Q Would you have considered it an injustice to be permitted to produce less gas from the other well, from Well A?

A Well, I would like to stay where we are on Well A and get more from Well B is what I would like, would like to do.

Q You believe that your well should be permitted to produce all that you can cause to flow through that well bore?

A Well, we would like to sell those kind of volumes.

Q You believe you should be permitted to sell all that your well can produce?

A Well, I think that if the market demand would permit that, that it would be immaterial what our proration formula was, whether it was per well --

Q There would be no necessity to have a proration formula in that case, is that correct?

A That's right.

Q Do you know what is historically referred to as the rule of capture, Mr. Holland?

A I think generally I have an idea of what it is.

Q Is this what you want in this as a means of handling the production of gas from this field?

A What we have recommended is a continuation of the present allowable formula.

Q But you would like more, is that it? Did you not just

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say that you would like more?

A You mean would we like to sell more gas? I think that's obvious.

MR. STOCKMAR: I think that's all, Mr. Holland.

MR. PORTER: Does anyone else have a question of this witness? Mr. Kellahin.

BY MR. KELLAHIN:

Q Mr. Holland, your ultimate gas recovery, how was that calculation made?

A It was made by an extrapolation of these pressure points to a 500 pound abandonment.

Q That's the production decline curve?

A That's correct.

Q What does a production decline curve measure?

A It measures the reserves of the particular well.

Q What do you define as the reserves of a particular well?

A Well, in this, in the South Blanco area, I would say that the gas reserves under the prescribed proration unit area.

Q Well, Mr. Holland, is it your testimony that a production decline curve reflects reserves under a given unit, in this instance, of a 320-acre unit?

A I think that's what these points represent, yes.

Q You think that is --

A Yes.

Q How do you relate that to 320 acres?

A I don't know exactly what the drainage area of these wells are. I do know that this formation is very tight.

Q Well, then, what you are saying is the reserves reflected here are the reserves that will reach the well bore, is that right?

A Well, no. I said that I thought this to the best of my knowledge represented the 320-acre unit.

Q But you said you don't know the drainage pattern. Is the figure related to the drainage pattern as well?

A Well, I don't know exactly what you mean. The only statement I can make is to assume, and I think it's a reasonable assumption, that this does represent the 320-acre drainage area.

Q Well, what is that assumption based on, Mr. Holland?

A Well, those are the units that have been established by the Commission. I think they are reasonable.

Q Are you through?

A And that's the basis of my statement.

Q Then you have assumed that the Commission, by entering its spacing order, has said this well will drain 320 acres, no more, no less, in order to say this reflects reserves under 320 acres?

A In establishing the 320-acre pattern, that was their conclusion.

Q And you accept that as being the true engineering conclusion?

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A I do in this situation, yes, sir.

Q All right, now. When did this Well A go on the line?

A It commenced producing in 1953.

Q Did you make any reserve calculations at that time?

A We had no pressure record until 1956, and --

Q So you did not make one?

A No, I did not. I didn't make any reserve studies.

Q Did you make any estimate based on initial potential or any other information that might be available?

A I think I made a guess at it.

Q Do you know what the initial deliverability of the well was?

A We didn't, at completion we didn't measure deliverability.

Q Do you know what the cumulative production was to the date of the deliverability test in 1961?

A 1,078,700 MCF.

Q Now, would the fact that the deliverability on this particular well is somewhat lower than the deliverability on your Well B be attributed to the decline in reserves already produced?

A Decline in deliverability?

Q Yes, sir. You have a 900 deliverability as compared to a 1766 deliverability on Well B. A Yes.

Q You produced 1,078,700 MCF on the well; would the fact that the 900 well is lower than the other be a reflection of the

production which has already been made by this group?

A Well, the other well has produced more gas than that.

Q It has?

A The other well has produced 1,564,400 MCF.

Q Have you any estimate as to what percent either one of these wells have been depleted?

A Well, a billion, one, over forty-six, would be a little less than 30 percent.

Q A little less than what, sir?

A A little less than 30 percent. A billion, six, over twelve billion would be, that would be about 15 percent, wouldn't it? A little less than 15 percent.

Q Then the Well A has actually had on a percentage basis almost twice as much depletion as Well B?

A That's correct.

Q Yet your pressures in both wells are going up?

A Well, they are going up slightly.

Q Actually the last pressure taken on the Well B, April of 1961, is the highest pressure you recorded on that well since the original pressure in 1956 --

A It increased --

Q -- isn't it?

A -- 49 pounds.

Q And yet it reached a low in 1958 of 1661 pounds; you call that a slight increase?

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A We, in reworking that well, we know that we opened up a new zone. That we know. And I think that will explain the pressure situation.

Q When did that occur?

A When did the --

Q Reworking.

A Right after the 1961 pressure you were looking at.

Q Well, then, it went up to 2243 and down to 2188?

A Right.

Q Now it's back up to 2441; did you rework it again?

A Well, I think I explained that we believe that the erratic pressure behavior on that well has been occasioned by the well cleaning up after the 100,000 pound frac treatment.

Q How long does it take a well to clean up after such a frac treatment, normally?

A I think from three to five years, something like that. I would like to point out that these increasing pressures favor Well B and further add impetus to the increase or the favoring of deliverability in a proration formula.

Q Well, now, were all these pressures taken in exactly the same manner?

A What do you mean by the same manner?

Q Well, were they all bottom hole pressures, prossure bombs used under identical circumstances?

A As far as I know.

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Q They are all identical?

A As far as I know, I believe I'm correct. I don't know for sure. Most of them were taken with our own gauge. At different times we have had a service company, but they are taken at the same datum and the shut-in times, as I explained, varied from seven to ten days.

Q Mr. Holland, how can you calculate a pressure decline curve on the Well B on the information you have given us?

A On Well B?

Q It takes a great deal of interpolation to do that, doesn't it?

A I think we'll have a better curve in a period of several more years.

Q Well, actually, at the moment you have got a rising curve, haven't you?

A Can I finish?

Q Yes, pardon me.

A No matter how you analyze this curve, if you analyze it on any different basis, take in account the decreasing pressures, you will come out with a figure higher than the twelve billion.

Q That takes a sum of a great deal of experience, in order to calculate reserves on the basis of this, doesn't it?

A Any interpretation would increase that figure.

Q Any interpretation might show you have infinite reserves, if you carried it far enough.

A I don't think so. We are going to abandon that well some day.

Q I'm talking about the information here, though. You have a rising pressure; if you interpolated and continued that rise, you would have infinite reserves?

A I don't think I said that rise would continue.

Q No, I don't think you did, either.

A And I won't say it, either.

MR. KELLAHIN: That's all the questions I have.

MR. PORTER: Anyone else have a question of Mr. Holland? Mr. Utz.

BY MR. UTZ:

Q Mr. Holland, at any time on either Well A or Well B, have you made volumetric calculations of your reserves on these 320-acre tracts?

A I have made some guesses, Mr. Utz.

Q Do you have those guesses with you?

A No, I don't.

Q You have no idea what they were?

A The problem with electric logs, I think everybody agrees, these wells, the logs were taken years ago. No sonic logs are available on them. In determining net pay I could come up with all kinds of figures. I think this is representative data and would rather not get into a volumetric guess on these wells.

Q You don't use volumetric reserves at all on your prop-

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erties?

A Yes, on an area-wide appraisal we have, but not particularly well to well, no.

Q Have you ever made any comparisons of the volumetric reserves versus the pressure decline reserves?

A On an area-wide basis I haven't, no.

Q Or on a per well basis?

A No.

Q You don't know whether the pressure decline reserves are more or less than the volumetric reserves?

A At this time I don't. We don't have enough area-wide pressure information. I have it on these two wells, as I have shown you.

Q Did you state the names of these two wells?

A I gave the locations, I don't think I gave the names.

Q I wonder if you would give me the names.

A Well A is our D-83 --

MR. KELLAHIN: What is that again? What is the number, please?

A D-83.

Q (By Mr. Utz) The location?

A Northwest Southeast, Section 5. Well B, D-204, Southeast Southeast of Section 9, all in 26, 6.

MR. UTZ: That's all the questions I have.

MR. PORTER: Does anyone else have a question of this

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witness? You may be excused.

(Witness excused.)

MR. SETH: That's all we have, Mr. Commissioner.

MR. PORTER: Mr. Keleher.

MR. KELEHER: We have a short witness in Mr. Gorham.

MR. PORTER: Have Mr. Gorham come forward and be sworn.

(Witness sworn.)

FRANK D. GORHAM

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q State your name.

A Frank D. Gorham, Junior.

Q What is your profession, Mr. Gorham?

A I am a Petroleum Geologist.

Q What is your official position with Pubco?

A Executive Vice-President.

Q How long have you been employed by Pubco?

A Since its inception in late 1950, actually incorporated in 1951.

Q How long have you been in the petroleum work, altogether?

A After graduating from the University of Missouri in 1942, I entered the Armed Forces. Upon return in 1946, I was with

Creole Petroleum Corporation in Venezuela for three years. After returning to the United States, I was with the Pure Oil Company for one and one-half years. At the end of that time I went with Pubco Petroleum Corporation in 1950.

Q And you have been with Pubco ever since?

A Yes, sir.

Q Are you familiar with the San Juan Dakota Basin?

A Yes, I am.

Q Testimony has been submitted here, Mr. Gorham, that Pubco operates a total of 81 wells in the San Juan Basin, is that about correct?

A Yes, sir.

Q How many wells do you have in the Dakota?

A Nine wells at this time.

Q The testimony here is to the effect that Pubco has 40,000 acres under lease. Is that approximately correct?

A That is approximately correct.

Q And Pubco for 1962 plans to drill how many wells?

A That, sir, will depend a lot on what our concept of future market is in the Basin. It will depend a lot on the development of wells being drilled by others in the neighborhood of some of our proposed locations, but at the present time it is my understanding that we tentatively plan approximately 22 wells.

Q And at what per well?

A Approximately $60,000 per well.

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Q That would cause an expenditure of approximately how much?

A Approximately 31,500,000.

Q So would you say that Pubco is interested in this case?

A I certainly would.

Q In a very important way?

A Yes, sir.

Q Now Consolidated Oil and Gas, Inc., the Applicant here, has contended, as I understand it, that because the wells in the Basin-Dakota Pool have an abnormally high deliverability, and because the present Rule 9-C creates waste, does not properly recognize correlative rights and permits and will increasingly permit non-ratable taking of gas from the pool and drainage between producing tracts in the pool which is not equalized by counter-drainage, a special formula should be adopted pertaining to the Basin-Dakota Gas Pool. I'll ask you if you would care to comment on that.

A Yes, sir. In my opinion the proration formula should remain as is on a 75 percent deliverability times acreage plus 25 percent acreage basis. However, if the Commission should consider any change in the formula, that change should be in the direction of 100 percent deliverability, which we believe is directly proportional to the existing reserves under the individual wells.

Q Would you state that well deliverability more truly

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reflects recoverable reserves?

A I certainly would, yes, sir.

Q What, if anything, would you care to say in regard to Pubco's position to the effect that an increase in the acreage factor at the expense of deliverability would in effect violate correlative rights?

A I believe that we have testified, as have most of the other companies present during the hearing, that reserves under individual wells vary considerably. Any time that an acreage factor is included as a norm throughout the field, it does not recognize the difference in reserves between existing wells and represents an invasion, in my opinion, or a violation of correlative rights.

Q Have you personally been active in the field in connection with the wells that have been drilled up there by Pubco?

A Yes, sir. I would like to say at this time that early in 1950 and 1951, I had the opportunity to examine the Dakota formation at the outcrop in various portions of the perimeter of the Basin. We found at that time, and geologists have found since that time that the Dakota formation is a very difficult formation to map, particularly on individual sand body bases. It's possible, for example, to be in a canyon and see the Dakota section on one side and be unable to trace the sandstone members from one side to the next. Within the San Juan Basin productive area, however, there does seem to be in certain areas a better consistency.

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However, those areas are interrupted at various times by wells which have absolutely no reservoir rocks as such, silt in place of sandstone, and that in my opinion, the problem relative to sandstone thicknesses is an extreme one.

We notice, for example, on our cross section B-B^1, a very radical change in thickness from three wells located only one location apart, and in my opinion in those areas that show consistency, there's an excellent opportunity that between those wells there's liable to be silt stones actually interrupting what does apparently appear to be a consistent reservoir.

Q Can you state whether or not the reservoir changes rapidly occur on surface and sub-surface areas?

A Yes, I believe I have. I feel they do change very rapidly.

Q You have been personally identified on the ground, have you not, since 1951, with the wells that have been drilled by Pubco?

A That is correct.

Q And are familiar with the situation on the ground and very closely followed the drilling personally?

A That is correct.

Q Now what, if anything, can you say to the Commission in reference to the direct relationship between deliverability and recoverable reserves?

A We have found within the various departments of our

company through the years that there seems to be, or is, rather, a direct relationship between deliverability and recoverable reserves.

There's been mention throughout this hearing of so-called freak wells. I take exception to the term "freak wells" on the basis, in my opinion, the main reason that we cannot explain those particular wells is because in most cases they represent wells where only two, three wells at the most, for example, are in that particular category. Where we have an abundance of wells in a particular deliverability range, we seem to have sufficient information to establish a norm.

Insofar as various deliverability problems, it has been testified and it has been our experience that following the use of the sand-water fracture treatment, it is difficult to ascertain exactly when the well will clean up. Some wells will clean up in a relatively short period of time. Other wells will take extremely long periods; as a matter of fact, in my opinion wells sometimes will not clean up at all.

So that when we're talking in terms of deliverability, we do have occasional exceptions insofar as their behavior, relative to the mechanical conditions which they have been subjected to.

Insofar as reserves are concerned, we have been in most cases using an average insofar as electric log thicknesses are concerned. We have been using averages on a township-wide basis

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on porosity. We have not had access to core analyses on every well in the field, and I believe that on the basis of the actual characteristics of the rock formation itself, that we can expect to see extreme variances. These variances will change from well to well, and I believe that the problem that we're seeing here today is not a problem of our formula, it's not a problem of anything other than a lack of experience incofar as being able to calculate reserves on a pressure decline method; and I feel that the erratics, if you wish, that we do see, are those which have either extenuating circumstances or we do not have sufficient information to actually evaluate them.

Q What, if anything, can you say, Mr. Gorham, as to major changes that have occurred and will continue to occur within the Basin, the Basin-Dakota Pool in porosity, permeability, water saturation, sand thickness, and those other factors?

A Insofar as, or in reference to Pubco Exhibit No. 1, we have shown those areas which have been developed to date, and in those areas we have shown that the one parameter, thickness, changes very rapidly in most cases to the exterior of that particular pod or area.

We have shown large areas in white. Now some of those areas in white obviously, on the basis of new drilling efforts, may become productive. There's a good question in my mind, of course, as to exactly where those areas are going to be. I have no idea whether they will inter-connect. They may or may not.

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I believe our Exhibit No. 1 aptly demonstrates the fact that the Dakota Pool, as currently defined, has within it areas of extreme thickness, and in my opinion, based on examinations of electric logs, there are equally as extreme changes or variances in porosity and water saturation.

Q Assuming the Commission would grant the application of Consolidated, Mr. Gorham, what is your opinion as to whether or not such change would permit the weaker wells with less reserves to ultimately produce gas from the common source of supply in amounts in excess of their actual reserves?

A Well, I feel that the deliverability formula or the formula being currently used, using only 75 percent deliverability has already penalized operators who own wells with higher reserves and consequently higher deliverabilities at this time. I feel that if any change were made in the direction of an increase in acreage, that that inequity would be obviously increased.

Q What is your recommendation to the Commission at this time?

A It is my recommendation that the Commission continue to utilize the formula as currently used, and I believe that the 25 percent acreage factor adequately prevents premature abandonment and waste.

Q To that extent you join with El Paso Natural Gas, Aztec, Caulkins, and the other companies which have appeared here today and yesterday and the day before?

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A That is correct. I would hinge that, however, on the basis that if any change were to be considered by the Commission, in my opinion it should be in the favor of 100 percent deliverability.

Q Do you desire to make any other comment to the Commission, Mr. Gorham?

A No, sir.

MR. KELEHER: We would like to express our regret at the long continued length of this hearing. You may have the witness.

MR. MORRIS: Mr. Keleher, did you qualify Mr. Gorham as an expert witness?

MR. KELEHER: I think he has been qualified as a witness before the Commission before this time, but I'll ask the Commission to accept him as a qualified witness.

MR. PORTER: The witness' qualifications will be accepted. Any questions?

MR. STOCKMAR: One question. Ted Stockmar for the Applicant.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q I believe you stated that we do not have enough experience in this field to validly compute reserves by the pressure decline method. I believe you stated that the reservoir characteristics by which we might make volumetric estimates vary so rapidly

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at such short distances that it would seem that we could not make volumetric estimates of reserves, so I submit that you are asking this Commission to compare deliverabilities with reserves that cannot be validated.

MR. KELEHER: Just a minute.

A I take exception --

MR. KELEHER: Just a minute. I don't think the witness has testified anything to that effect at all. He wasn't asked anything about it. Counsel is assuming that something is in the testimony from this witness that isn't before this Commission at all.

MR. STOCKMAR: I will let the record speak for itself, Gentlemen.

MR. PORTER: Did you have any more questions, Mr. Stockmar?

MR. STOCKMAR: No, sir.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: I have no questions.

MR. PORTER: Anyone else have any questions of this witness? He may be excused.

(Witness excused.)

MR. PORTER: At this time we are going to recess the hearing until 9:00 o'clock tomorrow morning.

(Whereupon, the hearing was recessed.)

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MORNING SESSION
Saturday, April 21, 1962

MR. PORTER: The hearing will come to order, please. Does anyone desire to put on further testimony?

MR. STOCKMAR: If the Commission please, the Applicant would like to recall Mr. Trueblood as a rebuttal witness, if the opposition's cases have been concluded.

MR. PORTER: Will you call Mr. Trueblood, please, as a rebuttal witness called by Mr. Stockmar.

H. A. TRUEBLOOD

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, are you the same Harry A. Trueblood who previously testified in direct testimony in this hearing?

A Yes, I am.

Q Mr. Trueblood, near the end of yesterday's session, we asked the witness for El Paso Natural Gas Company for certain basic data sheets which he graciously made available to us. Have you studied these and from these made certain calculations, and from those calculations drawn certain conclusions?

A Yes, I have.

Q Will you review the study which you have made, and state the conclusions therefrom?

A We took the El Paso basic data which actually we had utilized in our original testimony on 160 wells, although we didn't have all the data available to us from the 160-well study; and had we had that data available, we would have arrived at the same conclusion and would have had somewhat more beautiful exhibits to present than we are going to present to the Commission this morning.

However, El Paso's work, which was down by townships and ranges throughout the Basin, and calculating deliverabilities versus reserves, they testified, I believe, that they had studied 457 wells; somewhere in the mad scramble we've only come up with 451 of the wells, but it is possible that three or four of the wells or some number may have been overlooked by us, but may not have been on the data sheet with which we were working. We feel that is relatively immaterial with what we plan to present.

The one thing that must be kept in mind in a presentation of this type, it is our belief that, in order to avoid this argumentative problem of what reserves have been withdrawn or where it is today or what the deliverability is today, that when you are computing net pays and net recoverable reserves under a given 320-acre tract that are originally in place, and you are relating them to deliverability, then you must relate them to the original deliverability in order to have some semblance of continuity. Otherwise, you do lose your concept. However, this can be done in this way, if you can do it. In other words, we could start

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all over again and also do it where we took the present deliverabilities and took the present reserves and replotted those. We don't believe that it would make a material change in the character of the curve, if you are working with the same approach.

Now if you will, Mr. Stockman, so that the Commission can see and others can see, we have taken Consolidated's Exhibit No. 3 that was originally presented to this Commission, and we have regrouped the wells studied by El Paso in the same concept in which our original approach was made, in a study of the range of wells and the number of wells which are in the categories of deliverability range of zero to 1,000, 1,001 to 2,000, 2,001 to 3,000, 3,001 to 4,000, 4,001 to 4,000, 5,001 to 6,000, and over 6,000, which total 451 wells, and as I stated before, as compared to their testimony of 457, and it's quite possible that we either overlooked six or maybe it was not available, as compared with our 473 wells taken from the Basin-Dakota Gas Pool in February.

Now I believe that El Paso's testimony with respect to reserves and with wells that they cut off at December 31, 1961, so that there may in any individual category be a slight change in the position of the number of wells at that time, but in any event you can see at a glance that on the whole there is on the order of some very similar percentage of the wells in each group.

We then took all of the wells in the zero to 1,000 deliverability range that El Paso had studied, and took their reserves and grouped them as a whole. We took an average of all of

those groups lying within the category of zero to 1,000; and when we computed the reserves in that category, we found that the average reserve in that group was 3.02 billion cubic feet. We then found that in the 1,001 to 2,000, that the average reserve was 3.69 billion cubic feet.

We found in the category of 2,001 to 3,000 there were 3.52 billion cubic feet, which you might note is slightly lower than the 1,000 to 2,000. There must have been some thin sand on wells in those particular higher deliverability wells to explain that.

3,001 to 4,000, we found 4.19 as the average reserve. In the 4,001 to 5,000, we found 3.90 billion cubic feet. In the 5,001 to 6,000 we found 1.98 average reserve, and that can be readily explained by the fact there were only two wells in that group, or at least our computation showed that, and that these were probably, once again, probably thin sand section wells with high deliverabilities, and El Paso was unable to manufacture sand to give them enough additional reserves. This is a guess on my part. We don't consider it material.

Over 6,000 we found 4.20 bil. cubic feet in that particular category. Now in order that we can look at this interpretation in a more realistic light, first of all we took the weighted average reserves of the El Paso group as a whole and found that it was 3.34 billion as a weighted average group, and it falls very closely on the average concept that I believe Mr. Kelley testified

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to, that the average of his curve was around the 3.1 to the 3.2 billion cubic feet. I don't remember exactly what he did testify to, but in any event, it gets back to their original work of 160 wells and this work, that the average well in the San Juan Basin, the Basin-Dakota Field has a reserve of something on the order of 3.34 billion cubic feet without regard to deliverability in any way, shape, or form; that it just happens to be that 451 wells, added up on a straight weighted average method, came out 3.34 billion cubic feet.

Now we have previously testified, or I have, and it is Consolidated's opinion that in a graphical construction of interpretive information, that it is well that, since the deliverability, as has been stated over and over and over again to this Commission, is the only precise measurement that can be measured, that these be grouped as a group and averaged. If they are grouped together as a group and averaged and then plotted against the more unknown quantity which has been computed for the deliverability wells without regard to deliverability as a function of reserves, but in fact using the average reserves in a deliverability category, that this really gives a more realistic picture and it's much easier for me to defend, in any event, as a petroleum engineer, this concept of producible reserves in place.

As was stated in someone's testimony, I believe it was Pubco's geologist, that there's one thing certain, and it's about the only thing certain in our account here, is that you can't have

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more net pay than gross pay and with this point, no matter what your deliverability is, you can't manufacture new pay. Now you can manufacture the areal extent and the radius of drainage. You can enlarge your area, but you can't put more net sand there, so based on that concept, we have averaged the wells in each group and found that the 243 wells -- excuse me just one second -- If the Commission please, I would like to use El Paso's Exhibit 1 and unfortunately it's not big enough for the room to see, but I think some of you probably have them, and if I may, I'll put this up and apologize for the fact that it has a lot of my hen scratching on it from prior testimony, which is our Exhibit 6.

Now we have averaged, as I say, the precise number of wells of the only true thing we know for sure, and that's deliverability, and we are able to measure that. Now every single engineer in this room can sit and guess what reserves are. We can come up with, the same well, with 12 different opinions, that has been stated here, but the one precise thing that we know is the deliverability.

El Paso, in looking at the Basin as a whole, which is the problem of the Commission, and not looking at red spots and green spots and what have you, but looking at the Basin as a whole by townships, and taking 50 core analyses, I believe they testified, or 67, and all the logs in the township and coming up with these reserves without any other objective except for them to determine, I'm sure, for their own fact light with the FPC to get

additional outlet for the San Juan Basin at some later time, that they're going to show them they have these reserves and that we will all benefit in the long run with greater gas sales.

In so doing, I have read you from our Exhibit No. 5, we found that the 243 wells, which is not on Exhibit 5, but this item, we found they had an average deliverability of 509 for this 3.02 reserve average that you find on your Exhibit No. 5 for Consolidated. We have plotted as best we could 3.02 versus 509, and have placed a point thereon.

In the next category of 121 wells, we found an average deliverability of 1358 for 121 wells, with an average reserve of 3.69. We have so plotted 1358 versus 3.69. We then found 46 wells in a category of 2392, that had an average reserve of 3.52, which fell to the left of the 121 wells, but we've tried to be as fair as possible in that we certainly can't subscribe, even though some of the points fall to the left, that the higher the deliverability, the lower the reserves. The only reason that it can be lower reserves is the net sand thickness I have spoken of in a few isolated ranges.

Then we took the average deliverability of the next group of 18 wells and found an average deliverability of 3397 with a 4.19 reserve, which we have plotted 18 wells. In order to stay on the chart or slightly off of that, we took the last category of 17 wells, which had an average deliverability of 4455, two wells with 5695, four wells with 7943. We weighted those averages

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and found that the reserves --

MR. PORTER: Would you repeat the deliverability of the 17 wells?

A Yes, sir, the average deliverability for the 17 wells was 4455, the average for the two wells was 5695, and for the four wells, 7943. Now in order to put all these groups on this chart, and as they have done in the past, they brought a lot of these out in the outer ranges in; from the other standpoint, we took those 23 wells and weighted averaged those 23 wells and have a 5140, which is slightly off of this map, with a 3.78 reserve -- and I'll write that on here, but there are 23 wells with 5140 and 3.78, which it can be read from here, and we have attempted to draw the best line we have through those points.

Now I have testified earlier that I absolutely subscribe to, there's a relationship between deliverability and reserves in the range of 200,000 and below because it is my feeling that a 200,000 and below well will not probably drain 320 acres and that you are chopping down your effective acreage and, furthermore, you are using the old engineering system that all of us have employed since time immemorial, that every time we come up with a reserve we have what we call a peak factor and that peak factor is that we're looking at the deliverability or the producibility of the well before we put our final number down, and it gets very embarrassing sometime. It's happened to me, when you come up with an oil well that has a million barrels of oil but it won't produce

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but ten barrels a day, it would take some ten years to produce it. I think we all have that tendency, and this I think is what enters into the deliverability, but we are looking at the reserves around the bore hole, we are looking at the log around the bore hole, the sand around the bore hole.

The one factor that we don't know in any given instance when we set pipe is, how far is that frac treatment that we are about to embark on going to travel horizontally? How far out is it going to reach? What fracture system is it going to touch? What is it going to drain? This is the factor that we don't know when we set pipe. We know how thick the sand is because we can count it. Net effective sand sometimes changes that deliverability but you can't put more there than was there to begin with. This is the one factor that has to stay there.

In subscribing to this obvious, zero permeability or deliverability has to have zero reserves, we have subscribed out here to 200,000 that there is some relationship at which point it starts to bend. What does that curve really tell you? What it tells me is that every well in excess of 500,000 deliverability in the San Juan Basin is certainly going to drain its reserves from its 320-acre tract, given the time, and deliverability is nothing more than a measure of time.

The allocation formula with a deliverability factor in it is nothing more than a measure of time. That's all in the world it is. If given time, even a 200,000 cubic foot well, unrestricted,

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could eventually drain its reserves that's going to get to that well bore, and it's my estimation it isn't going to reach past 320 acres, it's going to do very well as a general rule to get out maybe to 160 acres; but in any event this, why the low reserves appear in this figure, because you do have this peak factor, as I call it, and that this radius of drainage is probably something less than 320, but this curve tells me that at 500,000 deliverability and above that, every well given its opportunity is going to drain its 320 acres.

Now the problem before this Commission is how do we theoretically wind up with all the wells exhausted of all their reserves at the same instantaneous time; and since time is in there, there must be some portion of deliverability in there, because deliverability does have a relation, to some small extent, to porosity and all the other factors that have been discussed, but as a true measurement deliverability really does nothing more than measure the permeability under the given set of pressures to that well bore. That's all in the world we're measuring.

Now with that concept of mine, and ignoring the fact that we have a point, even a weighted average point of 23 wells over here, where this curve could actually turn back the other way and start saying that the greater the deliverability the lesser the reserves. We will not make that argument from this witness stand. I'm afraid that I couldn't even stand up to that, but what it does tell me is that in El Paso's apparent fair work that they

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have done throughout the Basin in an attempt to find out something about the San Juan Basin, they have recognized that you can get an occasional freak where you have a 15-foot sand well and some 500 millidarcys or 200 millidarcys or some large millidarcy permeability. That is nothing more than a pipeline into that well bore. You may only have two feet of it, you may have five feet of it, there may be twenty feet of thick sand, but all it really says is that occasionally you are going to get one of these pipelines and what does that pipeline do? You have got a great big sleeping giant out here of thick sand, thinning in places, but an overall great big thick reservoir, and when you get one of those pipelines -- and I'll call it pipeline deliverability in this instance, and it's only got a thin sand section, it's going to drain this 320 real fast. But then at some future date that deliverability is going to drop off, because it's starting to reach beyond its 320-acre tract.

Now I believe one of the witnesses for the opposition did testify that this pressure have began to drop over and reach over and reach over and was beginning to finally cross the boundary line. These I think are some fairly practical engineering assumptions and fairly practical economical assumptions. However, this does tell me that at some point -- and that point is about two million cubic feet -- that no matter what you do deliverability-wise, there is no relation between deliverability and reserves.

If I can go on from there, if the Commission already

has El Paso's Exhibit No. 2, this will not be an exhibit of ours, but I would like for you to refer to it, if you will, for purposes of what I'm about to say; and that is that El Paso has brought out a usual industry-wide parameter that's used throughout the industry in different fields and different places, that one million cubic feet of gas should be taken for every ten billion cubic feet of reserves.

They have called it for this purpose a fixed depletion rate and have placed it on Exhibit 2 opposite the various deliverabilities and reserves, in order to show the Commission what these fixed depletion rates would be.

Now, we subscribe that what they've done is probably fully accurate in the manner in which they presented it, but if you put that in the category we have, which is our case in the San Juan Basin where we have a tremendous number of wells, not twelve wells or not 83 wells, not the total of 95 wells below a million cubic feet, but 243 wells on their study and 278 wells from what we got from the February proration formula. We averaged then those 243 wells and, as previously testified, we found an average deliverability factor of 509.

Now it just so happened that that almost approximated the first two categories of El Paso's Exhibit No. 2, and therefore we were at liberty to use their projection, since we aren't qualified to project what the gas sales will be in the future, and we were also qualified, however, to take this 509 and the 3.02 billion

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cubic feet, which from our Exhibit 5 is the average reserve in that group, and under this one for ten concept, the wells in that group should be receiving an average of 302,000 cubic feet per day times 365 days per year, and they're able to make it because their average deliverability in that group is 509, which is considerably in excess of the 302, they would have a fixed depletion rate of 110.230.000 as opposed to, by averaging the 49402 and the 61698 and rounding it off, approximately 55,000,000 under the 75 percent - 25 percent formula;and as opposed to 9,000,000 by averaging the approximately 76 and 72, so what we're really saying is, to this Commission and to our opposition, is we would like as much as we could get, just as you would like to get as much as you could get. We'll be extremely honest in that. However, we would like for the Commission to be aware of the fact that the wells in that reserve group and in that deliverability range which can make their reserves are not getting, under the present formula, but half of what would be a normal industry parameter of one for ten.

As a matter of fact, what we have asked for is only 75 percent of that normal industry parameter ourselves. Now to go on from there, and since all of their deliverabilities on their Exhibit No. 2 range in the range of -- well, I can read them off to you, 1330 MCF per day, 1441, 1718, 1674, 1577, all of those are something below two million, so for the purposes here we, in order to stay in the same concept that we are talking about, we

averaged all of the wells in the San Juan Basin from El Paso's work, and have previously ascribed the average deliverability of above 1,000 MCFD, and we came up with all the wells in that category having an average deliverability of 4,206 MCF per day, and an average reserve of 3.58 billion.

Now under the one for ten concept, these wells should receive 358,000 a day times 365 days a year, or 131 million per year. Once again, since we're averaging again and this is, I think, the approach that we must all take, even though every once in a while every one of us gets in an extreme case one way or the other, average, again under El Paso's Exhibit No. 2 under the 75-25 formula, we have averaged all of their projected year's allowables and found the average would be in all the wells having in excess of 1,000 deliverability, would be 116 million. Now that is as opposed to 121 million that they should be receiving under the fixed depletion rate.

However, you should keep in mind that wells below 1,000 MCF are getting less than their fixed depletion rate they should have. However, this happens to represent a somewhat higher percentage of their fixed depletion rate than those in the category below 1,000 MCFD. Now under our proposed formula, the wells in that entire group would be penalized to the extent that they would average, under a 60-40 formula, 60 percent acreage and 40 percent deliverability, they would have an average allowable under our 60-40 formula of 111,934,000.

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Now, they have been penalized an average of five million cubic feet per well per year. They are still more under our formula, percentage-wise, of their fixed depletion rate formula, than even the wells under 1,000 MCFD.

If the Commission please, we have another exhibit, and once again I must apologize for the appearance of these exhibits. They aren't quite as elaborate as we would like to have them.

This is Aztec's Exhibit, I believe Exhibit No. 1, which is an exhibit which purports to show from the El Paso work the percentage change or the percent of recoverable reserves of all those different categories of wells as what they're getting under the 75-25; and it shows under this work taken from specific points on El Paso Exhibit 1 that the wells in the lower category range are getting approximately 5.5 percent of their reserves under the present allocation formula; and the wells in the extremely high deliverability range, which is around two million, which if you'll recall was around the bending point of El Paso's chart, were receiving only 2.3 percent of their reserves.

Now for our Exhibit No. 7, we have taken these things by categories again, and once again using El Paso's reserves, but since we've once again run into this problem of the fact that their graph was constructed only up to three million and done from El Paso's work, that shows this at around two million cubic feet, which really tells me that around two million cubic feet deliverability that all the other factors come into play,

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and that deliverability has nothing to do with reserves above that point and only has a slight amount to do with it at any point above about 500,000 cubic feet to a million cubic feet.

In any event, we took then all the wells from the El Paso data, averaged them up and averaged their reserves and arrived at a weighted average reserve picture; actually, we did it by groups and then averaged the groups together arithmetically, and we came up with the fact that the average deliverability well, of all of the wells in excess of the 243 wells, which were approximately a little more than half of the wells studied, all the wells averaged together, came up with a deliverability factor of 4206, which happens to be off of this chart, that under the 25-75 proposition without regard to deliverability in this other concept, but with regard to actual deliverability versus reserves in this category concept, that they were being allowed 3.6 percent of their reserves under the existing allocation formula per year; and that the wells in the 500,000 category, which is by far the most massive number of wells in the San Juan Basin today, and I would predict that it will continue to be that way in future years unless we happen to find some more soft spots out there -- those 500,000 cubic foot deliverability wells averaged, those 243 wells were only being allowed approximately 1.55 to 1.6 percent of their reserves per year under the present allocation formula.

Let's look at it under our proposed allocation formula.

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Once again using the same category, using the same percentage of reserves, and using the 60-40 concept that we're asking for, we found that the wells in the 500,000 deliverability category were now being allowed to produce 2.55 to 2.6 percent of their reserves per year, which is fairly uneconomical within itself, but in any event, we won't get into that -- 4206 average deliverability, however, of the larger deliverability wells, were being allowed 3.4 percent of their reserves per year.

This further strengthened my conviction as to the propriety, and which I have stated earlier, that I had a lack of guts to ask for the 75-25 concept of 75 percent acreage and 25 percent deliverability, but it does tend to straighten this thing up considerably, and we admitted that all we were asking for in our Exhibit No. 4 was something that would still give these fellows an almost two to one advantage. Certainly it may not be two to one, but it certainly must be, even by rejuggling figures, may be a 50 percent advantage, and this tells us from Aztec's work reversed that we are still granting them approximately seven-tenths of a percent per year over [illegible], so be that as it may, approximately 30 percent advantage.

We are willing to live with this for a period of time. Take a look at this formula that we proposed; we get some more reliable reserve figures from the pressure decline method, which has been argued back and forth here for a considerable length of time, and our own interpretation of the pressure decline method of

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computing reserves, if you can get true bottom hole pressures to work with and give them enough statistics from the reservoir, it is undoubtedly the most advantageous and certainly the most correct way of determining reserves, but it is determining reserves under a radius of drainage.

What is that well bore supposed to get? I believe we had a very hard fought case that we took no position in one way or another, but that Southern Union subscribed to 640-acre spacing in the San Juan Basin, and they took the so-called sweet area, if you'll recall, in that, and flowed, before the allocation formula went into effect, flowed very hard one well, taking periodic bottom hole pressures in the surrounding wells. They had some slight indication of interference, but once again, time being a factor, which is always a factor in a pressure decline interpretation method of reserves under a radius of drainage area. The Commission did not see fit to agree with the 640-acre spacing.

It is my firm conviction that, although we did not appear in any way at all, there are probably some areas in the San Juan Basin that should be on 640 acres, in order to make these wells commercial, commercial from the standpoint of ultimate return on your money, but to have a blanket Blanco Mesaverde Basin-Dakota spacing pattern of 640 acres would be disastrous from the standpoint of the lower deliverability wells.

It's been shown on a lot of different ways here that there are local variations throughout the San Juan Basin and there

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are sweet areas. We agree with that whole-heartedly, we don't argue the point. We think the broad concept is that it is a fairly massive sandstone. The Commission will be interested to note that on this particular exhibit, which I don't recall the number of --

MR. KELLAHIN: Pubco No. 1.

A -- No. 1, Pubco has isolated these certain areas and granted some of the logs were not available, I must apologize, ours was not available, one of ours is not available this morning, but I'll reveal the general details and we will make it available after the hearing, release the log. We have drilled a well in the Southwest Quarter of Section 6 of Township 23 North, Range 3 West, which has encountered one of the most massive Dakota sandstone developments that I have had the pleasure of seeing, from a standpoint of continuity, thickness, and what have you, in the various wells that we have drilled.

We have a problem in this well in the fact that we don't know whether it's an oil well or a gas well. I'm quite certain that under the El Paso method of eliminating condensate and only using condensate and water saturation and only using net gas porosity, that we are going to have an extremely low gas in place number, because this well will hardly flow against 550 pound line pressure; and yet it was potentialed for approximately 100 barrels of oil a day, 750,000 cubic feet of gas per day.

We are testing this well at this time to find out if we

have an oil well or gas well. At this time it's an oil well. However,we have a feeling that perhaps the oil ratio will drop off sufficiently to be able to call it a gas well so we can sell our gas and get hooked up and get an allowable that we can operate under. But if we get an allowable for this well, which is going to be admittedly a low deliverability gas well under the present formula; but at any rate, under our formula, which would aid us some, we're going to have a hard time producing this well.

So in other words, if Pubco had had that one additional point, we could have had a big area.

In a moment I will introduce one other item which we attempted to do with respect to our acreage position in response to this massive sandstone. We subscribe to one theory in the San Juan, that you can't get gas where there is no sand. I think this is basically true, and we further subscribe to the fact that what is deliverability gas or what is producible gas, if you may, prior to a fracture treatment job in a massive sandstone, might change its characteristics if enough is exposed via the fracture treatment route.

Therefore it has been Consolidated's whole approach, time-worn, to stay in Pubco's red area, and we have been fairly successful in doing that. However, we have not been successful, admittedly, in getting the highest deliverability wells.

Fortunately, we happen to have been lucky enough or smart enough, I don't know what it is, that our NSL division order

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interests happen to be the highest in our higher deliverability wells, and vice versa. This wasn't known in advance, it just worked out that way, but our whole concept is to follow this thick broad section policy, because if the reserves are there, I feel that technology, in the long range viewpoint, if we protect this reservoir from drainage between tracts, that we'll have the technology and we'll know how to get these massive thick, what are now to a certain extent non net pay reserves from these wells; and if we can prove that, El Paso will have no problems with the Federal Power Commission in proving to their satisfaction that probably the San Juan Basin-Dakota formation might have enough gas in it to take care of California by itself.

One other thing that I would like to add, if I may, I would like for the Commission to receive what was Pubco's Dakota isopach map of the gross producing sandstone in the Basin-Dakota Field, which we attempted to introduce through cross examination, which we would like to call our Exhibit No. 9. This merely shows Consolidated's general outline of acreage, its acreage position in the Kutz Canyon Field, its general acreage position in this area, and our acreage position in this area and incidentally, this was commented on quite a bit in one of the testimonies, this particular area, and we have another problem with oil problems down there, and the zone that I think that was criticized on the logs so badly was the offset well that we tried to drill with gas, ran into oil, and we had a problem trying to drill the well and damned

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near lost the north well and the south well. We made certain to get into that sand and as a consequence we have something approaching an oil well there. And then this new acreage position in the 23 North, 3 West, which is the new area that I just spoke of. That is the general outline, and if this in fact proves to everyone's satisfaction, and I hope that it will, that the interpretation of the gross section is something on the order of 140 feet or 150 feet, but certainly well over a hundred under almost anybody's pick, that once again we will be in the red area.

In conclusion, I would like to restate that we didn't do this reserve work, this is not our work. We think, however, that is representative work and it's work, we are already convinced of competent engineers who can predict two years ahead of time that this same general broad picture relationship of deliverability versus reserves is going to be approximately what it is today. If you'll recall, in my testimony, that we didn't have the numbers so we had to go at this category of five to three, this average category, because we didn't have the deliverabilities to go with the exact reserves. We stated in our testimony that this three to five relationship was about 60 percent variance, and I did make the statement that it was my opinion that it was something, probably not quite that bad, it was something in the order, or something less than 50 percent.

If you'll examine this interpretation approach where we did have the data available, you have something on the order of

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four billion in the extremely high deliverability range, and the 500,000 deliverability which is the heavy massive portion of the wells, there's three billion, so there's 33-1/3 percent difference.

We subscribe that deliverability is necessary in the formula in some form, in some percentage to take care of that problem. We believe that a certain amount of it should remain in it. It's up to the Commission to decide what that right one is, and only God knows, but I hope that you all can come mighty close to it.

That, by and large, is our whole feeling in this respect. It's frankly why we're here. It's been a long and tiring fight amongst all of us, and I think that we're probably all a lot more knowledgeable about the Basin-Dakota Field, I know I certainly am, than I was when I arrived. It's our feeling, and now I'm speaking as management and not as an engineer, that even though we more strongly today feel that even a lower deliverability, higher acreage factor might be the proper one, we feel that a 60-40 trial balloon for a somewhat similar period of 16 to 18 months that we are under this type of thing, until we can get more data, will encourage additional development in these areas that are white on the map and will prove beneficial to Southern Union and El Paso in further convincing El Paso's case with the FPC of the tremendous amount of reserves that I have always believed are in the San Juan Basin.

I know our company, if we feel that we can at least

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commercially operate and can foresee, if we happen to get a low deliverability well -- I say a low deliverability, I mean 500,000 cubic feet -- that our company, if we have a ten-year payout, will attempt to live with it, because we feel that we're technically able to stay somewhere above that 500 and maybe we can stay in the range of an eight-year payout or a nine-year payout on the overall average under the present market conditions.

We feel this formula will do this, as proposed. We would like to give it a trial balloon. It is not our plan to be immediately back petitioning for a 75-25, if we were so lucky as to be granted a 60-40. We believe everything needs a trial. We feel this is a move in the right direction. We believe it will continue to encourage development. We feel that the pressure on the Federal Power Commission of additional gas reserves will greatly aid El Paso in their attempts to extract additional gas from the San Juan Basin, which will materially improve the payout situation for all, and that we will all eventually, including the State of New Mexico, via the substition, benefit tremendously.

Q (By Mr. Stockman) Are you through, Mr. Trueblood?

A Yes.

MR. STOCKMAN: If the Commission please, we would like to ask that the Applicant's Exhibits Nos. 5, 6, 7, 8, and 9 be marked as such and received in evidence.

(Whereupon, Consolidated's Exhibits Nos. 5, 6, 7, 8, & 9 marked for identification.)

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MR. PORTER: Is there any objection?

MR. KELEHER: We object to the admission of so-called Exhibit 9 on the ground that no proper foundation has been laid.

MR. STOCKMAR: If the Commission please, I can lay --

MR. PORTER: Is this Exhibit 9?

MR. STOCKMAR: Yes.

MR. PORTER: The exhibits will be admitted to the record.

MR. KELEHER: Exception as to No. 9.

MR. PORTER: The record will show the exception. Any questions of Mr. Trueblood? Mr. Howell.

MR. HOWELL: If the Commission please, I have one question.

CROSS EXAMINATION

BY MR. HOWELL:

Q Mr. Trueblood, in that portion of your closing argument before you began the speech to the stockholders, you referred to the summation --

MR. STOCKMAR: I have been patient a number of times, as you have not with me. I do object to this line of conversation.

MR. HOWELL: Well, I will rephrase the question.

Q (By Mr. Howell) You referred, I believe, to the only factors that contribute to deliverability as being permeability, at certain pressures, do I recall your testimony correctly?

A I said those are the major factors, I believe.

Q Well, actually, is not the thickness of the pay sand also a major factor?

A Well, certainly, but I assumed that once the thickness of the pay sand was already there, that I do not know which number of feet are contributing, since through fracturing that we are making via artificial stimulation, I cannot tell you what the number of feet exposed to the well bore happens to be.

Q Mr. Trueblood, could you answer whether or not thickness is a contributing factor to deliverability?

A It absolutely is.

MR. HOWELL: Thank you.

MR. PORTER: Mr. Keleher.

BY MR. KELEHER:

Q Mr. Trueblood, you have testified or stated that the results of your work are based on averaging the averages both in deliverability and reserves, is that correct?

A That is correct.

Q Is it not true --

A Excuse me, under certain categories, in certain categories.

Q Is it not true that if you were to continue to average the averages ad infinitum that you would eventually have nothing but a fixed figure for average reserves and a fixed figure for deliverability?

A No, I couldn't say that would be exactly so, Mr.

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Keleher. As a matter of fact, I don't believe I testified that that was so, other factors entering into it; and I believe it was my testimony that other factors do enter into it, one of which happens to be that, and it's been said here, that there is some relationship of deliverability to the available porosity of the well bore; of pressures, in a certain area we have bottom hole pressures, I believe it has been testified, ranging from 2400 to 2200; that we have certain thickness of sand, certain other factors where deliverability does enter into it enough; and that in fact on that curve which I have drawn through the points I have noted that there is a difference attributable somewhat to deliverability. As a matter of fact, I've stated that there is a 33-1/3, and I have also stated that I believe this to be a bad point at 5140 MCF per day deliverability with only a 3.7 reserve, because in that particular point, if I had taken into consideration completely, I would have had to have turned the curve around and from a strict standpoint of graphical, true graphical interpretation, we do not subscribe to that, we merely stated that because there were probably some thin sand zones somewhere that no matter what you do to them you couldn't increase the gross net pay, but you had twelve million deliverability or what have you; that this was happening, and that these so-called freaks that have been bandied around from time to time throughout the hearings are freaks, in some instances where you have extremely high deliverability, but no matter what you do, you can't get more than 20 feet of net pay.

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I believe that's what I said. I do not believe by averaging the averages you could always come out with -- however, the construction of El Paso's Exhibit 1 is an average of the average. We have taken an average of the average in a different direction.

Q What you are attempting to do is to solve the solution, is it not?

MR. STOCKMAR: I would like to ask that that question be restated. I do not understand it.

MR. KELEHER: Well, I won't ask the witness any more.

MR. PORTER: Is that all you have, Mr. Keleher?

MR. KELEHER: That's all.

MR. PORTER: Anyone else have a question of Mr. Troublood? He may be excused.

(Witness excused.)

MR. PORTER: Anyone else have testimony to present? Mr. Everett.

MR. EVERETT: I have a statement I would like to make in behalf of Ohio Oil Company whenever the time comes.

MR. KELLAHIN: I do have one item of testimony, if you will permit me, Mr. Everett. El Paso will ask the Commission to take administrative knowledge of the Commission's files covering the two wells testified to by Mr. Troublood in his direct testimony, being the Consolidated Government Wells well 1-8-L, and Consolidated Government Wells well No. 1-[illegible]-N, with reference to the report filed by Consolidated on drilling and completion

history showing the treatment to the Owens Well to be sand-water fracked with 50,000 pounds of sand and 50,000 gallons of water, 750 gallons acid; the treatment to the Leeds Well being sand-water fracked with 100,000 pounds sand, 129,000 gallons water, 500 gallons acid.

MR. PORTER: Could you give me the Section, Township, and Range of those two wells?

MR. HOWELL: The Government Owens Well appears to be in Section 7, Township 31 North, Range 12 West; and the Government Leeds Well appears to be in Section 8, Township 31 North, Range 12 West; these being the two wells used for comparison by Mr. Trueblood in his direct examination.

MR. PORTER: The Commission will take administrative notice of the files.

MR. STOCKMAR: We certainly have no objection to this, except that my people advise me that the Owens Well happens to be a Mesaverde completion, thus not material to the Dakota presentation.

MR. HOWELL: I have misnamed that. The file jacket shows the Government Owens. The actual log from which I read is the Government Gross.

MR. PORTER: The Government Gross.

MR. HOWELL: The Government Gross, which was the well. It appears to be mislabeled on the file jacket from which I was reading.

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MR. PORTER: Is that the same number?

MR. HOWELL: The number is the same.

MR. PORTER: The location is the same?

MR. HOWELL: The location is the same. The label of the file is apparently wrong as to the name.

MR. STOCKMAR: There's no objection on the part of the Applicant.

MR. PORTER: We are going to take a very short recess.

(Whereupon, a short recess was taken.)

MR. PORTER: The meeting will come to order, please. We are going to ask for statements in the case, and I would like for anyone who is going to give a statement to please come down to the front so that the reporter can hear what he's saying. Who wants to be first? Mr. Stockman.

MR. STOCKMAR: I think in the normal course, the Applicant starts and then the others may have the last word.

I think Mr. Truebood's testimony will serve as our major argument. I would like only to say that the company has given serious consideration, among other things, to the problem of a maximum and minimum allowable. It feels that no proper maximum and minimum approach can be achieved by that route alone. It has been testified, and it's the belief of the company that the adoption of its formula will in effect provide the minimum allowable, which will achieve the results desired by the Commission.

MR. PORTER: Mr. Kellahin.

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MR. KELLAHIN: If the Commission please, Jason Kellahin for Southern Union Gas Company. Southern Union Gas Company is in great sympathy with the case which was presented by Mr. Utz for a minimum allowable. However, it is their view, on the basis of the evidence presented in this case, that if a proper allowable formula, such as has been advocated here, is adopted, there would be no need for a minimum allowable for a period of a number of years. If, however, there is to be no change in the proration formula, a minimum allowable should be adopted; and on the basis of the experience of Southern Union Gas Company as an operator in the Basin-Dakota Pool, we believe that the minimum suggested might be somewhat low and suggest that the Commission might want to consider something more on the order of five million.

In any event, if there is no change in the formula, it would certainly simplify the Commission's bookkeeping and that of the pipeline companies, too, if a minimum were adopted.

Now, turning to the case that has been presented here, I want to make just two very brief comments. The testimony offered by Mr. Haseltine is generally to the effect that there was a general continuity in this reservoir which gradually changed across the reservoir, with the exception, as we all know, of deliverabilities. We feel that that statement has been fully supported by the evidence presented by Pubco and by the El Paso Natural Gas Company. Now Pubco offered two cross sections -- well, they

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offered three, but one of them is on an edge location, B-B^1, which I don't believe shows a reservoir condition except in a small isolated area.

There are other cross sections, that C-C^1, they utilized eight wells covering the distance of some 76 miles, and admittedly, by their own testimony, you would normally expect considerable variation over that distance. That does not in any way refute the testimony offered by Mr. Haseltine.

Now on the other exhibit, A-A^1, they offered that in an effort to show there was no continuity in this reservoir, there were radical changes from well location to well location. I think it's very apparent if you just glance at the exhibit that it shows a continuity across the reservoir, and significantly across the longitudinal axis of the sand beds in that reservoir. In other words, if you are going to expect any radical change, you would expect it if you cut across those beds rather than going down the length of them; and we see no way that that exhibit supports the contention that there are drastic changes in the sand body from well location to well location. Instead, it supports the view that there is a general continuity in this reservoir.

Now Mr. Rainey testified that every reserve point, or every reserve range that he used on his exhibit, there was a wide scattering of deliverabilities. That certainly doesn't support any conclusion that deliverability and reserves are in a direct

relationship.

Now El Paso in their presentation also used a township average for the reservoir conditions. The only change in the concept that they were able to note on the basis of their calculations was on the changes in deliverabilities again, which again does not support any conclusion that deliverabilities and reserves are related and does support Mr. Haseltine's contention that there is a general sand body showing gradual changes as you digress through the reservoir, the only differences being changes from well to well and the deliverabilities encountered in those wells.

Southern Union is in support of the application which has been presented here in this hearing.

MR. PORTER: Mr. Everett.

MR. EVERETT: I have a prepared statement, Mr. Porter. Before I get into that, I would like to answer or point out one matter to which Mr. Kellahin has just referred, and that is the Southern Union Exhibits. I call the Commission's attention to the fact that that was drawn on a scale of one inch to 400 feet, which would mean that looking at that exhibit, a tenth of an inch equals 40 feet. I would suggest, Mr. Haseltine had drawn it an inch to 4,000 feet, that the line of a pencil would show this point that he has been trying to make, he could have just drawn a pencil line right through all those well logs and they would have been uniform throughout. So when the Commission views that exhibit, please bear in mind the scale which is thereon.

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My name is W. Hume Everett. I am the Division Attorney of the Casper Division of The Ohio Oil Company. I represent my company herein in opposition to the application of Consolidated Oil and Gas Company, Inc.

In support of its opposition The Ohio Oil Company hereby adopts (as fully and completely as though presented by it) all of the exhibits, testimony, and opinion evidence offered herein by Pubco Petroleum Corporation, El Paso Natural Gas Company, Aztec Oil and Gas Company, Sunset International Petroleum Corporation, and Caulkins Oil Company, and states that under the facts in this case the allocation formula set forth in Commission Order No. R-1670-C should not be changed to increase the acreage factor or to decrease the deliverability factor as requested by Consolidated Oil and Gas, Inc., in that any such change would be highly inequitable and unreasonable and would result in a failure to recognize correlative rights.

The Commission after hearing on October 13, 1960, entered its Order No. R-1670-C, having found therein that the producing capacity of the wells in the Basin Dakota Pool is in excess of the market demand for gas from said common source of supply, "and that for the purpose of preventing waste and protecting correlative rights" adopted appropriate procedures "to provide a method of allocating gas among the proration units in the area encompassed by the Dakota Producing Interval, commencing February 1, 1961." Said interval and common source of supply was by such order

designated and "denominated the Basin-Dakota Gas Pool."

At the time of the entry of said Order No. R-1670-C, the Commission, as it is required to do under applicable New Mexico statutes, found and held: "That since the evidence presented, established that there is a general correlation between the deliverabilities of the gas wells in the Dakota Producing Interval and the recoverable gas in place under the tracts dedicated to the wells, the gas allocation formula for the pool should be based on seventy-five (75) per cent acreage times deliverability plus twenty-five (25) per cent acreage," and that, "Such a formula will protect correlative rights and will, insofar as is practicable, prevent drainage between producing tracts which is not equalized by counter-drainage."

The Commission thereby afforded each owner of each property in the pool with the opportunity to produce his or its just and equitable share of the gas in the pool in an amount so far as can be practically determined and so far as such can be practicably obtained without waste substantially in the proportion that the quantity of the recoverable gas under such property bears to the total recoverable gas in the pool, and has permitted each owner the right to use his just and equitable share of the reservoir energy.

In entering Order No. R-1670-C, and at all times since, the Commission has protected correlative rights by giving equitable consideration not only to acreage but to "pressure, open flow,

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porosity, permeability, deliverability, and quality of gas," as well, so as to eliminate, upon a reasonable basis, the production of natural gas from any gas well or wells within or from said gas pool in excess of the reasonable market demand from such source of natural gas of the type produced, or in excess of the capacity of gas transportation facilities for such gas.

Wherefore, The Ohio Oil Company respectfully states that under the law as applied to the facts in this case the application of Consolidated Oil and Gas, Inc., should be in all things denied, and that the Commission Order No. R-1670-C be continued in full force and effect without change.

Respectfully submitted this 21st day of April, 1962.

I have given the reporter a copy of the statement. In addition to that, I would like to state that the position of The Ohio Oil Company is that there is no need for a minimum allowable as suggested; there is no need for such an allowable at this time.

It is our feeling that the acreage factor in the present formula is a sufficient and adequate minimum, and that the order in toto should remain unchanged.

MR. PORTER: Mr. Kelehor, did you want to make a statement, too, sir?

MR. KELEHER: Mr. Chairman, and Gentlemen of the Commission, I. A. Kelehor, for Kobco Petroleum.

Rule C, 9-C of the Commission's General Rules provides that the gas allocation formula for gas pools of Northwestern New

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Mexico shall be based on 75 percent acreage times deliverability plus 25 percent acreage.

Consolidated Oil and Gas, the Applicant here, proposes to change the formula in the Basin-Dakota Field to 40 percent acreage times deliverability plus 60 percent acreage.

The pool as of April, 1962, according to the testimony presented to the Commission, had 572 wells developed with an areal extent of about 183,000 acres. In Consolidated's application, Consolidated proposes to change for these reasons: One, the pool has abnormally high deliverability; Two, the present rule, (a), creates waste, (b), permits and will increasingly permit non-ratable taking of gas from the pool and drainage between tracts which is not equalized by counter-drainage.

Consolidated maintains in its application that the change in formula will, One, prevent waste; Two, distribute the allowable production among the producers in the pool on a reasonable basis; Three, not violate or prejudice correlative rights; Four, prevent premature abandonment of wells which are uneconomic under the present formula established by Rule 9-C.

Consolidated further maintains in its application that under the present formula it is suffering and will increasingly suffer economic hardship as a result of continuation of the present formula.

Pubco's position here, as we have endeavored to express it in testimony, is that the formula should not be changed for a

higher acreage factor allowable; and if any change is to be made it should be made toward a higher deliverability factor allowable, since deliverability is proportional to recoverable reserves.

At the outset, may it please the Commission it is our contention that the burden is on the Applicant to sustain by a preponderance of evidence its contentions. It is our contention that the Applicant has utterly failed through the testimony it submitted, the testimony submitted on behalf of Southern Union, to sustain the contentions; and that the application must fail and that the application must be decided adversely.

As indicated in the testimony, this case is of great importance to our company. We have many wells in this area; we have nine wells in the Dakota. We are pioneers in this area. We have a schedule by which we propose to drill 18 wells in the San Juan Basin in 1962, costing not less than $1,500,000, not insignificant to a small company such as ours.

The contention suggested by Mr. Trueblood in his direct examination at the opening of this case, that Consolidated want to get its piece of the pie, short sums up the situation. The testimony was to the effect that Consolidated can't do that under the existing formula, and Consolidated wants this Commission to assist them in that direction. This very morning Mr. Trueblood, in connection with his final statement, said, "We haven't been fortunate enough or successful enough to get high deliverability wells." That about sums up the situation.

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Our witness, Dan Cleveland, who was on the stand for many hours and was submitted to severe cross examination on behalf of Consolidated, stated that his calculation was to the effect that on the basis of wells presently completed, about $520,000 annually would be taken from 17 different operators and distributed among 33 other operators in the Pool. Now I submit respectfully to the Commission that this Commission is not here for that purpose of equalizing distribution of money, but it's here to see that justice is done but not to reward those who are not fortunate enough, as has been expressed, in getting high deliverability wells, or spreading out, making the uneven, even.

The Commission has heard testimony submitted by an alinement of respectable companies which have great investment in this field, great interest. Pubco, El Paso Natural Gas, Ohio Oil, Aztec, Caulkins Oil, Pan American, Sunset International, very respectable array of companies which are sincerely interested in the progress and development of that field. It is inconceivable that these companies would go to the extent of drawing the graphs and preparing the exhibits that have been submitted to you here today unless those companies were sincerely of the opinion that this rule formula should not be changed.

The Applicant has entirely failed, in my humble opinion, in presenting or submitting any concrete evidence. I was astonished at the lack of exhibits, the failure of the Applicant to present testimony which would support, studies which would tend to demon-

strate the justice and the wisdom of their cause. Apparently their strategy was to submit one or two or three informal studies which could have been prepared by any ninth grade student in high school, demonstrating things that are ABC, and relying entirely on exhibits and testimony presented by those in opposition to the change in formula, relying on cross examination of the experts produced by those in opposition, rather than in presenting before the Commission experts who would testify to the contentions they were making; indicating to my mind that they were unable to produce experts who would testify favorably to their position.

Mr. Cleveland, one of our witnesses, in closing, in answer to a question said that, assuming a continuance of even a modest development program in the San Juan Basin-Dakota, any change in formula in favor of acreage as opposed to deliverability would be highly prejudicial to those operators having higher deliverability wells and higher reserves in favor of those with lower deliverability wells and lower reserves.

Pubco's position here is that such is not the mission or objective of this Commission, to attempt to award those who have not been successful in finding the wells they wished and hoped for, and penalizing those who have borne heat and labor of the day in the San Juan Basin, thus penalizing them.

We submit the matter to the Commission with every confidence that the Commission will reach a correct and proper decision in this matter.

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I'll close with the statement of Mr. Utz of the Commission's staff, who testified to thirteen years or more background, experience. He said, and this is his testimony in the rough, at this point the acreage factor does provide a sufficient formula. I know the day will come when the formula should be changed. It's our contention, we respectfully submit to the Commission, that that day is not here.

MR. PORTER: Mr. Howell.

MR. HOWELL: I defer for the minute to Mr. Seth. He would like to make his statement first.

MR. SETH: If the Commission please, Tenneco left a short statement with me. Tenneco Oil Company opposes Consolidated Oil and Gas Company's application in this case, and believes that prudent operators have an interest in the present allocation formula of 75-25 percent. These operators have conducted all their activities in the Basin-Dakota Field, including the acquisition of acreage and the development drilling, based on the income developed from the present method of allocation. A change from the previously established precedent as to allowables in the field at this date would place an economic hardship on these operators.

Tenneco Oil Company also believes strongly that the economically recoverable gas reserves from Basin-Dakota wells is a function of the wells productivity. The present allocation formula adequately protects correlative rights and equitably

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distributes the market demand or gas in the field among the presently completed and connected wells. That's the end of the Tenneco statement.

If the Commission please, while I'm up, I would also like to make just a few brief remarks about Sunset and Caulkins. I appeared for both of these companies.

Caulkins has been in the field, as the Commission knows, for a considerable length of time. They are a relatively small company compared to the other parties in this case. They have, however, a very real interest in the field. They have done a great deal of reservoir work through quite a broad distribution in the field. They conscientiously urge, seriously urge the Commission to continue the present formula. Caulkins is prepared to proceed with its development program as it has in the past under the present formula, and that I believe speaks as good an argument as can be made that the present formula is fair.

As far as Sunset is concerned, it has also been in the field a considerable period of time. They have done a great deal of the basic work on the development of face plans for particular wells. They have done a lot of work on separation. They know the field very well, too. They are prepared to go ahead and continue their development on the present formula. Sunset is connected entirely to Southern Union, who has aligned itself with the Applicant here. Caulkins is primarily connected to Southern Union.

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As has been mentioned any number of times in hearings before the Commission, its rules and regulations, its administration has to be geared to the particular field. It has to be on a field-wide basis. It has to cover the typical situation. Its general rules and regulations obviously can't cover all the possibilities. The erratic wells can be well covered and protected and handled through continuing proceedings before the Commission, and under its present rules the administration has to be on these general considerations; and I think the Commission has probably observed on this particular point of general considerations that by far the preponderance of the wells, that is, the operators of a preponderance of the wells, I should say, have indicated to the Commission that they believe that the present formula should be continued. This indicates to my mind that the rules generally apply, as they stand now, to these wells generally throughout the field.

I won't belabor the Commission with any unduly long comments on the case, but we were struck by the very persuasive development of the opinions and conclusions of the Applicants. I think their witnesses did an excellent job in that area, but we are also struck by the scarcity of particular and definite facts to put in the record to support these conclusions and opinions. I think we are all struck by that aspect of the case.

On behalf of these two companies, I would like to urge the Commission to continue the present rule. Thank you.

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MR. PORTER: Mr. Howell.

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company. May it please the Commission, it seems to me that in facing the problem of any proration, the starting point is the recoverable reserves. Certainly El Paso in its studies began with that point, an effort to determine what are the recoverable reserves.

I feel I should call the Commission's attention that Mr. Kellahin in his argument overlooked the fact that the testimony shows that El Paso took account of the sharp variations which occur in net pay, and in giving reserves considered each well log separately and assigned a net pay to that well based upon the conditions which exist as to that well. Certainly every effort was made to determine the other factors from the best evidence available. Since there are only 65 or 68 cores available, that's all the core information that can be used. Everything has been done that can be done to get the most definite information.

Then if we start with reserves, what are we going to do with them? The gas is in the ground and it needs to be produced. It seems to me that the Commission's original order giving 75 percent deliverability times acreage plus 25 acreage has done a great deal to make possible the development and uncovering of these tremendous Dakota reserves, because the emphasis given to deliverability has induced operators to use methods of completion in the field, the opportunity certainly exists under the develop-

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ment of a new field to use the best and most effective means of getting the greatest possible portion of the gas, and that that is true conservation; and that the emphasis given to deliverability by the formula has resulted in giving an incentive to operators to produce ultimately the greatest proportion of the gas in place and add that to the recoverable reserves.

I think that the cause of conservation and the prevention of waste is well served by that.

Now from that starting point, one next goes to the means of allocating or prorating these recoverable reserves that exist under each tract. I might pause, incidentally, to state that we had a great deal of cross examination of witnesses who testified concerning estimates made on the basis of pressure decline as to the area of drainage that any one well would drain. I submit that the answers which these witnesses gave, the testimony generally was that"I don't know and nobody knows," that the Commission by establishing a pattern of spacing has established counter-drainage which gives to each well the opportunity to expand its circle until it meets the circle of the surrounding wells drilled within the pattern established by the Commission; and thus following the statutory injunction to prevent drainage that is not balanced by counter-drainage, and that you have done so.

I would like then to say that starting with that point, El Paso then considers the deliverability in relation to the

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reserves which it has determined to exist, and finds that the averages -- conceding that there will be individual variations in wells, those could result in some instances from mechanical problems in the well or matters within the sand, no two wells are going to be exactly alike -- and they come up with a reasonable relationship; and the Commission so found two years ago, and the testimony of the additional wells that have come in, the evidence from these wells indicates that that relationship still exists.

Now I think it's particularly significant that regardless of the method used in determining reserves, whether it be El Paso's volumetric method, whether it be Caulkins' or Sunset's pressure decline method, in each instance the correlation between the deliverability and the reserves attributable to the wells is the same; the general overall correlation and relationship is the same.

Now I'm not a mathematician, I can't get up and conclude what a curve would look like if you took and grouped by a different set of factors, you might come up with some kind of curve. I don't know. We do know that when we started with reserves and considered on the basis of wells with similar reserves, we found a consistent relationship.

Now the proponents do not take the wells and average within the same groups that we have averaged. They average averages in many instances. As a mathematician, I don't know

how much that varies your results. I do want to call your attention to the fact that El Paso's exhibits based upon averages, Sunset's and Caulkins' based upon individual wells, c me out with about the same general relationship. I believe it's conceded by everybody that there is some relationship, I don't think anyone is willing to express it mathematically, between recoverable reserves and the deliverability.

So we submit that the proponents have not made any better case, the proponents of a change have not made any better case than they made in October of 1960. Their position is the same. Both Consolidated and Southern Union at that time desired a greater acreage factor. I have no criticism to offer of Consolidated. I think it's normal that a company will strive to get, as they put it, a larger piece of the pie, but I think that maybe a better analogy than what we have here is that everybody that came in and put the money in drilling in this Basin and came in after November, 1960, would know the rules of the game, and the cards had been dealt out and somebody got some deuces. Now you can reshuffle those cards and deal them again, but as long as there's only 52 cards in the deck, somebody's going to get some deuces. And I believe that the only thing that ultimately would help Consolidated's position is, as I think Mr. Fmeblood frankly admitted, the opportunity for everybody to market more gas.

That doesn't seem to be likely in the near future. I believe he was quite frank when on cross examination he said he

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probably wouldn't have drilled some wells that he did had he known that there were going to be as many other wells drilled and that the market would not be increased. So that unless we are going to increase the deck and change the game and put two decks in there, which we can't do because the size of the deck is limited by the size of the market, I think we ought to continue to play the game by the rules that we have.

Now El Paso's position as to minimums I think was stated by Mr. Rainey, and I would like to reiterate it. Certainly we have no desire, we are strongly opposed to anything that would cause premature abandonment of a well, and that's just not philanthropy. We have an investment of gathering facilities going to these wells, and we would like to get the benefit of those gathering facilities and we would like to have that gas available and not shut off from the market; but we don't think that the evidence in this case could justify the minimum at this time. We feel very strongly that an allowable to prevent premature abandonment should be considered in the places where it is needed.

I personally very seriously doubt if there is any legal justification for imposing a rule, in the light of the testimony, that isn't necessary at this time, and I think we shall endeavor with a great deal of interest and with an open mind and a desire to work with everyone to prevent premature abandonment, the hearing which I understand the Commission proposes to call with reference to the possibility of imposing minimum allowables

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or allowables to prevent premature abandonment in other pools.

So if I haven't, or our witnesses haven't made our position clear, I can now state that El Paso opposes the application of Consolidated Oil and Gas.

MR. KELLAHIN: If the Commission please, at the outset I entered an appearance for R. & G. Drilling Company. I want to state their position is in support of the application.

MR. PORTER: Mr. Kelly.

MR. KELLY: Booker Kelly of Gilbert, White and Gilbert. I have two statements, one on behalf of Sunray Mid-Continent. Sunray Mid-Continent Oil Company believes that gas should be allocated on the basis of reserves. We do not believe that deliverability reflects reserves, at least on a direct relationship. We do not believe that the testimony has shown that. We believe that acreage and the thickness of production formula more nearly reflects reservas, more nearly reflects reserves than deliverability. Consolidated Oil and Gas Company's formula contains a heavier factor of acreage than the present formula, we would urge the Commission to adopt the Consolidated formula.

I also have a statement on behalf of Texaco. It is Texaco's opinion that deliverability does not have a direct correlation to the recoverable gas reserves in place under any particular tract, and therefore should not be considered as a factor in the prorating of gas production. It is believed that to include deliverability as a factor increases the tendency to

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perforate longer intervals, which results not in an increase in reserves for any particular well but merely in an increase in the well's deliverability. We believe such practices in an effort to increase deliverability cause both physical and economic waste. Texaco believes that to protect the correlative rights of all parties concerned, the most equitable proration formula for the Basin-Dakota Pool would be a formula based on 100 percent acreage. Texaco urges that both oil and gas proration formulas be based on 100 percent acreage. However, we are in favor of any change in the Basin-Dakota allocation formula which tends to place more emphasis on acreage, and would therefore recognize this as a step in the right direction.

At the present time Texaco does not operate any producing wells in the Basin-Dakota Gas Pool. However, we are the operators of five wells completed in the Basin-Dakota reservoir that are currently shut in. We do own an interest in several wells that are currently in the Basin, and Texaco also owns considerable undeveloped acreage in the immediate area.

Therefore Texaco, Inc.,as a very interested party, recommends that the proration formula for the Basin-Dakota Pool be based upon 100 percent acreage. However, we recognize the application of Consolidated Oil and Gas as a step in the right direction, and therefore concur with their application.

MR. WYNN: My name is R. C. Wynn, with Delhi-Taylor Oil Corporation; and in the interest of orderly sequence of aline-

ment in this case, we would like to submit our statement at this time as nearly as possible to the alinement of the opponents of the application in this case; and Delhi-Taylor submits to the Commission that the present Dakota proration allocation formula is fair and equitable to all, and we recommend that no change in that allocation formula be made. In summary, Delhi-Taylor opposes the application in this case, 2504.

MR. PORTER: Mr. Eaton.

MR. EATON: For Pan American Petroleum Corporation, George W. Eaton, Jr. Pan American owns an interest in or operates 126 Basin-Dakota Pool gas wells. In addition, Pan American is also the owner of a large amount of presently undeveloped but possibly productive acreage in the Basin-Dakota Pool.

Now based on the Commission's experience, I am sure that it is aware that several companies generally support the use of a deliverability factor in a proration formula. There are also other companies who generally oppose the use of such a deliverability factor. Pan American does not fall into either category. As the Commission will recall, Pan American in the Jalmat case supported 100 percent acreage. We supported that allocation formula because all evidence indicated to us that 100 percent acreage in that pool was equitably distributing the allowable.

At the original hearing to adopt a proration formula for the Basin-Dakota Pool, Pan American supported the current

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formula of 75 percent acreage times deliverability, plus 25 percent acreage. We supported that formula because we believed that such a formula would equitably distribute allowables in this pool. Based on our continuing study, we are firmly convinced that this formula is operating properly.

The primary purpose of any allocation formula is to give each operator an opportunity to produce his fair share of a pool's reserves. In this hearing we feel it's extremely revealing that not until this morning when in a rehash of El Paso's data -- none of the witnesses for those advocating a change in the current formula introduced any engineering exhibits to show that deliverability does not bear a direct relationship to reserves. Now several of these witnesses spoke generally of reserves, but only one single exhibit relating to this critical point was introduced by the advocates of a change. On the contrary, several witnesses for those operators who support the current allocation formula introduced many exhibits that dealt directly with this critical point; and they conclusively showed that in the Basin-Dakota Gas Pool there is a direct relationship between deliverability and reserves.

It is our firm conviction that the record made in this case conclusively shows that the application of Consolidated should be denied in its entirety.

Now with respect to the Commission's staff proposal relating to a minimum allowable for wells in this pool, it is

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Pan American's recommendation that this be denied. The record is clear that such a minimum is not needed at this time and that the Commission cannot properly evaluate the effect of a minimum allowable until there is a need for such a minimum.

MR. MILLS: George Mills for the Atlantic Refining Company.

MR. PORTER: Mr. Mills.

MR. MILLS: The formula of 60 percent acreage plus 40 percent acreage times deliverability proposed by Consolidated Oil and Gas would be an improvement over the one presently in effect, but it's Atlantic's contention that deliverability should not be a factor in any field allocation formula.

Atlantic believes a proration formula should assure an operator the opportunity to recover an amount equal to the reserves underlying his tract. In our opinion, the present formula with its 75 percent acreage times deliverability factor does not assure this right. The deliverability of a well is dependent upon the manner the well is completed, stimulation treatments applied, and the effective permeability surrounding the well. Deliverability has no relation to reserves in place.

Therefore, when deliverability is a portion of a proration formula, a tract with a low deliverability and a large amount of gas in place will not be allowed to recover its fair share of the reserves.

It is for these reasons, or this reason, that Atlantic

believes that a proration formula should not include deliverability, and that a 60 percent acreage plus 40 percent acreage times deliverability would be less inequitable than the present formula of 25 percent acreage plus 75 percent acreage times deliverability.

MR. PORTER: Mr. McGrath.

MR. McGRATH: Phil McGrath with the United States Geological Survey. We would like to support the application of Consolidated Oil and Gas that the formula be changed.

MR. MORRIS: If the Commission please --

MR. PORTER: Does anyone else have a statement to make?

MR. MORRIS: I wish to make a brief comment.

MR. PORTER: Yes, sir.

MR. MORRIS: If the Commission please, I would like to make the position of the staff quite clear on the record. Mr. Utz in his testimony has gone on record as neither concurring with or opposing the application of Consolidated in this case. Where both sides of the controversy have been expressed with great ability on both sides, the Commission staff does not feel it advisable to take a position in the case.

Now I believe to clarify Mr. Kelehar's last point in his argument, Mr. Utz in his testimony concerned himself only with the effectiveness of the 25 percent acreage factor in the present formula to provide a minimum allowable. He did not testify concerning the effectiveness or ineffectiveness of the present pro-

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ration order to distribute the allowable on an equitable basis. That concludes my statement.

If the Commission please, the Commission has received statements of position from several interested parties in this case. In favor of the application, Tidewater Oil Company has submitted a statement favoring the application. Bruce Anderson Oil and Gas Properties supports the application. The Frontier Refining Company supports the application. Kay Kimbell, Oil Operator, supports the application. Amerada Petroleum Corporation supports the application. Humble Oil and Refining Company supports the application.

In opposition to the application in this case, statements have been entered by Pioneer Production Company, Western Natural Gas Company, Redfern and Herd, Inc., Southwest Production Company, and the British-American Oil Producing Company.

I offer these statements to the reporter and ask that they be included in the transcript of this case.

MR. PORTER: These letters of statement of position from these various interested parties will be made a part of the record. Mr. Stockman.

MR. STOCKMAN: I sincerely appreciate having the last word as an opportunity for expressing to the Commission and to the staff our appreciation for their patience and serious attention to this long and hard hearing. I'm sure that all of us here would join me in expressing those thanks.

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As to the legal point raised by others of the burden of proof, we submit that we have conclusively showed by a preponderance of the evidence that there is no general correlation between deliverabilities and reserves underlying the respective spacing units. Mr. Keleher, Mr. Seth, and Mr. Eaton all say that the Applicant has not submitted its own exhibits in evidence, but has used those of the opposition. This whole situation reminds me of the story of David and Goliath. These men are complaining that the stone that slew Goliath was Goliath's own data. We believe that the correct interpretation of that data, by using deliverability groups and not reserve groups, is conclusive.

I think we have shown that 100 percent deliverability is the equivalent of the rule of capture. The incentive provided by the rule of capture is not conservation. You heard a lot about a piece of the pie. Mr. Trueblood has testified that he wants his participants to get their fair share of the pie. As to the card game Mr. Howell wants to play, in the dealing of the cards, we do not want all aces. We just want an average seven.

I would like to make it clear, finally, that the position of the Applicant relates only to the Basin-Dakota reservoir, and not necessarily to any other reservoir in the State. We believe that each reservoir must stand upon the basis of the data available as to it.

As to the position of the staff, we sincerely hope that the staff will give deep and serious consideration to the testimony

and evidence developed this morning with an eye to reconsidering in favor of our application.

Again, thank you very much, gentlemen, for your patience and attention.

MR. PORTER: Anyone else have anything to offer in this case? The Commission will take the case under advisement and hope you get home in time for Easter, if you are going to go home; and if you don't, we hope you stay and enjoy it in Santa Fe.

(Whereupon, the hearing was adjourned.)

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STATEMENT OF HUMBLE OIL & REFINING
COMPANY TO BE ENTERED IN CASE # 2504

Humble Oil & Refining Company is not a producer in the Basin Dakota Pool but is the owner of oil and gas leases in the area and is concerned with the allocation formula adopted for the field.

There is no direct relationship between the reserves under a tract and the deliverability of a well or wells on the tract. Deliverability may be greatly affected by the method of completion and stimulation and by natural or artificial restrictions of the flow of the gas.

Acreage is a direct function of the reserves under a given tract and consequently is a more equitable and reliable parameter on which to base the allocation of the field production.

This case is an example of the fallacy of using deliverability in an allocation formula. Since there is no direct relationship between deliverability and gas in place under a proration unit, it would be surprising if the use of a deliverability factor did not contribute to migration between tracts and result in the violation of correlative rights.

We strongly urge that the Commission reconsider the advisability of using deliverability in an allocation formula.

HUMBLE OIL & REFINING COMPANY

/s/ Howard Bratton
HOWARD BRATTON

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TIDEWATER OIL COMPANY

BOX 1404 HOUSTON, TEXAS

April 6, 1962

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.
Secretary - Director

Gentlemen:

Re: Case 2504

This is regarding the subject application of Consolidated Oil & Gas, Inc. for an amendment to Rule 9 (C) of Order R-1670 for the Basin - Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

Since I will be unable to attend this hearing on April 18, 1962, I wish to reiterate Tidewater's position as stated at the first hearing on this matter held March 14, 1962. Tidewater Oil Company concurs with Consolidated's application and hereby respectfully urges the Commission to revise the allocation formula applicable to this pool as requested by Consolidated.

Very truly yours,

TIDEWATER OIL COMPANY

/s/ John S. Cameron, Jr.

JOHN S. CAMERON, JR.

JSC:mp
cc: Consolidated Oil & Gas, Inc.
1700 Broadway
Denver 2, Colorado
Attn: Mr. Robert B. Tension, Vice President

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BRUCE ANDERSON
Suite 230
The Petroleum Club Building
Denver 2, Colorado

April 9, 1962

Oil Conservation Commission
Santa Fe, New Mexico

Dear Sirs:

As of this date, we are commencing the drilling of a well in the Basin gas pool of San Juan County, New Mexico, in Section 29-31N-13W.

We have locations for approximately five wells in this immediate area, but, under the present proration formula, we will only be able to drill one well which is drilled primarily to hold our lease. Both the Beard Oil Company, of Oklahoma City, who is joining with me in this well and myself feel that the present formula gives far too much credit to initial deliverability. In a fractured reservoir such as the Dakota, it allows certain wells and areas to unfairly drain the reserves of their neighbors.

While our wells are shut-in because of the formula, the gas from our lease migrates to other leases where they may have a better frac pattern but no better reserves to be giving them higher allowables.

Both the Beard Oil Company and myself join in earnestly requesting that you change the formula whereby it is based 75% on land and only 25% on deliverability. This would seem infinitely more fair to us. We make this statement before we have completed our first well, and, if we are one of the lucky ones who happen to get a frac pattern that would give us high deliverability, I would still stand by my statement that the present formula is definitely inequitable. Should you change the present formula, I am quite sure that we would go ahead with the drilling of our lease since the economics of our payout would then be present.

Sincerely yours,

/s/ Bruce Anderson

BRUCE ANDERSON

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WESTERN UNION TELEGRAM

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

1962 March 13

RE: Hearing of Case No. 2504 TN March 14: The Frontier Refining Company supports the application of Consolidated Oil & Gas, Inc. recommending an allocation formula for the Basin-Dakota Gas Pool based 60 0/0 on acreage and 40 0/0 on acreage times deliverability.

We believe the proposed formula will more equitably allocate allowable production from this reservoir, without continued discrimination against wells with equal original reserves but with lower deliverability.

The Fronter Refining Co.
By E. B. Granville
Superintendent of Drilling and
Production

- - - - - -

WESTERN UNION TELEGRAM

New Mexico Oil Conservation Commission
Box 871, Santa Fe, New Mexico

1962 March 12

Pursuant to your March 14th meeting, Kay Kimbell should like to go on record as opposing the present allowable formula in the San Juan Basin. It is clear to see the fallacy in this formula when 10 0/0 of the wells get 40 0/0 of the total allowable. We feel the Commission should adopt a new formula which would permit the wells in the lower deliverability range to pay out. The majority of the operators are now harnessed with such wells. We recommend a new formula based on a higher acreage factor.

Kay Kimbell, Oil Operator
By: Sam W. Sims, Jr.

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AMERADA PETROLEUM CORPORATION

P. O. Box 2040

Tulsa 2, Okla.

March 12, 1962

New Mexico Oil Conservation Commission
State Land Office Building
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504 - Application by Consolidated Oil & Gas, Inc., to amend the allocation formula in the Basin-Dakota Gas Pool

Gentlemen:

Amerada Petroleum Corporation, owner and operator of three wells and part owner of eleven wells in the area covered by caption cause, supports the applicant in Case No. 2504.

Although we oppose the inclusion of a deliverability factor in any allocation formula, we support the applicant's position here because he is asking for greater weight of the acreage factor in the amended order.

Very truly yours,

AMERADA PETROLEUM CORPORATION

/s/ H. D. Bushnell

By H. D. Bushnell, Attorney

HDB:1

cc: Consolidated Oil & Gas, Inc.

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P. O. Box 2542
Amarillo, Texas

New Mexico Oil Conservation Commission
Santa Fe
New Mexico

Attention: Mr. A. L. Porter, Director

Gentlemen:

Pioneer Production Corporation presently operates twenty-two wells in the Basin Dakota pool and has varying interests in twelve other wells in the same pool that are operated by others.

We do not believe that on the basis of the testimony presented at this hearing there is any justification for a change in the allocation formula from that provided by Rule 9 (c) of Commission Order No. R-1670, dated May 20, 1960, as amended by order No. R-1670-c, dated November 4, 1960.

Accordingly, we recommend that the Commission deny the application of Consolidated Oil and Gas, Inc.

Yours very truly,

Pioneer Production Corporation

/s/ E. S. Morris

E. S. Morris,
Vice President

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For Commission Records: Basin-Dakota Hearing

Case # 2504

Roy Jeter, Assistant Division Superintendent, on behalf of Western Natural Gas Company urges the Commission to retain the rules in the present form, believing that deliverability bears a reasonable relationship to recoverable gas reserves and that the present allocation formula furnishes a practical measuring device to permit each operator to produce his fair share of the reservoir.

WESTERN NATURAL GAS COMPANY

/s/ Roy C. Jeter

By: Roy C. Jeter

- - - - - - - - -

3-14-62

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Basin Dakota Hearing

Gentlemen:

As an operator in the Basin Dakota Pool we wish to be recorded as opposing a change in the proration formula at this time.

REDFERN & HERD, INC.

/s/ John J. Redfern, Jr.

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April 20, 1962

Due to the length of this hearing, this is a statement from Carl W. Smith, General Superintendent, authorized to speak for Southwest Production Company. Southwest Production Company began its operations in what is now the Basin Dakota Gas Pool in the fall of 1959, and now operates some 70 Dakota wells, approximately 12 of which were drilled in 1962 and approximately 35 drilled in 1961. Southwest is the sole working interest owner in these wells, except where it was necessary to communitize or pool tracts owned by the leaseholders within the drilling unit.

Southwest did the major part of the development under the present proration rules, and has found them fair and workable, allowing us to produce our share of recoverable reserves.

If our sand development is so poor that we cannot drain the gas under our acreage, we do not feel that an offset operator with better sand can drain our gas from the same poor sand and that no violation of correlative rights occurs. Therefore we feel that the present formula giving much value to deliverability is equitable, and that no change in the formula should be made at this time.

/s/ Carl W. Smith

CARL W. SMITH.
General Superintendent
Southwest Production Co.

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THE BRITISH-AMERICAN OIL PRODUCING COMPANY
Denver Club Building
Denver 1, Colorado

April 12, 1962

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: Case 2504 - Docket 12-62
Regular Hearing - April 18, 1962

Gentlemen:

The British-American Oil Producing Company will be unable to have a representative present during the hearing of Case 2504. Since our company operates wells in the Basin-Dakota Gas Pool, San Juan County, New Mexico, we wish to reiterate our position in this case. Our Company's position to all concerned is herewith quoted from our telegram of March 13, 1962, sent to the New Mexico Oil Conservation Commission on subject case which was to have been heard on March 14, 1962.

"As one of the many operators active in the Basin-Dakota Gas Pool, The British-American Oil Producing Company recognizes that under the present proration formula, the continuously decreasing well deliverability, coupled with the current limited gas market, results in well allowables that might be construed as inequitable. The fixing of a minimum and maximum allowable has some merit. British-American, however, does not feel that a change to a predominantly acreage proration formula or the instigation of a minimum or maximum allowable is justified for the following reasons:

1. Gas purchase contracts and pool development to date have been motivated by well deliverability, thus penalties should not now be inflicted by changing to a predominantly acreage proration formula.
2. Predominance of well deliverability in the proration formula is necessary to provide incentive and reward for employment of best well completion methods.
3. Any consideration in proration for minimum and maximum well allowables could conceivably encourage pool development on an unsound and an uneconomical basis, resulting in the drilling of unnecessary wells.

It is therefore urged that the Commission retain the current gas proration formula. In the alternative, should a change in the

proration formula be dictated, deliverability should continue to be the predominant factor. No maximum or minimum allowable limitation is recommended."

Respectively yours,

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

/s/ Thomas M. Hogan
Thomas M. Hogan
District Superintendent

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

WE, ADA DEARNLEY and MARIANNA MEIER, Notaries Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings was reported by us in stenotype and that the same was reduced to typewritten transcript under our personal supervision and contains a true and correct record of said proceedings to the best of our knowledge, skill and ability.

DATED this 9th day of May, 1962, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1963

Marianna Meier
NOTARY PUBLIC

My Commission Expires:

April 8, 1964

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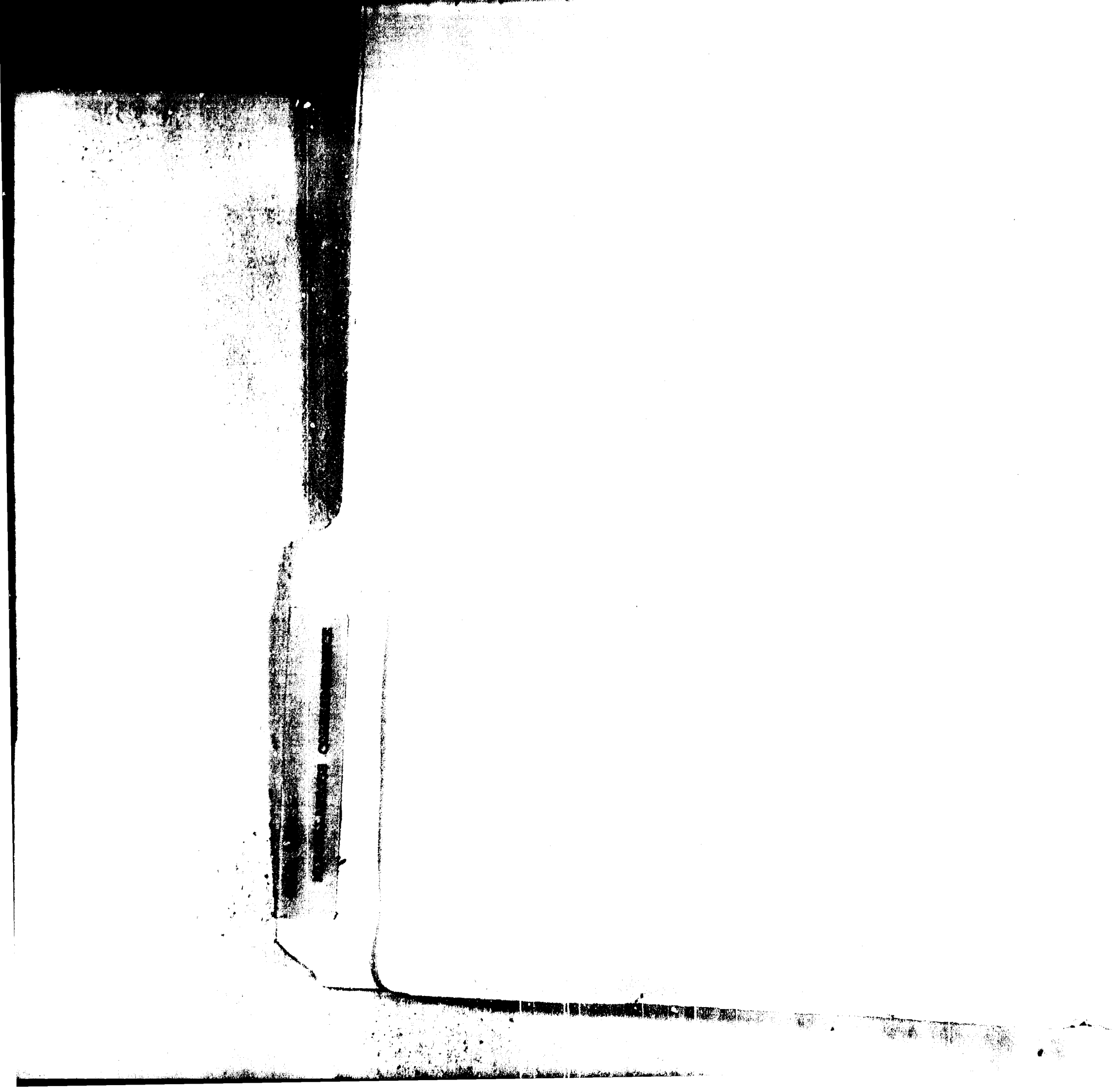

Case No.

2504

Petition, Transcript,

Bill Exhibits, Etc.

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

July 9, 1963

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Box 1713
Santa Fe, New Mexico

Re: Case No. 2504
Order No. R-2259-B
Applicant:
Consolidated Oil & Gas, Inc.

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
OTHER All appearances

SEE ATTACHED MAILING LIST

MAILING LIST FOR CASE 2504

Mr. Ted Stockmar
Holme, Roberts, More, Owen and Stockmar
Attorneys at Law
1700 Broadway - 2112 Tower Building
Denver 2, Colorado

Consolidated Oil & Gas
Writern Building
4150 East Mexico Avenue
Denver 22, Colorado

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Kellahin & Fox
Attorneys at Law
Box 1713
Santa Fe, New Mexico

Mr. J. J. Lacey
Tenneco Oil Company
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Durango, Colorado

Mr. Howard Bratton
Hervey, Dow & Hinkle
P. O. Box 10
Roswell, New Mexico

Mr. George Selinger
Skelly Oil Company
P. O. Box 1650
Tulsa 2, Oklahoma

Mr. P. J. Farrelly
Compass Exploration Company
101 University Boulevard
Denver 6, Colorado

Mr. Roy C. Jeter
Western Natural Gas Company
823 Midland Tower
Midland, Texas

Mr. Wm. Federici
Seth, Montgomery, Federici & Andrews
Box 828
Santa Fe, New Mexico

Mr. Hume Everett, Attorney
P. O. Box 636
Casper, Wyoming

Mr. Ben Howell
El Paso Natural Gas Company
Box 1492
El Paso, Texas

Mr. Kenneth Swanson
Aztec Oil & Gas Company
920 Mercantile Securities Building
Dallas, Texas

Mr. Guy Buell
Pan American Petroleum Corporation
Box 1410
Fort Worth, Texas

Mr. W. A. Keleher, Attorney
Pubco Petroleum Corporation
First National Bank Bldg.
Albuquerque, New Mexico

Mr. Bob Wynn
Delhi-Taylor Oil Corporation
Fidelity Union Tower
Dallas 1, Texas

Mr. George Eaton
Pan American Petroleum Corporation
P. O. Box 480
Farmington, New Mexico

Mr. George Mills
The Atlantic Refining Company
Post Office Box 379
Durango, Colorado

Mr. Booker Kelly
Gilbert, White & Gilbert
P. O. Box 787
Santa Fe, New Mexico

Mr. Phil McGrath
U. S. Geological Survey
Box 959
Farmington, New Mexico

Mr. A. F. Holland
Caulkins Oil Company
1130 First National Bank Building
Denver, Colorado

Mr. John S. Cameron, Jr.
Tidewater Oil Company
P. O. Box 1404
Houston 1, Texas

Bruce Anderson Oil & Gas Properties
Suite 930
The Petroleum Club Building
Denver 2, Colorado

Mr. E. B. Granville
The Frontier Refining Company
4040 East Louisiana Avenue
Denver 22, Colorado

Mr. Sam Sims
Kay Kimbell Oil Operator
P. O. Box 1540
Fort Worth, Texas

Mr. E. S. Morris, Vice Pres.
Pioneer Production Corporation
P. O. Box 2542
Amarillo, Texas

Mr. John J. Redfern
1203 Wilco Building
Midland, Texas

Mr. Carl W. Smith
Southwest Production Company
207 Petroleum Club Plaza
Farmington, New Mexico

Mr. Thomas M. Hogan
District Superintendent
The British American Oil Prod. Co.
P. O. Box 180
Denver 1, Colorado

Mr. Bob Black
Proration Department
Texaco Inc.
P. O. Box 3109
Midland, Texas

Mr. H. D. Bushnell, Attorney
Amereda Petroleum Corporation
P. O. Box 2040
Tulsa 2, Oklahoma

Mr. Paul Cooter
Atwood & Malone
Attorneys at Law
P. O. Drawer 700
Roswell, New Mexico

Mr. George L. Verity
Verity, Burr & Cooley
Attorneys at Law
152 Petroleum Center Building
Farmington, New Mexico

Mr. Wm. J. Cooley
Verity, Burr, Cooley & Jones
Attorneys at Law
152 Petroleum Center Building
Farmington, New Mexico

Mr. R. W. McCanne
Division Manager
The Ohio Oil Company
P. O. Box 120
Casper, Wyoming

Mr. Manuel Sanchez
Attorney at Law
Box 666
54 Lincoln Avenue
Santa Fe, New Mexico

Mr. Ross Malone
Atwood & Malone
P. O. Drawer 700
Roswell, New Mexico

Driscoll & Llewellyn
3110 Southland Center
Dallas, Texas

Mr. R. C. Wynn
Delhi-Taylor Oil Corporation
Fidelity Union Tower
Dallas, Texas

The British American Oil
Producing Company
Box 330
Farmington, New Mexico

Mr. Kent B. Hampton
Marathon Oil Company
P. O. Box 120
Casper, Wyoming

Mr. Wm. Ralph Stroble
Delhi-Taylor Oil Corporation
423 Newhouse Building
Salt Lake City, Utah

Mr. Richard S. Morris
Seth, Montgomery, Federici &
Andrews
Attorneys at Law
Box 828
Santa Fe, New Mexico

Mr. Bill Loar
Sunray Mid-Continent Oil Co.
Box 2039
Tulsa 2, Oklahoma

Mr. Frank Gorham
Pubco Petroleum Corp.
First National Bank Building
Albuquerque, New Mexico

PIONEER PRODUCTION CORPORATION
P. O. BOX 2542
AMARILLO, TEXAS

1963 FEB 12 AM 11 28 OCC

E. S. MORRIS
Vice President

February 11, 1963

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr., Secretary-Director

Re: Case 2504 (Rehearing) February 14, 1963
Application of Consolidated Oil & Gas, Inc.
for amendment of allocation formula
in Order No. R-1670-C.

Gentlemen:

Pioneer Production Corporation presently operates 33 wells in the Basin Dakota Pool and has varying interests in 22 additional wells in the same pool, that are operated by others. As an operator in the Basin Dakota Pool, we hereby wish to go on record as opposing any change in the method of allocating production from the wells in this field. We are still of the opinion that the present allocation formula, as provided by Rule 9 (C) of Commission Order No. R-1670, dated May 20, 1960, and as amended by Commission Order No. R-1670-C, dated November 4, 1960, is fair and equitable and comes closer to protecting the correlative rights of all concerned than that proposed by Consolidated Oil & Gas, Inc.

We respectfully request that the Commission deny the application of Consolidated Oil & Gas, Inc. and leave the allocation formula for the Basin Dakota Pool as it is.

Yours very truly,

E. S. Morris

ESM:dc

MAIN OFFICE OCC

CONTINENTAL OIL COMPANY

P. O. Box 3312
Durango, Colorado
February 6, 1963

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

Continental Oil Company wishes to be on record supporting the application of Consolidated Oil and Gas Company in Case 2504 to change the gas allocation formula to 60% acreage and 40% acreage times deliverability. It is our contention that the emphasis on deliverability in the present formula results in economic waste. An operator often spends many thousands of dollars sandfracing a well to increase the deliverability in order to obtain a bigger allowable. This increase in deliverability is not needed to meet the current demands since the allowable is much less than the deliverability. Thus, in order to be competitive, an operator must waste many thousands of dollars developing deliverability of gas that connot be sold. The oil industry today must take every opportunity to reduce their costs and the elimination of the waste in developing large gas deliverabilities is one way the industry can reduce its overall costs. For this reason, Continental supports the reduction in deliverability as a factor for computing gas allocations.

Very truly yours,

H. D. Haley
District Superintendent
Durango District
Production Department

HDH/cb

cc: Mr. R. E. White, Continental Oil Company, Denver, Colorado (2)

ATWOOD & MALONE
LAWYERS

JEFF D. ATWOOD (1883-1960)
ROSS L. MALONE
CHARLES F. MALONE
RUSSELL D. MANN
PAUL A. COOTER
BOB F. TURNER
ROBERT A. JOHNSON

P. O. DRAWER 700
TELEPHONE 505 622-6221
SECURITY NATIONAL BANK BUILDING
ROSWELL, NEW MEXICO

September 28, 1962

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.,
Secretary-Director

Dear Mr. Porter:

On behalf of George Eaton, we enclose herewith the original and two copies of a Memorandum Brief in support of the Motion to Quash the Subpoena Duces Tecum served upon Mr. Eaton.

Very truly yours,

Ross L. Malone RJ

for ATWOOD & MALONE

RAJ:ps
encl.

W. A. KELEHER
A. H. McLEOD
T. B. KELEHER
JOHN B. TITTMANN
RUSSELL MOORE
WILLIAM B. KELEHER

LAW OFFICES
OF
W. A. KELEHER
A. H. McLEOD
ATTORNEYS AND COUNSELLORS AT LAW
FIRST NATIONAL BANK BUILDING
ALBUQUERQUE, NEW MEXICO

September 27, 1962

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen: Attention: Mr. A. L. Porter, Jr.

Herewith please find one original and two copies of Memorandum Brief in Case No. 2504.

Yours very truly,

WAK:cp
Enclosure

AZTEC OIL & GAS COMPANY
920 MERCANTILE SECURITIES BLDG.
DALLAS 1, TEXAS

September 25, 1962

LAND DEPARTMENT
H. L. SNIDER, JR., MANAGER
KENNETH A. SWANSON, ATTORNEY
GORDON E. COE, ATTORNEY

Mr. A. L. Porter, Jr., Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Case 2504, Consolidated's Application to Amend Order No. R-1670-C relating to Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico

Dear Mr. Porter:

Enclosed is an original and two copies of Aztec Oil & Gas Company's Memorandum Re Subpoena Duces Tecum. It is our understanding that copies need not be served on other parties interested in the subject case.

Yours very truly,

Kenneth A. Swanson

KAS/et
Enclosures

W. H. EVERETT
ATTORNEY AT LAW
Suite 504
Consolidated Royalty Bldg.
P. O. Box 636
Casper, Wyoming.

September 18, 1962.

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico.

Attention Miss Ida Rodriguez

Dear Miss Rodriguez,

Thank you so very much for the many courtesies extended to me and Mr. Hampton on the occasion of our recent visit to Santa Fe. I have apparently misplaced the note which you gave me concerning the payment for copy of the application for rehearing filed by Consolidated Oil & Gas, Inc. in case No. 2504. I do remember that the charge for the copy was $2.40 and that you asked that it be paid by check. I am accordingly enclosing herewith my check in the amount of $2.40 payable to the order of the Commission and will appreciate your kindness in handing it to the proper person to mark the charge "paid".

Again thanking you, I am

Very truly yours,

W. H. Everett

PIONEER PRODUCTION CORPORATION
P. O. BOX 2542
AMARILLO, TEXAS

September 10, 1962

E. S. MORRIS
Vice President

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Secretary-Director

Re: Case 2504 (Rehearing)
Application of Consolidated Oil & Gas, Inc.
for Amendment of allocation formula in
Order No. R-1670-C

Gentlemen:

Pioneer Production Corporation, as an operator in the Basin Dakota Pool, San Juan County, New Mexico, wishes to go on record as opposing any change in the method of allocating production in this pool. We believe that the present allocation formula, as provided by Rule 9(C) of Commission Order No. R-1670, dated May 20, 1960, and as amended by Commission Order No. R-1670-C, dated November 4, 1960, is just and equitable and adequately protects correlative rights.

We respectfully request that the Commission deny the application of Consolidated Oil & Gas, Inc. and let the allocation formula remain as it is.

Yours very truly,

E. S. Morris

ESM/gw

REDFERN & HERD, INC.
WILCO BUILDING
MIDLAND, TEXAS

POST OFFICE BOX 1747
TELEPHONE MUTUAL 4-5591

September 8, 1962

IN REPLY REFER TO
FILE:

Case 2504

Re: Case No. 2504
Application of Consolidated Oil and Gas, Inc. for amendment of Order No. R-1670C

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

As owners of one Dakota producing gas well that is presently connected to the pipeline, we would like to recommend the continuance of the present allocation formula.

Very truly yours,

REDFERN & HERD, INC.

John J. Redfern, Jr.

JJR:bjb

HOLME, ROBERTS, MORE & OWEN

J. CHURCHILL OWEN
PETER H. HOLME, JR.
JOHN M. DICKSON
TED P. STOCKMAR
DONALD C. McKINLAY
KEITH ANDERSON
JOHN N. STULL
L. DOUGLAS HOYT
LUCIUS E. WOODS
KENNETH R. WHITING
A. EDGAR BENTON
JAMES E. BYE
JAMES C. OWEN, JR.
RICHARD G. WOHLGENANT
RICHARD L. SCHREPFERMAN

PAUL D. HOLLEMAN
JOSEPH W. MORRISEY, JR.
SAMUEL L. McCLAREN
EDWARD M. HEPPENSTALL
RICHARD E. YOUNG
[illegible] COHEN
DONALD K. BAIN

1700 BROADWAY-DENVER 2, COLORADO

TABOR 5-7231

September 7, 1962

Mr. Garrett C. Whitworth
El Paso Natural Gas Company
P. O. Box 1492
El Paso, Texas

Dear Mr. Whitworth:

We have been advised by the Oil Conservation Commission of the State of New Mexico that you have filed several motions to quash or dismiss, in whole or in part, the subpoena duces tecum served upon David H. Rainey in case number 2504 before the Commission

You are no doubt aware that Consolidated Oil & Gas, Inc., initiated the subpoenas and as such is willing to cooperate with El Paso Natural Gas Company in any reasonable way so long as the desired information is made available at the rehearing of case number 2504 as expert testimony.

As to the subpoena itself, it is obvious that the production of the eight data sheets described in item 1 is not an onerous problem and this should cause you no trouble. As to item 2, if Mr. Rainey would like to prepare a simple modification of the eight data sheets so that the identification of each well and its location is clearly shown thereon, then there will be no need to bring underlying books, records and papers. This assumes, of course, that Mr. Rainey would be willing to state that these are the proper identifications of the eight wells, etc.

As to item 3 on the subpoena, again we are interested only in competently established results and if Mr. Rainey would be willing to create a new set of data sheets covering wells other than the 457 wells covered by item 1 and which showed the identification and location of the wells and the recoverable well reserves attributable to them, this should certainly save interference with your company's books, records and papers. Such a tabulation should, of course, include

COPY

the same data for tracts or parcels upon which no well has been drilled or which is not yet producing insofar as such information has been developed by or in the possession of El Paso Natural Gas Company. In using such a shortcut, it is expected that Mr. Ramey would testify that the original work was done according to approved engineering methods and generally support the data as expert opinion subject, of course, to any qualifications which he would feel it necessary to make.

If in the spirit of cooperation the Company would be willing to furnish to us in advance of the hearing copies of such data sheets and tabulations, it is certain that the time which will be consumed at the hearing would be materially shortened.

Very truly yours,

HOLME, ROBERTS, MORE & OWEN

By: Ted P. Stockman

TPS:ap

cc: The Oil Conservation Commission
of the State of New Mexico
Attn: Mr. Porter

Mr. Jason Kellahin

COPY

KELLAHIN AND FOX
ATTORNEYS AT LAW

JASON W. KELLAHIN
ROBERT E. FOX

54½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

TELEPHONES
983-9396
982-2991

August 16, 1962

Oil Conservation Commission
of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

Enclosed find the following in regard to Case No. 2504, wherein Consolidated Oil & Gas, Inc., is the applicant:

1. Subpoena Duces Tecum, which shows that a copy thereof was served on Frank D. Gorham on August 15, 1962, by Tom Gonzales;

2. Subpoena Duces Tecum, which shows that a copy thereof was served on David H. Rainey on August 14, 1962, by Tom Gonzales;

Very truly yours,

Jason W. Kellahin

JASON W. KELLAHIN

jwk:mas
enclosures 2

THE FRONTIER REFINING COMPANY

4040 EAST LOUISIANA AVENUE • DENVER 22, COLORADO • SKyline 6-1511

1962 AUG 9 PM 1 16

August 8, 1962

AIR MAIL

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Subject: Case 2504 (Rehearing)

Gentlemen:

With regard to the rehearing of Case No. 2504 on August 15, 1962 this is to advise that Frontier takes the same stand as stated in our telegram to you dated March 12, 1962:

> "The Frontier Refining Company supports the application of Consolidated Oil & Gas, Inc. recommending an allocation formula for the Basin-Dakota Gas Pool based 60% on acreage and 40% on acreage times deliverability. We believe the proposed formula will more equitably allocate allowable production from this reservoir, without continued discrimination against wells with equal original reserves but with lower deliverability."

Thank you for your consideration in this matter.

Yours very truly,

E. B. Granville

E. B. Granville
Superintendent of
Drilling and Production

EBG:dm

The Ohio Oil Co.
P. O. Box 130
Casper, Wyoming

R. W. McCanne
Division Manager

July 31, 1962

A. L. Porter, Jr., Secretary-Director
State of New Mexico
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

We are in receipt of your letter of July 24, 1962, in the matter of application of Consolidated Oil & Gas, Inc. for an amendment of Order No. R-1670-C in Case No. 2504 (Rehearing). The Notice states that the case has been continued by the Commission to the September 13, 1962, regular hearing at 9:00 A.M., Morgan Hall, State Land Office Building, Santa Fe, New Mexico. The letter goes on to state that W. H. Everett is named Ohio's attorney who has entered an appearance in the above entitled and numbered case and to the respective interest he represents.

The purpose of this letter is to advise you that Mr. Everett has elected to take early retirement from our Company effective August 1, 1962, and I would appreciate any additional information in regard to the hearing be directed to my attention. Mr. Everett will undoubtedly represent The Ohio Oil Company in the forthcoming hearing on a retainer basis.

Yours very truly,

R. W. McCanne

RWMcC:st

cc: Mr. E. L. Spieles
Mr. W. H. Everett

W. McCanne has been placed on
Mailing list for Case 2504 — Ltr.

KELLAHIN AND FOX
ATTORNEYS AT LAW
54½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

July 16, 1962

10

Oil Conservation Commission
of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504
Order No. R-2259

Gentlemen:

Enclosed is certificate of service for filing in the above captioned case.

Yours very truly,

Jason W. Kellahin

JASON W. KELLAHIN

JWK:ss
Encl.

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 871
SANTA FE

July 9, 1962

Mr. Jason Kellahin
Kellahin & Fox
Box 1713
Santa Fe, New Mexico

Re: Case No. 2504
Order No. R-2259-A
Applicant:
Consolidated Oil & Gas, Inc.

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
OTHER Mr. W. A. Keleher

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 871
SANTA FE

June 7, 1962

Mr. Jason Kellahin
Kellahin & Fox
Box 1713
Santa Fe, New Mexico

Re: Case No. 2504
Order No. R-2259
Applicant:

CONSOLIDATED OIL & GAS CO.

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC

Aztec OCC x

OTHER Printed copies of order will be sent to all interested parties.

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

1962 MAY 7 AM 9 06

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

1000 RIO BRAZOS ROAD
AZTEC

May 3, 1962

Mr. A. L. Porter
Oil Conservation Commission
Santa Fe, New Mexico

Re: Case No. 2504

Dear Mr. Porter:

The attached is a copy of an exhibit Elvis presented relative to minimum allowables in subject case.

I have extrapolated Elvis' figures toward payout. The "Finds" cannot show "payment" as a reason for minimum allowables. They are only the "Economic facts of life" as Bill Russell said in his project allowable case earlier.

I do not have the basic figures that Elvis used; therefore, I cannot make similar calculations using the proposed 60%-40% formula. Such minimums ~~will~~ would be needed under the proposed formula.

Yours very truly

A. R. Kendrick
Engineer, District #3

ARK:ks

Attachment

EXAMPLE OF INCOME FOR VARIOUS MINIMUM ALLOWABLES
BASIN-DAKOTA GAS POOL

	2000 Minimum	2500 Minimum	3000 Minimum	8000 Minimum
Gas @ .13 MCF	$260.00	$325.00	$390.00	1040.00
Less Royalty @ .125	32.50	40.62	48.75	130.00
Less Well Operating cost	100.00	100.00	100.00	100.00
Gross Monthly Income	$127.50	$182.38	$241.25	$810.00
Average Well Cost	$90,000.00	$90,000.00	$90,000.00	$90,000.00
Payout - using the minimum allowable as average allowables				
Months	705.9	493.5	373.1	111.1
Years	58.8	41.1	31.1	9.3

The Ohio Oil Co.
Legal Department
W. Hume Everett
Division Attorney
Casper, Wyoming
P.O. Box 120

1962 APR 25 PM 1:37

April 23, 1962

Mr. A. L. Porter, Jr.,
Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

In re: Case No. 2504

Dear Mr. Porter:

Prior to the time I left Santa Fe I handed the reporter in the above case Ohio's Exhibits "A" and "B", with the request that she furnish me photostatic copies thereof.

Pursuant to the courtesy extended to me I withdrew from the reporter Ohio's Exhibits "C," "D," "E," and "F," the originals of which are enclosed herewith, and described as follows:

Exhibit "C" -- 1960 Annual Report of Consolidated Oil & Gas, Inc.

Exhibit "D" -- 1961 Annual Report of Consolidated Oil & Gas, Inc.

Exhibit "E" -- Letter of transmittal to shareholders of Consolidated Oil & Gas, Inc. dated January 18, 1962.

Exhibit "F" -- Notice of Special Meeting of Stockholders of Consolidated Oil & Gas, Inc., dated January 19, 1962.

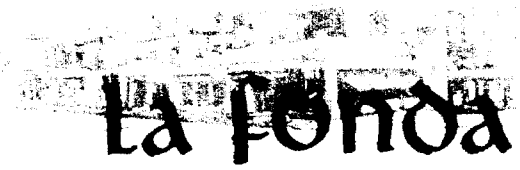
Again let me thank you personally, and through you the other Commissioners and the members of your staff for the many courtesies extended

to all of us, particularly for the extra time spent permitting the completion of the hearing on this case during the one trip.

Sincerely yours,

WHE:jp
Enc.

Via Certified Mail,
Return Receipt Requested



the inn at the end of the trail

April 20, 1962

Due to the length of this hearing, this is a statement from Carl W. Smith, General Superintendent, authorized to speak for Southwest Production Company. Southwest Production Company began its operations in what is now the Basin Dakota Gas Pool in the fall of 1959, and now operates some 70 Dakota wells, approximately 12 of which were drilled in 1962 and approximately 35 drilled in 1961. Southwest is the sole working interest owner in these wells, except where it was necessary to communitize or pool tracts owned by the leaseholders within the drilling unit.

Southwest did the major part of the development under the present proration rules, and has found them fair and workable, allowing us to produce our share of recoverable reserves.

If our sand development is so poor that we cannot drain the gas under our acreage, we do not feel that an offset operator with better sand can drain our gas from the same poor sand and that no violation of correlative rights occurs. Therefore we feel that the present formula giving much value to deliverability is equitable, and that no change in the formula should be made at this time.

Carl W. Smith

CARL W. SMITH
General Superintendent
Southwest Production Co.

OIL CONSERVATION COMMISSION
1962 APR 17 PM 1 20

VERITY, BURR & COOLEY
ATTORNEYS AND COUNSELORS AT LAW
SUITE 152 PETROLEUM CENTER BUILDING
FARMINGTON, NEW MEXICO

GEO. L. VERITY
JOEL B. BURR, JR.
WM. J. COOLEY

NORMAN S. THAYER
RAY B. JONES

TELEPHONE 325-1702

April 16, 1962

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Case No. 2504, Application of
Consolidated Oil & Gas, Inc. for
an amendment of Order R-1670-C

Gentlemen:

Please enter our appearance in the captioned matter on behalf of Aztec Oil & Gas Company. Mr. Kenneth A. Swanson, of the Dallas Bar, will appear in this case and we will appreciate your allowing his appearance at the Commission in our absence.

Very truly yours,

VERITY, BURR & COOLEY

By Geo. L. Verity

GLV/dh

cc: Mr. Kenneth A. Swanson

ATWOOD & MALONE
LAWYERS

1962 APR 16 AM 8:23

JEFF D. ATWOOD (1883-1960)
ROSS L. MALONE
CHARLES F. MALONE
RUSSELL D. MANN
PAUL A. COOTER
BOB F. TURNER

P. O. DRAWER 700
TELEPHONE MAIN 2-6221
ROSWELL PETROLEUM BUILDING
ROSWELL, NEW MEXICO

April 12, 1962

New Mexico Oil Conservation Commission
State Land Office Building
Post Office Box 871
Santa Fe, New Mexico

Re: Docket of April 18, 1962,
Cases No. 2504, 2049 and 1641

Gentlemen:

As local counsel for Pan American Petroleum Corporation, we enclose herewith our Entry of Appearance with Guy Buell of the Texas Bar, in the cases referred to above.

Very truly yours,

Ross L. Malone

for ATWOOD & MALONE

RLM:ps
encl.
cc: J. K. Smith, Esquire
Pan American Petroleum Corp.
Oil and Gas Building
Fort Worth, Texas

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

DENVER CLUB BUILDING
DENVER 1, COLORADO
PRODUCTION & ENGINEERING DEPT.
ADDRESS ALL CORRESPONDENCE TO
POST OFFICE BOX 180

1962 APR 16 AM 8:25

April 12, 1962

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: Case 2504 - Docket 12-62
Regular Hearing - April 18, 1962

Gentlemen:

The British-American Oil Producing Company will be unable to have a representative present during the hearing of Case 2504. Since our company operates wells in the Basin-Dakota Gas Pool, San Juan County, New Mexico, we wish to reiterate our position in this case. Our company's position to all concerned is herewith quoted from our telegram of March 13, 1962, sent to the New Mexico Oil Conservation Commission on subject case which was to have been heard on March 14, 1962.

"As one of the many operators active in the Basin-Dakota Gas Pool, The British-American Oil Producing Company recognizes that under the present proration formula, the continuously decreasing well deliverability, coupled with the current limited gas market, results in well allowables that might be construed as inequitable. The fixing of a minimum and maximum allowable has some merit. British-American, however, does not feel that a change to a predominantly acreage proration formula or the instigation of a minimum or maximum allowable is justified for the following reasons:

1. Gas purchase contracts and pool development to date have been motivated by well deliverability, thus penalties should not now be inflicted by changing to a predominantly acreage proration formula.
2. Predominance of well deliverability in the proration formula is necessary to provide incentive and reward for employment of best well completion methods.
3. Any consideration in proration for minimum and maximum well allowables could conceivably encourage pool development on an unsound and an uneconomical basis, resulting in the drilling of unnecessary wells.

It is therefore urged that the Commission retain the current gas proration formula. In the alternative, should a change in the proration formula be dictated, deliverability should continue to be the predominant factor. No maximum or minimum allowable limitation is recommended."

Respectively yours,

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

Thomas M. Hogan
District Superintendent

SOG/lld

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

MAIN OFFICE OCC
W. P. MARSHALL, PRESIDENT

SYMBOLS
DL = Day Letter
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1962 MAR 13 PM 1:55

LA162MAR 13 PM 1:55

KL DVA201 RX LONG PD=K DENVER COLO 13 118P MST=

NEW MEXICO OIL CONSERVATION COMMISSION=

STATE LAND OFFICE BLDG SANTAFE NMEX=

Case 2504

RE: CONSERVATION COMMISSION HEARING, MARCH 14, 1962, DOCKET 8-62, CASE 2504, PROPOSED CHANGE OF PRORATION FORMULA, BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

AS ONE OF THE MANY OPERATORS ACTIVE IN THE BASIN-DAKOTA GAS POOL, HE BRITISH-AMERICAN OIL PRODUCING COMPANY RECOGNIZES THAT UNDER THE PRESENT PRORATION FORMULA, THE CONTINUOUSLY DECREASING WELL DELIVERABILITY COUPLED WITH THE CURRENT LIMITED GAS MARKET RESULTS IN WELL ALLOWABLES THAT MIGHT BE CONSTRUED AS INEQUITABLE. THE FIXING OF A MINIMUM AND MAXIMUM ALLOWABLE HAS SOME MERIT. BRITISH-AMERICAN HOWEVER DOES NOT FEEL THAT A CHANGE TO A PREDOMINANTLY ACREAGE PRORATION FORMULA OR THE INSTIGATION OF A MINIMUM OR MAXIMUM ALLOWABLE IS JUSTIFIED FOR THE FOLLOWING REASONS:

1. GAS PURCHASE CONTRACTS AND POOL DEVELOPMENT TO DATE HAVE BEEN MOTIVATED BY WELL DELIVERABILITY, THUS PENALTIES SHOULD NOT NOW BE INFLICTED BY CHANGING TO A PREDOMINANTLY ACREAGE PRORATION FORMULA.

2. PREDOMINANCE OF WELL DELIVERABILITY IN THE PRORATION FORMULA IS NECESSARY TO PROVIDE INCENTIVE AND REWARD FOR EMPLOYMENT OF BEST WELL COMPLETION METHODS.

MEMORIAL SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
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WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1220
R-4-60

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3. ANY CONSIDERATION IN PRORATION FOR MINIMUM AND MAXIMUM WELL ALLOWABLES COULD CONCEIVABLY ENCOURAGE POOL DEVELOPMENT ON AN UNSOUND AND AN UNECONOMICAL BASIS, RESULTING IN THE DRILLING OF NECESSARY WELLS.

IT IS THEREFORE URGED THAT THE COMMISSION RETAIN THE CURRENT GAS PRORATION FORMULA. IN THE ALTERNATIVE, SHOULD A CHANGE IN THE PRORATION FORMULA BE DICTATED, DELIVERABILITY SHOULD CONTINUE TO BE THE PREDOMINANT FACTOR. NO MAXIMUM OR MINIMUM ALLOWANCE LIMITATION IS RECOMMENDED=

THOMAS M HOGAN DISTRICT SUPERINTENDENT
THE BRITISH-AMERICAN OIL PRODUCING CO=

MAIN OFFICE OCC
1962 MAR 13 PM 1:55

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

MAIN OFFICE OCC
1962 APR 10 PM 1 : 21

BRUCE ANDERSON
OIL AND GAS PROPERTIES
SUITE 930
THE PETROLEUM CLUB BUILDING
DENVER 2, COLORADO

TELEPHONE ALPINE 5-3428

Case 2504
psm

April
9
1962

Oil Conservation Commission
Santa Fe
New Mexico

Dear Sirs:

As of this date, we are commencing the drilling of a well in the Basin gas pool of San Juan County, New Mexico, in Section 29-31N-13W.

We have locations for approximately five wells in this immediate area, but, under the present proration formula, we will only be able to drill one well which is drilled primarily to hold our lease. Both the Beard Oil Company, of Oklahoma City, who is joining with me in this well and myself feel that the present formula gives far too much credit to initial deliverability. In a fractured reservoir such as the Dakota, it allows certain wells and areas to unfairly drain the reserves of their neighbors.

While our wells are shut-in because of the formula, the gas from our lease migrates to other leases where they may have a better frac pattern but no better reserves to be giving them higher allowables.

Both the Beard Oil Company and myself join in earnestly requesting that you change the formula whereby it is based 75% on land and only 25% on deliverability. This would seem infinitely more fair to us. We make this statement before we have completed our first well, and, if we are one of the lucky ones who happen to get a frac pattern that would give us high deliverability, I would still stand by my statement that the present formula is definitely inequitable. Should you change the present formula, I am quite sure that we would go ahead with the drilling of our lease since the economics of our payout would them be present.

Sincerely yours,

BRUCE ANDERSON

BA-sam

TIDEWATER OIL COMPANY
BOX 1404 HOUSTON 1, TEXAS
PRORATION AND [illegible]
D. H. CONNELL, JR., MANAGER
JOHN S. CAMERON, JR., SUPERVISOR OF PRORATION
EVERETT HARGRAVE, SUPERVISOR OF UNITIZATION

NEW MEXICO OCC
1962 APR 9 AM 8 11

April 6, 1962

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.
Secretary - Director

Gentlemen:

Re: Case 2504

This is regarding the subject application of Consolidated Oil & Gas, Inc. for an amendment to Rule 9 (c) of Order R-1670 for the Basin - Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.

Since I will be unable to attend this hearing on April 18, 1962, I wish to reiterate Tidewater's position as stated at the first hearing on this matter held March 14, 1962. Tidewater Oil Company concurs with Consolidated's application and hereby respectfully urges the Commission to revise the allocation formula applicable to this pool as requested by Consolidated.

Very truly yours,

TIDEWATER OIL COMPANY

John S. Cameron Jr.

JOHN S. CAMERON, JR.

JSC:mp
cc: Consolidated Oil & Gas, Inc.
1700 Broadway
Denver 2, Colorado
Attn: Mr. Robert B. Tenison, Vice President

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

Case 2504

March 21, 1962

Mr. A. M. Wiederkehr, Vice-President
Exploration & Gas Supply
Southern Union Gas Company
Fidelity Union Tower
Dallas 1,Texas

Dear Mr. Wiederkehr:

Although it is possible that Consolidated Oil & Gas Company's application may not be heard until the morning of April 19th, it was definitely continued to April 18th, and if the other cases on the docket are disposed of in time, a portion of the testimony in the Consolidated case will be heard on the 18th.

At the time the Commission decided to continue the case, we considered continuing it to the 19th, but due to the tight schedule of the governor and Land Commissioner we decided that a portion of the case should be heard on the 18th if at all possible.

As you probably know, the Angels Peak and Devils Fork cases are scheduled for the same day.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

cc: Mr. Jason Kellahin
P. O. Box 1713
Santa Fe, New Mexico

MAIN OFFICE OCC
1962 MAR 21 PM 1:34

SOUTHERN UNION GAS COMPANY
FIDELITY UNION TOWER
DALLAS 1, TEXAS

A. M. WIEDERKEHR
VICE-PRESIDENT
EXPLORATION AND SUPPLY

March 19, 1962

Mr. A. L. Porter
New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Dear Mr. Porter:

It is my understanding that Consolidated Oil & Gas Company's application to change the Dakota proration rules has been re-scheduled for April 18th at the regular state wide hearing.

Southern Union Gas Company and Southern Union Production Company are materially interested in this case, but will have some difficulty being represented on the 18th due to the fact that we are having our annual stockholder's meeting on that date. It would be very much appreciated if this hearing could be set for the following day in order to allow us to be totally represented.

Your consideration to the above request will be appreciated.

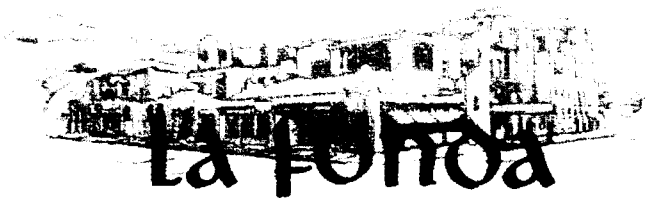
Yours very truly,

SOUTHERN UNION GAS COMPANY

A. M. Wiederkehr

AMW:t

cc: Mr. Jason W. Kellahin
54½ E. San Francisco
Santa Fe, New Mexico



the inn at the end of the trail

On the Plaza Santa Fe, New Mexico Telephone 6-5511 Telegrams Santa Fe N.M. 5801

3-14-62

N.M. Oil Conserv. Comm.
Santa Fe. N M.

Re Basin Dakota Hearing

Gentlemen:

As an operator in the Basin Dakota Pool we wish to be recorded as opposing a change in the proration formula at this time.

Redfern & Herd. Inc
John J. Redfern Jr.

CLASS OF SERVICE
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WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

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1220 R-4-60

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1952 MAR 13 AM

LA009 KA062

K BVA131 LONG NL PD=FAX DENVER COLO 12=

NEW MEXICO OIL CONSERVATION COMMISSION=

SANTAFE NMEX=

RE: HEARING OF CASE NO. 2504 TN MARCH 14: THE FRONTIER REFINING COMPANY SUPPORTS THE APPLICATION OF CONSOLIDATED OIL & GAS, INC. RECOMMENDING AN ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL BASED 60 0/0 ON ACREAGE AND 40 0/0 ON ACREAGE TIMES DELIVERABILITY.

¶ WE BELIEVE THE PROPOSED FORMULA WILL MORE EQUITABLY ALLOCATE ALLOWABLE PRODUCTION FROM THIS RESERVOIR, WITHOUT CONTINUED DISCRIMINATION AGAINST WELLS WITH EQUAL ORIGINAL RESERVES BUT WITH LOWER DELIVERABILITY=

THE FRONTIER REFINING CO BY E B GRANVILLE
SUPERINTENDENT OF DRILLING AND PRODUCTION...

1952 MAR 13 AM 9:40

MAIN OFFICE OCC

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

MAIN OFFICE OCC

AMERADA PETROLEUM CORPORATION

1962 MAR 14 AM 8 05

2040

TULSA 2, OKLA.

LEGAL DEPARTMENT

March 12, 1962

New Mexico Oil Conservation Commission
State Land Office Building
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504 - Application by Consolidated Oil & Gas, Inc., to amend the allocation formula in the Basin-Dakota Gas Pool

Gentlemen:

Amerada Petroleum Corporation, owner and operator of three wells and part owner of eleven wells in the area covered by caption cause, supports the applicant in Case No. 2504.

Although we oppose the inclusion of a deliverability factor in any allocation formula, we support the applicant's position here because he is asking for greater weight of the acreage factor in the amended order.

Very truly yours,

AMERADA PETROLEUM CORPORATION

By H. D. Bushnell
H. D. Bushnell, Attorney

HDB:1

cc Consolidated Oil & Gas, Inc.
Suite 2112 Tower Bldg.
1700 Broadway
Denver 2, Colorado
Att.: Mr. Robert B. Tenison

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WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

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1201 (4-60)

MAIN OFFICE OCC

1962 MAR 12 AM 10 31

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LA09 1962 MAR 12 AM 10:54

D FWA179 RX PD=FAX FORT WORTH TEX 12 1100A CST=
NEW MEXICO OIL CONVERSATION COMMISSION=
BOX 871 SANTA FE NMEX=

2504

PURSUANT TO YOUR MARCH 14TH. MEETING, KAY KIMBELL SHOULD LIKE TO GO ON RECORD AS OPPOSING THE PRESENT ALLOWABLE FORMULA IN THE SAN JUAN BASIN. IT IS CLEAR TO SEE THE FALLACY IN THIS FORMULA WHEN 10 O/O OF THE WELLS GET 40 O/O OF THE TOTAL ALLOWABLE. WE FEEL THE COMMISSION SHOULD ADOPT A NEW FORMULA WHICH WOULD PERMIT THE WELLS IN THE LOWER DELIVER ABILITY RANGE TO PAY OUT. THE MAJORITY OF THE OPERATORS ARE NOW HARNESSED WITH

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

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SUCH WELLS. WE RECOMMEND A NEW FORMULA BASED ON A HIGHER ACREAGE FACTOR=

KAY KIMBELL OIL OPERATOR BY: SAM W SIMS JR.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Consolidated Oil & Gas, Inc.

Executive Offices
SUITE 2112 TOWER BLDG.
DENVER-U.S. NATIONAL CENTER
1700 BROADWAY
DENVER 2, COLORADO
PHONE AMHERST 6-1306

File
MAIL OFFICE OCC
1962 FEB 5 AM 8:19

February 2, 1962

Mr. F. D. Gorham, Jr.
Pubco Petroleum Corporation
P. O. Box 1419
Albuquerque, New Mexico

Dear Mr. Gorham:

With reference to your letter of January 31, we would like to bring to your attention the fact that the Dakota formula has been in effect for one year to date, and was put into effect with the proviso that further study would be given to the necessity or desirability for affixing a maximum and minimum allowable per well. To date no hearing has been held with respect to this matter. Our intention is to demonstrate the present inequities which our study has revealed and to have an open discussion of any approach to what we feel is a common problem.

Representation has been indicated from a substantial number of the operators and additionally, Mr. Jack Cooley of Verity, Burr and Cooley in Farmington, has requested an opportunity to present support for the pending application for Basin-wide Dakota oil well spacing. Regardless of your apparent lack of sympathy for a change in the Dakota formula, we again extend to you, or your representative, an invitation to the meeting and would appreciate the opportunity to review any evidence you desire to present supporting continuation of the present formula. It is not our intention to bring up any discussion as to the application of the formula to Mesa Verde and Pictured Cliffs proration.

Very truly yours,

CONSOLIDATED OIL & GAS, INC.

Robert B. Tenison

Robert B. Tenison
Vice President

RBT:bw

cc: San Juan Basin Operators
New Mexico Oil & Gas Conservation Commission
United States Geological Survey

PUBCO PETROLEUM CORPORATION

MAIN OFFICE OCC

1962 JAN 1 AM 8:14

January 31, 1962

COPY

Consolidated Oil and Gas Company
2112 Tower Building
1700 Broadway
Denver, Colorado

Attention: Mr. Robert Tenison

Gentlemen:

This is to acknowledge your letter of January 19 inviting us to attend a meeting which you are calling for the purpose of proposing a change in the proration formula as it pertains to the Dakota Formation in the San Juan Basin.

Since the establishment of this formula by the New Mexico Oil Conservation Commission, we have continuously followed developments in the San Juan Basin and are even more convinced now than at the time of the adoption of the formula that it is fair and equitable to everyone concerned. Under these circumstances we see no reason for any consideration or attempt to change the formula which has worked satisfactorily for a number of years.

In view of our position and the belief that there is no reason for the meeting, we do not propose to attend and, if necessary, we plan to oppose any change in the formula to the maximum extent.

Very truly yours,

Frank D. Gorham, Jr.
Executive Vice President

FDGJr:GJSJr:gt

cc: New Mexico Oil and Gas Conservation
San Juan Operators

D. W. Reeves

Case 2504

Consolidated Oil & Gas, Inc.

Executive Offices
SUITE 2112 TOWER BLDG.
DENVER-U.S. NATIONAL CENTER
1700 BROADWAY
DENVER 2, COLORADO
PHONE AMHERST 6-1306

MAIN OFFICE OCC
1962 JAN 22 AM 8:40

January 19, 1962

SAN JUAN BASIN OPERATORS

Gentlemen:

We have done extensive work and study or the Dakota formation in the San Juan Basin with specific emphasis on the present allowable formula. Our findings indicate an inequity exists under this formula as related to payout and depletion of reserves.

Our present plans are to apply to the New Mexico Oil & Gas Conservation Commission for a hearing to change the formula for the Dakota formation in the near future. Prior to making this application, we would like to have a meeting of all interested operators to illustrate the work that we have done and review any approach other operators might have to the problem. In general, to see if we can reach an agreement as to what would be fair and equitable for all concerned.

We hereby tender you an invitation to a meeting to be held at 9 a.m., February 6, 1962, at the Petroleum Club in Denver, Colorado. We sincerely hope that all interested parties will be present and would appreciate your advising us whether or not you will have a representative at the meeting.

Very truly yours,

CONSOLIDATED OIL & GAS, INC.

Robert B. Tenison
Vice President

RBT:bw
Attachment

Attached Letter Sent To:

Adobe Oil Company

Amerada Petroleum Corp.

Aspen Crude Purchasing Co.

Aztec Oil & Gas Company

Atlantic Refining Co.

Benson-Montin-Greer Drilling Corp.

British-American Oil Production Co.

Caulkins Oil Company

Compass Exploration, Inc.

Delhi-Taylor Oil Corporation

El Paso Natural Gas Company

El Paso Natural Gas Products Co.

Frontier Refining Co.

Gulf Oil Corporation

International Oil Corporation

Kay Kimball

La Plata Gathering System

Northwest Production Corporation

Occidental Petroleum Corporation

Pan American Petroleum Corporation

Pubco Petroleum Corporation

Skelly Oil Company

Southern Union Gas Company

Southwest Production, Inc.

Sunray Mid-Continent Oil Company

Sunset International Petroleum Corporation

Tidewater Oil Company

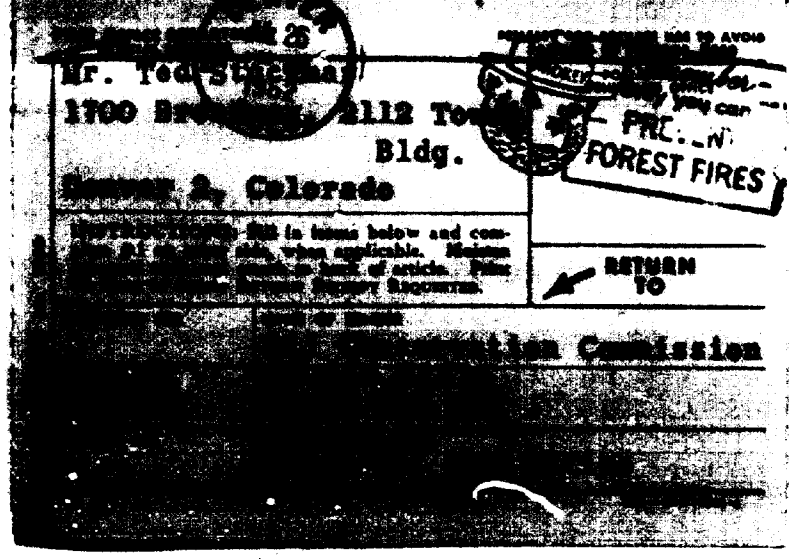
New Mexico Oil & Gas Conservation Commission - Aztec & Santa Fe

United States Geological Survey Farmington & Roswell

RECEIPTS RETURNED - CERTIFIED MAIL SENT OUT

JULY 26th TO INTERESTED PARTIES IN CASE 3004

(CONSOLIDATED OIL & GAS)



No. 859073

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Ted Stahman

STREET AND NO.
1700 Broadway - 2112 Tower Bldg.

CITY AND STATE
Denver 2, Colorado

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Mr. Jason Kellahin

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Box 1713

CITY AND STATE
Santa Fe New Mexico

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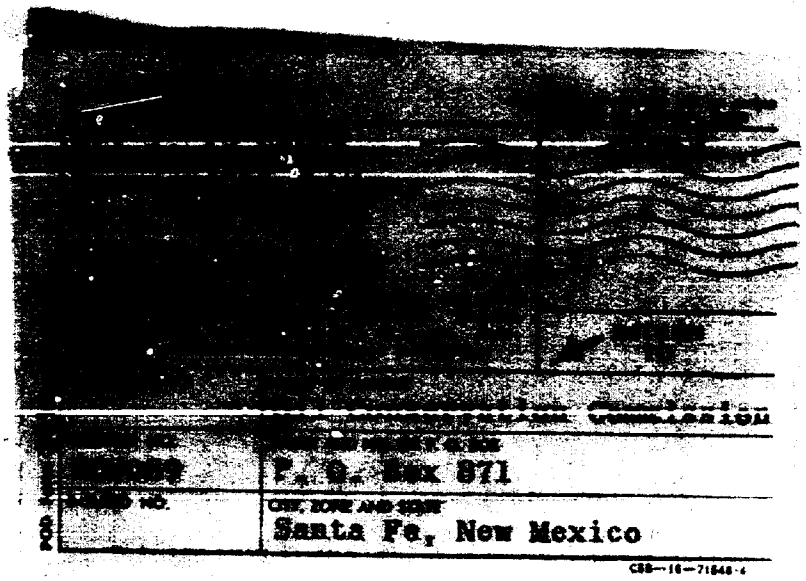

No. 859089

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. J. J. Lacey

STREET AND NO.
P.O. Box 1714

CITY AND STATE
Durango, Colorado

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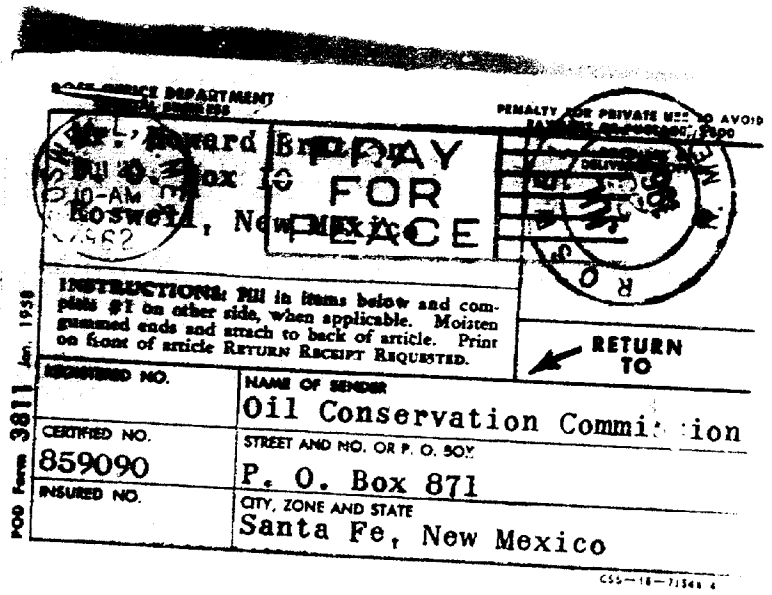

No. 859090

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Howard Bratton

STREET AND NO.
P.O. Box 10

CITY AND STATE
Roswell, New Mexico

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PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. George Selinger
Skelly Oil Company
P. O. Box 1650
Tulsa 2, Oklahoma

OFFICIAL DELIVERY ESTABLISHED
JUL 26 1962
OKLA

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

Oil Conservation Commission

No. 859091

RECEIPT FOR CERTIFIED MAIL—20¢

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Mr. George Selinger
STREET AND NO.
P.O. Box 1650
CITY AND STATE
Tulsa 2, Oklahoma

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Apr 1960

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No. 859092

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. P. J. Farnelly
STREET AND NO.
101 University Boulevard
CITY AND STATE
Denver 6, Colorado

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☐ 15¢ shows to whom, when, and address where delivered
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Apr 1960

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Santa Fe, New Mexico

CSS—16—71548-4

No. 859093

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Ray C. Yates
STREET AND NO.
323 Midland Tower
CITY AND STATE
Midland Texas

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Apr 1960

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POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. Oliver Seth
Box 828
Santa Fe, New Mexico

POSTMARK OF DELIVERING OFFICE

NEW MEXICO STATEHOOD 1912 - 1962 GOLDEN ANNIVERSARY

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REGISTERED NO.	NAME OF SENDER
	Oil Conservation Commission
CERTIFIED NO. 859094	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

CSS—16—71548-4

No. 859094

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Oliver Seth
STREET AND NO.
Box 828
CITY AND STATE
Santa Fe, New Mexico

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☐ 15¢ shows to whom, when, and address where delivered
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#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Mr. Selinger SKELLY Oil Co.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

A. L. Daniel

DATE DELIVERED: JUL 20 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

C55—16—71548-4 GPO

POST OFFICE DEPARTMENT OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. Howard Bratton
P. O. Box 10
Roswell, New Mexico

POSTMARK OF DELIVERING OFFICE

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RETURN TO

REGISTERED NO.	NAME OF SENDER
	Oil Conservation Commission
CERTIFIED NO. 859090	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

COLORADO EXPLORATION, INC.
1700 BROADWAY BOULEVARD
DENVER 2, COLORADO

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: 7-26-62

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

C55—16—71548-4 GPO

POST OFFICE DEPARTMENT OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. T. J. [illegible]
Texaco Inc. Agency
P. O. Box 2114
Durango, Colorado

POSTMARK OF DELIVERING OFFICE

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER
	Oil Conservation Commission
CERTIFIED NO. [illegible]	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Roy C. Jeter

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Barbara Fasset

DATE DELIVERED: JUL 21 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

C55—16—71548-4 GPO

POST OFFICE DEPARTMENT DENVER 26 JUL 1962

Mr. Ted [illegible]
1700 Broadway, [illegible] Tower
Bldg.
Denver 2, Colorado

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER
	Oil Conservation Commission
CERTIFIED NO. 859073	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

C55—16—71548-4

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Oliver Seth

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

C Barker

DATE DELIVERED: 7-25-62 JUL 24

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

C55—16—71548-4 GPO

POST OFFICE DEPARTMENT OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. Jason McLahin
Box 1713
Santa Fe, New Mexico

SANTA FE JUL 25 6 PM 1962 N. MEX.

POSTMARK OF DELIVERING OFFICE

NEW MEXICO STATEHOOD
1912 - 1962
GOLDEN ANNIVERSARY

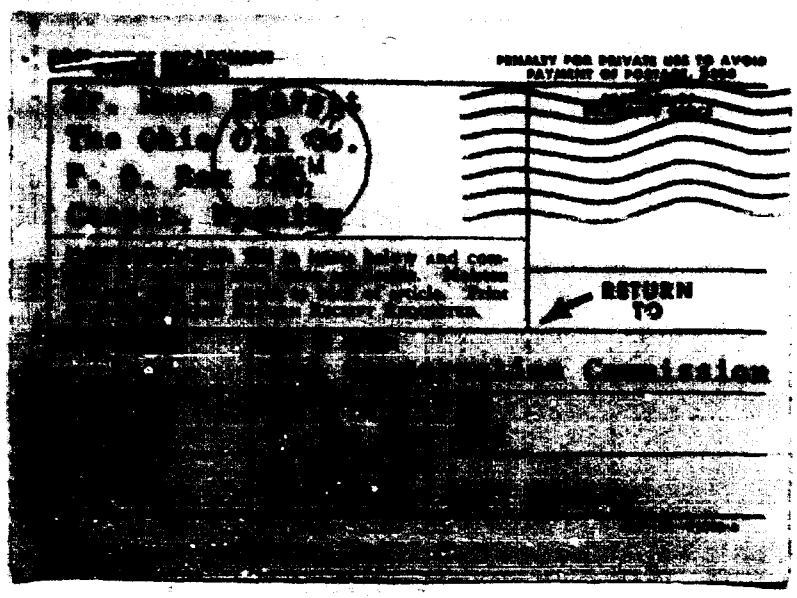
INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER
	Oil Conservation Commission
CERTIFIED NO. 859072	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

C55—16—71548-4



RETURN TO

Oil Conservation Commission

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859095

SENT TO
Mr. Hume Everett

STREET AND NO.
P. O. Box 120

CITY AND STATE
Casper Wyoming

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered

If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859096

SENT TO
Mr. Ben Howell

STREET AND NO.
Box 1492

CITY AND STATE
El Paso, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered

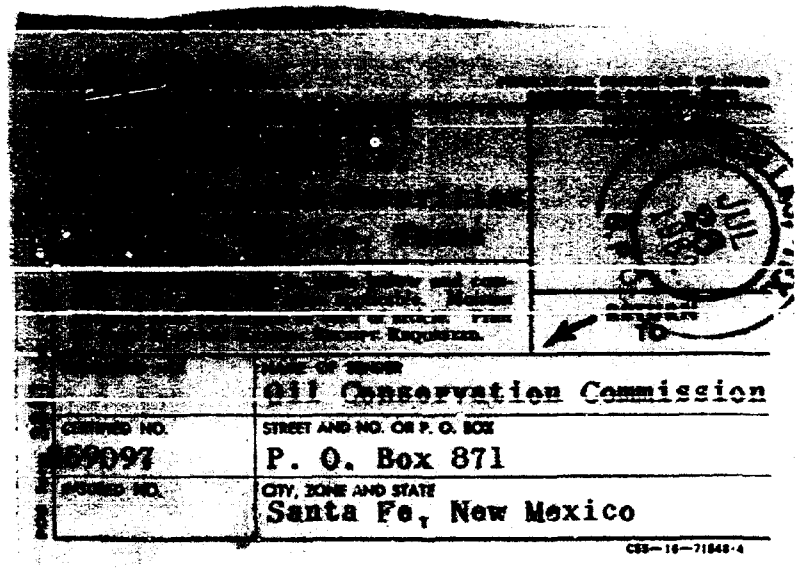
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE



Oil Conservation Commission

CERTIFIED NO. 859097	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

CSS—16—71848-4

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859097

SENT TO
Mr. Kenneth Swanson

STREET AND NO.
920 Mercantile Security Bldg

CITY AND STATE
Dallas 1, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered

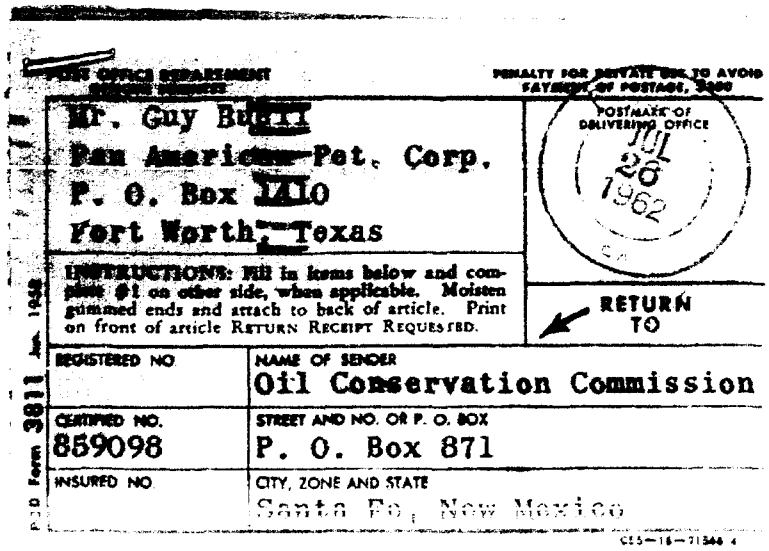
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE



POST OFFICE DEPARTMENT

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. Guy Buell
Pan American Pet. Corp.
P. O. Box 1410
Fort Worth, Texas

POSTMARK OF DELIVERING OFFICE
JUL 26 1962

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO	NAME OF SENDER Oil Conservation Commission
CERTIFIED NO. 859098	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO	CITY, ZONE AND STATE Santa Fe, New Mexico

P.O. Form 3811 Jan. 1958

CSS—16—71846-4

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859098

SENT TO
Mr. Guy Buell

STREET AND NO.
P. O. Box 1410

CITY AND STATE
Fort Worth, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered

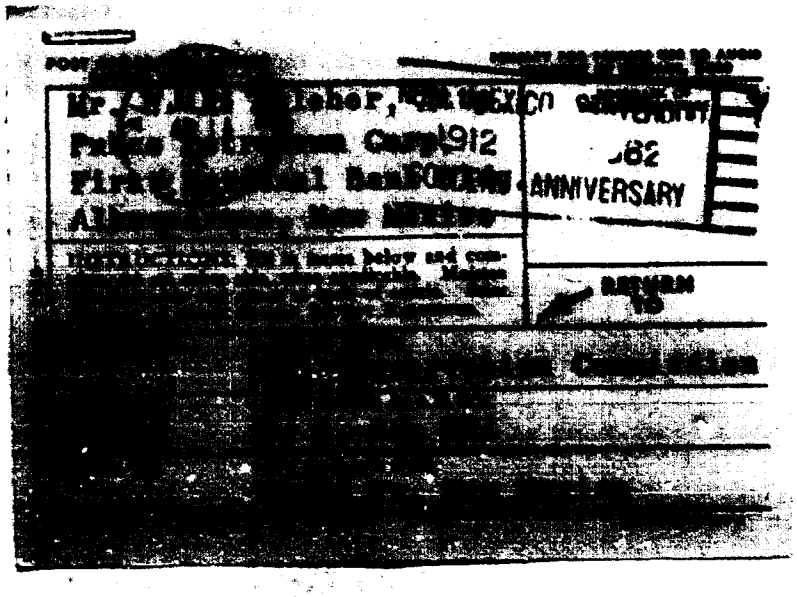
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE



No. 859099

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Mr. W. A. Ketchum, Manager
STREET AND NO.: First National Bank Bldg.
CITY AND STATE: Albuquerque, N. M.

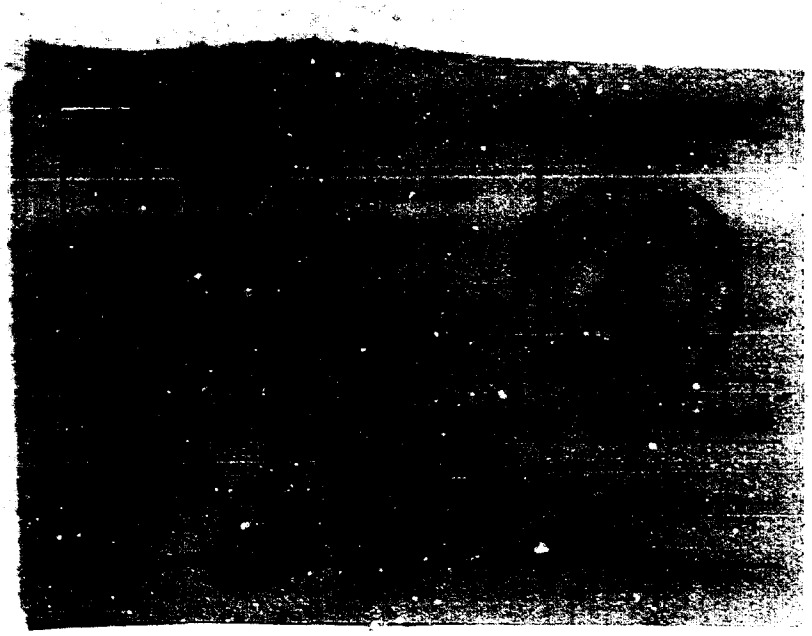
If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE



No. 859100

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Mr. Bob Wynn
STREET AND NO.: Fidelity Union Tower
CITY AND STATE: Dallas, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

POST OFFICE DEPARTMENT

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

POSTMARK OF DELIVERING OFFICE

RETURN TO

CERTIFIED NO. 859034
INSURED NO.

NAME OF SENDER: Oil Conservation Commission
STREET AND NO. OR P. O. BOX: P. O. Box 871
CITY, ZONE AND STATE: Santa Fe, New Mexico

No. 859034

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Mr. George Eaton
STREET AND NO.: P.O. Box 480
CITY AND STATE: Farmington, N. M.

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

POST OFFICE DEPARTMENT

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. George E. Mills
The Atlantic Refining Co.
P. O. Box 379
Durango, Colorado

POSTMARK OF DELIVERING OFFICE

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO
CERTIFIED NO. 859101
INSURED NO.

NAME OF SENDER: Oil Conservation Commission
STREET AND NO. OR P. O. BOX: P. O. Box 871
CITY, ZONE AND STATE: Santa Fe, New Mexico

POD Form 3811 Jan. 1958

No. 859101

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Mr. George E. Mills
STREET AND NO.: The Atlantic Rfg Co.
CITY AND STATE: Durango, Colorado

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

W A Kelleher

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

E E McConaby

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Hume Everett

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Gale Clarke

DATE DELIVERED

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Dutch Taylor

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Jane B Taylor

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

EL PASO NATURAL GAS CO.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Frazie Conley

DATE DELIVERED: JUL 25 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

George Eaton

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

David E Dicken

DATE DELIVERED: JUL 25 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Aztec Oil & Gas Co.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Genevieve L Ninger

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

George Mills

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

W E Baker

DATE DELIVERED

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

PAN AMERICAN PETROLEUM CORPORATION

Guy Brett

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Robert L Nicholson

DATE DELIVERED

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

Roger Kelly

[illegible], New Mexico STATEHOOD

P. O. Box 752 1912 - 1962

[illegible], N. Mex. ANNIVERSARY

RETURN TO

[illegible] Conservation Commission

[illegible]

[illegible]

[illegible]

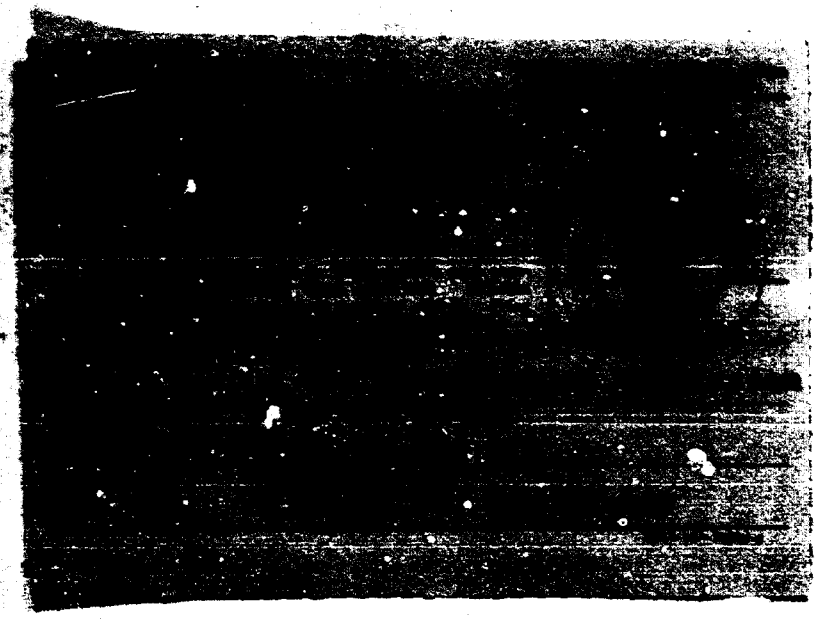
Bruce [illegible] Oil & G[illegible]
[illegible] Property
Suite 930, Pet. Club Bl[illegible]
Denver 2, Colorado

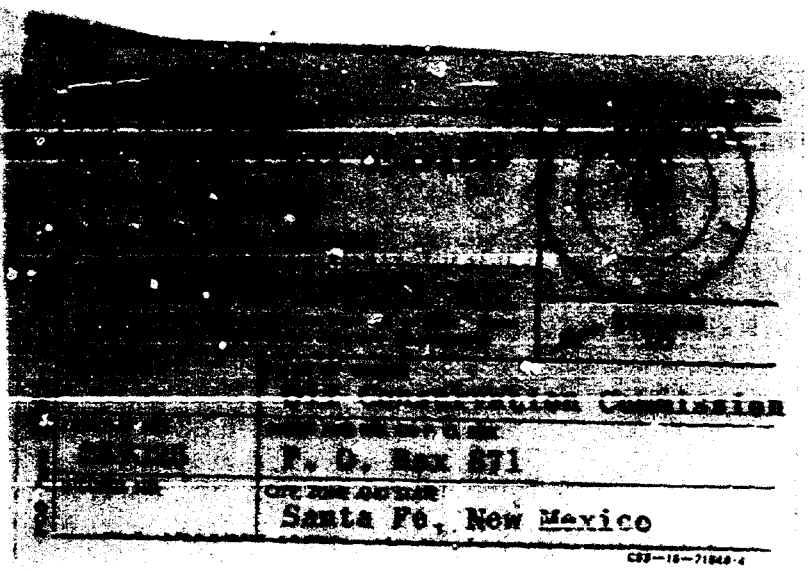
INSTRUCTIONS: Fill in items below and comp[illegible] #1 on other side, when applicable. Moisten [illegible] and attach to back of article. Print [illegible] Return Receipt Requested.

RETURN TO
Oil Conservation Commission

19h2

Only you can PRE...NT FOREST FIRES





P. O. Box 871
Santa Fe, New Mexico

CSS—16—71848-4

POST OFFICE DEPARTMENT
PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. E. S. Morris
Pioneer Production Corp.
P. O. Box 2542
Amarillo, Texas

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

AUG 1 1962 AMARILLO, TEX.

RETURN TO

REGISTERED NO.
CERTIFIED NO. 859026
INSURED NO.

NAME OF SENDER
Oil Conservation Commission

STREET AND NO. OR P. O. BOX
P. O. Box 871

CITY, ZONE AND STATE
Santa Fe, New Mexico

POD Form 3811 Jan 1958

CSS—16—71548-4

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859023

SENT TO
Bruce [illegible] Oil & Gas Properties
STREET AND NO.
Suite 930 Petroleum Club Bldg
CITY AND STATE
Denver 2, Colorado

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859024

SENT TO
Mr. E. B. Granville
STREET AND NO.
4040 E. Louisiana Ave.
CITY AND STATE
Denver 22 Colorado

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859025

SENT TO
Mr. Sam Sims
STREET AND NO.
P.O. Box 1540
CITY AND STATE
Fort Worth, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

RECEIPT FOR CERTIFIED MAIL—20¢

No. 859026

SENT TO
Mr. E. S. Morris
STREET AND NO.
Pioneer Production Corp
CITY AND STATE
P.O. Box 2542
Amarillo, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Bruce Anderson

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

S. McGuinness

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

William Banks Kelly

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Wm B Kelly

DATE DELIVERED: 7/25/62

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

FRONTIER REFINING CO.
4040 E. LOUISIANA AVE.
DENVER 22, COLORADO

B. Clare

JUL 26 19

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

P. Tinnell

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

SAM SIMMS

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

G F Freeman

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Gay Freeman

DATE DELIVERED

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☒ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

E. A. Morris

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: AUG 1 1962

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Tidewater Oil

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

C J Landro

DATE DELIVERED: JUL 26 19

ADDRESS WHERE DELIVERED *(only if requested in item #1)*

POST OFFICE DEPARTMENT

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. John J. Redfern
1203 Wilco Building
Midland, Texas

JUL 25 1962 TEX ANNEX

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.

NAME OF SENDER
Oil Conservation Commission

CERTIFIED NO.
859029

STREET AND NO. OR P. O. BOX
P. O. Box 871

INSURED NO.

CITY, ZONE AND STATE
Santa Fe, New Mexico

POD Form 3811 Jan. 1948

C55—16—71548-4

No. 859027

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. John J. Redfern

STREET AND NO.
1203 Wilco Building

CITY AND STATE
Midland, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 15¢ shows to whom, when, and address where delivered

If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1959

SEE OTHER SIDE

No. 859028

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Carl W. Smith

STREET AND NO.
204 Petroleum Club Plaza

CITY AND STATE
Farmington N. M.

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 15¢ shows to whom, when, and address where delivered

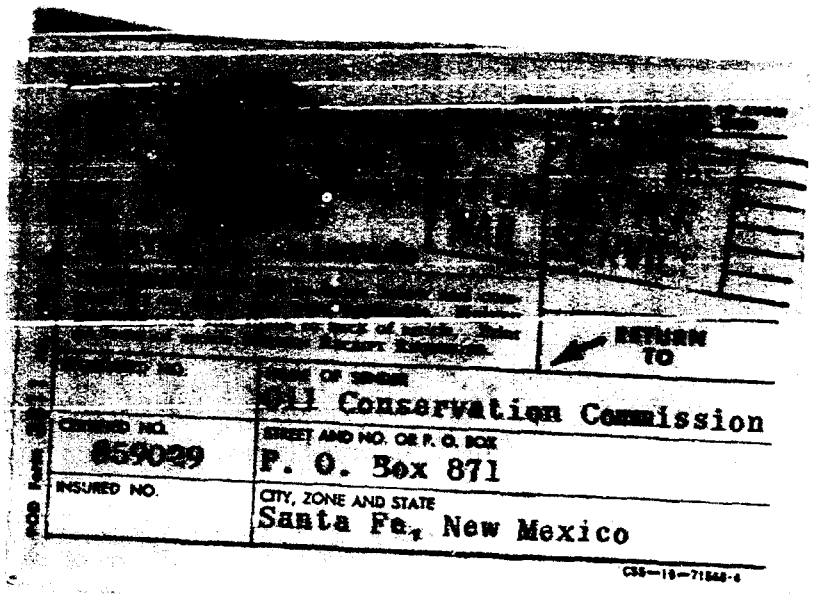
If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1959

SEE OTHER SIDE



No. 859029

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Thomas M. Hagan

STREET AND NO.
P.O. Box 180

CITY AND STATE
Denver, Colorado

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 15¢ shows to whom, when, and address where delivered

If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1959

SEE OTHER SIDE

POST OFFICE DEPARTMENT

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. Bob Black
Taxaco Incorporated
P. O. Box 3109
Midland, Texas

JUL 26 1962 TEX ANNEX

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.

NAME OF SENDER
Oil Conservation Commission

CERTIFIED NO.
859030

STREET AND NO. OR P. O. BOX
P. O. Box 871

INSURED NO.

CITY, ZONE AND STATE
Santa Fe, New Mexico

POD Form 3811 Jan. 1948

C55—16—71548-4

No. 859030

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Bob Black

STREET AND NO.
P. O. Box 3109

CITY AND STATE
Midland, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 15¢ shows to whom, when, and address where delivered

If you want restricted delivery, check here
☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1959

SEE OTHER SIDE

W. L. Mitchell, Atty.
Amerada Petroleum Corp.
P. O. Box 2040
Tulsa 2, Oklahoma

JUL 1962 OKLA

RETURN

No. 859031

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr W. L. Mitchell
STREET AND NO.
P.O. Box 2040
CITY AND STATE
Tulsa 2 Oklahoma

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

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No. 859032

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Paul Cootes
STREET AND NO.
P.O. Drawer 700
CITY AND STATE
Roswell New Mexico

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

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Apr 1960

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PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

RETURN TO

REGISTERED NO.	NAME OF SENDER
CERTIFIED NO. 859033	STREET AND NO. OR P. O. BOX P. O. Box 871
INSURED NO.	CITY, ZONE AND STATE Santa Fe, New Mexico

No. 859033

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
Mr. Gene L. Verity
STREET AND NO.
152 Petroleum Centre Bldg
CITY AND STATE
Farmington N. M.

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

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POSTMARK OR DATE

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PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

Mr. David H. Rainey
El Paso Natural Gas Company
P. O. Box 1492
El Paso, Texas

EL PASO OCT 29 1962 TEXAS

POSTMARK OF DELIVERING OFFICE

INSTRUCTIONS: Fill in items below and complete #1 on other side, when applicable. Moisten gummed ends and attach to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN

REGISTERED NO.	NAME OF SENDER
CERTIFIED NO. 859210	STREET AND NO. OR P. O. BOX Box 871
INSURED NO	CITY, ZONE AND STATE Santa Fe, New Mexico

POD Form 3811 Jan. 1958

No. 859210

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO
David H. Rainey
STREET AND NO.
Bx 1492 - El Paso Natural
CITY AND STATE
El Paso, Texas

If you want a return receipt, check which
☐ 10¢ shows to whom and when delivered
☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

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#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

A. D. Bachnell

AMERADA PETROLEUM CORPORATION

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: JUL 26 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71842-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Bob Bluck

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

E C Story

DATE DELIVERED

ADDRESS WHERE DELIVERED (only if requested in item #1)

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

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SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Paul Coster

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

A Mooney

DATE DELIVERED: JUL 25 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver ONLY to addressee

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Carl W Smith

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

by: Patricia E. Lange

DATE DELIVERED: 7-25-62

ADDRESS WHERE DELIVERED (only if requested in item #1)

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

George L. Verity

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: 7/24/62

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

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SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: 7-26-62

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

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SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

EL PASO NATURAL GAS CO

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: OCT. 22 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

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(Additional charges required for these services)

RETURN RECEIPT

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SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

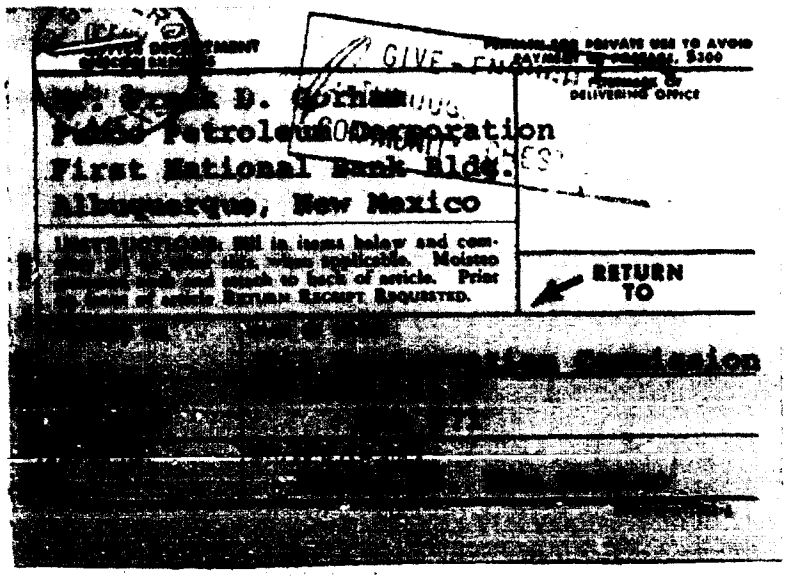
John J. Redfern, Jr.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED: 7/MAY/26 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO



RECEIPT FOR CERTIFIED MAIL—20¢

No. 859209

SENT TO: Frank D. Gorham
STREET AND NO.: 1st Natl. Bank Bldg
CITY AND STATE: Albuquerque N. M.

If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 15¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

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RECEIPT FOR CERTIFIED MAIL—20¢

No. 859208

SENT TO: Geo Eaton
STREET AND NO.: P.O. Box 480
CITY AND STATE: Farmington, N. M.

If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 15¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

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POD Form 3800
Apr 1960

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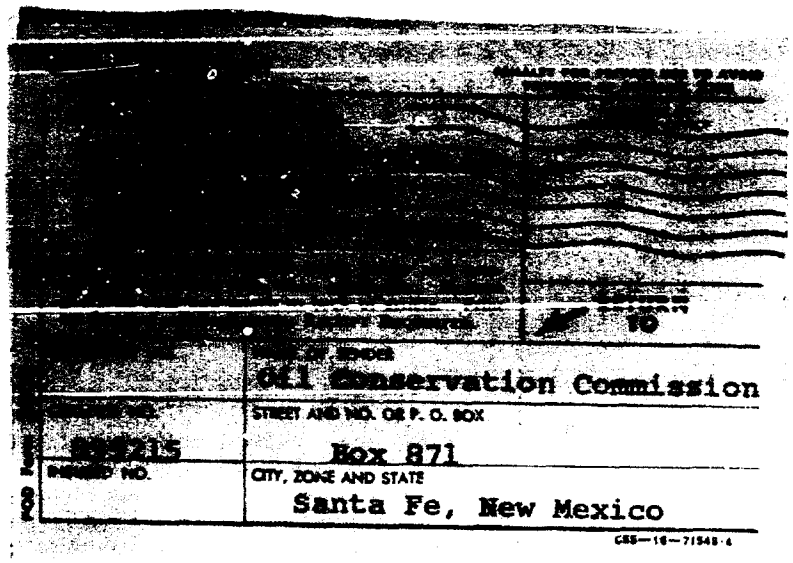


RECEIPT FOR CERTIFIED MAIL—20¢

No. 859215

SENT TO: Carl Smith
STREET AND NO.: 404 McDonald
CITY AND STATE: Prod - Farmington N.M.

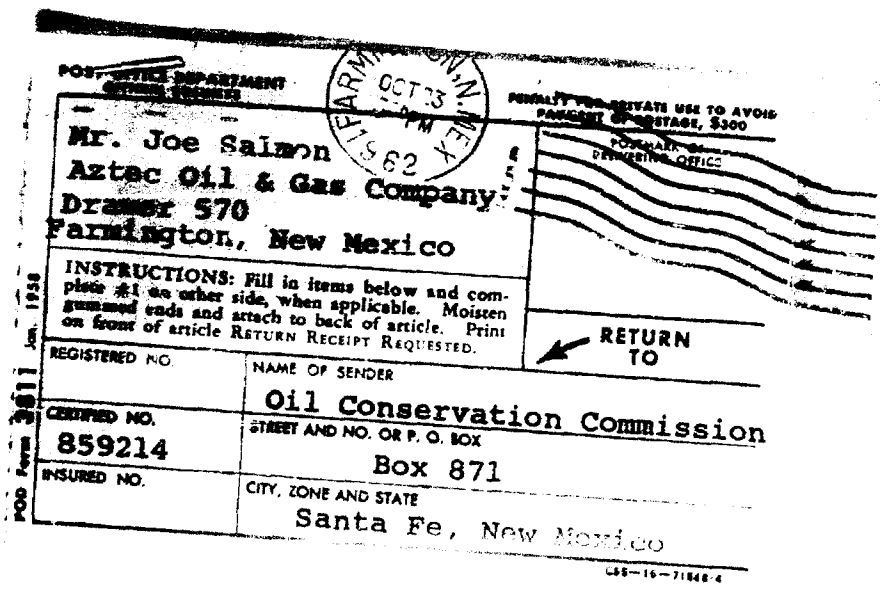
If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 15¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1960

SEE OTHER SIDE



RECEIPT FOR CERTIFIED MAIL—20¢

No. 859214

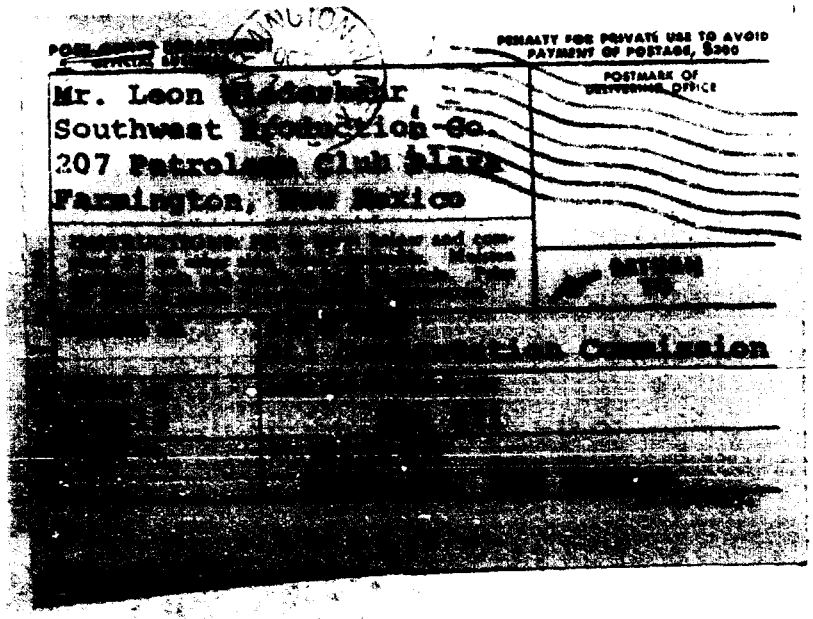
SENT TO: Joe Salmon
STREET AND NO.: Aztec O & G - Drw. 570
CITY AND STATE: Farmington N. M.

If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 15¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

SEE OTHER SIDE



No. 859213

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Leon Wiedenkeller
STREET AND NO.: 907 Petr SW Prod. Co - Clint Moyer
CITY AND STATE: Farmington N. M.

If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

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Apr 1960

SEE OTHER SIDE

No. 859212

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: L. M. Stevens
STREET AND NO.: Utex Oil & Gas Co. Drw. 570
CITY AND STATE: Farmington N. M.

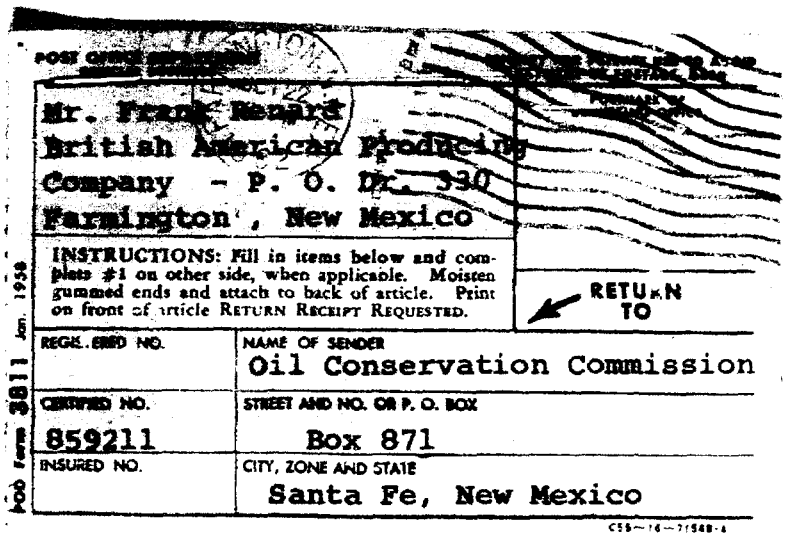
If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

POD Form 3800
Apr 1959

SEE OTHER SIDE



No. 859211

RECEIPT FOR CERTIFIED MAIL—20¢

SENT TO: Frank Reuhrt
STREET AND NO.: British Amer.
CITY AND STATE: Farmington, N. M.

If you want a return receipt, check which: ☐ 10¢ shows to whom and when delivered ☐ 35¢ shows to whom, when, and address where delivered
If you want restricted delivery, check here ☐ 50¢ fee

FEES ADDITIONAL TO 20¢ FEE

POSTMARK OR DATE

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#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Kent Wickersham

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Ken Powell

DATE DELIVERED

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

X Ruben Petroleum

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

X Mary Rathyfad

DATE DELIVERED

OCT 22 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

L. M. Stevens-Cyclone Oil & Gas

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Jack Bacon

DATE DELIVERED

10/23/62

ADDRESS WHERE DELIVERED (only if requested in item #1)

Farmington N.M.

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Carl W. Smith

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED

10-20-62

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Frank Renard

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED

OCT 22 1962

ADDRESS WHERE DELIVERED (only if requested in item #1)

CSS—16—71548-4 GPO

#1-INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee ☐ Show address where delivered

(Additional charges required for these services)

RETURN RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)

Joe C. Salmon, Cyclone Oil & Gas Co.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Jack Bacon

DATE DELIVERED

10/23/62

ADDRESS WHERE DELIVERED (only if requested in item #1)

Farmington N.M.

CSS—16—71548-4 GPO

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO

No. 2504

MEMORANDUM BRIEF

In connection with the rehearing in the above entitled cause, PUBCO PETROLEUM CORP. filed two pleadings, one entitled "Motion to Quash Subpoena Duces Tecum", and the other entitled "Objections to Order of Commission Granting Rehearing". The Commission considered these pleadings, and other pleadings filed in the cause, on September 13 and 14. Upon a recess, the Commission invited the participants to file briefs with the Commission within fifteen days from and after September 14. At the threshold of the rehearing it appears to Pubco that the Commission is confronted with a policy decision. The question arises as to whether or not Consolidated is acting in good faith in asking the Commission to change the formula in the Basin-Dakota Gas Pool.

Reference is made to an exhibit admitted into the record on September 14, on motion of Marathon Oil Co. (formerly known as The Ohio Oil Co.), to which no objection was made by Consolidated, of a communication dated July 6, 1962, designated "Memorandum to Participants", written on the letterhead of Consolidated Oil & Gas, Inc., signed "J. B. Ladd". The exhibit in question is most enlightening, and reveals the objective sought by Consolidated. In the second paragraph of the letter

this statement is made: "In essence, it is obvious that we won the battle but lost the war". In the second paragraph reference is made to the "famous New Mexico Supreme Court Jalmat decision", which points up the fact that Consolidated is seeking to bring itself within the framework of the Jalmat decision. How may Consolidated accomplish this objective? It is contended by Pubco that Consolidated resorted to the device of employing the processes of the Commission by having a subpoena duces tecum served on Pubco, and other interested participants, for the express purpose of compelling such participants to provide the information in regard to reserves, with which Consolidated hopes to bolster up its case. The enormity of the task and the hopes of achieving results satisfactory and acceptable to it, are set forth very definitely in the exhibit. Instead of providing engineering data gathered at its own expense, it is obvious that Consolidated planned to once again resort to the use of the data prepared by other companies, as it did on cross-examination at the time of the original hearing. There is here quoted the ambition of Consolidated as expressed in the third paragraph of the letter of July 6, 1962:

> "The impact of this on our proposal is indicated when one realizes that there are over 600 wells in the San Juan Basin Dakota reservoirs. We have now approached the Commission with the formal request that they require all operators to submit sufficient information regarding their particular wells such that the requirements of the Jalmat decision could be met. We are confident that a thorough engineering review, with objective conclusions based on all available data, would prove our proposed allocation formula more valid than the original formula which is now in effect. It is possible (and even quite probable) that while we may not be able to generate approval for our proposed new formula, we will succeed in invalidating the original formula. The net effect of this would be no proration at all. This would be good since we would then undeniably be governed by the unqualified intent of the contractual minimum-take guarantee; i.e., 50% of each well's ability rather than being limited to a lesser volume as suggested by the existing proration formula."

Basically, as Pubco views it, the Commission will be obliged to consider 65-3-14 N.M.S.A. 1953, particularly subsection (a). Such subsection is herein quoted for ready reference by the Commission:

> "(a) The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil or gas, or both, in the pool, being an amount, so far as can be practically determined, and so far as such can be practicably obtained without waste, substantially in the proportion that the quantity of the recoverable oil or gas, or both, under such property bears to the total recoverable oil or gas or both in the pool, and for this purpose to use his just and equitable share of the reservoir energy."

Likewise the Commission should consider subsection (d) of 65-3-15 and (e) of the same subsection, here quoted as follows:

> "(e) Any common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with this act. The Commission, in promulgating such rules, regulations and orders may consider the quality and the deliverability of the gas, the pressure of the gas at the point of delivery, acreage attributable to the well, market requirements in the case of unprorated pools, and other pertinent factors."

Pubco contends that all parties to this cause had their day in court at the time of the original hearing which began on April 18, 1962. Pubco contends that the order of the Commission of July 7, 1962, denying Consolidated's petition, should be considered as res ajudicata. The "Petition for Rehearing" filed with this Commission by Consolidated fails to allege any fact or thing which would justify the Commission to reopen this case.

Authority for the subpoena duces tecum is contained in Section 65-3-7 N.M.S.A. 1953, which provides that any member of the Commission shall be empowered to issue a subpoena duces tecum. This particular Section has never been tested in court. It is recognized, however, that courts are liberal in permitting an administrative body full exercise of its powers to require the production of books, papers and documents. Nevertheless, the subpoena power is limited by the Constitutional prohibition against unreasonable search and seizure. It was decided by the U. S. Supreme Court in the case of Hale v. Henkel 201 U.S. 43, 26 S.Ct. 370, 50 L. Ed. 652, (1906) that a corporation was entitled to freedom from unreasonable searches and seizures under the 4th Amendment. In the case of Fleming v. Montgomery Ward & Co. 114 F. 2d 384 (1940) the Administrator of the Wage and Hour Division of the Department of Labor had petitioned the U. S. District Court to enforce a subpoena duces tecum which had been issued pursuant to authorization of the Fair Labor Standards Act of 1938. The court, while holding that the subpoena would be enforced stated that the demand must be expressed in lawful process and that it was required that the lawful process:

> ". . . limit is requirement to certain described documents and papers which are easily distinguished and clearly described." (page 389)

It is stated in 73 C.J.S. Public Admin. Bodies 1962 Cumulative Annual Pocket Part at Section 92, page 53 that:

> "An administrative body, to avoid being arbitrary and oppressive in issuance of subpoenas duces tecum should call individuals and take testimony as to existence and custody of the documents sought, and should seek in advance to determine whether they are material and relevant to the issues before the board. In issuance of subpoenas for records of companies, it should not designate all documents in a particular class, but only those which it has found by its

> preliminary inspection to be in the possession or under the control of the persons to whom the subpoenas are directed and to be relevant and material to the issue."

In oral argument before the Commission on September 14, counsel made reference to the matter of the subpoena duces tecum describing it as a "fishing expedition" and also a "shot gun" procedure. The subpoena in question was directed to Frank D. Gorham, and not to Pubco Petroleum Corp., which is considered a fatal defect. Frank D. Gorham does not own the documents in question. To compel Pubco to produce the material requested would be unreasonable and detrimental to its business relations. Pubco's figures on reserves, even if revealed, would not be official and would not assist the Commission to any great extent in determining the issues in this cause. Furthermore, any papers in Pubco's possession relating to reserves calculations are subject to the contention that Pubco does not have exclusive ownership of such records and retains the same for its own use only.

Several weeks ago a Subcommittee of the U. S. Senate issued a subpoena duces tecum directing some nine steel companies to furnish the committee with information relating to production figures and costs of manufacturing. Upon objection being made on behalf of the steel companies that such information was confidential and that the public interest would not be served by disclosing it, threats were made to find the steel companies in contempt of the Senate. On September 25, 1962, a majority of the Senate committee announced its decision, upholding the rights of the steel companies and absolving them from any charges of contempt.

There is no known method by which reserves of gas or oil can be accurately calculated. One Petroleum Engineer, using one method, will calculate reserves and reach one result; and another Engineer, using a different method, will reach a different result.

AS TO GRANTING THE REHEARING

Section 65-3-22 provides that within twenty days after the entry of any order or decision of the Commission, any person affected thereby may file with the Commission an application for rehearing in respect of any matter determined by such order or decision setting forth "the respect in which such order or decision is believed to be erroneous". It is respectfully submitted to the Commission that the petition for a rehearing, filed on June 27, fails to adequately state in what respect the decision of the Commission is believed to be erroneous. No question but that the applicant for a rehearing now attempts to come within the boundaries of the Jalmat case. However, the petition fails to point out any error, any act of omission or commission which would justify a rehearing.

CONCLUSION

In conclusion, it is respectfully submitted that Pubco's motion to quash should be sustained and likewise its objections to the order of the Commission granting a rehearing should be sustained.

Respectfully submitted,

PUBCO PETROLEUM CORP.

By _____
ITS ATTORNEY
First National Bank Building
Albuquerque, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL & GAS, INC. TO AMEND ORDER NO. R-1670-C RELATING TO BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO - UPON REHEARING	)	CASE NO. 2504

MEMORANDUM RE SUBPOENA DUCES TECUM

Consolidated Oil & Gas, Inc. caused a subpoena duces tecum to issue to Joe Salmon, Aztec Oil & Gas Company's district superintendent in Farmington, New Mexico, on September 10, 1962. Mr. Salmon's copy of the subpoena was forwarded to Aztec's Dallas office and received there on September 11, 1962, allowing only one intervening day to assemble the voluminous material covered by the subpoena prior to the commencement of the rehearing of the subject case on September 13, 1962. (By agreement with Consolidated, this subpoena was quashed on the understanding that L. M. Stevens, Aztec's witness at the April 18, 1962 hearing of the subject case, would be available for service of a similar subpoena at the rehearing. Mr. Stevens was subpoenaed in Santa Fe on September 13, 1962.)

The subpoena served on Aztec called for three categories of information: 1) reports, determinations, etc. relating to Aztec-owned or-operated Basin-Dakota Pool properties showing enumerated data from which reserves could be calculated (mentioned in detail below) and the reserve calculations themselves, 2) reserve calculations with respect to 29 particular wells and 3) any reports, etc. relating to recoverable gas reserves in the Basin-Dakota Pool not covered by 1) and 2), above.

The Commission has statutory authority for the issuance of subpoenas. Rule 1211 of the Commission's Rules and Regulations covers, as its title states, the "Power of Commission to Require Attendance of Witnesses and Production of Evidence." Rule 1212, Rules of Evidence, states in part, "In general, the rules of evidence applicable in a trial before a court without a jury shall be applicable, provided that such rules may be relaxed, where, by so doing, the ends of justice will be better served."

It is contended that if the Commission follows the rules of evidence applicable in a trial before a court without a jury, the information required

by Consolidated's subpoena would not be admissable in evidence and the subpoena would be quashed. It is further contended that the ends of justice would not be better served by relaxing this general rule. In support of its contentions, Aztec would respectfully show the following:

I.

RESERVE REPORTS AND CALCULATIONS

Aztec has spent a considerable amount of time, money and effort in developing reserve estimates in portions of the Basin-Dakota Gas Pool in order to make intelligent operations in the area possible, preserve and enhance its competitive position, evaluate its holdings, and direct its exploratory and development program. To compel Aztec to disclose the confidential reports of its experts would be grossly unjust.

> "Utmost discretion should be exercised in ordering the production of information which is confidential or which contains trade secrets."

Herman v. Civil Aeronautics Board 237 F.2d 359 (9th Cir. 1956), Korman v. Schull 184 F. Supp. 928 (D.C. W.D. Mich. 1960), Florida Co. v. Attapulgas Clay Co. 26 F. Supp. 968 (D.C. Del. 1939), 4 Moore's Federal Practice, Section 34.15, Pathe Laboratories, Inc. v. Dupont Film Mfg. Corp. 3 F.R.D. 11 (D.C.S.D. N.Y. 1943).

II.

INFORMATION AVAILABLE FROM OTHER SOURCES

Such a harsh requirement is even more onerous and unnecessary when the information on which the reserve reports are based is available to Consolidated from other sources.

> "Good cause for the production of an expert's report is not shown where the documents on which the report was based are available to the moving party."

Colonial Airlines v. Jonas (13 F.R.D. 199)

In addition to reserve calculations and reports, the first category of information which Consolidated's subpoena required included data which is readily available to Consolidated from other public sources. The items and the sources from which they may be obtained are listed below:

a) Description of the property and the acreage - The forms C-101, Notice of Intention to Drill and C-128, Well Location and Acreage Dedication Plat of the Commission which are required to be filed for each well drilled in the Basin-Dakota Gas Pool contain this information.

b) Initial reservoir pressure - C-105, Well Record Form of the Commission.

c) Average porosity, total and net gas saturation - Logs accompanying Form C-105 allow measurement of porosity and calculation of total and net gas saturation, if suitable logs were run. If not, this information is not available to Aztec unless cores were taken and analyzed.

d) Average permeability - This data is not necessary to calculate reserves.

e) Initial open-flow potential - C-122, Multi-Point Back Pressure Test for Gas Wells Form of the Commission.

f) Deliverabilities, initial and most recent - C-122a, Gas Well Test Data Form of the Commission; this data is also available from the Commission's monthly Proration Schedules.

g) Gross gas pay - Logs accompanying Form C-105 allow measurement of gross gas pay.

h) Net gas pay - Logs accompanying Form C-105 allow measurement of net gas pay.

In addition to these public sources, such information is obtainable in part from commercial well reproduction companies and the completion reports provided by commercial petroleum information services.

> "Interrogatories requiring a substantial amount of compilation need not be answered where the information is otherwise available to the interrogating party."

Caldwell-Clements, Inc. v. McGraw-Hill Pub. Co. 12 F.R.D. 531, Zenith Radio Corp. v. Radio Corp. of America 106 F. Supp. 561.

III.

PROPERTIES OF WHICH AZTEC IS NOT SOLE OWNER

The subpoena would compel the disclosure of reserve calculations and the data on which they were based relating to properties in which parties other than Aztec own interests. The rules of evidence do not require nor is justice served by forcing a party to disclose confidential information which is the property of third persons. Herman v. Civil Aeronautics Board 237 F. 2d 359 (9th Cir. 1956).

In summary, the disclosure of Aztec's expert reserve calculations to a competitor is not required under the rules of evidence or in the interests of justice and would create a dangerous precedent. It is not necessary since the data on which the calculations were based is readily available to the competitor from which, if he desires to commit himself to the time and effort required, his

own reserve determinations may be made. Further, to compel Aztec to furnish the data outlined in the subpoena when available from public records and commercial sources, particularly on such short notice, would be both unreasonable and oppressive and would unduly interfere with Aztec's business operations. Consolidated has neither made nor offered to make any showing as to good cause for the disclosure of this information.

Accordingly, the subpoena duces tecum should be quashed.

Respectfully submitted,

By Kenneth A. Swanson
Kenneth A. Swanson
Attorney for

AZTEC OIL & GAS COMPANY

BEFORE THE OIL CONSERVATION COMMISSION

OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL AND GAS, INC. for an Amendment of Order No. R-1670-C Changing the Allocation Formula in the Basin-Dakota Gas Pool.	CASE 2504

MEMORANDUM ON MOTION TO QUASH SUBPOENAS

The subpoena power of the Commission is derived from Section 65-3-7, N.M.S.A., 1953 Comp. and Rule 1211 of the Commission's Rules and Regulations. Rule 45 of the Rules of Civil Procedure for the District Courts of the State of New Mexico also is applicable.

No contention is made that the Commission does not have the power of subpoena; the contention is that the Commission's exercise of that power is governed by the general law applicable to subpoenas - particularly that part of the law relating to oppressive use of and unreasonable demands in subpoenas duces tecum.

I. RAINEY'S MOTION

The subpoena duces tecum issued by the Oil Conservation Commission at the request of Consolidated Oil and Gas, Inc. and served on David H. Rainey on August 14, 1962, demands, in its third paragraph, that Rainey produce:

> "Any reports, determinations or tabulations of initial and subsequent reserve calculations made by or in the possession of El Paso Natural Gas Company concerning recoverable gas reserves in the Basin-Dakota Gas Pool not included in the eight data sheets subpoenaed above."

The Affidavit of David H. Rainey on file with the Commission states that he has neither the custody nor the posses-

sion of the reports and determinations demanded, and that he does not have the authority to remove them from the possession of the custodian.

A subpoena duces tecum should be quashed where it has been served on a person not having possession and not being authorized to take possession of the documents, records or things demanded. See Moore's Federal Practice, Vol. 5, Section 45.05.

In Keiffe v. La Salle Realty Co., 163 La. 824, 112 So. 799, the Court stated the general rule to be that the subpoena should issue directly to the officer or employee of the corporation who is the custodian of the records desired, or, if the subpoena is directed to the corporation, it should designate some officer of the corporation as the person who shall respond thereto.

The rule as stated in 97 C.J.S., Witnesses, Section 25, is as follows:

> "The person who has the control of, and the ability to produce, the desired books or papers is the proper person to be subpoenaed..."

David Rainey, being neither an officer of El Paso nor the person having custody of the records demanded, is not the proper person upon whom the subpoena should have been served. Accordingly, the subpoena duces tecum should be quashed.

II. EL PASO'S MOTION

A. The information demanded in paragraph 3 of the subpoena duces tecum, quoted above, has been compiled by El Paso over a period of years. These records are in constant use by El Paso in its normal course of business, and to remove them from their location at the home office of the company in El Paso, Texas, would seriously disrupt and interfere with El Paso's business operations. Furthermore, the records are quite bulky and their

transportation to and from Santa Fe would be expensive as well as troublesome.

By failing to specify and indentify the material demanded, Consolidated places an unreasonable burden on El Paso, for if El Paso is to comply with the subpoena, it must produce all of these voluminous records.

Where the production of information demanded by a subpoena duces tecum is a burden in that a mass of documents is demanded without specifying and identifying the exact material sought, the subpoena duces tecum may be quashed as being unreasonable. U. S. v. Woerth , 130 F. Supp. 930 (D. C. Iowa 1955), affirmed, 231 F. 2d 822; 2Am. Jr. 2d, Administrative Law, Sec. 264, p. 95.

In U. S. v. Woerth, supra, at page 824 of 231 F. 2d, the Court stated the test for upholding the validity of a subpoena duces tecum as follows:

> "The subpoena duces tecum in question is not couched in broad and sweeping language. It does not call for indefinite records or a mass of records. It is very specific and limited in its terms. The production of the records called for by the subpoena duces tecum would not disrupt or interfere with the respondent's business activities or place an undue burden on him or cause hardship to him."

It is submitted that the subpoena duces tecum issued by the Commission at Consolidated's request meets not one single element of the test quoted above.

In 5 Moore's Federal Practice, Section 45.02, at p. 1725, the rule is stated as follows:

> "A subpoena is unreasonable or oppressive if it is too broad and sweeping. It should normally be limited to a reasonable period of time and should designate the documents desired, or the subjects to which the docu-

ments relate with reasonable particularity...

"That undue inconvenience or expense would be involved in producing the papers may be a ground for quashing a subpoena..."

See also annotation, Form, particularity, and manner of designation required in subpoena duces tecum for production of corporate books, records and documents, 23 A.L.R. 2d 862

Where the information demanded would be largely cumulative the subpoena duces tecum may be quashed. See Pittsburgh & Lake Erie R. Co. v. Pennsylvania Public Utility Commission, 85A.2d 646 (1952). See also Chapman v. Maren Elwood College, 225 F.2d 230 (9th Cir. 1955) concerning the reasonableness of the demand made by a subpoena duces tecum.

In Hermann v. Civil Aeronautics Board, 237 F.2d 359 (9th Cir. 1956), a case concerned with the enforcement of a subpoenas duces tecum issued by the CAB, the party upon whom demand had been made to produce information objected on the ground that the subpoenas were "oppressive and unreasonable" and "that compliance with the said subpoenas would unduly and unreasonably hamper and interfere with the business conducted by the companies named in the said subpoenas." The Court prescribed the proper procedure to be followed in this language:

"(1-5) The Civil Aeronautics Board is given broad powers of subpoena of individuals for the purpose of testifying to the matters which are before them.*** Obviously, it will be assumed that these matters will not be irrelevant to the proceeding. The Board is also given an extremely comprehensive power of inspection of all of the documents, books and papers in the office of any of the corporations or individuals operating under the control of the Board.*** In order to prevent their action from being arbitrary and oppressive, the Board should call the individuals and take testimony as to the existence and custody of the documents. Materiality and relevancy to the issues

> before the Board can be established in this method without the necessity of bringing truck loads of records to the hearing officer. Likewise, by the power of inspection, all the documents can be gone over, photographed and copied without regard to materiality and relevance. It is obvious that, if after these inspections the Board finds that the existence of other documents relevant and material to the issue is probable or that they are being concealed, then again a witness can be called and examined regarding these features, but the subpoenas thereafter issued should not designate all the documents in the class, but only those which the Board has found are in the possession or under the control of the persons to whom directed and which are relevant and material to the issue." (Emphasis supplied)

B. Some of the information in El Paso's possession concerning recoverable gas reserves in the Basin-Dakota Gas Pool is confidential in nature and relates to the property of other parties.

The privacy of third persons should not be invaded by use of a subpoena duces tecum directed to a party having in his possession confidential material. Herman v. Civil Aeronautics Board, 237 F.2d 359 (9th Cir. 1956); Floriden Co. v. Attapulgus Clay Co., 26 F. Supp.968. And discretion should be exercised to avoid unnecessary disclosure of such material, particularly where the action is between competitors. See 4 Moore's Federal Practice, Section 34.15.

Accordingly, El Paso should not be required to produce this confidential information pursuant to the subpoena duces tecum. Had Consolidated been more specific concerning the documents and material desired, this problem may have been obviated.

Respectfully submitted,

SETH, MONTGOMERY, FEDERICI & ANDREWS

By Wm Federici

Attorneys for El Paso Natural Gas Company.

BEFORE THE OIL CONSERVATION COMMISSION

OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL AND GAS, INC. For an Amendment of Order No. R-1670-C Changing the Allocation Formula in the Basin-Dakota Gas Pool.

CASE 2504

BRIEF OF EL PASO NATURAL GAS COMPANY AND DAVID H. RAINEY IN SUPPORT OF MOTIONS TO QUASH SUBPOENA DUCES TECUM

The subpoena power of the Commission is derived from Section 65-3-7, N.M.S.A., 1953 Comp. and Rule 1211 of the Commission's Rules and Regulations. Rule 45 of the Rules of Civil Procedure for the District Courts of the State of New Mexico also is applicable.

We do not contend that the Commission does not have the power of subpoena; that right is conferred by Statute; However, the exercise of that power by the Commission is governed by the general law applicable to subpoena.

POINT I.

THE SUBPOENA DUCES TECUM WAS NOT SERVED ON A PERSON HAVING CUSTODY OR CONTROL OVER THE MATERIAL DEMANDED.

The subpoena duces tecum issued by the Oil Conservation Commission at the request of Consolidated Oil and Gas, Inc. and served on David H. Rainey on August 14, 1962, demands, in its third paragraph, that Rainey produce:

> "Any reports, determinations or tabulations of initial and subsequent reserve calculations made by or in the possession of El Paso Natural Gas Company concerning recoverable gas reserves in the Basin-Dakota Gas Pool not included in the eight data sheets subpoenaed above."

The Affidavit of David H. Rainey on file with the Commission states that he has neither the custody nor the possession of the reports and determinations demanded, and that he does

not have the authority to remove them from the possession of the custodian.

A subpoena duces tecum should be quashed where it has been served on a person not having possession and not being authorized to take possession of the documents, records or things demanded. Alma-Schuhfabrik AG v. Rosenthal, 25 F.R.D. 100 (D.C.E.D.N.Y. 1960). See Moore's Federal Practice, Vol. 5, Section 45.05.

In Kaiffe v. La Salle Realty Co., 163 La. 824, 112 So. 799, the Court stated the general rule to be that the subpoena should issue directly to the officer or employee of the corporation who is the custodian of the records desired, or, if the subpoena is directed to the corporation, it should designate some officer of the corporation as the person who shall respond thereto.

The rule as stated in 97 C.J.S., Witnesses, Section 25, p. 380, is as follows:

> "The person who has the control of, and the ability to produce, the desired books or papers is the proper person to be subpoenaed..."

David Rainey, being neither an officer of El Paso nor the person having custody of the records demanded, is not the proper person upon whom the subpoena should have been served. Accordingly, the subpoena duces tecum should be quashed.

POINT II.

THE SUBPOENA DUCES TECUM IS AN UNREASONABLE SEARCH AND SEIZURE.

The subpoena duces tecum demanding the production of reserve calculations and information in the possession of El Paso constitutes an unreasonable search and seizure in violation of the Fourth Amendment of the Constitution of the United States and of Section 10, Article II of the Constitution of the State of New Mexico.

The subpoena demands the compulsory production of private papers, unlimited as to the number of documents and extending over an indefinite period of time. The effect of complying with these demands would be a disruption of El Paso's business operations for the sole purpose of allowing Consolidated to conduct an inquisitorial examination of these private business papers.

The courts, repeatedly, have refused to permit unreasonable and oppressive demands to be made.

In the leading case of Hale v. Henkel, 201 U.S. 43, 26 S.ct. 370 50 L. Ed. 652 (1906), the Court said (p. 666 of 50 L. Ed.):

> "We are also of opinion that an order for the production of books and papers may constitute an unreasonable search and seizure within the 4th Amendment. While a search ordinarily implies a quest by an officer of the law, and a seizure contemplates a forcible dispossession of the owner, still... the substance of the offense is the compulsory production of private papers, whether under a search warrant or a subpoena duces tecum, against which the person, be he individual or corporation, is entitled to protection."

The Constiution of the State of Oklahoma contains a provision similar to Section 10, Article II of the New Mexico Constitution prohibiting unreasonable searches and seizures. The Oklahoma Supreme Court construed and applied this provision in the case of State v. Chickasha Milling Co., Okla., 71 P. 2d 981 (1937), saying (71 P. 2d at p. 985):

> "Section 30, Art. 2 of the State Constitution protects such parties /corporations and individuals/ from unreasonable search and seizure of their private papers and effects, and the courts may not permit an examination thereof in an adversary proceeding without particular description of the papers sought..."

In the Chickasha case, the court further stated (71 P. 2d at p. 984):

> "Our attention is called to no decision of this or any other court where one party, upon the theory that he may discover some competent evidence to support his cause or defense, has been permitted to examine promiscuously into the private affairs of his adversary."

In Shell Oil Co. v. Superior Court, Cal., 292 P. 531, the court construed the California constitutional provision relating to unreasonable search and seizures as applied to the compulsory production of corporate records, documents and papers relating to oil and gas leases, and stated (292 P. at p. 536):

> "The affidavit further shows, through its length, that it is a mere "fishing device," as contended for by petitioner. Being a fishing device, it is in direct violation of the constitutional immunity against unlawful searches and seizures."

Among the many cases adhering to this view are the following: Mobile Gas Co. v. Patterson, 293 F. 208; In Re United Shoe Machinery Corporation, 6 F R. D. 347; Kullman, Salz & Co. v. Superior Court, Cal. App., 114 P. 589.

POINT III.

THE SUBPOENA DUCES TECUM IS UNREASONABLE AND OPPRESSIVE.

The information demanded in the subpoena duces tecum has been compiled by El Paso over a period of years. These records are in constant use by El Paso in its normal course of business, and to remove them from their location at the home office of the Company in El Paso, Texas, would seriously disrupt and interfere with El Paso's business operations. Furthermore, the records are quite bulky and their transportation to and from Santa Fe would be expensive as well as troublesome.

By failing to specify and identify the material demanded, Consolidated places an unreasonable burden on El Paso for if El Paso is to comply with the subpoena, it must produce all of these voluminous records.

Where the production of information demanded by a subpoena duces tecum is a burden in that a mass of documents is demanded without specifying and identifying the exact material sought, the subpoena duces tecum may be quashed as being unreasonable. Walling v. American Rolbal Corp., 135 F. 2d 1003 (2nd Cir. 1943), followed in Walling v. Golebiewski, 142 F. 2d 1015 (2d Cir. 1944); U. S. v. Woerth, 130 F. Supp 930 (D. C. Iowa 1955), affirmed, 231 F. 2d 822; 2Am. Jr. 2d, Administrative Law, Sec. 264, p. 95.

In Walling v. American Rolbal Corp., the Court said (p.1005):

> "Requiring records to be produced away from the place where they are ordinarily kept may impose an unreasonable and unnecessary hardship which in itself would make the issuance of the subpoena, otherwise proper, arbitrary and capricious."

In U. S. v. Woerth, supra, at page 824 of 231 F. 2d, the Court stated the test for upholding the validity of a subpoena duces tecum as follows:

> "The subpoena duces tecum in question is not couched in broad and sweeping language. It does not call for indefinite records or a mass of records. It is very specific and limited in its terms. The production of the records called for by the subpoena duces tecum would not disrupt or interfere with the respondent's business activities or place an undue burden on him or cause hardship to him."

It is submitted that the subpoena duces tecum issued by the Commission at Consolidated's request meets not one single element of the test quoted above.

In 5 Moore's Federal Practice, Section 45.02, at p. 1725, the rule is stated as follows:

> "A subpoena is unreasonable or oppressive if it is too broad and sweeping. It should normally be limited to a reasonable period of time and should designate the documents desired, or the subjects to which the documents related with reasonable particularity...

> "That undue inconvenience or expense would be involved in producing the papers may be a ground for quashing a subpoena..."

See also annotation, Form, particularity, and manner of designation required in subpoena duces tecum for production of corporate books, records and documents, 23 A.L.R. 2d 862.

Where the information demanded would be largely cumulative the subpoena duces tecum may be quashed. See Pittsburgh & Lake Erie R. Co. v. Pennsylvania Public Utility Commission, 85A 2d 646 (1952). See also Chapman v. Haren Elwood College, 225 F 2d 230 (9th Cir. 1955) concerning the reasonableness of the demand made by a subpoena duces tecum.

In Hermann v. Civil Aeronautics Board, 237 F. 2d 359 (9th Cir. 1956), a case concerned with the enforcement of a subpoenas duces tecum issued by the CAB, the party upon whom demand had been made to produce information objected on the grounds that the subpoenas were "oppressive and unreasonable; and constitute an unreasonable search and seizure", that the subpeonas constituted "a general fishing expedition of the affairs of the parties" and "that compliance with the said subpoenas would unduly and unreasonably hamper and interfere with the business conducted by the companies named in the said subpoenas." The Court prescribed the proper procedure to be followed in this language:

> "The Civil Aeronautics Board is given broad powers of subpoena of individuals for the purpose of testifying to the matters which are before them. *** Obviously, it will be assumed that these matters will not be irrelevant to the proceeding. The Board is also given an extremely comprehensive power of inspection of all of the documents, books and papers in the office of any of the corporations or individuals operating under the control of the Board. *** In order to prevent their action from being arbitrary and oppressive, the Board should call the individuals and take testimony as to the existence and custody of the documents. Materiality and relevancy to the issues

> before the Board can be established in this method without the necessity of bringing truck loads of records to the hearing officer. Likewise, by the power of inspection, all the documents can be gone over, photographed and copied without regard to materiality and relevance. It is obvious that, if after these inspections the Board finds that the existence of other documents relevant and material to the issue is probable or that they are being concealed, then again a witness can be called and examined regarding these features, but the subpoenas thereafter issued should not designate all the documents in the class, but only those which the Board has found are in the possession or under the control of the persons to whom directed and which are relevant and material to the issue." (Emphasis supplied)

POINT IV.

THE INFORMATION DEMANDED BY THE SUBPOENA DUCES TECUM IS CONFIDENTIAL, AND THE COMMISSION SHOULD EXERCISE UTMOST DISCRETION BEFORE ORDERING IT PRODUCED.

Some of the information in El Paso's possession concerning recoverable gas reserves in the Basin-Dakota Gas Pool is confidential in nature and relates to the property of other parties. Some of the information has been derived at great expense by El Paso's staff; some may properly be classified as "trade secrets".

The information demanded by Consolidated is not just the facts -- it is the work product of highly skilled reservoir engineers and geologists which constitutes the stock-in-trade of a competitor in the petroleum industry. To require this type of information to be produced in response to a subpoena duces tecum, even though the Commission may have the power to do so, would be manifestly unfair and oppressive.

The privacy of third persons should not be invaded by use of a subpoena duces tecum directed to a party having in his possession confidential material. Herman v. Civil Aeronautics Board, 237 F. 2d 359 (9th Cir. 1956); Floriden Co. v. Attapulgus

Clay Co., 26 F. Supp. 268. And discretion should be exercised to avoid unnecessary disclosure of such material, particularly where the action is between competitors. See 4 Moore's Federal Practice, Section 34.15; Pathe' Laboratories Inc. V. Dupont Film Mfg. Corp., 3 F.R.D. 11 (D.C.S.D. N.Y. 1953); Korman v. Schull, 184 F. Supp. 928 (D.C.W.D. Mich. 1960).

Consolidated has made no showing that the information demanded could not be obtained from its own analysis of available well logs and other data. True, it would not be El Paso's reserve data; true, it would be expensive to obtain, but it could be done. It is submitted that the Commission should require it to be done, should require Consolidated to carry its own burden of proof-onerous though it may be, and that the subpoena duces tecum issued at the request of Consolidated should be quashed.

Respectfully submitted,

Ben R. Howell
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SETH, MONTGOMERY, FEDERICI & ANDREWS

By William R. Federici
Attorneys for El Paso Natural Gas Company

William R. Federici
William R. Federici
Attorney for David H. Rainey

BEFORE THE OIL CONSERVATION COMMISSION

OF

NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONSOLIDATED OIL & GAS, INC., FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

CASE NO. 2504

MEMORANDUM BRIEF

Consolidated Oil & Gas, Inc., by application filed with the Oil Conservation Commission of New Mexico, sought an order changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico. The proposal of Consolidated was to change the provisions of Order No. R-1670-C to provide that the allowable production from the Basin-Dakota Gas Pool be allocated on the basis of a formula giving weight of 60% to acreage, and 40% to acreage times deliverability.

After notice and hearing on April 18 through April 22, 1962, the Commission entered its Order No. R-2259, denying the application of Consolidated. This denial was based upon the single finding No. 4, "That the evidence presented at the hearing of this case concerning recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula."

Consolidated sought a rehearing, requesting among other things, that the Commission inquire into reserves in the Basin-

Dakota Gas Pool, and to that end, to make full use of its subpoena powers. The Commission by Order No. R-2259-A granted a rehearing, but by its ordered stated "That the scope of such rehearing shall be limited to matters concerning recoverable gas reserves in the Basin-Dakota Gas Pool."

Pursuant to this order for rehearing, Consolidated secured the issuance of subpoenas by the Oil Conservation Commission. Two of these subpoenas were fully filled in, directed to named individuals, when issued by the Commission Secretary. The remainder were issued in blank, and were filled in by Consolidated prior to service.

Written motion to quash the subpoenas were filed by Pubco Petroleum Corporation, El Paso Natural Gas Co., and George Eaton. In addition a motion to modify subpoena was filed by David H. Rainey. Motions to quash were made orally at the hearing on September 14 as to the subpoenas served on other persons.

Generally, the motions to quash the subpoenas were based upon the same grounds, and may be discussed together, with the exception of the issues raised in the motion filed on behalf of George Eaton. This motion raises certain legal questions that should be disposed of first.

The Subpoena Duces Tecum Was Issued By Authority of the Commission and is Valid

The authority of the Oil Conservation Commission to subpoena witnesses, require their attendance, and giving of testimony before it, is found in Section 65-3-7, NMSA, 1953. This statute vests in the "Commission, or any member thereof," the power to subpoena witnesses, require their attendance and

giving of testimony, and to "require the production of books, papers and records in any proceeding before the Commission." The Commission has implemented this statute by its Rule 1211.

In compliance with this statute and the rules of the Commission and upon written request by petitioner, the subpoenas complained of here were issued by the Commission.

On behalf of George Eaton, it is asserted that the subpoena duces tecum directed to him was issued without authority of the Commission and is invalid and void, in that it was signed by the Commission in blank, and was later completed by petitioner in this case. Admittedly, the subpoena when signed and sealed by the Secretary-Director of the Oil Conservation Commission, did not bear the name of the witness George Eaton, nor was it completed as to the papers, and documents sought to be obtained by the subpoena. This is in accordance with the law on the subject, and the subpoena was valid and effective when completed and served.

Issuance of subpoenas in blank has long been recognized by the courts as a ministerial function, and subpoenas issue as a matter of right, not as a matter of judicial discretion. In Southern Pacific Co., vs. Superior Court, 15 Cal. 2d 206, 100 P.2d 302, the court held that the issuance of a subpoena is merely ministerial, since the purpose of the subpoena is to initiate proceedings to have the documents and other matters described in the subpoena brought before the court in order that the court may determine whether they are material evidence in the case pending before it.

While at one time it may have been supposed that the issuance of a subpoena was a judicial function, requiring full

information on the part of the court before it would be issued, that day has long since passed. VIII Wigmore on Evidence, § 2200, points out:

> " * * * But modern demands for convenience and informality have resulted in the issuance of the subpoena, by practice in many states, from the clerk of the court alone, or even by the party himself. The name of the court thereon is a mere form in such cases. Ultimately, this goes back to the modern custom of granting the subpoena without any conditions imposed and without any showing of necessity, so that the court's discretion is not invoked and thus the judge's intervention would be needless."

In New Mexico practice, this rule has been embodied in the Rules of Civil Procedure as it has in the Federal Rules of Civil Procedure. Sec.. 21-1-1(45) New Mexico Statutes Annotated, which sets out the Rules of Civil Procedure provides:

> " * * * The clerk shall issue a subpoena, or a subpoena for the production of documentary evidence, signed and sealed but otherwise in blank, to a party requesting it, who shall fill it in before service."

The provisions of Rule 45 of the Federal Rules of Civil Procedure are identical. 4 Barron & Holtzoff, Federal Practice and Procedure, 128, 277.

The practice is not dependent upon rule of the court, however, nor on statutory provisions.

In Coney Island Dairy Products Co. v. Baldwin, 276 N.Y. Supp. 682 (1935), the party asked the commissioner in an administrative proceeding for the issuance of twenty subpoenas without stating the names to be inserted thereon, nor the contents of the subpoenas. The statute was similar to that of the New Mexico Oil Conservation Commission, making no explicit provision for the issuance of subpoenas in blank, but providing that "all subpoenas shall be signed and issued by the commissioner." It was

held that the subpoenas should have issued, the court holding:

> "the issuance of a subpoena for a witness during the progress of a cause at the request of a party is a matter of right, and not a matter where the discretion of a judge or a clerk may be exercised." (Emphasis added).

The reasoning the court in reaching this conclusion is clear:

> "The privilege of litigants to enforce the attendance of witnesses is an ancient right and should not be denied by prejudging the materiality of the testimony which may be given. * * * It is the function of the trial court to determine admissibility when evidence is offered. It may not be prejudged by withholding a subpoena for the witness."

The right to issuance of a subpoena is an ancient right, founded in the Statute of Elizabeth in 1562-63, and is thus a part of our common law, except as modified by statute or rule of court. 8 Wigmore, Evidence, 65.

Being a matter of right, whether the name of the party upon whom the subpoena is to be served is inserted before or after the Commission has signed and sealed it, is immaterial. If there existed a duty on the part of the Commission to determine in advance, the names of the parties and the matters to be produced on a subpoena duces tecum that would vest in the Commission the right to prejudge the materiality, relevancy, and admissibility of the testimony to be elicited from the witness.

It may be argued that there is a difference in the right to a subpoena where the production of books and documents is concerned.

The argument falls when the facts of this case are considered. When application for subpoenas was made, the petitioner sought the issuance of subpoenas in the form attached. Two of these subpoenas duces tecum were fully filled in, in the form desired, and no material change was made in the form as to the

other subpoenas issued. If it were proper for the Commission to pass upon the form and content of the subpoena at the time it was issued, which is not admitted, the Commission actually did so.

The right to a subpoena duces tecum, absent a statute, will be implied from the power to issue a subpoena. 8 Wigmore, Evidence, 122-123. It is thus on the same footing as a subpoena to compel testimony, except as modified by statute. No such modification is found in the instant case as would affect the right to the subpoena by petitioner. The witness has his remedy in a motion to quash, a remedy that has been sought in this proceeding. The issuance of the subpoena duces tecum without passing on the materiality of the evidence to be produced does not violate the prohibition against unreasonable searches and seizures where the party is afforded ample opportunity to protect his rights before the tribunal in which the action is pending, as is the case here. 58 Am. Jur. Witnesses § 22.

The Subpoenas are not Vague and Indefinite And There is No Violation of Due Process

Probably the most serious attack that has been made upon the subpoenas is the rather broad assertion that they are vague and indefinite in the matters called for, fail to specify with sufficient clarity the papers, documents or material to be produced, and amount to a violation of the constitutional safeguards against unreasonable searches and seizure and thus violate due process of law.

These are broad, general allegations which are directed in the main to the sound discretion of the Commission. In effect the parties seeking to quash the subpoenas allege an

abuse of discretion on the part of the Commission, amounting to a violation of their constitutional rights.

There has been no assertion that the information and material sought is not relevant and material to the question before the Commission, and it is submitted that the information sought to be obtained is essential to a decision by the Commission, under the provisions of New Mexico Statutes, particularly Sec. 65-3-13, et seq., and the decision of the court in the Jalmat case, Continental Oil Co. vs. Oil Conservation, N.M. , 373 P.2d 809.

The subpoena duces tecum should be struck down only on a clear and convincing showing that some constitutional right has been violated, or will be violated if the subpoena is enforced. 97 C.J.S. Witnesses § 19.

The reasons for this were stated in U. S. v. Byran, 339 U.S. 323, 94 L.Ed. , 70 S. Ct. 724, where the court held that persons summoned as witnesses by competent authority have a public duty, the discharge of which is essential to orderly operation of legislative and judicial machinery.

> "Every exception from testifying or producing records presupposes a very real and substantial individual interest to be protected."

To the same effect is the ruling in Shotkin v. Nelson, 146 F.2d 402.

As we have previously stated, the constitutional protection against an unlawful search and seizure extends only to an abuse of discretion on the part of the Commission. 79 C.J.S. Searches & Seizures, § 36, states:

> "The constitutional guaranty does protect a corporation to the extent that the books and papers which it may be required to produce must be relevant to the subject of inquiry, must be clearly described with sufficient particularity, must be proportionate to the ends sought, and their production must be

> required by lawful and sufficient process. Nevertheless, as has been said by the highest authority, in cases involving production of a corporation's books and papers in response to any order or subpoena authorized and safeguarded by judicial sanction, the constitutional guaranty, if applicable, at most guards againstabuse only by way of too much indefiniteness or breadth in the things required to be particularly described."

In support of this, the text cites Oklahoma Press Publishing Co. v. Walling, 327 U. S. 186, 90 L.Ed. 614; and News Printing Co. v. Walling, 327 U. S. 186, 90 L.Ed. 614.

The question then resolves itself into whether the books, papers, documents and other material sought by the subpoenas were designated with sufficient particularity, and whether they are proportionate to the ends sought.

They are proportionate to the ends sought. No argument was raised as to the necessity for reservoir information to be presented to the Commission, by any of the parties. The Jalmat Case, supra, was explicit in directing the Commission, in considering a proration order, to consider recoverable gas in the pool, and under the tracts dedicated to the wells in the pool "insofar as practicable." (373 P.2d at p. 815). How is this to be done if the Commission is to be denied access to the studies and the information of the only parties in a position to furnish such information? The Commission must of necessity obtain this basic information as the basis of a valid proration order insofar as it is practicable for it to do so.

The purpose of specifying with certainty the books, documents and records in a subpoena duces tecum is to protect the witness, and advise him in what manner he should comply. It was asserted in argument that the subpoenas issued by the Commission lack this definite, certain quality, and should therefore be quashed.

It should be remembered that the persons subpoenaed are experts in their field, most of whom have appeared and testified before the Commission. In the case of the witness David Rainey, and the witness Frank D. Gorham, both testified as experts in this case, testifying as to the reserves and recoverable gas in the pool and under some of the tracts in the pool. The information and material presently sought was, to a large extent, utilized by them in the previous hearing of this case.

In 97 C.J.S., Witnesses, § 25, at p. 386, the need for definiteness and certainty in such a subpoena is discussed as follows:

> "The books, papers or documents of which production is sought to be compelled by subpoena duces tecum should be specified in the motion or application, with all the certainty practicable under the circumstances. Inasmuch, however, as applicant has not usually the means of knowledge to describe them particularly, while the witness, if he has possession of them, ordinarily can have little difficulty in determining what is desired, considerable latitude should be allowed, in the motion, and a motion or application is sufficiently definite, with respect to the documents required, where the description is specific enough to enable the witness to produce them without uncertainty." (Emphasis added.)

And again at p. 391:

> "* * * The description (of books, records and documents to be produced) need not, however, be exact and full in all particulars, but it is sufficient if the books and papers desired are designated with reasonable certainty, so that the witness may know what is required of him."

No definite rule can be laid down as to what is definite and certain in a subpoena duces tecum, but each case must stand on its own. In re Eastman Kodak Co., 8 FRD 760 (N.Y.). Attention is directed to the annotation in 23 ALR 2d 826.

Several of those resisting the subpoenas have asserted that "a great mass of information is called for," and at least one claimed that the papers sought constituted records in daily

use and that to bring them in would seriously interfere with their business. This is not a valid ground for objecting to a subpoena duces tecum. The rule is stated in 97 C.J.S., Witnesses § 25, at p. 394:

> " * * * A witness cannot lawfully refuse to comply with a subpoena duces tecum on the ground that compliance will cause him to suffer great inconvenience, or will entail great expense, or that the production of the documents called for will result in the disclosure of valuable business secrets, or otherwise adversely affect his pecuniary interests."

It will be noted that the above citation holds, also, that the secret and confidential nature of the information sought is not a grounds for refusal to comply with the subpoena. The rule is stated in 59 Am. Jur., Witnesses § 31:

> "A party to an action may be compelled to produce books or papers in his possession or under his control to be inspected by the opposite party, and a witness or a party may be required to produce books or papers to be used as evidence on the trial, and this, notwithstanding the papers may be private. A corporation may be compelled to produce books and papers in like manner as if it were a natural person. Thus the officers of a corporation cannot refuse to produce its books in court or before an officer authorized to take a deposition, in response to a subpoena, on the theory that the privacy with which its business is carried on is a trade secret which it is entitled to protect from the inspection of strangers."

And in Sec. 32, it is held that it is no ground for the refusal of a witness to produce books and papers that they are private.

That a great mass of material is sought is no ground for quashing a subpoena duces tecum where the material is essential to some lawful function of the state, as is the case here. Hammond Packing Co. v. Arkansas, 212 U. S. 322, 53 L.Ed. 530; and see the annotation 23 ALR 2d 875. See also 2B Barron and Holtzoff, § 1004, p. 291.

If it be determined that the subpoenas are somewhat broader or call for more material than is essential to the functions

of the Commission in exercising its powers to prorate gas production, this fact does not affect the legality of the subpoena, which may be modified by the Commission. 97 C.J.S., Witnesses § 25, p. 394, states:

> "The fact that a subpoena is broader or more inclusive as to the documents to be produced, than it should be, or includes confidential matter with that rightfully subpoenaed, or directs the witness to produce books and papers which he cannot lawfully be required to produce, does not, ordinarily, affect the legality of the issuance of the subpoena or the obligation of the witness to appear in obedience to it; but he may refuse to produce, or permit the use or inspection of, documents which are of such confidential or privileged character that they could not be received in evidence over his objection. If he has doubts as to whether or not he should produce the document called for, he may submit it to the inspection of the court, and obtain a decision on the question of its production."

Thus the witnesses may be fully protected as to the production of any "confidential" information, if such there be. A ruling may be obtained from the Commission at the time the production of such evidence is called for.

Other Matters

Several other matters remain to be discussed briefly.

It was asserted during argument that the petitioner in this case was seeking to obtain information requiring judgment and expert opinion from the witnesses subpoenaed. When it is remembered that several of the witnesses subpoenaed have already submitted themselves in this case as expert witnesses, the absurdity of the argument is patent. An expert witness may be compelled to state his opinion upon hypothetical or other questions involving his professional knowledge, and that is all that is being sought here from these witnesses. Barnes v. Boatmen's National Bank, 348 Mo. 1032, 156 SW2d 597.

It has also been argued that the witnesses do not have possession or custody of the books and papers sought. Certainly

it is apparent that such books and papers were available to Mr. Rainey, who testified at length on reserves in the Basin-Dakota pool. Can it be said they are available to him for one purpose but not for another? At least, he can produce the papers used and relied upon in his previous testimony, and the commission has the power to require the basic documents and information upon which his expert opinion was based in order to reach its own conclusion as an expert commission. Certainly at a minimum, the want of possession of some documents and records does not excuse the production of those within the possession of the witness and those which he is able to produce. McGarry v. Securities and Exchange Commission, 147 F2d 389.

Pubco Petroleum Corporation, in their motion to quash the subpoena duces tecum directed to Frank D. Gorham, assert "That the matters and things referred to in the item described in the subpoena have been fully submitted and presented to the Commission at the hearing, * * * ." If this be the case, there is nothing more for Mr. Gorham to produce, and he can so state on the witness stand.

It was also alleged by some that the subpoenas should be quashed because of the shortness of time allowed for the production of the "great mass" of material sought in the subpoenas. This would properly be grounds for a motion for extension of time, which, in effect, they now have. It is not a ground for a motion to quash the subpoena. Even as an excuse for non-compliance with the subpoena, shortness of time is an excuse at best, directed to the discretion of the Commission. Due to the extension of time granted in this case, the argument becomes meaningless to this proceeding. In any event, time for compliance with the subpoena may be extended, within the sound discretion of the Commission. 97 C.J.S., Witnesses § 25, p. 396.

Another objection to the subpoenas was that there was no limit as to the period of time to be covered by the records sought. This is a defense occasionally asserted, and actually is nothing more than a claim that the subpoena is burdensome. Again this is within the discretion of the Commission, and it should be remembered that this is a relatively new pool, and any determinations of reserves, and books, records, and other matter relating thereto is of fairly recent vintage because there was no material upon which to base these determinations prior to the last few years.

Conclusion

In conclusion, we can do no better than to paraphrase the language of 97 C.J.S. at page 397: In determining, on such a motion or application to quash or vacate a subpoena duces tecum, whether the production of documents and other material should be enforced by the commission, it is proper to consider whether the subpoena duces tecum calls for the production of specific documents or proof; that is, documents or proof that can be identified by the witness from whom they are sought, with sufficient certainty for him to comply. If so, the commission must then consider whether that proof is prima facie sufficiently relevant and necessary to justify enforcing its production.

In general, whether the subpoena shall be set aside is a matter within the discretion of the commission. While in a proper case the subpoena may, or should be quashed or vacated, such relief will be granted only on a very clear showing of the right thereto; and the subpoena should not be quashed or set aside, on the ground that the evidence called for by it is not relevant or material, but only where the futility of the process to uncover anything useful or legitimate is inevitable

or obvious. Clearly this is not the case here.

It is submitted that the subpoenas are lawful, where issued in a valid exercise of the power of the Commission, seek information essential to the Commission in the performance of its duties, and should be enforced.

Respectfully submitted,

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BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL AND GAS, INC., for an amendment of Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico.	]	Case No. 2 5 0 4

MEMORANDUM BRIEF IN SUPPORT OF THE MOTION OF GEORGE EATON TO QUASH SUBPOENA DUCES TECUM

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MEMORANDUM BRIEF IN SUPPORT OF THE MOTION OF GEORGE EATON TO QUASH SUBPOENA DUCES TECUM

This Memorandum Brief is filed in the support of the Motion of George Eaton to quash the subpoena duces tecum issued in the above styled and numbered case and served on George Eaton on September 11, 1962, at Farmington , New Mexico.

The applicable facts on the basis of which the Commission's decision will be made, insofar as Respondent George Eaton is concerned, were stated to the Commission in oral argument and, under the Commission's ruling, an opportunity will be afforded to establish these facts by testimony should this be required as a result of any further proceedings. The pertinent facts are believed to be these:

1. George Eaton is a resident of Farmington, New Mexico, is employed by Pan American Petroleum Corporation as a Senior Reservoir Engineer in its Farmington District Office. The subpoena duces tecum in this case was served on him at Farmington on September 11, 1962, less than 48 hours prior to the time at which he was required to present himself with the voluminous records specified by this subpoena before the

Commission at Santa Fe, New Mexico.

2. The subpoena duces tecum which was served on George Eaton was issued by the Commission in blank; that is to say, at the time that the subpoena duces tecum was signed on behalf of the Commission and the seal of the Commission affixed thereto, the subpoena was in blank. Neither the name of the person to whom it was directed nor the documents that he was required to produce appeared in the instrument. These blanks were subsequently filled in by the attorney for Petitioner, Consolidated Oil and Gas, Inc. and the Commission had no knowledge of the person to whom the subpoena was directed as completed, nor as to the instruments which it required him to produce.

3. The records, reports, data sheets, determinations and tabulations of reserve information specified by the subpoena duces tecum are maintained in the Farmington District Office of Pan American Petroleum Corporation under the control and direction of the Superintendent in charge of that District and were not in the physical custody of George Eaton at the time the subpoena was served on him, nor does he have custody of them in the normal course of the operation of the Farmington office. Mr. Eaton does have unrestricted access to these records in connection with the performance of his duties for Pan American but no right to custody or control of them for any other purpose. He is not responsible to the West Texas-New Mexico Division office at Fort Worth for the custody of the records, or for the information contained in them.

4. Reserve calculations and tabulations are the "stock in trade" of every operating oil company. They are the most highly confidential

record maintained by the production department of Pan American Petroleum Corporation. Existing directives of the company prohibit the disclosure of reserve information to any person not an employee of the company requiring the use of the information in the performance of his duties, unless written authorization has first been obtained from the Vice President in charge of the West Texas-New Mexico Division of the company. The safeguards erected around the confidential reserve information of the company are typical of the safeguards in effect in companies throughout the industry. Oil and gas properties are bought, sold, developed, abandoned and produced on the basis of the reserve information of the company. Disclosure of this information to outside individuals would severly handicap the company in all of its dealings and result in irreparable injury to company operations.

5. Pan American Petroleum Corporation, the employer of George Eaton, did not enter an appearance in this case. While it entered an appearance in the original hearing on the application of Consolidated Oil and Gas, Inc., it presented no testimony and its activity in that hearing was limited to a statement at the conclusion of the hearing.

6. The subpoena served on George Eaton is directed to him as an individual. He is not an officer, director, or managing agent of Pan American Petroleum Corporation and the subpoena is not directed to him as an employee of that company. It does, however, direct him to produce before the Commission, reports, records and tabulations made by or in the possession of Pan American Petroleum Corporation.

7. George Eaton was present at the hearing of the Commission at the time and place specified in the subpoena duces tecum. At that time he filed the Motion to Quash Subpoena Duces Tecum which is now under consideration.

On the basis of the foregoing facts, it is respectfully submitted that the subpoena duces tecum served on George Eaton should be quashed for the following reasons.

1. GEORGE EATON DID NOT HAVE CUSTODY NOR CONTROL OF THE INSTRUMENTS SPECIFIED IN THE SUBPOENA AND HAS NO AUTHORITY TO REMOVE THEM FROM THE POSSESSION OF THE PERSONS RESPONSIBLE THEREFOR.

The general rule as to the effect of service of a subpoena duces tecum upon a witness who does not have custody of the documents specified is discussed at 8 Cyclopedia of Federal Procedure, §26.21, page 34 as follows:

> "But one may not be held in contempt as for disobedience to a subpoena duces tecum if he is unable, in good faith, to comply with it, as where documents which he is commanded to produce are neither in his possession nor subject to his control, and, if he were to produce them, he would first have to obtain them by unlawful means. However, the fact that a subpoena calls for documents which the witness cannot lawfully be required to produce does not affect his obligation to appear in obedience to it***."

At 97 C.J.S., Witnesses, Section 25, page 380, the rule is thus stated:

> "Whoever can be a witness can be compelled by a subpoena duces tecum to attend at a trial or hearing with books or papers desired in connection therewith; and the person who has the control of, and the ability to produce, the desired books or papers is the proper person to be subpoened.

* * *

> "Servant. A servant ordinarily cannot be compelled to produce his master's books or papers; but where the master is a corporation, which can be acted on only through its officers or servants, a subpoena duces tecum will properly run against the person having the actual custody of the books or papers desired, without regard to the master's orders." (Text underlining added)

The case of Schwimmer v. United States of America, 232 Fed. 2d 855 (8th Cir. 1956) recognizes the fact that, as a basis for a subpoena to compel the production of books and papers, there is no distinction between construction possession with control, on the one hand, and physical possession on the other. One or the other of these situations, however, must exist on the part of the person on whom the subpoena is served before he can be required to produce the documents in question.

As stated above, and as will be shown by testimony if required, George Eaton had neither constructive possession with control nor physical possession of the records in question at the time the subpoena was served. He only had access to the records for the purpose of performing his duties to his employer.

The following statement from Jones On Evidence, Volume 4, Section 884, is considered to be a correct statement of the rule as it is applied to the situation of Mr. Eaton. On the basis thereof, it is respectfully submitted that the subpoena directed to Mr. Eaton should be quashed. This well recognized authority states at page 1656:

> "Obviously, a witness cannot be compelled to produce documents by the subpoena duces tecum unless such documents are under his control or his possession.

> A mere clerk or employee is under no obligation to produce books which are properly under the control of his employer or superior. But one having the actual custody of documents may be compelled to produce them, although they may be owned by others. (underlining added).

On the basis of the foregoing authorities it is respectfully submitted that the subpoena duces tecum to which this Motion is directed was issued to, and served upon, the wrong person, if it was sought to obtain the reserve computations and related information of Pan American Petroleum Corporation. George Eaton, only having access to the records, and not having control, custody or possession of the records sought cannot be held responsible for their production. Under these circumstances, the subpoena should be quashed and George Eaton thereby discharged of responsibility to produce records which are not legally subject to production through him.

2. THE SUBPOENA DUCES TECUM WAS ISSUED IN BLANK BY THE COMMISSION AND IS INVALID. ITS SUBSEQUENT COMPLETION BY COUNSEL FOR A PARTY DOES NOT CONSTITUTE EXERCISE OF THE POWER OF THE COMMISSION.

Counsel for Consolidated, at the hearing before the Commission, agreed that the subpoena served on George Eaton had been signed by the issuing officer in blank and the seal affixed so that at the time the control of the subpoena was lost by the Commission it was a blank instrument directed to no one and specifying no documents to be produced. Subsequently, it was completed by counsel for Consolidated who filled in the name of Mr. Eaton and the instruments designated therein. It is respectfully submitted that such an instrument does not constitute a valid exercise

by the Commission of the subpoena power granted to it by the legislature and that the completion of the subpoena by the attorney for one of the parties litigant does not validate it.

Section 65-3-7 New Mexico Statutes Annotated, 1953, provides in part as follows:

> "The Commission, or any member thereof, is hereby empowered to subpoena witnesses, to require their attendance and giving of testimony before, it and to require the production of books, papers and records in any proceeding before the Commission. No person shall be excused from attending and testifying or from producing books, papers and records before the Commission, or from obedience to the subpoena of said Commission, whether such subpoena be signed or issued by one or more of the members of the said Commission. * * *" (Underlining added.)

It is to be noted that the legislature vested the subpoena power in "the Commission, or any member thereof". It did not vest the subpoena power in the attorney for a litigant appearing before the Commission. It also is apparent from the foregoing provision that the legislature contemplated that the subpoena would be both signed and issued by the Commission or a member thereof. The issuance of a subpoena is an act separate and apart from its signing. At the time of issuance it must be a completed subpoena or it does not constitute an exercise by the Commission itself of the power as granted to it by the legislature. It has been suggested by counsel for Consolidated that because the clerks of the District Courts of the State of New Mexico have been authorized to issue subpoenas duces tecum in blank, the Commission should have the same power and authority. The position is untenable. The court clerk would have no authority to issue a

subpoena in blank were it not for an express grant of authority which appears in the Rules of Procedure of the District Court. Thus Section 21-1-1 (45) N.M.S.A. 1953 provides in part "The Clerk shall issue a subpoena, or a subpoena for the production of documentary evidence, signed and sealed but otherwise in blank, to a party requesting it, who shall fill it in before service".

The foregoing provision is identical to the provision of Rule 45 of the Federal Rules of Civil Procedure. The Federal Rules of Civil Procedure, however, expressly extend the application of the rules to proceedings for the production of evidence before federal administrative agencies. There is no such extension or authorization by the State of New Mexico, and the rules of the District Courts have not been adopted by this Commission as rules of procedure in matters before it. The provision of the Federal Rules of Civil Procedure referred to, appears as Rule 81, Section (a), paragraph (3), as follows:

> "*** these rules apply (1) to proceedings to compel the giving of testimony or production of documents in accordance with a subpoena issued by an officer or agency of United States under any statute of the United States except as otherwise provided by statute or rules of the District Court or by order of the Court in the proceedings * * *" 28 U.S.C. §81(a)(3)

There is no provision of the New Mexico Rules of Civil Procedure comparable to the federal provision referred to above. By the same token, there is no authority for the issuance by the Commission of a blank subpoena duces tecum when the legislature has vested the subpoena power in the Commission and its members and has not made provision for issuance of other than a completed document.

The general rule as to delegation of powers by administrative bodies is stated at 73 C.J.S. Public Administrative Bodies and Procedure, Section 57, page 380 as follows:

> "Administrative officers and bodies cannot alienate, surrender,or abridge their powers and duties,or delegate authority and functions which under the law may be exercised only by them; and,although they may delegate merely ministerial functions, in the absence of statute or organic act permitting it, they cannot delegate powers and functions which are discretionary or quasi-judicial in character or which require the exercise of judgment."

At page 382 of the same authority, this statement appears:

> "Under some statutes, administrative offices or bodies have been held not to be authorized to delegate their power to issue subpoenas. Under other statutes, they have been held authorized to delegate the power to issue subpoenas, but not the power to determine whether or not a requested subpoena should be issued."

It is respectfully submitted that under either type statute referred to above the action of the Commission in this case would not have constituted a valid exercise of the subpoena power which the legislature has given to the Commission for the reason that when a subpoena is issued in blank, the Commission has not exercised "the power to determine whether a requested subpoena should be issued". When the Commission does not know to whom the subpoena is to be issued, or what documents he is going to be required to produce, it certainly cannot make a determination of any character that such a subpoena should be issued. The result of such an attempt is that the subpoena is invalid and void and that the subpoena served on George Eaton should be quashed.

3. THE SUBPOENA DUCES TECUM WAS UNREASONABLE IN THAT INADEQUATE TIME WAS ALLOWED FOR THE COLLECTION AND PRODUCTION OF THE MATERIALS REQUIRED BY ITS TERMS.

Disregarding for the moment all other respects in which it is asserted that the subpoena is invalid, it is submitted that the service of a subpoena duces tecum on a witness in Farmington, New Mexico, requiring him to accumulate the tremendous mass of materials specified by this subpoena duces tecum and to present the materials in person in Santa Fe in approximately 48 hours is so unreasonable as to constitute a violation of the constitutional prohibition against unreasonable searches and seizures.

There was no basis whatever for delay until 48 hours before the opening of this hearing for the service of the subpoena George Eaton. The files of the Commission will show that similar subpoenas duces tecum had been served upon other companies, particularly El Paso Natural Gas Company, and Pubco weeks prior to the hearing. Then presumably as an afterthought, and without any consideration for the demands that were being made upon the witness, Consolidated filled in the blank subpoena which the Commission had entrusted to it and served it on George Eaton requiring action which could not reasonably be taken within 48 hours.

The rule in this connection is well established. At 97 C.J.S. Witnesses, Section 19, page 369, it is said:

> "However, a witness is not punishable for failure to attend in obedience to a subpoena where it is served so late that sufficient time to comply with it is not afforded him; and in general, where the service of a subpoena is so delayed as not to give the witness reasonable time to prepare to attend

> the trial, his non-attendance will be excused on comparative slight grounds, although the shortness of the notice is not per se an excuse."

The Commission is not faced with a case of non-attendance on the part of the witness. Mr. Eaton presented himself at the time specified. The demands of the subpoena as regards the instruments which he was required to produce however, were wholly unreasonable. The all inclusive character of the documents and information described in the subpoena duces tecum, climaxed by the third paragraph which required him to produce "any reports, determinations, or tabulations of initial or subsequent reserve calculations made by or in the possession of Pan American Oil and Gas Company concerning recoverable gas reserves in the Basin Dakota Gas Pool, not included in paragraphs 1 and 2 above" would have required the witness to examine every sheet of paper in every file of the company in Farmington having any relation to the matter of reserves, whether on properties of Pan American or other operators, the withdrawal of these documents and transportation of them to Santa Fe for presentation at 9:00 A.M. on September 13, 1962.

At 42 Am. Jur., Public Administrative Law, Section 34, page 328, the general rule is stated that:

> "The power to require the production of books, papers, and documents may be conferred on administrative agencies, but this will not be construed to be an unlimited authority. It will be held within the restrictions of constitutional provisions against unreasonable search and seizure, and exercise of the power will be permitted only as to matters reasonably relevant to the inquiry and only as to books, papers and documents as to which there is some ground for supposing that they contain such relevant matter."

The same authority at Section 88 elaborates on the rule in this manner:

> "Although the courts are liberal in permitting an administrative agency full exercise of its powers to require the production of books, papers and documents, and declare that a subpoena duces tecum must be obeyed if the documents called for contain evidence which relates to the matter in question, such power is circumscribed by the constitutional prohibition of unreasonable search and seizure. A subpoena duces tecum, by reason of its scope and onerous requirements, may be unreasonable or constitute an abuse of discretion or an unreasonable search, as where the search involved is out of proportion to the end sought * * *".

It is respectfully submitted that the subpoena under attack was unreasonable and invalid and should be quashed by virtue of the unreasonable requirements of the subpoena in relation to the documents which the witness was required to assemble and produce on less than 48 hours notice.

4. THE UNRESTRICTED RANGE OF THE INSTRUMENTS REQUIRED BY THE SUBPOENA AND ITS APPARENT USE AS A "FISHING EXPEDITION" MAKE IT UNREASONABLE AND INVALID.

At 97 C.J.S., Witnesses, Section 25, page 377. The general rule with reference to subpoenas duces tecum is stated that:

> "**the constitution requires that the forced production of documents by subpoena be not unreasonable, and the production of records may not be required under such circumstances as to contravene such constitutional provisions. In determing whether a subpoena duces tecum is invalid as unreasonable and oppressive, each case must be judged according to the peculiar facts arising from the subpoena itself and other proper sources."

At page 381 of the same authority under the title "What May be Required to be Produced" the following statement appears.

> "A subpoena duces tecum may be used to compel the production of any proper documentary evidence, such as books, papers, documents, accounts and the like, which is desired for the proof of an alleged fact relevant to the issue before the court or officer issuing the subpoena; but such a subpoena may not be used for the purpose of discovery, either to ascertain the existence of documentary evidence or to pry into the case of the adverse party.
>
> * * *
>
> "A subpoena duces tecum may not be used for the purpose of discovery, either to ascertain the existence of documentary evidence, or to pry into the case of the adverse party, so, such a subpoena is not proper to be used for the purpose of obtaining facts or information needed by the party, at whose instance it is issued, in order to enable him to prepare proper pleadings, or to supply the facts needed therefor, * * * nor can it lawfully be employed for a mere 'fishing expedition', or general inquisitorial examination of books, papers or records with a view to ascertaining whether something of value may not show up therefrom, * * *."

It is only necessary to examine the provisions of the subpoena in this case to demonstrate that it goes far beyond any reasonable limitation such as is envisaged by the foregoing authorities. Mr. Eaton was required to produce any reports, data sheets, determinations, or tabulations, pertaining to some 168 wells of Pan American in the Basin-Dakota Pool which would show any of the following:

> acreage, initial reservoir pressure, average porosity, total and net gas saturation, average permeability, initial open flow potential, deliverabilities including initial and most recent figures available, gross gas pay, net gas pay, gas reserves, both original and most recent calculations.

When the provisions of paragraph 3 in addition are considered, the witness was also required to produce any reports, determinations, or tabulations of either initial or subsequent reserve calculations on any well and property in the Basin-Dakota Pool.

It is respectively submitted that such a shot-gun description does not meet the requirements of a reasonable subpoena duces tecum and that the enforcement of such a subpoena would constitute an unreasonable search and seizure violating the constitutional prohibition. It is the function of a subpoena duces tecum to require the production of specified documents. The normal procedure requires identification, with particularity, of the documents which are sought in order that it can be determined by the witness when he has met the requirements of the subpoena and it can likewise be determined by the issuing authority whether or not the witness in fact has met the requirements of the subpoena. The subpoena under consideration does not meet this standard in any respect. Neither George Eaton nor the Commission could ever know or would ever know when or whether Mr. Eaton had fully complied with the requirements which remained in the subpoena, yet the rule as stated at 58 Am. Jur. Witnesses, Section 25, Page 36, is as follows:

> "A subpoena duces tecum should describe the documents desired with sufficient definitness to enable the witness to identify them without any prolonged or extensive search. The writ may not be issued for a mere 'fishing' expedition. A Plaintiff is not entitled to have brought in a mass of books and papers in order that he may search them through to gather evidence. A subpoena so sweeping in its terms as to be unreasonable violates the prohibition against an unreasonable search and seizure."

Consolidated, in issuing this subpoena, has described no particular instrument whatsoever. It has sought to have the witness review all of the instruments and the files of Pan American to produce all instruments which have any of the information specified in the subpoena. It is respectfully submitted that such a requirement is a "fishing expedition" and that it contravenes the constitutional prohibition hereinabove referred to. For this additional reason the subpoena should be quashed.

5. WHETHER OR NOT THE COMMISSION HAS THE POWER TO ISSUE AND ENFORCE THE SUBPOENA, FOR THE PURPOSE INTENDED, IT SHOULD QUASH THE SUBPOENA BY REASON OF THE CHARACTER OF INFORMATION SOUGHT AND THE CIRCUMSTANCES UNDER WHICH THE PETITIONER SEEKS TO OBTAIN IT.

Without reference to whether or not the subpoena, as prepared and served on the witness, is valid or invalid, and without reference to whether or not the confidential material of Pan American Petroleum Corporation, which it seeks to obtain, can or cannot be reached by such a subpoena of the commission, it is respectfully submitted that the commission should exercise its discretion under the circumstances of this case and quash the subpoena.

For the reason stated in the statement of facts at the outset of this memorandum, the reserve calculations of operating oil companies, both as to the reserves of their own wells and the reserves underlying other properties in which they have a present or potential interest, constitute some of the most highly confidential information which the company

possesses. The safeguards which have been erected in Pan American and other companies to avoid the disclosure of this information to any outside person whomsoever, evidence the value of this information to the company and indicate the irreparable injury which could result from disclosure of the information. If the Commission is to permit every operator who seeks a change of a proration formula to subpoena all of the reserve computations of the operators in that pool in order to provide the petitioning operator with proof by which he might seek to obtain a change of proration formula, the Commission will be opening a Pandora's Box. It not only will do irreparable injury to the operations of the oil industry in New Mexico, but undoubtedly will plague the Commission for many years to come.

One of the first, and an inevitable, result of such action on the part of the Commission would be that all companies operating in New Mexico, which have offices outside of the state, will transfer all reserve information on New Mexico pools, outside of the state in order that it will not be subject to subpoena at the whim of competing operators in a pool in New Mexico. A second result which is inevitable is that the invitation to abuse of the Commission's process, as a means available to an operator to obtain information which he could not otherwise obtain under any circumstances, will be accepted by every unscrupulous operator who wants the information, whether or not he has any real desire to obtain a change in the proration formula.

Reserve information of operating oil companies constitutes a trade secret in every sense of the word. The protection which may be

afforded to trade secrets against disclosure through a subpoena duces tecum is a developing, and as yet somewhat uncertain, area of the law. It is submitted, however, that there is adequate authority to support the Commission in refusing, under the circumstances of this case, to require the disclosure of trade secrets in the form of reserve calculations of operators in the Basin-Dakota Pool.

8 Wigmore on Evidence § 2212, p. 155 discusses the trade secret problem in these words:

> "In a day of prolific industrial invention and active economic competition, it may be of extraordinary consequence to the master of an industry that his process be kept unknown from his competitors, and that the duty of a witness be not allowed to become by indirection the means of ruining an honest and profitable enterprise. This risk, and the necessity of guarding against it, may extend not merely to the chemical and physical composition of substances employed, and to the mechanical structure of tools and machines, but also to such other facts of a possibly private nature as the names of customers, the subjects and amounts of expense and the like.
>
> "Accordingly, there ought to be, and there is, in some degree, a recognition of the privilege not to disclose that class of facts which, for lack of a better term, have come to be known as trade secrets."

It is recognized that the cases generally support the proposition that there is no protection for a trade secret where the secret is material to the issue being tried, the information is in possession of one of the parties and its production is indispensable. But this is not such a case. The above quotation from Wigmore indicates, however, that there is a developing body of law which would protect such secrets against disclosure. At page 156 of the volume above quoted this further statement appears with reference to the protection of trade secrets:

> "What the state of the law actually is would be difficult to formulate precisely. It is clear that no absolute privilege for trade secrets is recognized. On the other hand, courts are apt not to require disclosure except in such cases and to such extent as may appear to be indispensible for the ascertainment of truth. More than this can hardly be ventured."

It is interesting to note in this respect that both the Model Code of Evidence and the Uniform Rules of Evidence contain provisions affording protection to trade secrets under circumstances such as those here involved.

In the case at bar it should be borne in mind that Pan American Petroleum Corporation, whose information Consolidated seeks to obtain by the subpoena, is not a party to the re-hearing and was not an active party so far as the original hearing was concerned. This in itself is a factor weighing against the enforcement of the subpoena. In Ex parte Hart, 200 So. 783 (1941) at p. 786 the Alabama Court said:

> "A document, which may become material evidence on some issue in the cause, may be produced by such process issued on order of the Court where, under the circumstances, the ends of justice require it.
>
> "There can be no sound reason for requiring an outside party, having no concern with the litigation, to bring in his private documents for the use of the litigants, other than like documents in the possession of the parties themselves." (Underlining supplied.)
>
> Later in this opinion the Court observed:
>
> "However, justice to all concerned, including the witness or the owner of private documents, may be considered in passing upon whether a document is of such evidential value as to demand its production. A judicial discretion is recognized on

this line, but not touching documents not legally subject to such process."

It is submitted that here, too, there is no sound reason for requiring an outside party to bring in its confidential reserve figures and there is the same discretion in this Commission to determine whether or not, under the circumstances of this case, the information which is sought to be obtained is of such character as to demand, that it be produced in the interest of justice. We suggest that the interests of justice, in fact, are all the other way, and that they can only be served by protection of the confidential trade secrets of the operators in the pool and the quashing of the subpoena under attack.

Whether or not there exists absolute authority for the protection of trade secrets, under the circumstances presented by this case, the Commission clearly has discretion which may be exercised in passing upon this motion to quash. Its choice is between overruling the motion and inviting the abuse of the subpoena power of the Commission by unscrupulous operators to obtain confidential information which is not otherwise available to them whether or not it actually has any relation whatever to conservation of oil and gas. The alternative is to draw the line now and establish a precedent which will contribute to the continued sound development of the industry in New Mexico and the protection of the powers of the Commission against abuse.

CONCLUSION

For each and all of the foregoing reasons it is respectfully submitted that the subpoena duces tecum served on George Eaton in this case should be quashed and Mr. Eaton should be discharged from any further responsibility by reason thereof.

ATWOOD & MALONE

By Rosa L. Malone cg

Attorneys for George Eaton
P. O. Drawer 700
Roswell, New Mexico

Memo

From

JAMES M. DURRETT JR.
GENERAL COUNSEL

To file:

Attached two subpoenas should be quashed. Counsel stipulated that Palamen & Smith would not be called (Tr. p 31-32).

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

October 29, 1962

William J. Cooley, Esq.
Verity, Burr & Cooley
Attorneys at Law
Suite 152 Petroleum Center Building
Farmington, New Mexico

Re: Case No. 2504 - (Rehearing)

Dear Mr. Cooley:

Reference is made to your letter of October 24, 1962.

Please be advised that the Commission will not require Mr. Leon Wiederkehr to appear in compliance with the ruling on subpoenas duces tecum if the proposed affidavit is filed with the Commission along with a stipulation between yourself and Mr. Kellahin that Mr. Wiederkehr's appearance will not be necessary.

Very truly yours,

A. L. PORTER, Jr.,
Secretary-Director

ALP/JMD/esr

cc: Jason W. Kellahin, Esq.
Kellahin & Fox
Attorneys at Law
P. O. Box 1713
Santa Fe, New Mexico

COPY

VERITY, BURR & COOLEY
ATTORNEYS AND COUNSELORS AT LAW
SUITE 152 PETROLEUM CENTER BUILDING
FARMINGTON, NEW MEXICO

GEO. L. VERITY
JOEL B. BURR, JR.
WM. J. COOLEY

NORMAN S. THAYER

RAY B. JONES

TELEPHONE 325-1702

October 24, 1962

Mr. A. L. Porter
Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Case No. 2504 - (Rehearing)

Dear Mr. Porter:

This is to confirm our conversation of this date wherein I advised you that Southwest Production Company had never cored any wells in the Basin-Dakota Gas Pool and that all electric and radioactivity logs which have been run by Southwest Production Company on its wells in the Basin-Dakota Gas Pool have heretofore been filed with the Commission as required by its rules and regulations.

I have reached an oral agreement with Mr. Jason W. Kellahin, of Kellahin & Fox, attorneys for Consolidated Oil & Gas, Inc. in the above referenced case, to the effect that Southwest Production Company would file an Affidavit with the Commission containing the information set forth in the above paragraph and that Consolidated Oil & Gas, Inc. would waive objection to the non-appearance of Leon Wiederkehr at the hearing in this case set for 9:00 A. M. on December 19, 1962. I have prepared and signed a Stipulation which formally sets forth the foregoing agreement and forwarded the same to Mr. Kellahin for his signature, together with an executed copy of the above referenced Affidavit.

Assuming that the aforementioned Stipulation and Affidavit are filed with the Commission, please advise whether the Commission will waive the appearance of Mr. Leon Wiederkehr in the above referenced hearing.

Very truly yours,

VERITY, BURR & COOLEY

By William J. Cooley

WJC/dh

cc: Mr. Jason W. Kellahin
Southwest Production Company

Telephone calls made to:

Dave Rainey
George Eaton
W. A. Keleher 11/3
Kenneth Swanson
Leon Wiederkehr

and to Frank Renard 11/4

regarding the continuance of Case 2504 to the February 14, 1963 regular Commission hearing.

Calls made by James M. Durrett and charged to Credit Card of Jason Kellahin

Memo

From IDA RODRIGUEZ

To DOCKETS AND MEMORANDUM

MAILED TO INTERESTED PARTIES.

12/6/62
ir

KELLAHIN AND FOX
ATTORNEYS AT LAW

JASON W. KELLAHIN
ROBERT E. FOX

54½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

TELEPHONES
983-9396
982-2991

October 29, 1962

Oil Conservation Commission of
New Mexico
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

Enclosed find original of affidavit together with stipulation for filing in the case of Consolidated Oil & Gas, Inc., Case No. 2504.

Very truly yours,

Jason W. Kellahin

JASON W. KELLAHIN

jwk:mas
enclosures

cc: Mr. William J. Cooley

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 2504
REHEARING

APPLICATION OF CONSOLIDATED OIL & GAS,
INC., FOR AN AMENDMENT OF ORDER NO.
R-1670-C, CHANGING THE ALLOCATION FORMULA
FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN,
RIO ARRIBA, AND SANDOVAL COUNTIES, NEW MEXICO.

RULING ON MOTIONS TO QUASH SUBPOENAS DUCES TECUM

BY THE COMMISSION:

This matter came on for hearing at 9 o'clock a.m. on September 13, 1962, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," upon written Motions to Quash Subpoenas Duces Tecum filed by George Eaton, El Paso Natural Gas Company, Pubco Petroleum Corporation, and David H. Rainey, and upon oral Motions to Quash Subpoenas Duces Tecum by Aztec Oil & Gas Company and Frank Renard.

NOW, on this 18th day of October, 1962, the Commission, a quorum being present, having read and heard the Motions and heard the arguments of counsel thereon, and being otherwise fully advised in the premises,

FINDS:

(1) That the Commission has jurisdiction over the subject matter and the parties to this cause.

(2) That during oral argument before the Commission, it was stipulated by counsel for the applicant, Consolidated Oil & Gas, Inc., and counsel for Southwest Production Company, that Carl Smith would not be called as a witness as Leon Wiederkehr had been subpoenaed and would appear in lieu of the said Carl Smith.

(3) That during oral argument before the Commission, it was stipulated by counsel for the applicant, Consolidated Oil & Gas, Inc., and counsel for Aztec Oil & Gas Company that Joe Salmon would not be called as a witness as L. M. Stevens had been subpoenaed and would appear in lieu of the said Joe Salmon.

(4) That the Subpoenas Duces Tecum served in this cause upon the said Carl Smith and Joe Salmon should be quashed.

(5) That under the subpoenas served in this cause on George Eaton, Frank D. Gorham, David H. Rainey, Frank Renard, L. M. Stevens, and Leon Wiederkehr, and subject to a determination of custody and/or control, the Commission should require only the production of all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by the respective companies of the subpoenaed witnesses.

(6) That the Commission should allow all parties subpoenaed in this cause to present evidence concerning custody and/or control of core analysis reports and electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by the respective companies of the subpoenaed witnesses.

(7) That all persons subpoenaed in this cause and determined by the Commission to have custody of core analysis reports and electric and radioactivity logs concerning any well or wells cored in the Basin-Dakota Gas Pool by their respective companies should appear before the Commission at 9 o'clock a.m., on December 19, 1962 in Morgan Hall, State Land Office Building, Santa Fe, New Mexico, and produce the aforesaid documents and/or reports in accordance with this ruling.

IT IS THEREFORE ORDERED:

(1) That the Subpoenas Duces Tecum served in this cause upon Carl Smith and Joe Salmon, be, and they are hereby, quashed.

(2) That under the subpoenas served in this cause and subject to a determination of custody and/or control, George Eaton, Frank D. Gorham, David H. Rainey, Frank Renard, L. M. Stevens, and Leon Wiederkehr, shall be, and they are hereby ordered to appear before the Commission at 9 o'clock a.m., on December 19, 1962 in Morgan Hall, State Land Office Building, Santa Fe, New Mexico, and there produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies.

(3) That all persons subpoenaed in this cause shall be allowed to present evidence concerning custody and/or control

of all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by their respective companies before the Commission at 9 o'clock a.m., on November 14, 1962 in Morgan Hall, State Land Office Building, Santa Fe, New Mexico.

(4) That jurisdiction of this matter is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

A. L. PORTER, Jr., Member & Secretary

ir/

E X H I B I T "B"

Adobe Oil Company
1223 Petroleum Life Building
Midland, Texas

Amerada Petroleum Corporation
Drawer 601
Durango, Colorado

Arizona Explorations, Inc.
417 Meadows Building
Dallas, Texas

Aspen Crude Purchasing Co.
P. O. Box 2060
Farmington, New Mexico

Atlantic Refining Co.
Petroleum Club Building
Denver, Colorado

Bayview Oil Corporation

Benson-Montin-Greer
58 Petroleum Center Bldg.
Farmington, New Mexico

Blackwood & Nichols Co.

M. J. Brannon, Jr.
P. O. Box 1728
Farmington, New Mexico

British American Oil Producing Co.
P. O. Box 180
Denver, Colorado

Alex N. Campbell

Caulkins Oil Company
1130 First National Bank Bldg.
Denver, Colorado

Congress Oil Company

Delhi-Taylor Oil Corporation
Fidelity Union Tower Bldg.
Dallas, Texas

Stella Dysart
220 Simms Building
Albuquerque, New Mexico

El Paso Natural Gas Co.
P. O. Box 1492
El Paso, Texas

El Paso Natural Gas Products Co.
P. O. Box 1161
El Paso, Texas

Elliott Production Co.

Bert Fields

Frontier Refining Company
4040 East Louisiana
Denver, Colorado

Greenbriar Oil Company
19 La Plata Place
Durango, Colorado

Gulf Oil Corporation
P. O. Box 2097
Denver, Colorado

W. H. Hudson
c/o J. B. Avart
1126 Mercantile Bldg.
Dallas, Texas

International Oil Corporation
512 East 2nd Street
Salt Lake City, Utah

Kern County Land Co.
304 Korber Building
Albuquerque, New Mexico

Kingswood Oil Company
1700 Broadway
Denver 2, Colorado

Kay Kimball
P. O. Box 1540
Fort Worth, Texas

La Plata Gathering System

Montosanto Chemical Co.
Denver Club Building
Denver, Colorado

Northwest Production Corp.
520 Simms Building
Albuquerque, New Mexico

Occidental Petroleum Corp.
5000 Stockdale Highway
Bakersfield, California

Ohio Oil Company
P. O. Box 159
Casper, Wyoming

Pan-American Petroleum Corp.
P. O. Box 40
Casper, Wyoming

Pioneer Production Co.

KELLAHIN AND FOX
ATTORNEYS AT LAW

JASON W. KELLAHIN
ROBERT E. FOX

54½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

TELEPHONES
983-9396
982-2991

August 14, 1962

Oil Conservation Commission
of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504, Application of Consolidated Oil & Gas, Inc., for an Order Amending Order No. R-1670-C, changing the allocation formula for the Basin-Dakota Gas Pool.

Gentlemen:

Applicant in the above-captioned case, in conformity with the provisions of Sec. 65-3-7, New Mexico Statutes, Annotated, 1953 Compilation, and Rule 1211 of the Commission's Rules and Regulations, requests issuance of subpoenas to the persons and in the form attached hereto, and directing the appearance of witnesses and the production of the books, papers and documents listed.

Yours very truly,

TED P. STOCKMAR
JASON W. KELLAHIN

By Jason W. Kellahin
Attorneys for Consolidated
Oil & Gas, Inc.

jwk:mas
enclosure

SUBPOENA DUCES TECUM

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

CASE NO. 2504

TO: _____, Greeting:

You are hereby commanded to appear before the Oil Conservation Commission of the State of New Mexico at Morgan Hall, State Land Office Building, Santa Fe, New Mexico, on September 13, 1962, at the hour of 9 o'clock a.m., then and there to testify in the cause therein pending wherein Consolidated Oil & Gas, Inc., is the applicant in Case No. 2504, and that you bring with you and there produce the following-named documents, to-wit:

And this as you under penalty of the law.

Given under my hand and the official seal of the Oil Conservation Commission of New Mexico this 14th day of August, 1952.

(SEAL)

A. L. Porter, Jr.

SHERIFF'S RETURN

STATE OF NEW MEXICO)
) ss.
COUNTY OF _____)

I, _____, Sheriff of _____ County, State of New Mexico, do hereby certify that I served the within subpoena by delivering a copy thereof, in the County aforesaid, in person to _____

_____

on _____.

Dated: _____

Fees: _____

SHERIFF

By _____
Deputy

RETURN

STATE OF NEW MEXICO)
) ss.
COUNTY OF _____)

_____, being duly sworn, upon his oath says, I am over the age of eighteen years, I served the within subpoena by delivering a copy thereof, in the County aforesaid, in person to _____

_____

on _____.

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

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L FRA055 PD=FARMINGTON NMEX 12 150P MST=

:A L PORTER, NEW MEXICO OIL CONSERVATION COMMISSION=

SANTA FE NMEX=

:RE CASE NO 2504 THIS IS TO INFORM YOU THAT MR FRANK RENARD IS AUTHORIZED TO FURNISH THE DATA AS ORDERED CONCERNING BASIN DAKOTA WELLS THAT HAVE BEEN CORED BY BRITISH AMERICAN OIL PRODUCING CO=

BRITISH AMERICAN OIL PRODUCING CO THOMAS M HOGAN=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

AZTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BLDG.
DALLAS 1, TEXAS

October 29, 1962

LAND DEPARTMENT
H. L. SNIDER, JR., MANAGER
KENNETH A. SWANSON, ATTORNEY
GORDON E. COE, ATTORNEY

AIR MAIL

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. James M. Durrett, Jr.

Re: NMOCC Case No. 2504 Rehearing

Gentlemen:

Receipt is acknowledged of a copy of the Commission's ruling with respect to the Motions to Quash Supoenas Duces Tecum.

As required by ordering paragraph (2), Mr. L. M. Stevens will appear before the Commission at 9:00 a.m. on December 19, 1962 and will there "produce all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Pool" by Aztec Oil & Gas Company.

Mr. Stevens has been given custody and control of such logs and reports for such purpose; therefore, Aztec Oil & Gas Company does not plan to argue that some party other than Mr. Stevens actually has custody and control of this data at the November 14, 1962 hearing.

Yours very truly,

Kenneth A. Swanson

KAS/et

cc: Mr. Jason Kellahin
Attorney at Law
P. O. Box 1713
Santa Fe, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

CASE NO. 2504

MOTION TO QUASH SUBPOENA DUCES TECUM

Comes now George Eaton, hereinafter referred to as "Respondent", on whom subpoena duces tecum in the above entitled and numbered cause was served on September 10, 1962, and moves the Commission to quash said subpoena and discharge him from obligation to respond thereto, and as grounds therefor states:

1. That said subpoena duces tecum was issued without authority of the Oil Conservation Commission and is invalid and void in that as signed and issued by the Commission it was not directed to Respondent, or to any other person, and specified no documents to be produced; that its subsequent completion and service by, or on behalf of, Petitioner in this case does not constitute a valid exercise of the power of the Commission.

2. That said subpoena was served on Respondent on September 10, 1962 and that it is unreasonable, arbitrary and oppressive, in requiring Respondent to produce in Santa Fe on September 13, 1962 the mass of material specified by said subpoena.

3. That the reports, determinations and tabulations therein specified contain information of the highest confidential character constituting exercise of judgment and opinion on the part of various employees of Pan American

Petroleum Corporation, in addition to Respondent. That said material was prepared for the confidential use of Pan American Petroleum Corporation and is not made available to third parties.

4. That said subpoena is so vague, general and all inclusive that it constitutes a "fishing expedition" by which Petitioner, in violation of constitutional safeguards, seeks to acquire instruments and material the existence of which is not specified or known.

5. That said subpoena fails to specify or identify any particular instrument or instruments to be produced in response thereto and therefore violates the constitutional prohibition against unreasonable searches and seizures, and is invalid.

6. That portions of the information included in the broad and all inclusive terms of said subpoena are the property of third persons, or the product of computations made by them, or on their behalf, and Respondent has no authority to produce them and would be in violation of express or implied prohibitions if required to do so.

7. That said subpoena is otherwise violative of the constitutional rights of Pan American Petroleum Corporation by whom Respondent is employed.

WHEREFORE, Respondent prays that the subpoena duces tecum served on him on September 10, 1962 in this cause be quashed and that Respondent be discharged from any obligation to respond thereto and that Respondent have such further relief as the Commission considers appropriate.

George Eaton
Respondent

Atwood & Malone
P. O. Box 700
Roswell, New Mexico

By Russell Malone
Attorneys for Respondent

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

APPLICATION OF CONSOLIDATED OIL & GAS, INC. FOR AN AMENDMENT OF ORDER NO. R-1670-C, CHANGING THE ALLOCATION FORMULA FOR THE BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO.

CASE NO. 2504

MOTION TO QUASH SUBPOENA DUCES TECUM

Comes now PUBCO PETROLEUM CORP., by its attorney, W. A. Keleher, and respectfully moves the Commission to quash the Subpoena Duces Tecum heretofore served upon Frank D. Gorham, and respectfully shows to the Commission:

1. That at the hearing in taking testimony in this cause, Consolidated Oil & Gas, Inc., which requested the issuance of such subpoena, had ample opportunity to examine the reports placed in evidence by Pubco and to cross-examine the witnesses who identified such exhibits.

2. That all reports have been filed with the Commission and are available and have been available to Consolidated since the time of filing.

3. That the subpoena is general in terms and not specific, and in substance and effect is nothing more than a "fishing expedition".

4. That the matters and things referred to in the item described in the subpoena have been fully submitted and presented to the Commission at the hearing, and the Commission

should not now give Consolidated an opportunity to re-try its case in an attempt to cure any defects or omissions which could have been avoided by the exercise of reasonable diligence.

Dated September 12, 1962.

Respectfully submitted,

PUBCO PETROLEUM CORP.

By _____

ITS ATTORNEY
First National Bank Building
Albuquerque, New Mexico

MOTION TO QUASH SUBPOENA

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

CASE NO. 2504

Now comes EL PASO NATURAL GAS COMPANY, a Delaware corporation with license to do business in the State of New Mexico, hereinafter called "El Paso," and files this Motion to Quash Subpoena duces tecum in Case No. 2504 and in support thereof alleges and states:

I

El Paso is one of the interested parties in Case No. 2504, an application of Consolidated Oil and Gas, Inc. for an order of this Commission to change the allocation formula for the Basin-Dakota Gas Pool.

II

On August 14, 1962, this Commission caused a subpoena duces tecum to be served on David H. Rainey, an employee of El Paso, commanding him, among other things, to bring and produce at the hearing on said case in Santa Fe, New Mexico, September 13, 1962:

> "Any reports, determinations or tabulations of initial and subsequent reserve calculations made by or in the possession of El Paso Natural Gas Company concerning recoverable gas reserves in the Basin-Dakota Gas Pool not included in the eight data sheets subpoenaed above."

III

The reports, determinations and tabulations called for in said subpoena duces tecum have been accumulated over a period of several years and constitute

records constantly used by El Paso comprising a bulk in excess of five hundred pounds.

Transportation of these reports, determinations and tabulations from El Paso, Texas to Santa Fe, New Mexico and return would constitute an unnecessary and expensive interference with El Paso's business operations.

IV

Said reports, determinations and tabulations contain some items which are the property of other parties, are confidential in nature, relating to the properties of such other parties. To require production of all such material instead of specifying and identifying documents and papers which are easily distinguished and clearly described and which are shown to be relevant, is violative of the constitutional prohibition of unreasonable searches and seizures.

V

Said subpoena duces tecum is oppressive and unreasonable and should be quashed.

VI

In the event any subpoena issue to El Paso the party or parties on whose behalf it was issued should be required to specify and describe the particular reports, determinations or tabulations required.

WHEREFORE, El Paso hereby moves the Commission that said subpoena duces tecum be quashed or that the Commission issue an order to provide for the above described alternative.

Garrett C. Whitworth
Attorney
EL PASO NATURAL GAS COMPANY

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

* * * * * * *

APPLICATION OF CONSOLIDATED OIL & GAS, INC.
FOR AN AMENDMENT OF ORDER NO. R-1670-C,
CHANGING THE ALLOCATION FORMULA FOR THE
BASIN-DAKOTA GAS POOL, SAN JUAN, RIO ARRIBA
AND SANDOVAL COUNTIES, NEW MEXICO.

CASE No. 2504
Order No. R-2259-A

MOTION TO VACATE ORDER NO.R-2259-A

Comes now Marathon Oil Company (formerly known as The Ohio Oil Company), having heretofore appeared herein and now appearing herein in opposition to the above captioned application of Consolidated Oil & Gas, Inc. (hereinafter called Consolidated), and respectfully moves this Commission to vacate its Order No. R-2259-A, dated July 7, 1962, granting Consolidated's petition for rehearing herein, and in support of this motion states and alleges that:

I.

Consolidated appeared at the hearing in October, 1960 in opposition to the allocation formula then proposed and later adopted by this Commission in its Order No. R-1670-C on November 4, 1960 effective February 1, 1961. Consolidated offered no evidence or testimony in support of its opposition. It did not upon the entry of the order or upon the effective date thereof or within the statutory period thereafter or within any reasonable time seek a rehearing of this Commission or a court review of said order. Since the entry and effective date of said order a great number of Basin-Dakota gas wells have been drilled in the Basin-Dakota pool and produced under said order.

II.

Consolidated on February 23, 1962 filed its application herein specifically requesting this Commission to adopt a special formula pertaining to the Basin Dakota gas pool, reading as follows:

> "The pool allowable remaining each month after deducting the total allowable assigned to marginal wells shall be allocated among the non-marginal wells entitled to an allowable in the following manner:
>
> "1. Forty percent (40%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's 'AD Factor' bears to the total 'AD Factor' for all non-marginal wells in the pool.
>
> "2. Sixty percent (60%) of the pool allowable remaining to be allocated to non-marginal wells shall be allocated among such wells in the proportion that each well's acreage factor bears to the total acreage factor for all non-marginal wells in the pool."

III.

After proper notice was given setting the application for hearing, this Commission did hold a full hearing thereon in Santa Fe, New Mexico commencing April 18, 1962. Said hearing continued without interruption for several days and nights and was concluded on April 21, 1962. At said hearing Consolidated (and those joining in or supporting the application) failed to prove the allegations of the application and failed to discharge the burden of proof in the presentation of applicant's exhibits and testimony offered in support of the application. They were afforded every opportunity to do so. Those parties appearing in opposition to the application presented exhibits and testimony supporting Order No. R-1670-C and opposing the application; their exhibits and witnesses were then available for complete cross-examination by anyone at the hearing and were thoroughly cross-exarined by Consolidated and those joining with it.

IV.

This Commission, as stated in its order No. R-2259 of July 7, 1962, "having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

* * *

"(2) That by Order No. R-1670-C, entered in Case No. 2095 effective February 1, 1961, the Basin-Dakota Gas Pool was created and prorated under an allocation formula based on seventy-five (75) percent acreage times deliverability plus twenty-five (25) percent acreage. " and * *

"(b) That the evidence presented at the hearing of this case concerning recoverable gas reserves in the subject pool is insufficient to justify any change in the present allocation formula." and then concluded

IT IS THEREFORE ORDERED:

"(1) That the subject application is hereby denied.

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

V.

On June 27, 1962, Consolidated filed with the Commission a petition for rehearing "on any basis agreeable to the Commission" and therein sought to compel (as if it could) opposition witnesses and parties to furnish expert opinion evidence favorable to Consolidated's already denied application. The Commission (prior to the time that Lavaton had an opportunity to appear and object to said petition) did by its Order No. R-2259-A of July 7, 1962

grant a rehearing in the subject case. Consolidated's correspondence and subpoenas duces tecum in Commission files prove beyond question that Consolidated is not seeking a rehearing on any newly discovered evidence of matters which occurred prior to April 21, 1962. Consolidated (and those supporting its application herein) have not and cannot truthfully claim prejudice by reason of not having a full and complete hearing on its application. Consolidated has not alleged,or proven that any competent evidence it now seeks in this so-called rehearing could not, with the exercise of reasonable diligence, have been obtained prior to April 21, 1962 or elicited from witnesses and parties on cross-examination at the hearing concluded on that date.

VI.

Consolidated, by its application herein, has expressly recognized (and is estopped in this case from questioning) deliverability and acreage as appropriate and proper items in the allocation formula adopted November 4, 1960.

VII.

Consolidated has failed:

a. to take timely action in connection with Order No. R-1670-C and is guilty of laches;

b. to show in support of its application herein (1) the amount of recoverable gas under each producer's tract, (2) the total amount of recoverable gas in the pool, (3) the proportion that (1) bears to (2); and (4) what portion of the arrived at proportion can be recovered without waste; and (5) just how under such determinations the correlative rights of producer's will be better protected than under the present formula;

c. to sustain the burden of proof by failing to present sufficient evidence to justify the Commission in making any change in Order No. R-1670-C;

d. in its endeavor to discredit any opposition exhibit or witness or to make its case therefrom .

Consolidated is no doubt disappointed with its failures and in Commission Orders No. R-1670-C and No. R-2259 but its failures and disappointments are not legally or equitably sufficient to warrant either (1) the granting of a rehearing or (2) any further proceedings under Order No. R-2259-A. To permit Consolidated to proceed under such order (at great expense and inconvenience to those opposing it) to "re-hash" and "re-hash" and "re-hash" a valid order of this Commission (entered after a full hearing nearly two years ago) and sustained only a few weeks ago (after another full hearing) would be unconscionable, inequitable and highly irregular tending to violate orderly procedure and due process of law. Consolidated has had its day in court.

WHEREFORE, Marathon Oil Company respectfully requests that Order No. R-2259-A, dated July 7, 1962, be in all things set aside, vacated and held for naught.

Respectfully submitted this 13th day of September, 1962.

MARATHON OIL COMPANY

BY W. Hume Everett

W. Hume Everett, Attorney
Suite 504 Consolidated Royalty Bldg.
P. O. Box 636
Casper, Wyoming.

CASE 2504 (REHEARING)
MOTIONS TO QUASH SUBPOENAS

Case No.

250

Petition, Transcript,

Bill Exhibits, etc.

FORM RMD P-6

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Company THE BRITISH-AMERICAN OIL PRODUCING COMPANY | Formation SEE BELOW | Page 1 of 1
Well WARREN NO. B-1 | Cores NO. 6 DIAMOND | File RP-3-250
Field WILDCAT | Drilling Fluid WATER BASE MUD | Date Report 4-27-66
County SAN JUAN State NEW MEXICO | Elevation 6815'KB | Analysts GAH:LB
Location S18-T27N-R12W | Remarks SERVICE NO. 8

CORE ANALYSIS RESULTS

(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS HORIZONTAL	PERMEABILITY MILLIDARCYS VERTICAL	POROSITY PERCENT	RESIDUAL SATURATION OIL % VOLUME % PORE	RESIDUAL SATURATION TOTAL WATER % PORE	PROBABLE PRODUCTION	REMARKS
								SAHASTER FORMATION(5373-75)
1	5373.5	10		4.2	45.3	40.5	(2)	Shaly sand.
2	5374.5	0.0		1.3	38.5	30.8	(2)	Shaly sand.
3	5375.5	0.0		1.6	43.7	25.0	(2)	Shaly sand. DAKOTA FORMATION
4	5853.5	0.0		5.2	25.0	59.6	(2)	VERTICAL FRACTURE, Sandstone, very fine-grain, gray.
5	5857	0.0		4.6	0.0	58.7	(2)	Sandstone, very fine-grain, gray.
6	5904.5	0.0		3.8	3.8	21.5	(2)	Sandstone, very fine-grain, white to gray.
7	5907.5	0.0		7.0	0.0	18.6	(2)	Sandstone, very fine-grain, white to gray.
8	5910.5	0.0		7.9	0.0	21.5	(2)	Sandstone, white to gray, interbedded with carbonaceous matter.
9	5913.5	0.0		4.3	4.7	48.8	(2)	Sandstone, fine-grain, white to gray.
10	5916.5	0.0		5.8	0.0	25.9	(2)	Sandstone, fine-grain, white to gray.
11	5918.5	0.0		9.9	0.0	38.4	(2)	Sandstone, fine-grain, white to gray.
12	5919.5	0.0		7.3	0.0	21.9	(2)	Sandstone, fine-grain, white to gray.
13	5920.5	0.0		8.1	6.2	30.9	(2)	Sandstone, fine-grain, white to gray.
14	5921.5	0.0		5.6	0.0	37.5	(2)	Sandstone, fine-grain, white to gray.
15	5922.5	0.0		3.8	13.2	68.4	(2)	Siltstone, gray.
16	5923.5	0.0		5.3	7.6	58.5	(2)	Sandstone, carbonaceous, white to gray.
17	5926.5	0.0		7.9	2.5	30.4	(2)	Sandstone, very fine-grain, gray.
18	5942.5	0.0		7.3	5.5	65.7	(2)	Sandstone, fine-grain, carbonaceous, gray.
19	5943.5	0.0		11.0	3.6	22.7	(2)	Sandstone, fine-grain, carbonaceous, gray.
20	5944.5	0.0		12.6	3.2	34.1	(2)	Sandstone, fine-grain, carbonaceous, gray.
21	5945.5	0.0		5.1	15.7	60.8	(2)	Sandstone, fine-grain, carbonaceous, gray.

NOTE:
(*) REFER TO ATTACHED LETTER.
(1) INCOMPLETE CORE RECOVERY—INTERPRETATION RESERVED.
(2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operation, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

CORE DESCRIPTION - NAVAJO #1

CORE #1

4880-4881.5	Sh, blk, piker chip.
4881.5-4885	Sh, Blk w/intlam slt stgrs.
4885-4885.5	Transition from predom sh as above to vfg ss w/occ sh stgr.
4885.5-4887	ss, vfg - 75% - w/intlam blk sh.
4887-4888	Sh, Blk - 90% - w/occ slt stgr.
4888-4889.5	Ss, vfg - 95% - w/occ blk sh stgr, good odor.
4889.5-4890	Ss as above, good odor, bleeding oil.
4890-4891.5	Ss as above, grading to fg at base w/incr in sh, good odor.
4892-4894	Ss, s&p, fg, ti, good stn & odor.
4894-4894.3	Sh, blk w/slt stgrs.
4894.3-4894.6	Ss, s&p, fg, ti, good stn & odor.
4894.6-4895	Sh, blk w/slt stgrs, NS.
4895-4896.5	Ss, s&p, f-mg, sl perm & por, good stn & odor.
4896.5-4897	Ss, fg, s&p, good odor & stn, intlam w/50 percent blk sh.
4897-4897.5	Ss, fg, s&p, good stn & odor, ti.
4897.5-4898	Ss, vfg, ti & 50 percent sh lam, ss has stn & odor.
4898-4899	Ss, vf-fg, good stn & odor, ti.
4899-4900	Transition from ss as above to predom blk sh & intlam slt, 60 % ss w/good odor & stn.
4900-4905	Ss, vfg, 50% w/intlam sh, ti, fnt odor & occ sli stn.
4905-4913.5	Ss, vfg, 40% w/intlam blk sh, no stn, occ very fnt to no odor.
4913.5-4914.5	Ss, vfg, 50% w/intlam blk sh, very sli odor, no stn.
4914.5-4917.5	Ss as above, no stn or odor.
4917.5-4918.5	Ss, fg, v calc, wh, ti, NS, many sh incl at base.
4918.5-4924	Ss, vfg, ti w/60% blk sh.
4924-4927	Ss, vfg-fg, ti 50% blk sh, sli apparent stn, no odor.
4927-4933	Ss, vfg & 60% intlam blk sh, NS.

CORE #2

4933-4940	Fg, gry-wht S&P ss, poor-fair por, scatt lt stn, scatt sh ptgs, appears rew, no odor.
4953-4956	Fg, gry-wht shly ss, poor por, tr v lt stn, no odor, 50% sh incl, rew.
4956-4957	Fg, gry-wht ss, poor por, even v lt stn, few sh incl, rew, fair odor.
4957-4962	Same, even fair stn, good odor.
4962-4963	Fg, gry-wht s&p ss, fnt stn, poor por, abdt sh incl, v fnt odor.
4963-4966	Same as 4957-62 except little tighter and shalier.
4966-4967.5	Fg gry-wht hd dns ss; sl fract, nor por, bleeding oil along fracts, occ 1/4" sh ptgs.
4967.5-4970	Same as 4963-66.
4970-4973.5	Fg gry-wht hd ss, frequent sh incl, lt stn, fnt odor, v tight.
4973.5-4974.5	Fg gry-wht hd dns shly ss, no odor.
4974.5-4976	Fg gry-wht hd dns ss, fnt odor & stn.
4976-4986	Fg gry-wht hd dns ss, no odor or stn, abdt sh incl & ptgs, rew throughout.

CORE ANALYSIS RESULTS

AMERICAN OIL PRODUCING
COMPANY
SCOTT NO. 8
WEST KUTZ
SAN JUAN N.MEXICO 6352 KB

DAKOTA
DIAMOND CONVENTIONAL
OIL EMULSION MUD
SECTION 22 27N 11W

RP-3-1089
10-13-59
ENGLISH

Lithological Abbreviations

1	6583-84	0.15	9.3	0.0	26.9	(2)	Sandstone, Fine-Grain.
2	6584-85	[illegible]	7.3	0.0	19.2	(2)	Sandstone, Fine-Grain.
3	6585-86	0.08	11.1	0.0	23.2	(2)	Sandstone, Fine-Grain.
4	6586-87	[illegible]	10.0	0.0	26.0	(2)	Sandstone, Fine-Grain.
5	6587-88	0.07	9.6	0.0	24.0	(2)	Sandstone, Fine-Grain.
6	6588-89	0.06	11.2	0.0	32.2	(2)	Sandstone, Fine-Grain.
7	6589-90	0.02	9.6	0.0	31.3	(2)	Sandstone, Fine-Grain.
8	6590-91	[illegible]	10.9	0.0	34.8	(2)	Sandstone, Fine-Grain.
9	6591-92	[illegible]	8.8	0.0	28.4	(2)	Sandstone, Fine-Grain.
10	6592-93	[illegible]	9.3	0.0	36.5	(2)	Sandstone, Fine-Grain.
11	6593-94	[illegible]	9.9	0.0	40.4	(2)	Sandstone, Fine-Grain.
12	6594-95	[illegible]	13.8	0.0	35.1	(2)	Sandstone, Fine-Grain.
13	6595-96	<0.01	11.3	0.0	35.9	(2)	Sandstone, Fine-Grain.
14	6596-97	[illegible]	10.4	0.0	32.5	(2)	Sandstone, Fine-Grain.
15	6597-98	[illegible]	11.5	4.3	36.2	(2)	Sandstone, Fine-Grain.
16	6598-99	[illegible]	11.8	4.2	30.5	(2)	Sandstone, Fine-Grain.
17	6599-6600	0.21	13.0	2.0	43.0	(2)	Sandstone, Fine-Grain, Vertical Fracture.
18	6600-01	[illegible]	9.9	5.1	35.4	(2)	Sandstone, Fine-Grain.
19	6601-02	[illegible]	10.5	4.8	34.3	(2)	Sandstone, Fine-Grain.
20	6602-03	[illegible]	11.3	4.4	37.1	(2)	Sandstone, Fine-Grain.
21	6603-04	[illegible]	11.2	4.5	32.1	(2)	Sandstone, Fine-Grain.
22	6604-05	<0.01	5.2	0.0	24.9	(2)	Sandstone, Fine-Grain.
23	6605-06	[illegible]	9.2	5.1	39.3	(2)	Sandstone, Fine-Grain.
24	6606-07	<0.01	5.8	3.5	27.6	(2)	Sandstone, Fine-Grain, Shaly.
25	6607-08	[illegible]	6.9	[illegible]	[illegible]	(2)	Sandstone, Fine-Grain.
26	6608-09	<0.01	9.0	2.2	28.9	(2)	Sandstone, Fine-Grain.
27	6609-10	<0.01	11.0	4.2	60.0	(2)	Sandstone, Fine-Grain.
28	6610-11	[illegible]	8.4	5.0	42.6	(2)	Sandstone, Fine-Grain, Shaly.
29	6611-12	[illegible]	8.5	5.5	42.1	[illegible]	Sandstone, Fine-Grain, Shaly.
30	6612-13	<0.01	10.0	3.0	38.[illegible]	(2)	Sandstone, Fine-Grain, Vertical Fractures.
31	6613-14	<0.01	10.3	4.9	29.7	(2)	Sandstone, Fine-Grain, Vertical Fracture.
32	6614-15	<0.01	7.9	0.7	52.1	(2)	Sandstone, Fine-Grain, Vertical Fracture.
33	6615-16	<0.01	8.5	4.7	36.8	(2)	Sandstone, Fine-Grain.
34	6616-17	<0.01	10.1	4.9	42.0	(2)	Sandstone, Fine-Grain.
35	6617-18	0.01	8.9	5.6	41.6	(2)	Sandstone, Fine-Grain.
36	6618-19	[illegible]	9.8	[illegible]	43.9	(2)	Sandstone, Fine-Grain.

CORE ANALYSIS RESULTS

BRITISH-AMERICAN OIL PRODUCING COMPANY
SCOTT No. 5
WEST KUTZ
SAN JUAN NEW MEXICO 6352 KB

DAKOTA
DIAMOND CONVENTIONAL
OIL EMULSION MUD
SECTION 22 27N 11W

RP-3-1089
10-13-59
ENGLISH

Lithological Abbreviations

37	6619-20	<0.01	7.2	6.9	62.6	(2)	Sandstone, Fine-Grain, Shaly.
38	6620-21	<0.01	8.9	5.6	39.3	(2)	Sandstone, Fine-Grain.
39	6621-22	<0.01	11.4	4.4	35.9	(2)	Sandstone, Fine-Grain, Shaly.
40	6622-23	<0.01	9.7	2.1	22.7	(2)	Sandstone, Fine-Grain.
41	6623-24	<0.01	2.3	22.2	74.1	(2)	Sandstone, Fine-Grain, Shaly, Vertical Fracture.
42	6624-25	<0.01	4.9	10.2	81.6	(2)	Sandstone, Fine-Grain, Shaly, Vertical Fracture.
43	6625-26	<0.01	4.7	14.9	78.7	(2)	Sandstone, Fine-Grain, Shaly, Vertical Fracture.
44	6626-27	<0.01	3.9	18.0	74.3	(2)	Sandstone, Fine-Grain, Shaly, Vertical Fracture.
45	6627-28	<0.01	5.0	14.0	81.0	(2)	Sandstone, Fine-Grain, Shaly.
46	6628-29	<0.01	6.1	8.2	78.3	(2)	Sandstone, Fine-Grain, Shaly.
47	6629-30	<0.01	9.6	10.9	80.4	(2)	Sandstone, Fine-Grain, Shaly.
48	6630-31	<0.01	7.6	0.0	84.6	(2)	Sandstone, Fine-Grain, Vertical Fracture.
49	6631-32	<0.01	2.2	0.0	95.6	(2)	Sandstone, Medium-Grain, Vertical Fracture.
50	6632-33	<0.01	2.0	0.0	95.2	(2)	Sandstone, Medium-Grain, Vertical Fracture
51	6633-34	<0.01	9.2	11.9	65.8	(2)	Sandstone, Medium-Grain, Shaly.
52	6652-53	0.04	2.5	30.0	60.2	(2)	Sandstone, Medium-Grain, Shaly.
53	6653-54	<0.01	9.0	0.0	68.9	(2)	Sandstone, Medium-Grain, Shaly.
54	6654-55	0.04	2.4	0.0	79.2	(2)	Sandstone, Medium-Grain, Shaly.
55	6655-56	<0.01	3.3	9.5	72.5	(2)	Sandstone, Medium-Grain, Shaly.

(2) Service No. 5 - No interpretation of results.

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company: The British American Oil Producing Company
Formation: DAKOTA
File: RP-3-907
Well: FULLERTON #5
Core Type: DIA. CONV.
Date Report: 1-18-59
Field: WILDCAT
Drilling Fluid: WBM.
Analysts: KH
County: SAN JUAN State: NEW MEX. El.: 6336 KB Location: SEC 15-27N-11W

Lithological Abbreviations

SANDSTONE-SS	DOLOMITE-DOL	ANHYDRITE-ANH	SANDY-SDY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SHALY-SHY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOS	ANY-LNY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STYLOLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
1	6640-41	0.08	9.9	5.0	30.3	Sandstone, shly carb.
2	41-42	0.06	11.7	6.0	44.4	" " "
3	42-43	0.04	10.1	5.0	32.7	" " "
4	43-44	0.06	11.0	4.5	49.2	" " "
5	44-45	0.15	9.5	5.3	54.8	" " "
6	45-46	0.06	10.4	4.8	50.0	" " "
7	46-47	0.09	12.5	4.0	35.2	" " "
8	47-48	0.10	12.0	4.2	35.0	" " "
9	48-49	0.05	8.9	5.6	37.0	" " "
10	49-50	0.05	11.2	4.5	43.7	" " "
11	50-51	0.02	10.7	4.7	50.5	" " "
12	51-52	0.10	11.1	4.5	45.0	" " "
13	52-53	0.07	9.1	7.7	61.4	" " "
14	53-54	<0.01	7.7	6.5	72.7	" " "
15	6654-55	0.02	8.3	6.0	61.5	" " "

Service # 8 No Interpretation

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company	The British American Oil Producing Company	Formation	Dakota	File	RP-3-907
Well	Fullerton # 5	Core Type	Diamond Conv.	Date Report	1-21-59
Field	Wildcat	Drilling Fluid	Water Base Mud	Analysts	English
County	San Juan	State New Mexico	6336 KB	Location	Sec15 27N 11W

Lithological Abbreviations

SAND-SD	LIMESTONE-LS	ANHYDRITE-ANH	SANDY-SDY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SILTY-SLTY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOSS	LIMY-LMY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STYLOLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
16	6668-69	0.02	5.9	3.4	76.4	Vertical Fracture
17	69-70	0.01	5.6	0.0	75.2	Vertical Fracture
18	70-71	0.04	4.9	0.0	79.6	
19	6672-73	<0.01	2.8	0.0	89.3	Vertical Fracture
20	6677-78	<0.01	4.2	11.9	81.1	Vertical Fracture
21	6697-98	0.03	6.3	3.2	84.3	

Service # 8 No Interpretation

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA File RP-3-1036
Well U.S.A. HARGRAVE "J" NO. 1 Core Type DIAMOND CONVENTIONAL Date Report 7-21-59
Field ANGEL PEAK DAKOTA Drilling Fluid OIL EMULSION MUD Analysts ENGLISH
County SAN JUAN State N.MEXICO Elevation 6132 RDB Location SECTION 3 27N 10W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS Max.	90°	POROSITY PER CENT		SAMPLE DESCRIPTION AND REMARKS
1	6545-47.0	0.5	0.1	8.1 [illegible] 44 (3' core)	(2)	Sandstone, Vertical Fracture.
2	6547.0-48.5	0.7	<0.1	7.9 41 - 45½	(2)	Sandstone, Vertical Fracture.
3	6548.5-50.5	<0.1	<0.1	5.3 45 - 47½	(2)	Sandstone, Vertical Fracture.
4	6550.5-52.3	0.4	0.2	7.3 47½ - 49.3	(2)	Sandstone, Vertical Fracture.
5	6552.3-54.0	0.2	0.1	7.8 49.3 - 51	(2)	Sandstone, Vertical Fracture.
6	6554.0-55.8	0.1	0.1	7.5 51 - 52.8	(2)	Sandstone, Vertical Fracture.
7	6555.8-57.1	0.5	0.4	6.7 52.8 - 54.1	(2)	Sandstone, Vertical Fracture.
8	6557.1-58.8	<0.01*		6.7 54.1 - 55.8	(2)	Sandstone, Vertical Fracture.
9	6558.8-60.6	0.1	<0.1	5.9 55.8 - 57.6	(2)	Sandstone, Vertical Fracture.
10	6560.6-62.5	0.3	0.1	7.2 57.6 - 59.6	(2)	Sandstone.
11	6562.5-64.5	0.6	0.3	5.2 59 - 61.5	(2)	Sandstone.
12	6564.5-66.3	0.3	0.1	4.1 61 - 63.3	(2)	Sandstone, Vertical Fracture.
13	6566.3-68.1	0.1	<0.1	5.4 63 - 65.1	(2)	Sandstone, Vertical Fracture.
14	6568.1-69.9	<0.1	<0.1	5.9 65.1 - 66.9	(2)	Sandstone.
15	6569.9-71.7	<0.1	<0.1	5.5 66.9 - 68.7	(2)	Sandstone.
16	6571.7-73.5	0.01*		5.9 68.7 - 70.5	(2)	Sandstone, Vertical Fracture.
17	6573.5-75.3	<0.01*		5.6 70.5 - 72.3	(2)	Sandstone, Vertical Fracture.
18	6575.3-76.6	<0.1	<0.1	6.9 72.3 - 73.6	(2)	Sandstone, Vertical Fracture.
19	6576.6-78.4	0.1	<0.1	8.8 73.6 - 75.4	(2)	Sandstone.
20	6578.4-80.0	0.3	0.1	9.2 75.4 - 77	(2)	Sandstone.
21	6580.0-81.7	0.1	0.1	5.8 77 - 78.7	(2)	Sandstone.
22	6581.7-83.1	<0.1	<0.1	5.1 78.7 - 80.1	(2)	Sandstone, Vertical Fracture.
23	6583.1-84.8	0.2	0.1	4.2 80.1 - 81.8	(2)	Sandstone, Vertical Fracture.
24	6584.8-86.5	<0.01*		3.2 81.8 - 83.5	(2)	Sandstone, Vertical Fracture.
25	6586.5-88.0	<0.01*		2.8 83.5 - 85	(2)	Sandstone, Vertical Fracture.
26	6588.0-90.0	<0.01*		4.1 85 - 87	(2)	Sandstone, Vertical Fracture.
27	6590.0-91.7	0.2	0.2	4.4 87 - 88.7	(2)	Sandstone, Vertical Fracture.
28	6591.7-93.0	0.3	0.1	4.1 88.7 - 90	(2)	Sandstone, Vertical Fracture.
29	6593.0-94.6	0.01*		5.8 [illegible] - 91.6	(2)	Shale, Sandy.
30	6594.6-96.5	<0.01*		8.3 91.6 - 93.5	(2)	Shale, Sandy.
31	6596.5-98.5	0.02*		3.9 93.5 - 95.5	(2)	Shale, Sandy.
32	6598.5-6600.1	0.01*		4.2 95.5 - 97.1	(2)	Shale, Sandy.
33	6600.1-01.9	0.01*		4.9 97.1 - 98.9	(2)	Shale, Sandy.
34	6601.9-02.8	0.02*		6.1 98.9 - 99.8	(2)	Shale, Sandy.
35	6626.0-27.7	1.3	<0.1	6.4 24 - 25.7 (Core 2')	(2)	Sandstone, Shaly.
36	6627.7-29.1	0.2	0.1	6.3 25.7 - 27.1	(2)	Sandstone, Shaly.
37	6636.0-37.2	0.01*		5.8 34 - 35.2	(2)	Shale, Sandy.
38	6637.2-38.5	<0.1	<0.1	5.8 35.2 - 36.5	(2)	Shale, Sandy.
39	6638.5-40.0	0.2	0.2	8.1 36.5 - 38	(2)	Shale, Sandy.

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company	PAN AMERICAN PETROLEUM CORP.	Formation	DAKOTA	File	RP-3-1036
Well	U.S.A. HARGRAVE "J" NO. 1	Core Type	DIAMOND CONVENTIONAL	Date Report	7-21-59
Field	ANGEL PEAK DAKOTA	Drilling Fl	OIL EMULSION MUD	Analysts	ENGLISH
County	SAN JUAN	State N.MEXICO	Elev. 6132 RDB	Location	SECTION 3 27N 10W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCIES Max.	PERMEABILITY MILLIDARCIES 90°	POROSITY %	RES. OIL SATURATION % PORE SPACE	GRAIN DENSITY	SAMPLE DESCRIPTION AND REMARKS
40	6640.0-41.0		0.02*	8.9 38-39		(2)	Shale, Sandy.
41	6648.0-49.8	5.5	1.8	9.5 46-47.8		(2)	Shale, Lignitic.
42	6657.0-58.9	1.8	0.1	8.6 55-56.9		(2)	Sand, Shale.
43	6658.9-60.5	6.0	1.0	9.8 56.9-58.5		(2)	Sand, Shale.

(2) Service No. 8 - No interpretation of results.

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AZTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BLDG.
DALLAS 1, TEXAS

December 6, 1962

LAND DEPARTMENT
H. L. SNIDER, JR., MANAGER
KENNETH A. SWANSON, ATTORNEY
GORDON E. COE, ATTORNEY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. A. L. Porter, Jr., Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Case No. 2504, Application of
Consolidated Oil & Gas, Inc.
to Change Basin-Dakota Gas Pool
Allocation Formula, San Juan,
Rio Arriba and Sandoval Counties,
New Mexico

Response to Ruling on Motions to
Quash Subpoenas Duces Tecum

Dear Mr. Porter:

Mr. James M. Durrett, Jr. advised earlier this week that at the December 19, 1962 hearing date, to which the subject case has been continued, the Commission plans to receive all core analysis reports and all electric and radioactivity logs concerning any and all wells that have been cored in the Basin-Dakota Gas Pool by the respective companies upon whose officers or employees subpoenas duces tecum have been served. After these items have been produced, the subject case will then be continued until February 14, 1963.

Mr. Durrett further advised that the Commission would deem the subpoena duces tecum served on L. M. Stevens satisfied if the information mentioned above with respect to any well or well cored by Aztec in the Basin-Dakota Gas Pool was delivered by mail to the Commission on or before December 19, 1962.

PLease note enclosed, therefore, copies of the following relating to the Aztec Oil & Gas Company-Richardson No. 6 Well, located in the SE¼ of Section 22, T-31-N, R-12-W, San Juan County, New Mexico:

1) Schlumberger Induction Electric Log dated May 13, 1960
2) Schlumberger Gamma Ray-Sonic Log dated May 14, 1960

3) Core Laboratories Core Analysis dated May 27, 1960
4) Core Laboratories Coregraph dated May 4-12, 1960

The Richardson No. 6 Well is the only well Aztec has cored in the Basin-Dakota Gas Pool.

The above items are provided in response to the subpoena duces tecum; it will not be necessary to return them to Aztec.

Should Mr. Stevens' presence be desired by the Commission at the December 19, 1962 hearing, he will be happy to appear.

Yours very truly,

Kenneth A. Swanson

KAS/et
Enclosures

Logs Comm. copy

1. Allison #1
2. Canyon Largo #29 (Superior-Sealey Government #1)
3. Canyon Largo #89
4. Case #8
5. Filan #5
6. English #1
7. Gartner #9
8. Huerfano #92
9. Huerfano #106
10. Huerfano #110
11. Huerfano #125
12. Huerfano #135
13. Jicarilla #92-2
14. Ludwick #15 (Delhi Taylor-Delhi Ludwick #1)
15. Michner #3 (Delhi Taylor-Michner #1)
16. Moore #8
17. Mudge #18
18. Rincon #1
19. Rincon #57
20. Rincon #127
21. Rincon #136
22. Rincon #159
23. San Juan 27-4 #22
24. San Juan 27-5 #1
25. San Juan 28-4 #24-26
26. San Juan 28-5 #35
27. San Juan 28-6 #98
28. San Juan 28-7 #12

29. San Juan 28-7 #109
30. San Juan 29-4 #18-33
31. San Juan 29-5 #32-29
32. San Juan 29-5 #45-22
33. San Juan 29-6 #35
34. San Juan 29-6 #62
35. San Juan 30-5 #27-20
36. San Juan 30-5 #28-23 X
37. San Juan 30-6 #31
38. San Juan 31-6 #16-33
39. San Juan 32-7 #22-29
40. San Juan 32-7 #37
41. San Juan 32-8 #35
42. San Juan 32-9 #70 X
43. Rincon #31

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

Production & Engineering
Departments
P. O. Drawer 330
Farmington, New Mexico

December 10, 1962

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr., Secretary & Director

Gentlemen:

Re: NMOCC Case No. 2504 - Rehearing

We are forwarding your office this date, by registered mail, the data which we are required to submit in connection with subject case. This data is as follows:

(1) Fullerton No. 5 - NE/4 Sec. 15-27N-11W
San Juan County, New Mexico
(a) Dakota Core analysis
(b) Schlumberger I-ES and ML
(c) Lane Wells Gamma Ray Log

(2) Scott No. 8 - NE/4 Sec. 22-27N-11W
San Juan County, New Mexico
(a) Dakota Core analysis
(b) Schlumberger I-ES and ML

(3) Navajo No. 1 - NW/4 Sec. 15-26N-14W
San Juan County, New Mexico, Dry hole, P&A
(a) Dakota Core analysis
(b) Schlumberger I-ES and ML

(4) Warren B-1 - NW/4 Sec. 18-27N-12W
San Juan County, New Mexico, Dry hole, P&A
(a) Dakota Core Analysis
(b) Schlumberger ES, Laterolog and ML

Yours very truly,

THE BRITISH-AMERICAN OIL PROD. COMPANY

Nae R. Stone, Field Superintendent

CMI:s

cc: Mr. Thomas M. Hogan

FORM 470 2-57

PAN AMERICAN PETROLEUM CORPORATION

P. O. Box 480, Farmington, New Mexico
December 5, 1962

File: N-1463-986.510.1

Subject: Core Data and Logs on Wells
Cored in the Basin Dakota Pool
By Pan American Petroleum Corporation

Mr. A. L. Porter, Jr.
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Sir:

With regard to the core data and logs on the wells cored by Pan American Petroleum Corporation in the Basin Dakota Pool, we have been advised by Mr. Durrett that it will be entirely satisfactory to send these data by mail rather than deliver them in person on December 19, 1962, as specified in the Commission's ruling on the subpoenas duces tecum. Accordingly, enclosed with this letter are the core data and the logs on the ten wells which have been cored by Pan American Petroleum Corporation in the Basin Dakota Pool.

Although only electrical and radio activity logs were specified in the Commission's ruling on the subpoenas duces tecum, some of the wells have been logged with additional surveys and, where such is the case, all logs run have been included.

Yours very truly,

PAN AMERICAN PETROLEUM CORPORATION

T. M. Curtis
District Superintendent

GWE:ep
Enclosure

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS
May 27, 1960

REPLY TO
754 PATTERSON BLDG
DENVER, COLORADO

Aztec Oil & Gas Company
Box 786
Farmington, New Mexico

Attention: Mr. Joe Salmon

Subject: Core Analysis
Richardson No. 6 Well
San Juan County, New Mexico
Location: Sec. T31N-R12W

Gentlemen:

Graneros formation analyzed from 7062 to 7111 feet and Dakota formation from 7126 to 7175 feet exhibit low permeability and/or low porosity and the matrix of these intervals is considered essentially nonproductive. There is evidence of a good fracture system which could be the reservoir and the means of passage to the well bore for fluids within these fractures. Further testing should be done to evaluate the fracture system.

Formation from the intervals, 7175 to 7179, 7197 to 7204, 7207 to 7222 and 7234 to 7238 feet, exhibits residual fluid saturations indicative of gas productive formation. Summaries have been prepared for the gas productive formations where sufficient permeability and porosity exist. A formation treatment will be necessary in order to obtain satisfactory rates of flow. The vertical fractures should increase the effective permeability.

The remaining analyzed formation is considered to be essentially nonproductive.

Thank you for this opportunity to be of service.

Very truly yours,

Core Laboratories, Inc.

J. D. Harris

J. D. Harris,
District Manager

JDH:[illegible]

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page 1 of 1 File RP-3-1175
Well Richardson No. 6

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Dakota 7197.0-7222.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	25.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		46.2
FEET OF CORE INCLUDED IN AVERAGES	16.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	46
AVERAGE PERMEABILITY: MILLIDARCYS	0.07	OIL GRAVITY: °API		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	1.1	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	5.8	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	2.8	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT		

Calculated maximum solution gas drive recovery is barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. *(Please refer to footnotes for further discussion of recovery estimates.)*

FORMATION NAME AND DEPTH INTERVAL: Dakota 7234.0-7238.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	4.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		46.0
FEET OF CORE INCLUDED IN AVERAGES	4.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	46
AVERAGE PERMEABILITY: MILLIDARCYS	3.2	OIL GRAVITY: °API:		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	13	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	6.7	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	5.4	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT		

Calculated maximum solution gas drive recovery is barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. *(Please refer to footnotes for further discussion of recovery estimates.)*

(c) Calculated (e) Estimated (m) Measured (*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

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RICHARDSON #6
CORE DESCRIPTION

Core 7179-7234: Cut 55', recovered 55'

7179-82	Sh, blk
7182-94	Ss, Shly, tite, vert. fracs
94-96	Ss, fi grn'd
96-97.5	Sh, arenaceous
7197.5-7205	Ss, white to gray, fi to med grn'd, fair porosity, bleeding gas
7205-09.5	Ss, fi grn'd, shale partings
09.5-24	Ss, wh, med. grn'd, good porosity, paper thin sh partings
24-27	Interbed ss and sh
27-28	Sh, blk
28-32	Ss, wh to gry, fi to med grn'd, poor porosity, bleeding gas
32-33.5	Ss, wh, med grn'd, good porosity, bleeding gas from titer portions
33.5-34	Sh, blk

GEOLOGICAL DEPARTMENT	V T
[illegible]	[illegible]
[illegible]	Well File
D M H	Land
H J S	Legal
R A M	[illegible]

CORE LABORATORIES, INC
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company [illegible] & GAS COMPANY
Well RICHARDSON #1
Field UNNAMED
County SAN JUAN State N.MEXICO Elev 6157 Gr. Location Sec22 T31N R12W

Formation GRANEROS
Core Type DIAMOND CONV.
Drilling Fluid

File RP-3-1175
Date Report 5/5/60
Analyst ENGLISH

Lithological Abbreviations

SAND SD SHALE SH LIME LM	DOLOMITE DOL CHERT CH GYPSUM GYP	ANHYDRITE ANHY CONGLOMERATE CONG FOSSIL FOSS	SANDY SDY SHALY SHY LIMY LMY	FINE FN MEDIUM MED COARSE CSE	CRYSTALLINE XLN GRAIN GRN GRANULAR GRNL
BROWN BRN GRAY GY VUGGY VGY	FRACTURED FRAC LAMINATION LAM STYLOLITIC STY	SLIGHTLY SL/ VERY V WITH W/			

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
1	7062-63	0.11	5.9	20.3	37.2	Vertical Fracture
2	63-64	<0.01	4.9	34.7	51.0	" "
3	64-65	<0.01	5.0	24.0	43.9	" "
4	65-66	<0.01	6.4	28.1	39.1	" "
5	66-67	<0.01	5.0	14.0	83.9	" "
6	67-68	<0.01	6.6	36.4	40.9	" "
7	68-69	0.01	6.5	38.5	43.1	" "
8	69-70	<0.01	5.8	12.0	86.2	" "
9	70-71	<0.01	3.4	14.7	82.4	" "
10	71-72	<0.01	4.8	29.2	64.6	" "
11	72-73	<0.01	5.6	25.0	71.4	" "
12	73-74	<0.01	6.9	39.1	45.0	" "
13	74-75	<0.01	7.1	40.8	35.2	" "
14	75-76	<0.01	4.8	10.4	87.6	" "
15	76-77	<0.01	4.3	4.7	93.1	" "
16	77-78	<0.01	3.8	0.0	97.3	" "
17	78-79	<0.01	3.6	0.0	97.2	" "
18	79-80	<0.01	3.8	0.0	94.6	" "
19	80-81	<0.01	4.7	10.6	85.1	" "
20	81-82	<0.01	1.7	29.4	64.7	" "
21	82-83	<0.01	3.4	0.0	91.4	" "
22	83-84	<0.01	3.2	0.0	96.9	" "
23	84-85	<0.01	5.0	10.0	88.0	" "
24	85-86	<0.01	3.8	0.0	97.4	" "
25	86-87	<0.01	4.7	10.6	85.1	" "
26	87-88	<0.01	4.0	12.5	82.4	" "
27	88-89	<0.01	4.1	12.2	85.5	" "
28	89-90	<0.01	4.8	10.4	87.5	" "
29	90-91	<0.01	4.3	0.0	97.6	" "
30	91-92	<0.01	4.8	10.4	87.5	" "
31	92-93	<0.01	4.0	12.5	84.9	" "
32	93-94	<0.01	3.6	0.0	97.1	" "
33	94-95	<0.01	3.6	5.6	91.7	" "
34	95-96	<0.01	4.1	4.9	96.7	" "
35	96-97	<0.01	3.9	0.0	97.4	" "

7062-7097 low porosity and low permeability show the matrix of this interval to be essentially non-productive. There is evidence of a good fracture system, which could be the reservoir and the means of passage to the well bore for fluids within these fractures. Further testing should be done to evaluate the fracture system.

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[redacted]
V T
Prod
Well File
D M H
Land
H J S
Legal
R A M
COMPANY
G
RICHARDSON
Field

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company [redacted] COMPANY
Well RICHARDSON
Field [redacted]
County SAN JUAN State NEW MEXICO Elev. 6157 Gr. Location Sec22 T31N R12W

Formation DAKOTA
Core Type DIAMOND CONV.
Drilling Fluid WATER BASE MUD

File RP-3-1175
Date Report 3/7/60
Analysts ENGLISH

Lithological Abbreviations

SHALE SH LIME LM	DOLOMITE DOL CHERT CH GYPSUM GYP	ANHYDRITE ANHY CONGLOMERATE CONG FOSSILIFEROUS FOSS	SANDY SDY SHALY SHY LIMY LMY	FINE FN MEDIUM MED COARSE CSE	CRYSTALLINE XLN GRAIN GRN GRANULAR GRNL	BROWN BRN GRAY GY MICRO MIC	FRACTURED FRAC LAMINATION LAM OOLITIC OOL	SLIGHTLY SLY VERY V WITH W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY, PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS	
36	7101-02	<0.01	8.5	8.3	89.7	Vertical Fracture	
37	02-03	<0.01	4.3	4.7	93.1	"	"
38	03-04	<0.01	3.8	5.3	92.2	"	"
39	04-05	<0.01	4.1	12.2	85.6	"	"
40	05-06	<0.01	4.9	10.2	71.5	"	"
41	06-07	<0.01	3.8	5.3	87.0	"	"
42	07-08	<0.01	3.2	6.2	84.5	"	"
43	08-09	<0.01	3.5	0.0	97.2	"	"
44	09-10	<0.01	3.4	0.0	97.0	"	"
45	10-11	<0.01	3.5	0.0	97.4	"	"
46	7126-27	0.02	5.3	9.4	75.4		
47	27-28	<0.01	5.7	8.8	75.5	"	"
48	28-29	<0.01	1.6	31.2	37.5		
49	29-30	0.01	4.6	10.9	67.5		
50	30-31	<0.01	5.2	13.4	71.1	"	"
51	31-32	<0.01	4.1	12.2	70.7	"	"
52	32-33	<0.01	7.8	13.1	58.0	"	"
53	33-34	<0.01	6.3	7.9	77.9	"	"
54	34-35	0.06	5.0	10.0	82.1	"	"
55	35-36	0.04	5.2	9.5	79.0	"	"
56	36-37	<0.01	4.1	12.2	61.1	"	"
57	37-38	<0.01	4.1	18.9	44.5		
58	38-39	0.22	3.6	5.6	66.9	"	"
59	39-40	<0.01	3.4	5.9	70.6		
60	40-41	<0.01	2.9	0.0	69.0		
61	41-42	<0.01	3.4	0.0	58.9		
62	42-43	<0.01	4.7	0.0	51.0		
63	43-44	<0.01	3.5	5.7	82.9		
64	44-45	<0.01	5.0	0.0	70.1		
65	45-46	<0.01	3.6	0.0	72.2		
66	46-47	<0.01	3.1	0.0	77.5		
67	47-48	<0.01	4.9	10.4	73.5	"	"
68	48-49	<0.01	3.4	0.0	64.8		
69	49-50	<0.01	4.1	0.0	56.1		
70	50-51	<0.01	4.0	0.0	82.6		

7101-7151 The samples analysed within this interval are essentially non-productive. There is evidence of a fracture system, which could be the reservoir and the means of passage to the well bore for fluids within these fractures. Further testing should be done to evaluate the fracture system.

(These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. and its officers and employees. Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.)

GEOLOGICAL DEPARTMENT V T

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CORE LABORATORIES, INC
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company AZTEC OIL & GAS COMPANY
Well RICHARDSON 6
Field UNNAMED
County SAN JUAN State N.MEXICO Elev. 6157 Gr. Location Sec22 T31N R12W

Formation DAKOTA
Core Type DIAMOND CONV.
Drilling Fluid WATER BASE MUD

File RP-3-1175
Date Report 5/9/60
Analysts ENGLISH

Lithological Abbreviations

SAND SD	DOLOMITE DOL	ANHYDRITE ANH	SANDY SDY	FINE FN	CRYSTALLINE X'LN	BROWN BRN	FRACTURE FRAC
SHALE SH	CHERT CH	CONGLOMERATE CONG	SHALY SHY	MEDIUM MED	GRAIN GRN	GRAY GY	LAMINATION LAM
LIME LM	GYPSUM GYP	FOSSIL FOSS/L	LIMY LMY	COARSE CSE	GRANULAR GRNL	VUGGY VGY	STYLOLITIC STY
							WITH W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
71	7153-54	0.08	2.2	0.0	59.1	Vertical Fracture
72	54-55	0.02	2.4	8.3	54.2	" "
73	55-56	0.26	3.4	0.0	47.1	" "
74	56-57	<0.01	2.6	7.7	88.4	" "
75	57-58	<0.01	3.7	5.4	91.9	" "
76	58-59	<0.01	4.7	4.3	89.4	" "
77	59-60	0.02	3.7	5.4	89.1	" "
78	60-61	<0.01	3.6	5.6	88.9	" "
79	61-62	<0.01	4.4	11.4	84.2	" "
80	62-63	<0.01	5.9	3.4	95.1	" "
81	63-64	<0.01	3.7	5.4	78.6	" "
82	64-65	<0.01	2.0	0.0	60.1	" "
83	65-66	<0.01	1.4	0.0	64.2	" "
84	66-67	<0.01	3.9	5.1	79.6	" "
85	67-68	0.02	4.5	4.4	93.4	
86	68-69	<0.01	4.7	4.3	93.6	
87	69-70	0.13	2.9	0.0	93.1	
88	70-71	<0.01	3.2	15.6	78.1	
89	71-72	<0.01	4.8	14.5	83.4	
90	72-73	<0.01	1.7	0.0	94.2	
91	73-74	<0.01	2.0	1.0	85.1	
92	74-75	<0.01	3.3	6.1	87.9	
93	75-76	<0.01	5.4	0.0	44.4	
94	76-77	<0.01	5.2	0.0	30.8	
95	77-78	0.02	6.1	0.0	37.8	
96	78-79	<0.01	4.2	0.0	47.6	

7153-7175 This interval is essentially non-productive . Further testing should be done to evaluate the fracture system .

7175-7179 This interval has low porosity (5.2% average) and low permeability (0.01 md./ft. average) . The saturations (residual oil [illegible] 0.0% average and total water 38.9% average) show the interval to be capable of low-capacity gas production .

These analyses, opinions or interpretations are based on data and [illegible] supplied by the client to whom and for whose exclusive and confidential use this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. and its officers and employees. Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representations as to the productivity, proper operations or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

CORE LABORATORIES INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company AZTEC OIL & GAS COMPANY
Well RICHARDSON # 6
Field UNNAMED
County SAN JUAN State N.MEXICO

Formation DAKOTA
Core Type DIAMOND CONV.
Drilling Fluid WATER BASE MUD
Elevation 6157 Gr. Location SEC22 T31N R12W

File RP-3-1175
Date Report 5/11/60
Analysts ENGLISH

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESID. SATURATION PER CENT PORE OIL	RESID. SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
97	7179-80	<0.01	5.5	9.1	89.1	Vertical Fracture
98	80-81	<0.01	4.7	10.6	87.2	" "
99	81-82	0.01	3.8	0.0	97.4	" "
100	82-83	<0.01	3.6	0.0	97.2	" "
101	83-84	<0.01	3.2	0.0	96.9	" "
102	84-85	<0.01	3.5	0.0	97.2	" "
103	85-86	<0.01	4.0	5.0	92.5	" "
104	86-87	<0.01	2.8	7.1	89.2	" "
105	87-88	<0.01	3.0	0.0	96.7	" "
106	88-89	0.01	3.4	5.9	91.1	" "
107	89-90	<0.01	2.2	9.1	86.4	" "
108	90-91	0.01	2.3	0.0	91.2	" "
109	91-92	<0.01	3.5	14.3	82.9	" "
110	92-93	0.01	3.7	0.0	64.8	" "
111	93-94	<0.01	2.8	7.1	89.2	" "
112	94-95	0.01	3.7	13.5	93.8	" "
113	95-96	<0.01	1.8	0.0	94.6	" "
114	96-97	0.01	4.5	11.1	77.8	
115	97-98	0.02	5.0	4.0	66.4	
116	98-99	0.01	5.2	9.6	63.2	
117	99-7200	0.01	4.8	10.4	64.6	
118	7200-01	0.70	5.7	3.5	51.0	" "
119	01-02	0.07	5.0	4.0	52.1	" "
120	02-03	0.01	6.3	7.9	41.3	" "
121	03-04	0.01	4.4	0.0	50.0	" "
122	04-05	0.02	1.1	0.0	72.7	
123	05-06	<0.01	1.0	0.0	70.0	
124	06-07	<0.01	1.3	0.0	53.9	
125	07-08	0.01	4.5	0.0	53.4	
126	08-09	0.12	9.0	2.2	32.2	
127	09-10	0.04	7.9	2.5	29.2	
128	10-11	0.02	4.3	0.0	46.4	
129	11-12	0.02	6.6	0.0	37.9	" "
130	12-13	0.03	7.6	0.0	30.3	" "
131	13-14	<0.01	5.3	0.0	56.6	" "
132	14-15	0.02	8.0	0.0	32.5	
133	15-16	<0.01	2.3	8.7	43.5	
134	16-17	0.03	2.9	3.4	57.9	" "
135	17-18	0.12	7.2	0.0	31.9	
136	18-19		4.2	2.5	25.3	
137	19-20	<0.01	10.1	2.0	28.7	" "
138	20-21	<0.01	8.6	3.8	31.9	" "

CORE LABORATORIES, INC
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company AZTEC OIL & GAS COMPANY
Well RICHARDSON # 6
Field UNWANED
County SAN JUAN State N. MEXICO Elev. 6157 Gr. Location SEC 22 T 31N R 12W

Formation DAKOTA
Core Type DIAMOND CONV.
Drilling Fluid WATER BASE MUD

File RP-3-2175
Date Report 5/11/60
Analysts ENGLISH

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
139	7221-22					
140	22-23	<0.01	5.0	4.0	36.0	Vertical Fracture
141	23-24	0.03	3.8	13.1	84.2	
142	24-25	<0.01	3.9	5.1	89.9	
143	25-26	0.06	3.2	6.2	93.8	
144	26-27	<0.01	6.0	3.3	93.4	
145	27-28	0.01	4.0	5.0	87.6	
146	28-29	<0.01	3.5	5.7	82.9	
147	29-30	0.53	3.4	5.9	91.2	
148	30-31	<0.01	2.9	6.9	89.8	
149	31-32	0.02	3.1	16.1	71.0	
150	32-33	<0.01	4.7	4.3	40.4	
151	33-34	<0.01	4.2	11.9	78.6	
		<0.01	3.7	15.9	75.7	

7179-7197 This interval is essentially non-productive .

7197-7204 This interval has low porosity (5.2% average) and low permeability (0.12 md./ft. average) . The saturations (residual oil 5.6% average and total water 55.5% average) show the interval to be capable of producing gas . The vertical fracture system should increase the effective permeability .

7204-7207 This interval is essentially non-productive .

7207-7223 This interval has low porosity (6.2% average) and low permeability (0.02 md./ft. average) . The saturations (residual oil 1.8% average and total water 39.8% average) show the interval to be capable of producing gas . The vertical fractures should increase the effective permeability .

7223-7235 This interval is essentially non-productive .

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company	AZTEC OIL & GAS COMPANY	Formation	DAKOTA	File	RP-3-1175
Well	RICHARDSON # 6	Cored	DIAMOND CONV.	Date	5-12-60
Field	UNNAMED				ENGLISH
County	SAN JUAN	N.MEX.	6157GR.	Sec 22 T31N R12W	

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE SPACE OIL	RESIDUAL SATURATION PER CENT PORE SPACE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
152	7234-35	.35	5.8	8.6	53.5	VERTICAL FRAC
153	35-36	1.1	6.7	7.5	49.4	" "
154	36-37	.17	6.5	3.1	35.4	" "
155	37-38	11.0	7.4	2.5	45.5	" "

7234-723[illegible] This interval has low porosity(6.6% average) and fair permeability(3.13md./ft. average). The saturations(residual oil 5.4% average and total water 45.9% average) show the interval to be capable of producing gas. The vertical fractures should increase the effective permeability.

CA-B PN

CORE LABORATORIES
Petroleum Reservoir Engineering
DALLAS TEXAS

CORE ANALYSIS RESULTS

Company	AZTEC OIL & GAS COMPANY	Formation	DAKOTA	File	RP-3-1175
Well	RICHARDSON # 6	Core Type	DIAMOND CONV.	Date Report	5/13/60
Field	UNNAMED	Drilling Fluid	WATER BASE MUD	Analysts	ENGLISH
County	SAN JUAN	State NEW MEXICO	Elev. 6157 GR	Location	Sec 22 T31N R12W

Lithological Abbreviations

SAND SD	DOLOMITIC DOL	ARGILLACEOUS ARG	SANDY SDY	FINE FN	CRYSTALLINE XLN	BROWN BRN	FRACTURED FRAC	SLIGHTLY SL/	
SHALE SH	CHERT CH	CONGLOMERATE CONG	EARLY ERLY	MEDIUM MED	GRAY GRY	GRAY GY	LAMINATION LAM	VERY V	
LIME LM	GYPSUM GYP	FOSSILIFEROUS FOSS	LIMY LY	COARSE CSE	GRANULAR GRNL	VUGGY VGY	STYLOLITIC STY	WITH W/	

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
1%	7281-82	0.05	3.4	0.0	76.3	Vertical Fracture

This sample is interpreted to be essentially non-productive .

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FORM 661 5-48

SOLIND OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS SUMMARY

341 DE
Wildcat

WELL Moore Unit #1
FIELD Ojo, Rio Arriba County, New Mexico
LOCATION 330' N & 330' E of Sec. 11 T-31-N R-6-W
FORMATION ANALYZED Dakota - Unknown

LAB. NO. 2690
DATE REPORTED 6-7-49
DATE RECEIVED 6-1-49
ELEV. 5362'

RECEIVED
LUBBOCK DISTRICT
JUN 20 1949
DS
DE
DG
AHC
Dr. Lewis
Dr. Finch
FILE

CORING DATA

ZONE	7941-8056	8058-62
START CORING	7941	8056
TOP OF SAND	7860	8056
BOTTOM OF SAND	8056	———
STOPPED CORING	8056	8068
TOTAL FEET CORED	81 *	12
TOTAL FEET OF FORMATION	196	———
RECOVERY, FEET OF FORMATION	82	12
RECOVERY, % OF FORMATION	41.8	———

TYPE OF DRILLING FLUID (OIL OR WATER BASE MUD) Gel-Chem
FILTRATE LOSS (CC. PER 30 MIN. API) 9

* Does not include drilling interval of 34'

SUMMARY OF CORE ANALYSIS

OIL CONTENT (BY EXTRACTION)

ZONE	FEET OF NET SAND	POROSITY MAX.	POROSITY MIN	POROSITY WTD. AVG.	AVERAGE OIL SAT. %
7941-8056	52	[illegible]	1.1	2.8	26.2
8056-62	4	4.1	3.4	[illegible]	48.0

*FOR COMPARATIVE PURPOSES ONLY. NOT TO BE USED IN ESTIMATING OIL IN PLACE.

PERMEABILITY*

ZONE	FEET OF NET SAND	MILLIDARCYS MAX.	MILLIDARCYS MIN.	MILLIDARCYS WTD. AVG	CAPACITY FEET X M. D.
7941-8056	52	1.58	.05	.47	24.44
8056-62	4	1.08	.45	.77	3.04

*UNLESS NOTED OTHERWISE, PERMEABILITIES ARE PARALLEL TO BEDDING PLANES
"<" INDICATES "LESS THAN"; ">" INDICATES "GREATER THAN".

Letter of transmittal by R. L. Morton, dated 5-26-49, file: 251.1.002
With graphical core analysis log.

cc: Lewis Finch, Jr.
H. T. Morley (2)
G. F. Bedford
J. E. Eastburn
R. L. Morton

BY J. W. Spurlock

FORM 661 6-48

S[illegible]OLIND OIL AND GAS COMP[illegible]Y

RESEARCH DEPARTMENT

CORE ANALYSIS SUMMARY

WELL Rose Unit Well #1 LAB. NO. 2690

FIELD Wildcat, Rio Arriba County, New Mexico DATE REPORTED 2-16-49

LOCATION Sec. 11 Twp 31 N - R6W DATE RECEIVED 2-4-49

FORMATION ANALYZED Dakota Sand ELEV. 6362'

CORING DATA

ZONE	7878-7931	7932-36
START CORING	7874	7932
TOP OF SAND	7868	7932
BOTTOM OF SAND	7932	———
STOPPED CORING	7932	7938
TOTAL FEET CORED	25 *	6
TOTAL FEET OF FORMATION	64	———
RECOVERY, FEET OF FORMATION	21-1/2	4
RECOVERY, % OF FORMATION		———

TYPE OF DRILLING FLUID (OIL OR WATER BASE MUD) Gel Chem

FILTRATE LOSS (CC. PER 30 MIN. API) 9

RECEIVED [illegible] MAY [illegible] 19[illegible] [illegible] FILE

* Does not include drilling interval of 33'

SUMMARY OF CORE ANALYSIS

OIL CONTENT (BY EXTRACTION)

ZONE	FEET OF NET SAND	POROSITY MAX.	POROSITY MIN.	POROSITY WTD. AVG.	AVERAGE OIL SAT. %
7878-7931	20	6.5	2.9	4.1	4.6
7932-36	4	4.1	4.1	4.1	2.8

*FOR COMPARATIVE PURPOSES ONLY. NOT TO BE USED IN ESTIMATING OIL IN PLACE.

PERMEABILITY*

ZONE	FEET OF NET SAND	MILLIDARCYS MAX.	MILLIDARCYS MIN.	MILLIDARCYS WTD. AVG.	CAPACITY FEET X M. D.
7878-7931	20	.59	<.05	.17	3.40
7932-36	4	<.05	<.05	<.05	.20

*UNLESS NOTED OTHERWISE, PERMEABILITIES ARE PARALLEL TO BEDDING PLANES
"<" INDICATES "LESS THAN"; ">" INDICATES "GREATER THAN".

Letter of transmittal not signed, dated 4-30-49, file 251.1.002
with graphical core analysis log.
Please attach to Report #2690, dated 2-16-49

cc: Leslie Flash, Jr.
H. T. Kerley (2)
C. F. Bedford
J. L. Weston
R. L. Morton

BY J. K. Spotleish

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

RECEIVED
MAR 30 1961

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORPORATION Formation GRANEROS File RP-3-1365
Well JICARILLA 155 # 12 Core Type DIAMOND CONVENTIONAL Date Report 2-11-61
Field JICARILLA Drilling Fluid OIL EMULSION MUD Analysts MC COMAS
County RIO ARRIBA State NEW MEX. Elev. 6469 KB Location SECTION 32 - 26N - 5W

Lithological Abbreviations

SAND-SD	DOLOMITE-DOL	ANHYDRITE-ANHY	SANDY SDY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SHALY SHY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOSS	LIMY-LMY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STYLOLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
1	6903-04	0.01	2.4			Sandstone, shaly, vertical fracture
2	6904-05	0.01	2.1			Sandstone, shaly, vertical fracture
3	6905-06	0.02	4.4			Sandstone, shaly, vertical fracture
4	6906-07	0.02	3.3			Sandstone, shaly, vertical fracture
5	6907-08	0.02	3.4			Sandstone, shaly, vertical fracture
6	6908-09	0.08	2.7			Sandstone, shaly, vertical fracture
7	6909-10	0.23	6.9			Sandstone, shaly, vertical fracture
8	6910-11	0.02	4.2			Sandstone, shaly, vertical fracture
9	6911-12	0.16	4.3			Sandstone, shaly, vertical fracture
10	6912-13	0.08	9.3			Sandstone, shaly, vertical fracture
11	6913-14	0.03	10.5			Sandstone, shaly, vertical fracture
12	6914-15	0.13	10.5			Sandstone, shaly, vertical fracture
13	6915-16	0.02	12.4			Sandstone, shaly vertical fracture
14	6916-17	0.04	6.3			Sandstone, shaly, vertical fracture
15	6917-18	0.01	7.0			Sandstone, shaly, vertical fracture
16	6918-19	0.07	9.9			Sandstone, shaly, vertical fracture
17	6919-20	0.03	8.3			Sandstone, shaly
18	6920-21	0.12	7.1			Sandstone, shaly
19	6921-22	0.04	10.8			Sandstone, shaly
20	6922-23	0.01	7.5			Sandstone, shaly
21	6923-24	0.01	8.7			Sandstone, shaly
22	6924-25	0.02	9.4			Sandstone, shaly
23	6925-26	0.01	11.3			Sandstone, shaly
24	6926-27	0.08	4.6			Sandstone, shaly
25	6927-28	0.01	4.7			Sandstone, shaly, vertical fracture
26	6928-29	0.03	4.0			Sandstone, shaly, vertical fracture
27	6929-30	24	3.9			Sandstone, shaly, vertical fracture
28	6930-31	0.68	7.9			Sandstone, shaly, vertical fracture
29	6931-32	16	13.9			Sandstone, shaly
30	6932-33	0.11	9.8			Sandstone, shaly
31	6933-34	0.09	9.3			Sandstone, shaly
32	6934-35	0.62	7.5			Sandstone, shaly
33	6935-36	2.2	6.6			Sandstone, shaly
34	6936-37	14	4.6			Sandstone, shaly
35	6937-38	0.23	4.0			Sandstone, shaly

SERVICE NO. 8 NO INTERPRETATION OF RESULTS

FARMINGTON DISTRICT

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Form [illegible]

SINCLAIR OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS DATA RECORD

LAB NO. 3708

DATE 3-5-57

WELL Jicarilla Contract 146 No. 9 FIELD Otero Graneros STATE New Mexico

SAMPLE NO.	DEPTH		DESCRIPTION	PERMEABILITY MILLIDARCY'S LARGE REGULAR CORE AT HORIZONTAL: MAXIMUM	% FROM MAX	PERMEABILITY MILLIDARCY'S REGULAR CORE HORIZONTAL	PERMEABILITY MILLIDARCY'S VERTICAL	EFFECTIVE POROSITY %	SATURATION % PORE SPACE OIL	WATER
P	7354	55	SN	.47	.42			4.0		
Q	7355	56	"	2.64	1.63			3.6		
R	7356	57	"	121.40	6.34			2.3		
S	7357	58	"	6.55	.91			2.7		
T	7358	59	"	.25	.23			4.8		
U	7359	60	"	9.30	6.04			2.5		
V	7360	61	SNXFR	21.48*				4.1*		
W	7361	62	SN	.36	.16			1.5		
X	7362	63	"	.94	.73			1.6		
Y	7363	64	"	.38	.29			1.8		
Z	7364	65	"	.76	.60			3.5		
AA	7365	66	"	22.20	11.79			4.5		
AB	7366	67	"	2.66	1.47			1.7		
AC	7367	68	"	.89	.68			3.2		
AD	7368	69	"	21.80	.77			3.2		
AE	7369	70	"	2.12	.38			2.8		
AF	7370	71	"	1.94*				5.7*		
AG	7371	72	"	2.34	2.06			4.7		
AH	7372	73	"	.22	.20			2.0		
AI	7373	74	"	.29	.25			3.7		
AJ	7374	75	"	1.06	.41			3.3		
AK	7375	76	"	.49	.29			3.3		
AL	7376	77	"	1.19	.58			3.5		
AM	7377	78	"	.53*				5.1*		
AN	7378	79	"	.27	.21			5.6		
AO	7379	80	"	.10	.10			4.4		
AP	7380	81	"	.64	.62			4.3		
AQ	7381	82	"	.15	.10			4.7		
AR	7382	83	"	42.30	.20			3.8		
AS	7383	84	"	21.40	.44			4.0		
AT	7384	85	"	.08	.07			4.8		
AU	7385	86	"	.20	.19			4.1		
AV	7386	87	"	.17	.16			5.1		
AW	7387	88	"	.20	.17			5.6		
AX	7388	89	"	.10	.10			3.2		
AY	7389	90	"	.16	.12			3.9		
AZ	7390	91	"	.62	.41			4.0		
BA	7391	92	"	.57	.37			4.7		
BB	7392	93	"	.57	.47			5.8		
BC	7393	94	SHYSN	2.50	2.34			6.3		
BD	7394	95	"	.67	.58			4.7		

Reported saturation, acid solubility, salinity and sieve analysis data are obtained from portion of core horizontally adjacent to or within two inches vertically of portion on which permeability and porosity tests are made.

BY [signature]

Form 882 10-55

SINCLAIR OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS DATA RECORD

LAB. NO. 3708

DATE 9-5-57

WELL Jicarilla Contract 146 No. 9 FIELD Otero Gregores STATE New Mexico

SAMPLE NO.	DEPTH		DESCRIPTION	PERMEABILITY-MILLIDARCYS LARGE - AS HORIZONTAL: MAXIMUM	90° FROM MAX	REGULAR CORE: HORIZONTAL	PERMEABILITY-MILLIDARCYS VERTICAL	EFFECTIVE POROSITY %	SATURATION % PORE SPACE	
BE	7395	96	SHYSN	.17	.12			1.5		
BF	7396	97	"	.08	.08			1.2		
BG	7397	98	"	<.05	<.05			1.3		
BH	7398	99	"	.08	.05			1.7		
BI	7399	7400	"	.09	.08			1.6		
BJ	7400	01	"	.09	.09			1.6		
BK	7401	02	"	.07	.06			1.9		
BL	7402	03	"	.17	.14			1.1		
BM	7403	04	"	.22	.21			2.3		

SN Sand
SHY Shaly
X With
FR Fracture

gc

Reported saturation, acid solubility, salinity and sieve analysis data are obtained from portion of core horizontally adjacent to or within two inches vertically of portion on which permeability and porosity tests are made.

BY D.W. Peek

...LIND OIL AND GAS CO... NY

RESEARCH DEPARTMENT

CORE ANALYSIS DATA RECO...

LAB NO. 3678

DATE 2-12-57

...Jicarilla Contract 145 No. 9 ... Otero Graneros ... New Mexico

SAMPLE NO.	DEPTH		FORMATION	PERMEABILITY MILLIDARCYS		SATURATION % PORE SPACE	
						%	WATER
AC	7259	60					
AP	7260	61	SN	.33	.20		
AQ	7261	62	SN	.19	.19	5.5	
AR	7262	63	SN	.27	.25	6.1	
AS	7263	64	SN	.25	.25	9.9	
AT	7264	65	SN	.13	.11	6.5	
AU	7265	66	SN	.10	.09	7.4	
AV	7266	67	SN	.14	.13	7.9	
AW	7267	68	SN	.14	.13	7.0	
AX	7268	69	SN	.12	.09	5.2	
				.07	.07	1.6	
						2.5	
AY	7269	70	SN				
AZ	7270	71	SN	.18	.11		
BA	7271	72	SHY SN	.22	.13	5.4	
BB	7272	73	SHY SN	.14	.17	2.6	
BC	7273	74	SHY SN	.14	.11	2.9	
BD	7274	75	SHY SN	.27	.20	2.3	
BE	7275	76	SHY SN	<.05	<.05	1.3	
BF	7276	77	SHY SN	.06	.05	3.0	
			SHY SN	.11	.13	2.1	
						4.2	

SN SAND
SHY SHALY

Hans Leo

FORM 661 10 57

STANOLIND OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS SUMMARY

WELL Jicarilla Contract 146, No. 9
FIELD Otero Graneros Rio Arriba, N. Mexico
LOCATION 1090 FSL & 1090 FWL SW1/4 Sec 10 T25N
FORMATION ANALYZED Otero Graneros /R-5-W

LAB NO. 3708
DATE CORED 8-13,14,15, 1957
DATE ANALYZED 9-5-57
ELEV 6945' RDB

CORING DATA

CORE INTERVAL	7354 - 7404
START CORING	4023
TOP OF SAND	7354
BOTTOM OF SAND	7404
STOPPED CORING	7404
TOTAL FEET CORED	50
TOTAL FEET OF FORMATION	50
RECOVERY, FEET OF FORMATION	50
RECOVERY, % OF FORMATION	100

TYPE OF DRILLING FLUID [illegible] Gas

FILTRATE LOSS (CC. PER 30 MIN. API)

SUMMARY OF CORE ANALYSIS

INTERVAL		NET FEET OF CORE	TYPE OF ANALYSIS	POROSITY MAX.	POROSITY MIN.	POROSITY WTD. AVG.	AVERAGE OIL SAT. *
7354	7404	47	Large core only	6.3	1.1	3.3	-
7354	7404	50	Large core + plugs	6.3	1.1	3.4	-

*FOR COMPARATIVE PURPOSES ONLY. NOT TO BE USED IN PETROLEUM OIL IN PLACE

INTERVAL		NET FEET OF CORE	TYPE OF ANALYSIS	PERMEABILITY - MILLIDARCIES * MAX.	PERMEABILITY - MILLIDARCIES * MIN.	PERMEABILITY - MILLIDARCIES * WTD. AVG.	CAPACITY FEET X MD
7354	7404	47	Large core max.	121.40	<.05	5.75	270.25
7354	7404	47	L.C. 90° from max.	11.73	<.05	.93	43.71
7354	7404	50	L.C. max. + plugs	121.40	<.05	5.88	294.0

*UNLESS NOTED OTHERWISE, PERMEABILITIES ARE PARALLEL TO BEDDING PLANES

"<" INDICATES "LESS THAN" ">" INDICATES "GREATER THAN"

Lewis Finch, Jr. Attn.: R. H. Smith
H. T. Morley (2)
E. V. Hewitt C. L. Kelley
W. J. Nolte L. O. Speer, Jr.

Letter of transmittal by L. O. Speer, Jr., 8-16-57, file: B2297-341. Data indicated by asterisks were obtained on small plugs due to insufficient sample for large core analysis.

bc

BY Lew Speer

FORM 681 10 53

UFM 341

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MAR 21 1957
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COMPANY OIL AND GAS COMPANY
RESEARCH DEPARTMENT
CORE ANALYSIS SUMMARY

WELL Jicarilla Contract 148 No. 9
FIELD Otero Graneros, Rio Arriba New Mexico
LOCATION 1145 FSL 1650' FWL Sec. 1, T-25N-R5W
FORMATION ANALYZED Graneros

FILE NO. 3678
DATE CORED 2-12-57
DATE ANALYZED 3-12-57
ELEV. 6663 RDB

CORING DATA

CORE INTERVAL	7214 - 7277
NET CORING	7182
TOP OF SAND	--
BOTTOM OF SAND	--
BOTTOM PENETRATION	7277
TOTAL FEET CORED	95
TOTAL FEET OF FORMATION	--
RECOVERY FEET OF FORMATION	--
PERCENTAGE OF RECOVERY	--

TYPE DRILLING FLUID OR MUD WATER BASE MUD (Oil Emulsion (Water Base)
CHLORIDE CONTENT OF MIXING WATER 4

SUMMARY OF CORE ANALYSIS

FORMATION	NET FEET	TYPE OF ANALYSIS	AVG. POROSITY %	AVG. PERMEABILITY MILLIDARCYS	AVG. RESIDUAL OIL % PORE SPACE	AVG. RESIDUAL WATER % PORE SPACE
7214 - 7277	49	Large Core Only	11.9	1.6	6.5	-
7214 - 7277	58	Large Core + Plugs	11.9	1.6	6.5	-

FORMATION	NET FEET	TYPE OF ANALYSIS	AVG. POROSITY %	AVG. PERMEABILITY MILLIDARCYS	AVG. RESIDUAL OIL % PORE SPACE	AVG. RESIDUAL WATER % PORE SPACE
7234 - 7277	43	Large Core Max.	6.72	<.05	.82	39.38
7234 - 7277	43	L.C. 90° From Max.	1.06	<.05	.30	14.70
7214 - 7277	58	Large Core + Plugs	6.72	<.05	.76	54.68

Unless Noted Otherwise Permeabilities Reported To Nearest Hundredth
< Indicates Less Than > Indicates Greater Than

Lewis Finch, Jr.
Albert R. E. Smith
C. T. Morley (?)
L. J. Hewlett
W. T. Kelte
L. J. Kelley
L. L. Spoor, Jr.

Letter of Transmittal by L.C.Spoor, Jr. 3-19-57,
File L-3033-MC. Data Submitted by Petroleum
Core Obtained on Small Plugs due to Insufficient
Sample for Large Core Analysis.

SINCLAIR OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS DATA RECORD

FILE NO. 3678

DATE 3-12-57

Jicarilla Contract 148 No. 5 — Ojito Cranberos — New Mexico

SAMPLE NO	DEPTH		PERMEABILITY MILLIDARCY* MAXIMUM	PERMEABILITY MILLIDARCY* HORIZONTAL	POROSITY %	SATURATION % PORE SPACE OIL
A	7214	15				
B	7215	16	SN	.30		
C	7216	17	SN	.72	2.8	
D	7217	18	SN	.36	.21	2.5
E	7218	19	SN	.60	.45	6.0
F	7219	20	SN	.58	.37	7.6
G	7220	21	SN	.15	.11	6.3
H	7221	22	SN	1.39	.79	5.0
I	7222	23	SN	.97	.84	7.4
J	7223	24	SN	.35	.28	6.3
				.57	.35	7.5
K	7224	25	SN			7.7
L	7225	26	SN	.48	.21	
M	7226	27	SN	.72	.43	7.5
N	7227	28	SN	.70	.50	6.1
O	7228	29	SN	2.39	.99	5.8
P	7229	30	SN	.23	.21	5.4
Q	7230	31	SN	.20	.17	5.3
R	7231	32	SN	1.36	.49	7.6
S	7232	33	SN	.24	.21	5.4
T	7233	34	SN	.22	.20	6.8
				.22	.22	8.3
U	7234	35	SN			11.9
V	7235	36	SN	.35	.25	
W	7236	37	SN	.34	.26	8.7
X	7237	38	SN	.25	.18	11.4
Y	7238	39	SN	.22	.23	11.2
Z	7239	40	SN	4.86*		10.3
AA	7240	41	SN	2.21*		10.1*
AB	7241	42	SN	1.67*		12.3*
AC	7242	43	SN	.05*		3.6*
AD	7243	44	SN	1.09	1.00	6.1
				.73	.66	4.7
AE	7245	46	SN			9.5
AF	7250	51	SN	2.75*		11.1*
AG	7251	52	SN	.12*		4.6*
AH	7252	53	SN	.66	.59	7.3
AI	7253	54	SN	.32	.30	9.1
AJ	7254	55	SN	.37*		4.1*
AK	7255	56	SN	<.05*		3.9*
AL	7256	57	SN	.15	.13	7.7
AM	7257	58	SN	1.04	.88	7.5
AN	7258	59	SN	.27	.23	7.7

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

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Page No. 1

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA File RP-3-1011
Well MILLER GAS UNIT NO.1 Core Type DIAMOND CONV. Date Report 6/16/59
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts CLIFFORD
County SAN JUAN State NEW MEXICO Elev. 5516 KB Location SEC 20 30N 13W

Lithological Abbreviations

SAND-SD	DOLOMITE-DOL	ANHYDRITE-ANHY	SANDY-SDY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SHALY-SHY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOSS	LIMY-LMY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STYLOLITIC-STYL	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS MAX	PERMEABILITY MILLIDARCYS 90°	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
1	5968.2-70.2	<0.1	<0.1	2.8			
2	70.2-72.0	0.6	<0.1	4.7			

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3	FE	
	SFE	
1	AFC	
	PE	
	FMS	

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Petroleum Reservoir Engineering
DALLAS, TEXAS

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CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA File RP-3-1011
Well MILLER GAS UNIT NO.1 Core Type DIAMOND CONV. Date Report 6/17/59
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts CLIFFORD
County SAN JUAN State NEW MEXICO Elev. 5516 KB Location

Lithological Abbreviations

SAND-SD	DOLOMITE-DOL	ANHYDRITE-ANHY	SANDY-SDY	FINE-FN	CRYSTALLINE-XLN	BROWN-BRN	FRACTURED-FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE-CONG	SHALY-SHY	MEDIUM-MED	GRAIN-GRN	GRAY-GY	LAMINATION-LAM	VERY-V/
LIME-LM	GYPSUM-GYP	FOSSILIFEROUS-FOSS	LIMY-LMY	COARSE-CSE	GRANULAR-GRNL	VUGGY-VGY	STY-OLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS MAX	PERMEABILITY MILLIDARCYS 90°	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
3	5972.0-73.8	0.1	<0.1	6.9			
4	73.8-75.5	<0.1	0.0	7.0			
5	75.5-77.3	<0.1	0.0	6.3			
6	77.3-78.9	0.1	<0.1	6.1			
7	78.9-80.7	<0.1	<0.1	6.7			
8	80.7-82.4	0.0	0.0	7.4			
9	82.4-84.1	0.02*		7.8			VERTICAL FRACTURE
10	8411-86.0	0.01*		8.4			VERTICAL FRACTURE
11	86.0-87.7	0.01*		7.2			VERTICAL FRACTURE
12	87.7-90.0	0.02*		7.0			VERTICAL FRACTURE
13	90.0-91.4	0.01*		9.8			VERTICAL FRACTURE
14	91.4-93.4	0.02*		8.4			
15	93.4-95.2	0.1	0.0	6.6			
16	95.2-97.2	<0.1	0.0	6.7			
17	97.2-98.9	0.0	0.0	6.1			
18	5998.9-00.8	0.0	0.0	5.8			
19	6000.8-02.7	<0.1	0.0	3.8			
20	02.7-04.5	<0.1	0.0	3.8			
21	04.5-06.3	<0.1	<0.1	3.9			
22	06.3-08.3	<0.1	0.0	4.9			
23	08.3-10.2	0.0	0.0	4.8			
24	10.2-12.0	<0.1	0.0	5.2			
25	12.0-13.8	0.0	0.0	4.7			
26	13.8-15.6	0.0	0.0	4.5			
27	15.6-17.3	0.0	0.0	4.2			
28	17.3-19.5	0.01*		3.9			VERTICAL FRACTURE
29	19.5-21.3	0.03*		4.2			VERTICAL FRACTURE
30	21.3-23.2	<0.1	0.0	4.2			
31	23.2-25.0	<0.1	<0.1	4.1			
32	25.0-26.8	<0.1	<0.1	4.0			
33	26.8-28.4	<0.1	0.0	4.3			
34	28.4-30.0	0.02*		4.9			VERTICAL FRACTURE
35	30.0-31.0	0.04*		11.2			VERTICAL FRACTURE

* MATRIX PERMEABILITY
SERVICE NO. 8-A PERMEABILITY & POROSITY ONLY

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Petroleum Reservoir Engineering
DALLAS, TEXAS

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CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA File RP-3-1011
Well MILLER GAS UNIT NO.1 Core Type DIAMOND CONV. Date Report 6/19/59
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts CLIFFORD
County SAN JUAN State NEW MEX. Elev. 5516 KB Location SEC 20 30N 13W

Lithological Abbreviations

SAND SD	DOLOMITE DOL	ANHYDRITE ANH	SHALY SHY	FINE FN	CRYSTALLINE XLN	BROWN BRN	FRACTURED FRAC	SLIGHTLY SL/
SHALE SH	CHERT CH	CONGLOMERATE CONG	SANDY SDY	MEDIUM MED	GRAIN GRN	GRAY GY	LAMINATION LAM	VERY V
LIME LM	GYPSUM GYP	FOSSILIFEROUS FOSS	MARLY MRY	COARSE CSE	GRANULAR GRNL	VUGGY VGY	STYLOLITIC STY	WITH W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS MAX	PERMEABILITY MILLIDARCYS 90°	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE GAS	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
36	6031.0-33.2	0.03*		12.6			VERTICAL FRACTURE
37	33.2-34.8	0.1	<0.1	12.3			
38	34.8-36.4	0.1	<0.1	7.8			
39	36.4-38.4	<0.01*		5.9			
40	38.4-40.0	<0.1	<0.1	[illegible]		5.8	
41	40.0-41.8	<0.1	<0.1	4.8			
42	41.8-43.5	0.9	0.6	4.3			
43	43.5-45.3	<0.01*		4.7			
44	45.3-47.0	<0.01*		6.1			
45	47.0-48.8	0.1	<0.1	8.3			
46	48.8-50.9	<0.1	<0.1	8.1			
47	50.9-52.5	0.1	<0.1	9.5			
48	52.5-54.0	0.1	<0.1	9.1			
49	54.0-56.0	<0.1	<0.1	8.5			
50	56.0-57.8	0.1	<0.1	8.1			
51	57.8-59.5	0.5	0.3	7.3			
52	59.5-61.4	<0.1	<0.1	8.9			
53	61.4-63.0	0.1	<0.1	8.3			
54	63.0-65.0	0.1	<0.1	7.4			
55	65.0-66.7	<0.1	<0.1	4.8			
56	66.7-68.3	0.1	<0.1	4.3			
57	68.3-70.1	<0.1	<0.1	3.9			
58	70.1-71.9	<0.01*		4.6			VERTICAL FRACTURE
59	71.9-74.0	<0.1	<0.1	3.6			
60	74.0-75.5	<0.01*					VERTICAL [illegible] FRACTURE

* MATRIX PERMEABILITY

SERVICE NO.8-A PERMEABILITY & POROSITY ONLY

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

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Page No. 1

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA
Well MILLER GAS UNIT NO.1 Core Type DIAMOND CONV.
Field WILDCAT Drilling Fluid WATER BASE MUD
County SAN JUAN State NEW MEX. Elev 5516 KB Location SEC 20 30N 13W

File RP-3-1011
Date Report 6/19/59
Analysts CLIFFORD

Lithological Abbreviations

SANDY SD	DOLOMITE DO	ARGILLACEOUS ARG	SANDY SDY	FINE FN	CRYSTALLINE XLN	BROWN BRN	FRACTURED FRAC	SLIGHTLY SL/
SHALE SH	CHERT CH	CONGLOMERATE CGL	SHALEY SHY	MEDIUM MED	GRAIN GRN	GRAY GY	LAMINATION LAM	VERY V
LIME LM	GYPSUM GYP	FOSSILIFEROUS FOSS	LIMEY LMY	COARSE CSE	GRANULAR GRNL	VUGGY VGY	STYLOLITIC STY	WITH W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS MAX	PERMEABILITY MILLIDARCYS 90°	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE GAS	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
61	6076.0-77.7	<0.01*		4.9			VERTICAL FRACTURE
62	77.7-79.4	<0.01*		4.3			VERTICAL FRACTURE
63	79.4-81.0	0.03*		5.2			VERTICAL FRACTURE
64	81.0-83.0	<0.01*		4.9			VERTICAL FRACTURE
65	83.0-84.4	<0.01*		5.2			VERTICAL FRACTURE
66	84.4-86.0	0.05*		7.0			VERTICAL FRACTURE
67	86.0-87.7	<0.01*		6.3			VERTICAL FRACTURE
68	87.7-89.8	<0.01*		6.4			VERTICAL FRACTURE
69	89.8-90.8	<0.01*		6.8			VERTICAL FRACTURE
70	90.8-92.0	0.04*		7.4			VERTICAL FRACTURE

* MATRIX PERMEABILITY
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CORE LABORATORIES
Petroleum Reservoir Engineering
DALLAS, TEXAS

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Page No. 1

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation
Well MILLER GAS UNIT NO. 1 Core Type
Field WILDCAT Drilling Fluid
County SAN JUAN State NEW MEX. Elev. 5516 KB Location SEC 20 30N 13W

File RP-3-1011
Date Report 6/22/59
Analysts CLIFFORD

Lithological Abbreviations

SAND-SD	DOLOMITE-DOL	ANHYDRITE ANHY	SANDY SDY	FINE-FN	BROWN-BRN	FRACTURED FRAC	SLIGHTLY-SL/
SHALE-SH	CHERT-CH	CONGLOMERATE CONG	SHALY SHY	MEDIUM-MED	GRAY-GY	LAMINATION-LAM	VERY V/
LIME-LM	GYPSUM GYP	FOSSILIFEROUS FOSS	LIMY-LMY	COARSE-CSE	YUGGY-VGY	STYLOLITIC-STY	WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MAXIMUM (MILLIDARCYS)	PERMEABILITY 90° (MILLIDARCYS)	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
71	6140.5-42.3	0.7	0.3	8.6			
72	42.3-44.1	0.7	0.2	9.0			
73	44.1-45.8	2.1	1.4	8.3			
74	45.8-47.7	0.8	0.5	7.5			
75	47.7-49.4	0.1	0.1	7.8			
76	49.4-51.2	0.6	0.3	9.1			
77	51.2-53.0	0.5	0.1	9.9			
78	53.0-54.7	0.2	0.2	9.7			
79	54.7-56.5	0.2	0.1	9.3			
80	56.5-58.3	0.5	0 .3	10.5			
81	58.3-60.3	0.7	0.1	10.3			
82	60.3-62.1	0.9	0.3	8.6			
83	62.1-64.0	0.1	0.1	5.8			

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FORM 661 5-48

STANOLIND OIL AND GAS COMPANY

RESEARCH DEPARTMENT

CORE ANALYSIS SUMMARY

WELL [redacted] Unit #4 — LAB. NO. 2872

FIELD Wildcat, San Juan County, New Mexico — DATE REPORTED 4-30-51

LOCATION Sec. 24 T26N R10W — DATE RECEIVED 2-2-51

FORMATION ANALYZED Dakota Sand - Unknown — ELEV. 6656'

RECEIVED
FARMINGTON DISTRICT OFFICE
JUN 11
DS
SE
FM
AME

CORING DATA

	Dakota Sand	Unknown
ZONE	6705-6873	6914-6984
START CORING	6705	----
TOP OF SAND	6635	----
BOTTOM OF SAND	6873	----
STOPPED CORING	6873	6984
TOTAL FEET CORED	134*	56**
TOTAL FEET OF FORMATION	168	----
RECOVERY, FEET OF FORMATION	134	56
RECOVERY, % OF FORMATION	79.8	----

TYPE OF DRILLING FLUID (OIL OR WATER BASE MUD) Gel Chemical (water Base)

FILTRATE LOSS (CC. PER 30 MIN. API) 7 cc

*This depth does not include 34' drilling interval

**This depth does not include 14' drilling interval

SUMMARY OF CORE ANALYSIS

OIL CONTENT (BY EXTRACTION)

ZONE	FEET OF NET SAND	POROSITY MAX.	POROSITY MIN.	POROSITY WTD. AVG.	AVERAGE OIL SAT. %
Large Core Only 6704-6873	78	15.5	2.2	8.6	----
Large Core and Small plug 6704-6873	92	15.5	2.2	8.2	----
Large Core Only 6914-6977	14	25.0	1.1	9.6	----
Large Core and Small Plug 6914-6984	16	25.0	1.1	8.9	----

*FOR COMPARATIVE PURPOSES ONLY. NOT TO BE USED IN ESTIMATING OIL IN PLACE.

PERMEABILITY*

ZONE	FEET OF NET SAND	MILLIDARCYS MAX.	MILLIDARCYS MIN.	MILLIDARCYS WTD. AVG.	CAPACITY FEET X M. D.
Large Core Maximum 6704-6873	78	886.00	.11	20.81	1623.18
L.C. 90° From Max. 6704-6873	78	284.10	.01	5.54	432.12
L.C. Max. & Plug 6704-6873	92	886.00	.01	17.73	1630.16
Large Core Maximum 6914-6977	14	99.10	.27	20.65	289.10
L.C. 90° From Max. 6914-6977	14	63.60	.13	11.08	155.12
L.C. Max. & Plug 6914-6984	16	99.10	.27	18.09	289.44

*UNLESS NOTED OTHERWISE, PERMEABILITIES ARE PARALLEL TO BEDDING PLANES

"<" INDICATES "LESS THAN"; ">" INDICATES "GREATER THAN"

Letter of transmittal by W. C. Wunnicke, Dated: 1-10-51, no file number
With graphical core analysis log. 1-19-51 no file number
1-26-51 no file number

Due to the core being unsuitable for large core analysis the data indicated by asterisks were obtained on small plug samples.

Vertical permeabilities determined for cores from interval 6914'-6984' at request of D. H. Reno of Research Laboratory.

Results of Resistivity Formation Factor Tests to follow this report as a supplement

cc: W. M. Elias
Attn: Lewis Finch, Jr.
H. T. Morley (2)
W. J. Molte
M. M. Montgomery
R. L. Hendrickson
[illegible]

BY J. W. Spurlock

RP-3-870

11-30-58

ENGLISH

PERMEABILITY & POROSITY ONLY
WHOLE CORE ANALYSIS

SAN JUAN

SECTION 10 26N 11W

Max. 90°

Dakota Formation

1	6250-51.8	0.3	0.1	9.6	(2) Sandstone, Shaly.
2	6251.8-54	2.4	0.2	6.5	(2) Sandstone, Shaly.
3	6254-55.8	0.2	0.2	9.7	(2) Sandstone, Shaly.
4	6255.8-57.5	0.2	0.1	12.7	(2) Sandstone, Shaly.
5	6257.5-59.5	0.1	0.1	10.5	(2) Sandstone, Shaly.
6	6259.5-61.2	<0.1	<0.1	8.6	(2) Sandstone, Shaly.
7	6261.2-63.1	<0.1	<0.1	9.3	(2) Sandstone, Shaly.
8	6263.1-65	0.3	0.3	8.9	(2) Sandstone, Shaly.
9	6265-66.8	0.1	<0.1	8.5	(2) Sandstone, Shaly.
10	6266.8-68.8	<0.1	<0.1	7.6	(2) Sandstone, Shaly.
11	6268.8-70.3	<0.1	<0.1	7.8	(2) Sandstone, Shaly.
12	6270.3-72.1	0.03	*	8.5	(2) Sandstone, Shaly.
13	6272.1-74	0.06	*	10.3	(2) Sandstone, Shaly.
14	6274-76	0.08	*	11.7	(2) Sandstone, Shaly.
15	6276-78	0.05	*	8.9	(2) Sandstone, Shaly.
16	6278-80	0.1	<0.1	4.5	(2) Sandstone, Shaly.
17	6292-94	0.14	*	4.0	(2) Sandstone, Shaly.
18	6294-96	0.02	*	4.9	(2) Sandstone, Shaly.
19a	6298.5-99	0.9	0.6	4.7	(2) Sandstone.
19b	6303.0-04.8	0.4	0.3	9.4	(2) Sandstone, Shaly.
20	6304.8-06.6	0.4	0.2	8.1	(2) Sandstone, Shaly.
21	6306.6-07.6	<0.1	<0.1	3.3	(2) Sandstone, Shaly, Vertical Fracture.
22	6307.6-09.0	0.3	0.1	6.1	(2) Sandstone, Shaly, Vertical Fracture.
23	6311.0-13.1	0.04	*	4.4	(2) Sandstone, Shaly.
24	6313.1-14.9	<0.1	<0.1	3.7	(2) Sandstone, Shaly.
25	6314.9-17.0	0.1	<0.1	5.5	(2) Sandstone, Shaly.
26	6317.0-19.0	1.5	0.0	4.5	(2) Sandstone, Shaly.
27	6322.0-24.2	0.2	0.1	9.0	(2) Sandstone, Shaly.
28	6324.2-25.6	0.1	0.1	5.7	(2) Sandstone, Shaly.
29	6325.6-27.5	0.1	0.1	7.3	(2) Sandstone, Shaly.

NOTE
(*) REFER TO ATTACHED LETTER.
(1) INCOMPLETE CORE RECOVERY--INTERPRETATION RESTRICTED.

...ATION ANALYSIS--NO INTERPRETATION OF RESULTS

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FORM 3M4U 6A 20

CORE LABORATORIES INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Company PAN AMERICAN PETROLEUM CORP. Formation AS NOTED Page 2 of 2
Well O. H. RANDEL "B" NO. 1 (#2) Core DIA. CONV. File RP-3-870
Field UNDESIGNATED DAKOTA Drilling Fluid WATER BASE MUD Date Report 11-30-58
County SAN JUAN State NEW MEXICO Elevation 6343 KB Analysts CLIFFORD
Location SECTION 10 26N 11W Remarks SERVICE NO. 8 - PERMEABILITY & POROSITY ONLY

CORE ANALYSIS RESULTS

WHOLE CORE ANALYSIS

(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS Horizontal Max.	PERMEABILITY MILLIDARCYS Vertical 90°	POROSITY PERCENT	RESIDUAL SATURATION OIL PERCENT PORE SPACE	REMARKS
30	6327.5-29.0	0.1	0.0	7.8	(2)	Sandstone, Shaly.
31	6329.0-30.8	0.02	*	4.7	(2)	Sandstone, Shaly.
32	6330.8-32.0	0.0	0.0	5.7	(2)	Sandstone, Shaly.
33	6336.0-37.5	0.0	*	4.4	(2)	Sandstone, Shaly.
34	6347-49	0.2	<0.1	5.0	(2)	Sandstone, Shaly.
35	6349-51	8.7	0.3	4.8	(2)	Sandstone, Shaly.
36	6353-55	0.1	<0.1	8.6	(2)	Sandstone, Shaly.
37	6355-57	0.1	<0.1	12.2	(2)	Sandstone, Shaly.
38	6367.5-69	0.3	0.1	6.7	(2)	Sandstone, Shaly.
39	6369-70.5	0.3	0.2	15.4	(2)	Sandstone.
40	6370.5-72	1.1	0.9	12.3	(2)	Sandstone.
41	6401.0-03.0	1.6	1.5	12.8	(2)	Conglomerate.
42	6403.0-05.0	0.8	0.6	11.8	(2)	Conglomerate.
43	6405.0-06.5	4.9	4.7	10.7	(2)	Conglomerate.
44	6406.5-08.0	0.2	0.2	9.3	(2)	Conglomerate.
45	6408.0-09.6	5.6	4.7	11.2	(2)	Conglomerate.
46	6409.6-11.0	0.1	0.0	10.3	(2)	Conglomerate.
47	6411.0-13.0	0.1	0.1	12.1	(2)	Conglomerate.
48	6413.0-15.0	2.1	1.6	11.3	(2)	Sandstone, Fine-grain.
49	6415.0-17.0	1.5	1.0	10.8	(2)	Sandstone, Fine-grain.
50	6417.0-19.0	3.4	1.1	12.2	(2)	Sandstone, Fine-grain.
51	6419.0-21.0	2.2	1.4	11.0	(2)	Sandstone, Fine-grain.
52	6421.0-22.5	2.3	1.5	14.3	(2)	Sandstone, Fine-grain.
53	6422.5-24.5	2.6	1.9	17.8	(2)	Sandstone, Fine-grain.
54	6424.5-27.0	2.4	1.3	16.1	(2)	Sandstone, Fine-grain.

6427 - Top of Morrison Formation.

6394-6401 - Drilled.

* Matrix Permeability.

NOTE:
(*) REFER TO ATTACHED LETTER (2) LOCATION ANALYSIS - NO INTERPRETATION OF RESULTS
(1) INCOMPLETE CORE RECOVERY--INTERPRETATION RESERVED.

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1	6253	0.23	5.3	[illegible] Sandstone, Shaly.
2	6255	<0.01	1.4	(2) Sandstone, Shaly.
3	6256	0.16	9.1	(2) Sandstone, Shaly.
4	6279	0.02	0.6	(2) Sandstone, Shaly.

(2) Service No. 8 Conventional Analysis - No Interpretation of Results. Permeability and Porosity Only.

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CORE LABORATORIES, INC.

CORE ANALYSIS RESULTS

Company	PAN AMERICAN PETROLEUM CORP.	DAKOTA	RP-3-870
Well	O. H. RANDEL "B" NO. 1 (#2)	DIA. CONV.	11-24-58
Field	UNDESIGNATED DAKOTA	WATER BASE MUD	ENGLISH
County	SAN JUAN N. MEXICO	6343 KB	SECTION 10 26N 11W

Lithological Abbreviations

SAMPLE NUMBER				
1	6253	0.23	5.3	(2) Sandstone, Shaly.
2	6255	<0.01	1.4	(2) Sandstone, Shaly.
3	6256	0.16	9.1	(2) Sandstone, Shaly.
4	6279	0.02	0.6	(2) Sandstone, Shaly.

(2) Service No. 8 Conventional Analysis - No Interpretation of Results. Permeability and Porosity Only.

CA-20

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company	PAN AMERICAN PETROLEUM CORP.	Formation	DAKOTA	File	RP-3-1668
Well	ABRAMS GAS UNIT "E"	Core Type	DIAMOND CONV.	Date Report	9/1/62
Field	BASIN DAKOTA	Drilling Fluid	OIL EMULSION MUD	Analysts	DEPPE
County	SAN JUAN State NEW MEX.	Elev.	5535 KB Location	SEC 30 T29N R10W	

Lithological Abbreviations

SAND SD	DOLOMITE DOL	ANHYDRITE ANHY	SANDY SDY	FINE FN	CRYSTALLINE XLN	BROWN BRN	FRACTURED FRAC	SLIGHTLY SLY
SHALE SH	CHERT CH	CONGLOMERATE CONG	SHALY SHY	MEDIUM MED	GRAIN GRN	GRAY GY	LAMINATION LAM	VERY V
LIME LM	GYPSUM GYP	FOSSILIFEROUS FOSS	LIMY LMY	COARSE CSE	GRANULAR GRNL	VUGGY VGY	STYLOLITIC STY	WITH W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS	
36	6211-12	<0.01	2.1			SHALE, SANDY	
37	6212-13	<0.01	3.2			SHALE, SANDY	
38	6240-41	0.03	5.0			SHALE, SANDY	VERTICAL FRACTURE
39	6241-42	<0.01	4.4			SANDSTONE	VERTICAL FRACTURE
40	6242-43	0.19	5.3			SANDSTONE	VERTICAL FRACTURE
41	6243-44	0.03	6.5			SANDSTONE	VERTICAL FRACTURE
42	6244-45	0.03	6.7			SANDSTONE	VERTICAL FRACTURE
43	6245-46	0.03	3.8			SANDSTONE	VERTICAL FRACTURE
44	6246-47	0.04	3.9			SANDSTONE,	VERTICAL FRACTURE
45	6247-48	0.05	4.0			SANDSTONE	VERTICAL FRACTURE
46	6248-49	<0.01	3.6			SANDSTONE	VERTICAL FRACTURE
47	6249-50	0.01	4.6			SANDSTONE	VERTICAL FRACTURE
48	6250-51	0.08	8.8			SANDSTONE	VERTICAL FRACTURE
49	6251-52	0.38	9.7			SANDSTONE	VERTICAL FRACTURE
50	6252-53	0.13	8.9			SANDSTONE	VERTICAL FRACTURE

Service No. 8 No Interpretation of results.

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CA-20

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

341

CORE ANALYSIS RESULTS

Company PAN AMERICAN PETROLEUM CORP. Formation DAKOTA File RP-3-1668
Well ABRAMS GAS UNIT "E" Core Type DIAMOND CONV. Date Report 8-30-62
Field BASIN DAKOTA Drilling Fluid OIL EMULSION MUD Analyst DEPPE
County SAN JUAN State NEW MEX Elev. 5535 KB Location SEC 30 T29N R10W

Lithological Abbreviations

SAND-SD, SHALE-SH, LIME-LM, DOLOMITE-DOL, CHERT-CH, GYPSUM-GYP, ANHYDRITE-ANHY, CONGLOMERATE-CONG, FOSSILIFEROUS-FOSS, SANDY-SDY, SHALY-SHY, LIMY-LMY, FINE-FN, MEDIUM-MED, COARSE-CSE, CRYSTALLINE-XLN, GRAIN-GRN, GRANULAR-GRNL, BROWN-BRN, GRAY-GY, VUGGY-VGY, FRACTURED-FRAC, LAMINATION-LAM, STYLOLITIC-STY, SLIGHTLY-SL/, VERY-V, WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS	
1	6176-77	0.01	2.0			SANDSTONE	VERTICAL FRACTURE
2	6177-78	0.01	2.6			SANDSTONE	VERTICAL FRACTURE
3	6178-79	0.13	14.5			SANDSTONE	VERTICAL FRACTURE
4	6179-80	0.16	14.4			SANDSTONE	VERTICAL FRACTURE
5	6180-81	0.03	7.2			SANDSTONE	VERTICAL FRACTURE
6	6181-82	0.05	7.6			SANDSTONE	VERTICAL FRACTURE
7	6182-83	0.02	5.2			SANDSTONE	VERTICAL FRACTURE
8	6183-84	<0.01	4.2			SANDSTONE	VERTICAL FRACTURE
9	6184-85	<0.01	1.9			SANDSTONE	VERTICAL FRACTURE
10	6185-86	<0.01	3.4			SANDSTONE	VERTICAL FRACTURE
11	6186-87	0.01	3.6			SANDSTONE, SHALEY	VERTICAL FRACTURE
12	6187-88	0.02	3.3			SANDSTONE, SHALEY	VERTICAL FRACTURE
13	6188-89	<0.01	3.8			SANDSTONE, SHALEY	VERTICAL FRACTURE
14	6189-90	<0.01	3.7			SANDSTONE, SHALEY	VERTICAL FRACTURE
15	6190-91	0.03	2.7			SANDSTONE, SHALEY	VERTICAL FRACTURE
16	6191-92	0.02	3.7			SANDSTONE, SHALEY	VERTICAL FRACTURE
17	6192-93	<0.01	4.2			SANDSTONE, SHALEY	VERTICAL FRACTURE
18	6193-94	<0.01	4.0			SANDSTONE, SHALEY	VERTICAL FRACTURE
19	6194-95	0.01	4.2			SANDSTONE, SHALEY	VERTICAL FRACTURE
20	6195-96	<0.01	3.5			SANDSTONE, SHALEY	VERTICAL FRACTURE
21	6196-97	<0.01	2.8			SANDSTONE, SHALEY	VERTICAL FRACTURE
22	6197-98	<0.01	3.0			SANDSTONE, SHALEY	VERTICAL FRACTURE
23	6198-99	0.01	3.4			SANDSTONE, SHALEY	VERTICAL FRACTURE
24	6199-6200	<0.01	3.1			SANDSTONE, SHALEY	VERTICAL FRACTURE
25	6200-01	<0.01	2.8			SANDSTONE, SHALEY	
26	6201-02	<0.01	2.7			SANDSTONE, SHALEY	
27	6202-03	<0.01	2.6			SANDSTONE, SHALEY	
28	6203-04	<0.01	2.6			SANDSTONE, SHALEY	
29	6204-05	<0.01	2.8			SANDSTONE, SHALEY	VERTICAL FRACTURE
30	6205-06	<0.01	3.1			SANDSTONE, SHALEY	VERTICAL FRACTURE
31	6206-07	<0.01	3.7			SANDSTONE, SHALEY	VERTICAL FRACTURE
32	6207-08	0.01	4.0			SANDSTONE, SHALEY	VERTICAL FRACTURE
33	6208-09	0.02	3.4			SANDSTONE, SHALEY	VERTICAL FRACTURE
34	6209-10	<0.01	3.0			SANDSTONE, SHALEY	VERTICAL FRACTURE
35	6210-11	<0.01	2.6			SANDSTONE, SHALEY	VERTICAL FRACTURE

Service No. 8 No interpretation of results.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

Consolidated Oil & Gas, Inc.

Executive Offices
SUITE 2112 TOWER BLDG
DENVER-U.S. NATIONAL CENTER
1700 BROADWAY
DENVER 2, COLORADO
PHONE AMHERST 6-1308

RECEIVED
JUL 11 1962
CASPER DIVISION
OFFICE OF THE
DIVISION MANAGER

July 6, 1962

MEMORANDUM TO PARTICIPANTS

Re: Dakota Proration Formula
San Juan Basin, New Mexico

We have previously informed you of the New Mexico Oil & Gas Conservation Commission denial of our request for a change in the method by which Dakota gas withdrawals are allocated. Our hearing in April resulted in what is reported to be the longest Commission session in history - the hearing consumed four days.

In essence, it is obvious that we won the battle but lost the war. The famous New Mexico Supreme Court Jalmat decision handed down recently said in principal that the Commission could not consider changing a proration formula unless detailed engineering reserve and performance data were included on each and every well in order that reservoir exploitation efficiency, and the always important issue of correlative rights, might be thoroughly and objectively defined.

The impact of this on our proposal is indicated when one realizes that there are over 600 wells in the San Juan Basin Dakota reservoirs. We have now approached the Commission with the formal request that they require all operators to submit sufficient information regarding their particular wells such that the requirements of the Jalmat decision could be met. We are confident that a thorough engineering review, with objective conclusions based on all available data, would prove our proposed allocation formula more valid than the original formula which is now in effect. It is possible (and even quite probable) that while we may not be able to generate approval for our proposed new formula, we will succeed in invalidating the original formula. The net effect of this would be no proration at all. This would be good since we would

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 1
CASE 2504

MARATHON EX.

then undeniably be governed by the unqualified intent of the contractual minimum-take guarantee; i. e., 50% of each well's ability rather than being limited to a lesser volume as suggested by the existing proration formula.

In any event, Consolidated Oil & Gas, Inc. is being heard from and we have gained respect in both our administrative and technological profiles.

J. B. Ladd

JBL:bw
Enclosure

Consolidated Oil & Gas, Inc.

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DENVER 2, COLORADO
PHONE AMHERST 8-1306

July 17, 1962

MEMORANDUM TO PARTICIPANTS

Re: Dakota Proration Formula
San Juan Basin, New Mexico

To keep you up-to-date on our application for the change in the Dakota formula, we have been granted a rehearing which was set for August 15, 1962. Due to conflicting dates, this hearing has now been moved to September 13.

We are preparing our own information and sincerely hope that all other interested companies will supply the necessary information for the reserve study required for a commission decision. We are confident that a study of all reserves in the San Juan Basin will support our position and feel that if we receive cooperation from the other companies we will ultimately gain a large portion of our goal.

For your further information, we are enclosing a copy of the Statehouse Reporting Service publication dated July 13, 1962.

Robert B. Tenison

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Marathon EXHIBIT No. 2
CASE 2504

MARATHON EX. ____

Consolidated Oil & Gas, Inc.

Executive Offices
SUITE 2112 TOWER BLDG
DENVER-U.S. NATIONAL CENTER
1700 BROADWAY
DENVER 2, COLORADO
PHONE AMHERST 6-1306

August 24, 1962

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AUG 24 1962
CASPER DIVISION
OFFICE OF THE
DIVISION MANAGER

Ohio Oil Company
P. O. Box 159
Casper, Wyoming

Gentlemen:

As you no doubt know, we have been granted a rehearing before the Oil Conservation Commission of the State of New Mexico in its Case No. 2504 which will be heard September 13, 1962. The Order of the Commission granting the rehearing states that the scope of the rehearing should be limited to matters pertaining to recoverable gas reserves in the Basin Dakota pool.

We enclose with this a list of some of your wells. We also enclose a blank data sheet listing reservoir information needed for the determination of recoverable gas reserves. We respectfully request that as to the wells designated on the first list you provide to us, at your earliest convenience and prior to September 10, 1962, all of the information suggested by the data sheet. This should include, if you have made the calculations, your determinations of recoverable gas reserves. If you do not have any particular item of information, we would appreciate your furnishing all that you do have.

Will you please advise us if you plan to attend the rehearing and, if so, whether you can have a witness available to testify to the recoverable reserve information for each of your wells.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Marathon EXHIBIT No. 3
CASE 2504

Yours very truly,

CONSOLIDATED OIL & GAS, INC.

George E. Farmar, Chief Engineer

GEF:lm
Enclosures

MARATHON Ex ____

O... Oil Co.

Ohio Gov't No. 26 E, P-26 28, 11

SAN JUAN BASIN
DAKOTA GAS RESERVOIR
PRODUCING WELLS

Tract Description & Designation	Acreage (Acres)	*Initial Reservoir Pressure (PSIG)	* Average Porosity Total (%)	* Average Porosity Net Gas Sat. (%)	* Average Permeability (Md.)	** Initial Absolute Open Flow Potential (MCFD)	** Deliverability Initial (MCFD)	** Deliverability Most Recent (MCFD)	Gross Gas Pay (Ft.)	Net Gas Pay (Ft.)	*** Gas Reserves Ultimate (MCF)	*** Gas Reserves At 6/1/62 (MCF)

* State source of data, measured or estimated.
** Standard New Mexico one-point method
*** Utilize following assumptions:
Base pressure = 14.4 PSIA
Abandonment pressure = 270 PSIA
Reservoir temperature - 180° F.

EXHIBIT 2

CONSOLIDATED OIL & GAS, INC.
NEW MEXICO OIL AND GAS CONSERVATION HEARING
March 14, 1962

BASIN DAKOTA GAS POOL

Data Sheet

(Information from February, 1962, Proration Schedule)

Number of participating wells in pool	507
Average deliverability of all wells used (473) -	
1962 factors	1,404 MCFD
Total deliverability of 473 wells (For distribution of deliverability - see Exhibit 2)	664,031 MCFD
Average allowable per well (473 wells)	16,039 MCFD
Total allowable of all wells (473 wells) (For distribution of allowable - see Exhibit 2)	7,586,552 MCFD

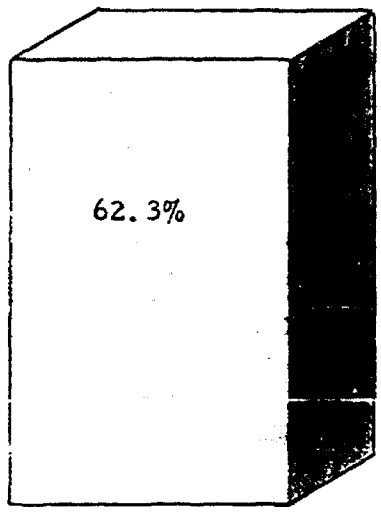
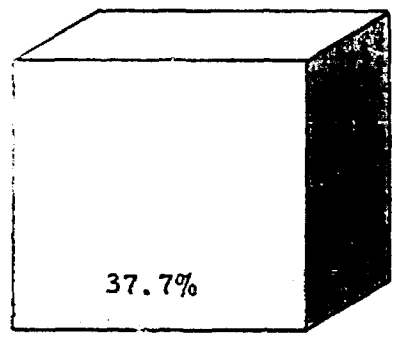
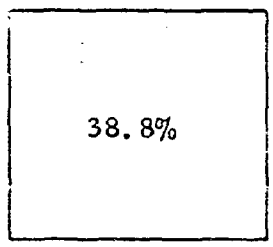
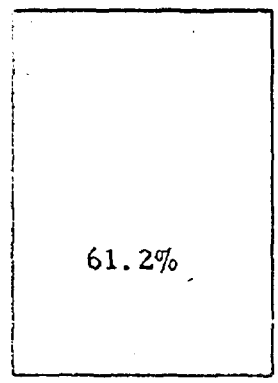
EXHIBIT 3

CONSOLIDATED OIL & GAS, INC.
NEW MEXICO OIL AND GAS CONSERVATION HEARING
March 14, 1962

BASIN DAKOTA GAS POOL

Comparison of distribution of total field deliverabilities and of total field allowable under existing rules (25% acreage, 75% acreage x deliverability).

Deliver-ability Range	No. of Wells	% of Field Wells	Ave. Deliver-ability MCFD	Group % of Deliver-ability	Group % of Allow-able	Ave. Well Allowable MCFD
0-1000	278	58.8	472	19.8	29.2	7,980
1001-2000	103	21.8	1,458	22.6	22.5	16,620
2001-3000	37	7.8	2,410	13.4	12.0	24,600
3001-4000	20	4.2	3,501	10.6	9.2	34,100
4001-5000	19	4.0	4,450	12.7	10.6	42,300
5001-6000	6	1.3	5,580	5.1	4.1	52,100
Over 6000	10	2.1	10,536	15.8	12.4	94,700
Total	473	100.0	1,404	100.0	100.0	16,039
0-1404 (Below Ave.)	329	69.6	579	28.7	38.8	8,936
1405-above (Above Ave.)	144	30.4	3,289	71.3	61.2	32,267

BELOW AVERAGE DELIVERABILITY WELLS	ABOVE AVERAGE DELIVERABILITY WELLS
% OF 473 FIELD WELLS (2-1-62) = 69.6	% OF 473 FIELD WELLS (2-1-62) = 30.4
% of Field Reserves (3 Billion MCF per Well)	
	% of Field Reserves (5 Billion MCF per Well)
% of February 1962 field allowable (329 Wells)	
	% of February 1962 field allowable (144 Wells)
February 1962 Average per well allowable (25/75 formula)	8.9 MMCF
32.3 MMCF	February 1962 Average per well allowable (25/75 formula)
PROPOSED allowable per well (60/40 formula)	12.2 MMCF per Month
24.6 MMCF per month	PROPOSED allowable per well (60/40 formula)

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 4
CASE 3514

Consolidated Oil & Gas, Inc. Exhibit No. 4

CONSOLIDATED OIL & GAS, INC.

EXHIBIT 4

2506

LEGEND

A . . . . . Acreage factor
D . . . . . Deliverability
R . . . . . Reserves
%R . . . . Per Cent of total reserves
F . . . . . Per Cent of deliverability in allowable formula
AL . . . . Allowable
% AL . . . Per cent allowable
A/R. . . . Per cent allowable divided by per cent reserves

ADOBE	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1G203113	92	.04386	100	2126	.0308	.70	30	7021	.1019	2.32
	330		75	3874	.0562	1.28	20	7721	.1120	2.55
	947		50	5622	.0816	1.86	10	8420	.1222	2.79
			40	6322	.0917	2.09	00	9119	.1323	3.02
1G192711	100	.17508	100	9333	.1354	.77	30	9738	.1413	.81
	1333		75	9477	.1375	.79	20	9796	.1422	.81
	3780		50	9622	.1396	.80	10	9854	.1430	.82
			40	9680	.1405	.80	00	9912	.1438	.82
1N203113	92	.04400	100	2441	.0354	.80	30	7116	.1033	2.35
	379		75	4111	.0597	1.36	20	7784	.1130	2.57
	950		50	5780	.0839	1.91	10	8452	.1226	2.79
			40	6448	.0936	2.13	00	9119	.1323	3.01
1N283113	100	.08036	100	3942	.0572	.71	30	8121	.1179	1.47
	563		75	5434	.0789	.98	20	8718	.1265	1.57
	1735		50	6927	.1005	1.25	10	9315	.1352	1.68
			40	7524	.1092	1.36	00	9912	.1438	1.79
1A 53013	100	.09694	100	3893	.0565	.58	30	8106	.1176	1.21
	556		75	5398	.0783	.81	20	8708	.1264	1.30
	2093		50	6903	.1002	1.03	10	9310	.1351	1.39
			40	7505	.1089	1.12	00	9912	.1438	1.48
1K223113	100	.07309	100	4075	.0591	.81	30	8161	.1184	1.62
	582		75	5534	.0803	1.10	20	8745	.1269	1.74
	1578		50	6994	.1015	1.39	10	9329	.1354	1.85
			40	7577	.1100	1.50	00	9912	.1438	1.97
1N143113	100	.09500	100	3067	.0445	.47	30	7859	.1140	1.20
	438		75	4778	.0693	.73	20	8543	.1240	1.31
	2051		50	6489	.0942	.99	10	9228	.1339	1.41
			40	7174	.1041	1.10	00	9912	.1438	1.51
1K113113	98	.10652	100	1118	.0162	.15	30	7135	.1035	.97
	163		75	3267	.0474	.44	20	7995	.1160	1.09
	2300		50	5416	.0786	.74	10	8855	.1285	1.21
			40	6276	.0911	.86	00	9714	.1410	1.32
1K333113	100	.09866	100	2625	.0381	.39	30	7726	.1121	1.14
	375		75	4447	.0645	.65	20	8455	.1227	1.24
	2130		50	6269	.0910	.92	10	9184	.1333	1.35
			40	6998	.1015	1.03	00	9912	.1438	1.46
1G213113	100	.04632	100	3858	.0560	1.21	30	8096	.1175	2.54
	551		75	5371	.0779	1.68	20	8701	.1263	2.73
	1000		50	6885	.0999	2.16	10	9307	.1351	2.92
			40	7491	.1087	2.35	00	9912	.1438	3.10

ADOBE		A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	2
AINSLIE												
1M2025	9	100	.05558	100	6511	.0945	1.70	30	8892	.1290	2.32	
		930		75	7361	.1068	1.92	20	9232	.1340	2.41	
		1200		50	8212	.1192	2.14	10	9572	.1389	2.50	
				40	8552	.1241	2.23	00	9912	.1438	2.59	
AMERADA												
3N2325	5	100	.23561	100	1176	.0171	.07	30	7292	.1058	.45	
		168		75	3360	.0488	.21	20	8165	.1185	.50	
		5087		50	5544	.0805	.34	10	9039	.1312	.56	
				40	6418	.0931	.40	00	9912	.1438	.61	
6E2625	5	100	.12029	100	2765	.0401	.33	30	7768	.1127	.94	
		395		75	4552	.0661	.55	20	8483	.1231	1.02	
		2597		50	6339	.0920	.76	10	9198	.1335	1.11	
				40	7054	.1024	.85	00	9912	.1438	1.20	
6D2225	5	100	.11028	100	69655	.0108	9.17	30	27835	.4039	3.66	
		9949		75	54719	.7941	7.20	20	21861	.3172	2.88	
		2381		50	39784	.5773	5.23	10	15887	.2305	2.09	
				40	33809	.4906	4.45	00	9912	.1438	1.30	
9P1625	5	100	.11579	100	29223	.4241	3.66	30	15706	.2279	1.97	
		4174		75	24395	.3540	3.06	20	13775	.1999	1.73	
		2500		50	19568	.2840	2.45	10	11843	.1719	1.48	
				40	17637	.2559	2.21	00	9912	.1438	1.24	
9A2024	5	100	.06947	100	16355	.2373	3.42	30	11845	.1719	2.47	
		2336		75	14744	.2140	3.08	20	11201	.1625	2.34	
		1500		50	13134	.1906	2.74	10	10557	.1532	2.21	
				40	12489	.1812	2.61	00	9912	.1438	2.07	
AZTEC												
3P342913		100	.14655	100	3207	.0465	.32	30	7901	.1146	.78	
		458		75	4883	.0709	.48	20	8571	.1244	.85	
		3164		50	6559	.0952	.65	10	9242	.1341	.92	
				40	7230	.1049	.72	00	9912	.1438	.98	
4D342913		100	.15632	100	8618	.1251	.80	30	9524	.1382	.88	
		1231		75	8942	.1298	.83	20	9654	.1401	.90	
		3375		50	9265	.1345	.86	10	9783	.1420	.91	
				40	9395	.1363	.87	00	9912	.1438	.92	
2P222813		100	.14330	100	18119	.2629	1.83	30	12374	.1796	1.25	
		2588		75	16067	.2332	1.63	20	11554	.1677	1.17	
		3094		50	14016	.2034	1.42	10	10733	.1558	1.09	
				40	13195	.1915	1.34	00	9912	.1438	1.00	
BAYVIEW												
1M 72712		48	.17258	100	625	.0091	.05	30	3518	.0511	.30	
		186		75	1658	.0241	.14	20	3931	.0570	.33	
		3726		50	2692	.0391	.23	10	4345	.0630	.37	
				40	3105	.0451	.26	00	4758	.0690	.40	

BAYVIEW	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	3
BENSON											
1A182712	100	.10662	100	882	.0128	.12	30	7203	.1045	.98	
	126		75	3140	.0456	.43	20	8106	.1176	1.10	
	2302		50	5397	.0783	.73	10	9009	.1307	1.23	
			40	6300	.0914	.86	00	9912	.1438	1.35	
1F122713	100	.16776	100	11349	.1647	.98	30	10343	.1501	.89	
	1621		75	10990	.1595	.95	20	10200	.1480	.88	
	3622		50	10631	.1543	.92	10	10056	.1459	.87	
			40	10487	.1522	.91	00	9912	.1438	.86	
1A342813	100	.12038	100	4621	.0671	.56	30	8325	.1208	1.00	
	660		75	5944	.0863	.72	20	8854	.1285	1.07	
	2599		50	7267	.1054	.88	10	9383	.1362	1.13	
			40	7796	.1131	.94	00	9912	.1438	1.19	
2P282813	100	.08596	100	1120	.0163	.19	30	7275	.1056	1.23	
	160		75	3318	.0482	.56	20	8154	.1183	1.38	
	1856		50	5516	.0800	.93	10	9033	.1311	1.53	
			40	6396	.0928	1.08	00	9912	.1438	1.67	
1A132713	100	.24516	100	12336	.1790	.73	30	10640	.1544	.63	
	1762		75	11730	.1702	.69	20	10397	.1509	.62	
	5293		50	11124	.1614	.66	10	10155	.1474	.60	
			40	10882	.1579	.64	00	9912	.1438	.59	
2K132713	100	.18527	100	4747	.0689	.37	30	8363	.1214	.66	
	678		75	6038	.0876	.47	20	8879	.1289	.70	
	4000		50	7330	.1064	.57	10	9396	.1363	.74	
			40	7846	.1139	.61	00	9912	.1438	.78	
1P172813	100	.05729	100	875	.0127	.22	30	7201	.1045	1.82	
	125		75	3134	.0455	.79	20	8105	.1176	2.05	
	1237		50	5394	.0783	1.37	10	9009	.1307	2.28	
			40	6298	.0914	1.60	00	9912	.1438	2.51	
10 12713	100	.13548	100	12308	.1786	1.32	30	10631	.1543	1.14	
	1758		75	11709	.1699	1.25	20	10392	.1508	1.11	
	2925		50	11110	.1612	1.19	10	10152	.1473	1.09	
			40	10871	.1577	1.16	00	9912	.1438	1.06	
BLACKWOOD											
1H2731 7	100	.13603	100	1099	.0160	.12	30	7268	.1055	.78	
	157		75	3302	.0479	.35	20	8150	.1183	.87	
	2937		50	5506	.0799	.59	10	9031	.1311	.96	
			40	6387	.0927	.68	00	9912	.1438	1.06	
58A1331 7	100	.13603	100	819	.0119	.09	30	7184	.1043	.77	
	117		75	3092	.0449	.33	20	8094	.1175	.86	
	2937		50	5366	.0779	.57	10	9003	.1306	.96	
			40	6275	.0911	.67	00	9912	.1438	1.06	

BLACKWOOD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	4
MJ BRANNON											
1P2025 9	100	.05873	100	2912	.0423	.72	30	7812	.1134	1.93	
	416		75	4662	.0677	1.15	20	8512	.1235	2.10	
	1268		50	6412	.0931	1.59	10	9212	.1337	2.28	
			40	7112	.1032	1.76	00	9912	.1438	2.45	
1A2825 9	100	.11061	100	1680	.0244	.22	30	7443	.1080	.98	
	240		75	3738	.0542	.49	20	8266	.1200	1.08	
	2388		50	5796	.0841	.76	10	9089	.1319	1.19	
			40	6620	.0961	.87	00	9912	.1438	1.30	
BRIT-AMER											
1M342711	100	.08471	100	20976	.3044	3.59	30	13231	.1920	2.27	
	2996		75	18210	.2642	3.12	20	12125	.1760	2.08	
	1829		50	15444	.2241	2.65	10	11019	.1599	1.89	
			40	14338	.2081	2.46	00	9912	.1438	1.70	
6E112711	100	.14822	100	11979	.1738	1.17	30	10532	.1528	1.03	
	1711		75	11462	.1663	1.12	20	10326	.1498	1.01	
	3200		50	10946	.1588	1.07	10	10119	.1468	.99	
			40	10739	.1558	1.05	00	9912	.1438	.97	
7K112711	100	.14682	100	8478	.1230	.84	30	9482	.1376	.94	
	1211		75	8837	.1282	.87	20	9626	.1397	.95	
	3170		50	9195	.1334	.91	10	9769	.1418	.97	
			40	9339	.1355	.92	00	9912	.1438	.98	
A N BROWN											
2P342710	50	.20912	100	959	.0139	.07	30	3757	.0545	.26	
	274		75	1958	.0284	.14	20	4157	.0603	.29	
	4515		50	2958	.0429	.21	10	4556	.0661	.32	
			40	3357	.0487	.23	00	4956	.0719	.34	
3H342710	50	.17800	100	539	.0078	.04	30	3631	.0527	.30	
	154		75	1643	.0238	.13	20	4073	.0591	.33	
	3843		50	2748	.0399	.22	10	4514	.0655	.37	
			40	3189	.0463	.26	00	4956	.0719	.40	
4N342710	100	.25807	100	1827	.0265	.10	30	7487	.1086	.42	
	261		75	3848	.0558	.22	20	8295	.1204	.47	
	5572		50	5870	.0852	.33	10	9104	.1321	.51	
			40	6678	.0969	.38	00	9912	.1438	.56	
A CAMPBELL											
1P232712	100	.08124	100	3095	.0449	.55	30	7867	.1142	1.41	
	442		75	4799	.0696	.86	20	8549	.1241	1.53	
	1754		50	6503	.0944	1.16	10	9231	.1339	1.65	
			40	7185	.1043	1.28	00	9912	.1438	1.77	
CAULKINS											
1D2426 6	100	.27522	100	9515	.1381	.50	30	9793	.1421	.52	
	1359		75	9614	.1395	.51	20	9833	.1427	.52	
	5942		50	9714	.1410	.51	10	9873	.1433	.52	
			40	9753	.1415	.51	00	9912	.1438	.52	

CAULKINS	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	5
COMPASS-EX											
2P353014	100	.06512	100	35104	.5094	7.82	30	17470	.2535	3.89	
	5014		75	28806	.4180	6.42	20	14951	.2170	3.33	
	1406		50	22508	.3266	5.02	10	12432	.1804	2.77	
			40	19989	.2901	4.45	00	9912	.1438	2.21	
1A303013	100	.06948	100	2429	.0353	.51	30	7668	.1113	1.60	
	347		75	4300	.0624	.90	20	8416	.1221	1.76	
	1500		50	6171	.0895	1.29	10	9164	.1330	1.91	
			40	6919	.1004	1.45	00	9912	.1438	2.07	
1H313013	100	.09726	100	1106	.0161	.17	30	7271	.1055	1.08	
	158		75	3308	.0480	.49	20	8151	.1183	1.22	
	2100		50	5509	.0799	.82	10	9032	.1311	1.35	
			40	6390	.0927	.95	00	9912	.1438	1.48	
1A232713	100	.11612	100	4649	.0675	.58	30	8333	.1209	1.04	
	664		75	5965	.0866	.75	20	8860	.1286	1.11	
	2507		50	7281	.1057	.91	10	9386	.1362	1.17	
			40	7807	.1133	.98	00	9912	.1438	1.24	
1K 326 7	100	.13895	100	4173	.0606	.44	30	8190	.1189	.86	
	596		75	5608	.0814	.59	20	8764	.1272	.92	
	3000		50	7043	.1022	.74	10	9338	.1355	.98	
			40	7617	.1105	.80	00	9912	.1438	1.03	
10253014	100	.06947	100	17566	.2549	3.67	30	12208	.1772	2.55	
	2509		75	15652	.2271	3.27	20	11443	.1661	2.39	
	1500		50	13739	.1994	2.87	10	10678	.1549	2.23	
			40	12974	.1883	2.71	00	9912	.1438	2.07	
CONSOL O G											
1N 23012	100	.08337	100	1911	.0277	.33	30	7512	.1090	1.31	
	273		75	3912	.0568	.68	20	8312	.1206	1.45	
	1800		50	5912	.0858	1.03	10	9112	.1322	1.59	
			40	6712	.0974	1.17	00	9912	.1438	1.72	
1H113113	100	.10190	100	1001	.0145	.14	30	7239	.1050	1.03	
	143		75	3229	.0469	.46	20	8130	.1180	1.16	
	2200		50	5457	.0792	.78	10	9021	.1309	1.28	
			40	6348	.0921	.90	00	9912	.1438	1.41	
1N 53112	100	.08337	100	6539	.0949	1.14	30	8900	.1292	1.55	
	934		75	7382	.1071	1.28	20	9238	.1341	1.61	
	1800		50	8226	.1194	1.43	10	9575	.1389	1.67	
			40	8563	.1243	1.49	00	9912	.1438	1.72	
11173113	100	.04400	100	2163	.0314	.71	30	7588	.1101	2.50	
	309		75	4101	.0595	1.35	20	8363	.1214	2.76	
	950		50	6038	.0876	1.99	10	9138	.1326	3.01	
			40	6813	.0989	2.25	00	9912	.1438	3.27	

CONSOL O G	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	6
1M 626 3	100	.14359	100	2800	.0406	.28	30	7779	.1129	.79	
	400		75	4578	.0664	.46	20	8490	.1232	.86	
	3100		50	6356	.0922	.64	10	9201	.1335	.93	
			40	7068	.1026	.71	00	9912	.1438	1.00	
12E 826 3	100	.11579	100	1596	.0232	.20	30	7418	.1076	.93	
	228		75	3675	.0533	.46	20	8249	.1197	1.03	
	2500		50	5754	.0835	.72	10	9081	.1318	1.14	
			40	6586	.0956	.83	00	9912	.1438	1.24	
CONT OIL											
1L 924 5	100	.03612	100	4320	.0627	1.74	30	8235	.1195	3.31	
	617		75	5718	.0830	2.30	20	8794	.1276	3.53	
	780		50	7116	.1033	2.86	10	9353	.1357	3.76	
			40	7675	.1114	3.08	00	9912	.1438	3.98	
2D1624 5	100	.03474	100	7001	.1016	2.92	30	9039	.1312	3.78	
	1000		75	7729	.1122	3.23	20	9330	.1354	3.90	
	750		50	8457	.1227	3.53	10	9621	.1396	4.02	
			40	8748	.1269	3.65	00	9912	.1438	4.14	
3P1624 5	100	.03706	100	9620	.1396	3.77	30	9825	.1426	3.85	
	1374		75	9693	.1407	3.80	20	9854	.1430	3.86	
	800		50	9766	.1417	3.82	10	9883	.1434	3.87	
			40	9795	.1421	3.83	00	9912	.1438	3.88	
4E2124 5	100	.06947	100	12756	.1851	2.66	30	10766	.1562	2.25	
	1822		75	12045	.1748	2.52	20	10481	.1521	2.19	
	1500		50	11334	.1645	2.37	10	10197	.1480	2.13	
			40	11050	.1604	2.31	00	9912	.1438	2.07	
DELHI-TAYL											
11282611	100	.14238	100	4544	.0659	.46	30	8302	.1205	.85	
	649		75	5886	.0854	.60	20	8839	.1283	.90	
	3074		50	7228	.1049	.74	10	9376	.1361	.96	
			40	7765	.1127	.79	00	9912	.1438	1.01	
1H133013	100	.04104	100	5622	.0816	1.99	30	8625	.1252	3.05	
	803		75	6694	.0971	2.37	20	9054	.1314	3.20	
	886		50	7767	.1127	2.75	10	9483	.1376	3.35	
			40	8196	.1189	2.90	00	9912	.1438	3.50	
2D282611	100	.16183	100	4054	.0588	.36	30	8155	.1183	.73	
	579		75	5518	.0801	.49	20	8741	.1268	.78	
	3494		50	6983	.1013	.63	10	9327	.1353	.84	
			40	7569	.1098	.68	00	9912	.1438	.89	
DYSART											
31K363014	104	.06484	100	7514	.1090	1.68	30	9470	.1374	2.12	
	1032		75	8213	.1192	1.84	20	9750	.1415	2.18	
	1400		50	8912	.1293	1.99	10	10029	.1455	2.24	
			40	9191	.1334	2.06	00	10309	.1496	2.31	

DYSART	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	7
ELLIOTT PR											
1A243014	100	.09263	100	2905	.0422	.46	30	7810	.1133	1.22	
	415		75	4657	.0676	.73	20	8511	.1235	1.33	
	2000		50	6409	.0930	1.00	10	9212	.1337	1.44	
			40	7110	.1032	1.11	00	9912	.1438	1.55	
EL PASO NT											
7P1032 7	112	.21079	100	4815	.0699	.33	30	9216	.1337	.63	
	614		75	6386	.0927	.44	20	9844	.1429	.68	
	4551		50	7958	.1155	.55	10	10473	.1520	.72	
			40	8587	.1246	.59	00	11102	.1611	.76	
9G1332 7	100	.27304	100	6112	.0887	.32	30	8772	.1273	.47	
	873		75	7062	.1025	.38	20	9152	.1328	.49	
	5895		50	8012	.1163	.43	10	9532	.1383	.51	
			40	8392	.1218	.45	00	9912	.1438	.53	
11A2332 7	100	.20597	100	10887	.1580	.77	30	10205	.1481	.72	
	1555		75	10643	.1544	.75	20	10107	.1467	.71	
	4447		50	10400	.1509	.73	10	10010	.1453	.71	
			40	10302	.1495	.73	00	9912	.1438	.70	
12G1432 7	100	.19162	100	31337	.4547	2.37	30	16340	.2371	1.24	
	4476		75	25981	.3770	1.97	20	14197	.2060	1.08	
	4137		50	20625	.2993	1.56	10	12055	.1749	.91	
			40	18482	.2682	1.40	00	9912	.1438	.75	
13M1232 7	100	.15330	100	2366	.0343	.22	30	7649	.1110	.72	
	338		75	4253	.0617	.40	20	8403	.1219	.80	
	3310		50	6139	.0891	.58	10	9158	.1329	.87	
			40	6894	.1000	.65	00	9912	.1438	.94	
16N1532 7	100	.30181	100	2814	.0408	.14	30	7783	.1129	.37	
	402		75	4589	.0666	.22	20	8493	.1232	.41	
	6516		50	6363	.0923	.31	10	9203	.1335	.44	
			40	7073	.1026	.34	00	9912	.1438	.48	
17K2432 7	100	.11495	100	3795	.0551	.48	30	8077	.1172	1.02	
	542		75	5324	.0773	.67	20	8689	.1261	1.10	
	2482		50	6854	.0995	.87	10	9301	.1350	1.17	
			40	7465	.1083	.94	00	9912	.1438	1.25	
20L1832 6	100	.20597	100	11468	.1664	.81	30	10379	.1506	.73	
	1638		75	11079	.1608	.78	20	10224	.1484	.72	
	4447		50	10690	.1551	.75	10	10068	.1461	.71	
			40	10535	.1529	.74	00	9912	.1438	.70	
23M1932 6	100	.08143	100	5118	.0743	.91	30	8474	.1230	1.51	
	731		75	6316	.0917	1.13	20	8953	.1299	1.60	
	1758		50	7515	.1091	1.34	10	9433	.1369	1.68	
			40	7995	.1160	1.42	00	9912	.1438	1.77	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	8
1M 22711	100	.12969	100	22761	.3303	2.55	30	13767	.1998	1.54	
	3251		75	19549	.2837	2.19	20	12482	.1811	1.40	
	2800		50	16337	.2371	1.83	10	11197	.1625	1.25	
			40	15052	.2184	1.68	00	9912	.1438	1.11	
2L202711	100	.17600	100	7967	.1156	.66	30	9329	.1354	.77	
	1138		75	8454	.1227	.70	20	9523	.1382	.79	
	3800		50	8940	.1297	.74	10	9718	.1410	.80	
			40	9134	.1326	.75	00	9912	.1438	.82	
1A172911	100	.13432	100	14906	.2163	1.61	30	11410	.1656	1.23	
	2129		75	13657	.1982	1.48	20	10911	.1583	1.18	
	2900		50	12409	.1801	1.34	10	10412	.1511	1.12	
	5055		40	11910	.1728	1.29	00	9912	.1438	1.07	
4K 63011	101	.08337	100	5424	.0787	.94	30	8635	.1253	1.50	
	767		75	6570	.0953	1.14	20	9094	.1320	1.58	
	1800		50	7718	.1120	1.34	10	9553	.1386	1.66	
			40	8176	.1187	1.42	00	10012	.1453	1.74	
95B3625 6	100	.11890	100	13449	.1952	1.64	30	10973	.1592	1.34	
	1921		75	12565	.1823	1.53	20	10620	.1541	1.30	
	2567		50	11681	.1695	1.43	10	10266	.1490	1.25	
			40	11327	.1644	1.38	00	9912	.1438	1.21	
110D 124 6	107	.24520	100	12870	.1868	.76	30	11285	.1638	.67	
	1718		75	12304	.1785	.73	20	11059	.1605	.65	
	5294		50	11738	.1703	.69	10	10833	.1572	.64	
			40	11512	.1671	.68	00	10606	.1539	.63	
111G 124 6	107	.20805	100	3169	.0460	.22	30	8375	.1215	.58	
	423		75	5028	.0730	.35	20	9119	.1323	.64	
	4492		50	6888	.0999	.48	10	9863	.1431	.69	
			40	7631	.1107	.53	00	10606	.1539	.74	
9K 83111	100	.13895	100	5727	.0831	.60	30	8657	.1256	.90	
	818		75	6773	.0983	.71	20	9075	.1317	.95	
	3000		50	7820	.1135	.82	10	9494	.1378	.99	
			40	8238	.1195	.86	00	9912	.1438	1.03	
5K3228 9	107	.15313	100	18084	.2624	1.71	30	12850	.1865	1.22	
	2414		75	16214	.2353	1.54	20	12102	.1756	1.15	
	3306		50	14345	.2082	1.36	10	11354	.1648	1.08	
			40	13597	.1973	1.29	00	10606	.1539	1.01	
6D3228 9	100	.22737	100	12112	.1758	.77	30	10572	.1534	.67	
	1730		75	11562	.1678	.74	20	10352	.1502	.66	
	4909		50	11012	.1598	.70	10	10132	.1470	.65	
			40	10792	.1566	.69	00	9912	.1438	.63	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	9
5M 527 8	100	.17396	100	6406	.0930	.53	30	8861	.1286	.74	
	915		75	7283	.1057	.61	20	9211	.1337	.77	
	3756		50	8159	.1184	.68	10	9562	.1388	.80	
			40	8510	.1235	.71	00	9912	.1438	.83	
8N1928 8	95	.04211	100	1477	.0214	.51	30	7035	.1021	2.42	
	222		75	3462	.0502	1.19	20	7829	.1136	2.70	
	909		50	5447	.0790	1.88	10	8623	.1251	2.97	
			40	6241	.0906	2.15	00	9417	.1367	3.25	
9L3028 8	96	.19471	100	8536	.1239	.64	30	9222	.1338	.69	
	1270		75	8781	.1274	.65	20	9320	.1352	.69	
	4204		50	9026	.1310	.67	10	9418	.1367	.70	
			40	9124	.1324	.68	00	9516	.1381	.71	
10H3028 8	100	.09472	100	2002	.0291	.31	30	7539	.1094	1.15	
	286		75	3980	.0578	.61	20	8330	.1209	1.28	
	2045		50	5957	.0865	.91	10	9121	.1324	1.40	
			40	6748	.0979	1.03	00	9912	.1438	1.52	
9P252710	94	.15294	100	2178	.0316	.21	30	7176	.1041	.68	
	331		75	3963	.0575	.38	20	7890	.1145	.75	
	3302		50	5748	.0834	.55	10	8604	.1249	.82	
			40	6462	.0938	.61	00	9318	.1352	.88	
9A3330 8	100	.03705	100	1414	.0205	.55	30	7363	.1068	2.88	
	202		75	3539	.0514	1.39	20	8213	.1192	3.22	
	800		50	5663	.0822	2.22	10	9063	.1315	3.55	
			40	6513	.0945	2.55	00	9912	.1438	3.88	
2P242710	96	.09379	100	4570	.0663	.71	30	8032	.1166	1.24	
	680		75	5807	.0843	.90	20	8527	.1237	1.32	
	2025		50	7043	.1022	1.09	10	9021	.1309	1.40	
			40	7538	.1094	1.17	00	9516	.1381	1.47	
5M3128 9	95	.11580	100	11094	.1610	1.39	30	9920	.1440	1.24	
	1668		75	10675	.1549	1.34	20	9752	.1415	1.22	
	2500		50	10255	.1488	1.28	10	9585	.1391	1.20	
			40	10088	.1464	1.26	00	9417	.1367	1.18	
1N142912	100	.12505	100	28201	.4092	3.27	30	15399	.2235	1.79	
	4028		75	23629	.3429	2.74	20	13570	.1969	1.57	
	2700		50	19057	.2765	2.21	10	11741	.1704	1.36	
			40	17228	.2500	2.00	00	9912	.1438	1.15	
1A283111	100	.15002	100	6378	.0926	.62	30	8852	.1285	.86	
	911		75	7262	.1054	.70	20	9206	.1336	.89	
	3239		50	8145	.1182	.79	10	9559	.1387	.92	
			40	8499	.1233	.82	00	9912	.1438	.96	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	10
14G293111	100	.08638	100	2653	.0385	.45	30	7735	.1122	1.30	
	379		75	4468	.0648	.75	20	8461	.1228	1.42	
	1865		50	6283	.0912	1.06	10	9187	.1333	1.54	
			40	7009	.1017	1.18	00	9912	.1438	1.66	
16L283111	100	.15456	100	679	.0099	.06	30	7142	.1036	.67	
	97		75	2987	.0434	.28	20	8066	.1170	.76	
	3337		50	5296	.0768	.50	10	8989	.1304	.84	
			40	6219	.0902	.58	00	9912	.1438	.93	
17G323111	100	.11579	100	3487	.0506	.44	30	7985	.1159	1.00	
	498		75	5093	.0739	.64	20	8627	.1252	1.08	
	2500		50	6699	.0972	.84	10	9270	.1345	1.16	
			40	7342	.1065	.92	00	9912	.1438	1.24	
92F 726 9	100	.12460	100	2653	.0385	.31	30	7735	.1122	.90	
	379		75	4468	.0648	.52	20	8461	.1228	.99	
	2690		50	6283	.0912	.73	10	9187	.1333	1.07	
			40	7009	.1017	.82	00	9912	.1438	1.15	
99C 22610	100	.09342	100	1743	.0253	.27	30	7462	.1083	1.16	
	249		75	3785	.0549	.59	20	8279	.1201	1.29	
	2017		50	5828	.0846	.91	10	9095	.1320	1.41	
			40	6645	.0964	1.03	00	9912	.1438	1.54	
101F192710	104	.11125	100	9043	.1312	1.18	30	9929	.1441	1.30	
	1242		75	9360	.1358	1.22	20	10056	.1459	1.31	
	2402		50	9676	.1404	1.26	10	10182	.1478	1.33	
			40	9803	.1423	1.28	00	10309	.1496	1.34	
104P172610	100	.08008	100	10257	.1488	1.86	30	10016	.1453	1.81	
	1465		75	10171	.1476	1.84	20	9981	.1448	1.81	
	1729		50	10085	.1463	1.83	10	9947	.1443	1.80	
			40	10050	.1458	1.82	00	9912	.1438	1.80	
105P292710	100	.11941	100	4866	.0706	.59	30	8398	.1219	1.02	
	695		75	6127	.0889	.74	20	8903	.1292	1.08	
	2578		50	7389	.1072	.90	10	9408	.1365	1.14	
			40	7894	.1146	.96	00	9912	.1438	1.20	
106J332710	100	.09342	100	2065	.0300	.32	30	7558	.1097	1.17	
	295		75	4027	.0584	.63	20	8343	.1211	1.30	
	2017		50	5989	.0869	.93	10	9128	.1325	1.42	
			40	6774	.0983	1.05	00	9912	.1438	1.54	
107E352710	100	.12015	100	4299	.0624	.52	30	8228	.1194	.99	
	614		75	5702	.0827	.69	20	8790	.1276	1.06	
	2594		50	7106	.1031	.86	10	9351	.1357	1.13	
			40	7667	.1113	.93	00	9912	.1438		

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	10
14G293111	100	.08638	100	2653	.0385	.45	30	7735	.1122	1.30	
	379		75	4468	.0648	.75	20	8461	.1228	1.42	
	1865		50	6283	.0912	1.06	10	9187	.1333	1.54	
			40	7009	.1017	1.18	00	9912	.1438	1.66	
16L283111	100	.15456	100	679	.0099	.06	30	7142	.1036	.67	
	97		75	2987	.0434	.28	20	8066	.1170	.76	
	3337		50	5296	.0768	.50	10	8989	.1304	.84	
			40	6219	.0902	.58	00	9912	.1438	.93	
17G323111	100	.11579	100	3487	.0506	.44	30	7985	.1159	1.00	
	498		75	5093	.0739	.64	20	8627	.1252	1.08	
	2500		50	6699	.0972	.84	10	9270	.1345	1.16	
			40	7342	.1065	.92	00	9912	.1438	1.24	
92F 726 9	100	.12460	100	2653	.0385	.31	30	7735	.1122	.90	
	379		75	4468	.0648	.52	20	8461	.1228	.99	
	2690		50	6283	.0912	.73	10	9187	.1333	1.07	
			40	7009	.1017	.82	00	9912	.1438	1.15	
99C 22610	100	.09342	100	1743	.0253	.27	30	7462	.1083	1.16	
	249		75	3785	.0549	.59	20	8279	.1201	1.29	
	2017		50	5828	.0846	.91	10	9095	.1320	1.41	
			40	6645	.0964	1.03	00	9912	.1438	1.54	
101F192710	104	.11125	100	9043	.1312	1.18	30	9929	.1441	1.30	
	1242		75	9360	.1358	1.22	20	10056	.1459	1.31	
	2402		50	9676	.1404	1.26	10	10182	.1478	1.33	
			40	9803	.1423	1.28	00	10309	.1496	1.34	
104P172610	100	.08008	100	10257	.1488	1.86	30	10016	.1453	1.81	
	1465		75	10171	.1476	1.84	20	9981	.1448	1.81	
	1729		50	10085	.1463	1.83	10	9947	.1443	1.80	
			40	10050	.1458	1.82	00	9912	.1438	1.80	
105P292710	100	.11941	100	4866	.0706	.59	30	8398	.1219	1.02	
	695		75	6127	.0889	.74	20	8903	.1292	1.08	
	2578		50	7389	.1072	.90	10	9408	.1365	1.14	
			40	7894	.1146	.96	00	9912	.1438	1.20	
106J332710	100	.09342	100	2065	.0300	.32	30	7558	.1097	1.17	
	295		75	4027	.0584	.63	20	8343	.1211	1.30	
	2017		50	5989	.0869	.93	10	9128	.1325	1.42	
			40	6774	.0983	1.05	00	9912	.1438	1.54	
107E352710	100	.12015	100	4299	.0624	.52	30	8228	.1194	.99	
	614		75	5702	.0827	.69	20	8790	.1276	1.06	
	2594		50	7106	.1031	.86	10	9351	.1357	1.13	
			40	7667	.1113	.93	00	9912	.1438	1.20	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	11
108E 12610	100	.15127	100	4502	.0653	.43	30	8289	.1203	.80	
	643		75	5854	.0850	.56	20	8830	.1281	.85	
	3266		50	7207	.1046	.69	10	9371	.1360	.90	
			40	7748	.1124	.74	00	9912	.1438	.95	
109I 22610	100	.10680	100	2149	.0312	.29	30	7583	.1100	1.03	
	307		75	4090	.0594	.56	20	8360	.1213	1.14	
	2306		50	6031	.0875	.82	10	9136	.1326	1.24	
			40	6807	.0988	.93	00	9912	.1438	1.35	
110I 32610	100	.11570	100	2997	.0435	.38	30	7838	.1137	.98	
	428		75	4725	.0686	.59	20	8529	.1238	1.07	
	2498		50	6454	.0937	.81	10	9221	.1338	1.16	
			40	7146	.1037	.90	00	9912	.1438	1.24	
111F2026 9	100	.17800	100	4677	.0679	.38	30	8342	.1211	.68	
	668		75	5986	.0869	.49	20	8865	.1286	.72	
	3843		50	7295	.1059	.59	10	9389	.1362	.77	
			40	7818	.1135	.64	00	9912	.1438	.81	
113C332710	100	.03562	100	6357	.0923	2.59	30	8846	.1284	3.60	
	908		75	7246	.1051	2.95	20	9201	.1335	3.75	
	769		50	8135	.1180	3.31	10	9557	.1387	3.89	
			40	8490	.1232	3.46	00	9912	.1438	4.04	
115C122610	100	.14237	100	1470	.0213	.15	30	7380	.1071	.75	
	210		75	3581	.0520	.37	20	8224	.1193	.84	
	3074		50	5691	.0826	.58	10	9068	.1316	.92	
			40	6536	.0948	.67	00	9912	.1438	1.01	
116C112610	100	.11126	100	2962	.0430	.39	30	7827	.1136	1.02	
	423		75	4699	.0682	.61	20	8522	.1237	1.11	
	2402		50	6437	.0934	.84	10	9217	.1338	1.20	
			40	7132	.1035	.93	00	9912	.1438	1.29	
117P162610	100	.10680	100	7841	.1138	1.07	30	9291	.1348	1.26	
	1120		75	8359	.1213	1.14	20	9498	.1378	1.29	
	2306		50	8877	.1288	1.21	10	9705	.1408	1.32	
			40	9084	.1318	1.23	00	9912	.1438	1.35	
120C252610	100	.12460	100	12273	.1781	1.43	30	10621	.1541	1.24	
	1753		75	11683	.1695	1.36	20	10385	.1507	1.21	
	2690		50	11093	.1610	1.29	10	10148	.1473	1.18	
			40	10857	.1575	1.26	00	9912	.1438	1.15	
121F272610	100	.15571	100	34565	.5016	3.22	30	17308	.2512	1.61	
	4937		75	28402	.4121	2.65	20	14843	.2154	1.38	
	3362		50	22239	.3227	2.07	10	12378	.1796	1.15	
			40	19773	.2869	1.84	00	9912	.1438	.92	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	12
125E3026 9	100	.12015	100	9459	.1373	1.14	30	9776	.1419	1.18	
	1351		75	9572	.1389	1.16	20	9822	.1425	1.19	
	2594		50	9686	.1406	1.17	10	9867	.1432	1.19	
			40	9731	.1412	1.18	00	9912	.1438	1.20	
126P 526 9	100	.14682	100	9886	.1435	.98	30	9904	.1437	.98	
	1412		75	9892	.1436	.98	20	9907	.1438	.98	
	3170		50	9899	.1436	.98	10	9910	.1438	.98	
			40	9902	.1437	.98	00	9912	.1438	.98	
60M 426 9	100	.11909	100	5006	.0726	.61	30	8440	.1225	1.03	
	715		75	6232	.0904	.76	20	8931	.1296	1.09	
	2571		50	7459	.1082	.91	10	9422	.1367	1.15	
			40	7950	.1154	.97	00	9912	.1438	1.21	
61G 426 9	100	.14034	100	5139	.0746	.53	30	8480	.1231	.88	
	734		75	6332	.0919	.65	20	8958	.1300	.93	
	3030		50	7526	.1092	.78	10	9435	.1369	.98	
			40	8003	.1161	.83	00	9912	.1438	1.02	
5N2925 5	100	.13033	100	6861	.0996	.76	30	8997	.1306	1.00	
	980		75	7624	.1106	.85	20	9302	.1350	1.04	
	2814		50	8387	.1217	.93	10	9607	.1394	1.07	
			40	8692	.1261	.97	00	9912	.1438	1.10	
10M3025 5	100	.10936	100	5818	.0844	.77	30	8684	.1260	1.15	
	831		75	6841	.0993	.91	20	9094	.1320	1.21	
	2361		50	7865	.1141	1.04	10	9503	.1379	1.26	
			40	8275	.1201	1.10	00	9912	.1438	1.31	
12N2128 9	100	.10671	100	4481	.0650	.61	30	8283	.1202	1.13	
	640		75	5839	.0847	.79	20	8826	.1281	1.20	
	2304		50	7197	.1044	.98	10	9369	.1360	1.27	
			40	7740	.1123	1.05	00	9912	.1438	1.35	
13K2028 9	100	.11602	100	13337	.1935	1.67	30	10940	.1588	1.37	
	1905		75	12481	.1811	1.56	20	10597	.1538	1.33	
	2505		50	11625	.1687	1.45	10	10255	.1488	1.28	
			40	11282	.1637	1.41	00	9912	.1438	1.24	
14A3028 9	95	.06031	100	9451	.1372	2.27	30	9427	.1368	2.27	
	1421		75	9443	.1370	2.27	20	9424	.1368	2.27	
	1302		50	9434	.1369	2.27	10	9420	.1367	2.27	
			40	9431	.1369	2.27	00	9417	.1367	2.27	
16B2028 9	100	.10208	100	5426	.0787	.77	30	8566	.1243	1.22	
	775		75	6547	.0950	.93	20	9015	.1308	1.28	
	2204		50	7669	.1113	1.09	10	9464	.1373	1.35	
			40	8118	.1178	1.15	00	9912	.1438	1.41	

	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
17G2128 9	100	.11579	100	3011	.0437	.38	30	7842	.1138	.98
	430		75	4736	.0687	.59	20	8532	.1238	1.07
	2500		50	6461	.0938	.81	10	9222	.1338	1.16
			40	7152	.1038	.90	00	9912	.1438	1.24
8P1927 9	100	.10204	100	4663	.0677	.66	30	8338	.1210	1.19
	666		75	5975	.0867	.85	20	8862	.1286	1.26
	2203		50	7288	.1058	1.04	10	9387	.1362	1.33
			40	7813	.1134	1.11	00	9912	.1438	1.41
9C1927 9	100	.10630	100	4719	.0685	.64	30	8354	.1212	1.14
	674		75	6017	.0873	.82	20	8874	.1288	1.21
	2295		50	7316	.1062	1.00	10	9393	.1363	1.28
			40	7835	.1137	1.07	00	9912	.1438	1.35
10 30 27 10										
15A193010	100	.07410	100	4551	.0660	.89	30	8304	.1205	1.63
	650		75	5891	.0855	1.15	20	8840	.1283	1.73
	1600		50	7232	.1049	1.42	10	9376	.1361	1.84
			40	7768	.1127	1.52	00	9912	.1438	1.94
16G313010	100	.09759	100	1736	.0252	.26	30	7460	.1082	1.11
	248		75	3780	.0549	.56	20	8277	.1201	1.23
	2107		50	5824	.0845	.87	10	9095	.1320	1.35
			40	6642	.0964	.99	00	9912	.1438	1.47
17B293010	100	.08217	100	4845	.0703	.86	30	8392	.1218	1.48
	692		75	6112	.0887	1.08	20	8899	.1291	1.57
	1774		50	7379	.1071	1.30	10	9406	.1365	1.66
			40	7885	.1144	1.39	00	9912	.1438	1.75
18B 62910	98	.08800	100	2559	.0371	.42	30	7568	.1098	1.25
	373		75	4348	.0631	.72	20	8283	.1202	1.37
	1900		50	6137	.0891	1.01	10	8999	.1306	1.48
			40	6852	.0994	1.13	00	9714	.1410	1.60
19B 52910	100	.08337	100	3410	.0495	.59	30	7962	.1155	1.39
	487		75	5035	.0731	.88	20	8612	.1250	1.50
	1800		50	6661	.0967	1.16	10	9262	.1344	1.61
			40	7311	.1061	1.27	00	9912	.1438	1.72
20K293010	100	.10653	100	5097	.0740	.69	30	8468	.1229	1.15
	728		75	6301	.0914	.86	20	8949	.1299	1.22
	2300		50	7505	.1089	1.02	10	9431	.1369	1.29
			40	7986	.1159	1.09	00	9912	.1438	1.35
21N313010	96	.09727	100	4557	.0661	.68	30	8028	.1165	1.20
	678		75	5797	.0841	.86	20	8524	.1237	1.27
	2100		50	7036	.1021	1.05	10	9020	.1309	1.35
			40	7532	.1093	1.12	00	9516	.1381	1.42

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
2D2027 9	100	.07230	100	5643	.0819	1.13	30	8632	.1253	1.73
	806		75	6710	.0974	1.35	20	9059	.1315	1.82
	1561		50	7778	.1129	1.56	10	9485	.1376	1.90
			40	8205	.1191	1.65	00	9912	.1438	1.99
4K1428 9	100	.11139	100	2436	.0354	.32	30	7670	.1113	1.00
	348		75	4305	.0625	.56	20	8417	.1221	1.10
	2405		50	6174	.0896	.80	10	9165	.1330	1.19
			40	6922	.1004	.90	00	9912	.1438	1.29
5N2428 9	100	.15748	100	1960	.0284	.18	30	7527	.1092	.69
	280		75	3948	.0573	.36	20	8322	.1208	.77
	3400		50	5936	.0861	.55	10	9117	.1323	.84
			40	6732	.0977	.62	00	9912	.1438	.91
3M1528 9	100	.07424	100	5552	.0806	1.09	30	8604	.1249	1.68
	793		75	6642	.0964	1.30	20	9040	.1312	1.77
	1603		50	7732	.1122	1.51	10	9476	.1375	1.85
			40	8168	.1185	1.60	00	9912	.1438	1.94
6H3128 9	100	.14849	100	16775	.2434	1.64	30	11971	.1737	1.17
	2396		75	15059	.2185	1.47	20	11285	.1638	1.10
	3206		50	13344	.1936	1.30	10	10599	.1538	1.04
			40	12657	.1837	1.24	00	9912	.1438	.97
1P162611	100	.14238	100	7820	.1135	.80	30	9285	.1347	.95
	1117		75	8343	.1211	.85	20	9494	.1378	.97
	3074		50	8866	.1287	.90	10	9703	.1408	.99
			40	9076	.1317	.92	00	9912	.1438	1.01
2A 23013	100	.08578	100	5286	.0767	.89	30	8524	.1237	1.44
	755		75	6442	.0935	1.09	20	8987	.1304	1.52
	1852		50	7599	.1103	1.29	10	9450	.1371	1.60
			40	8062	.1170	1.36	00	9912	.1438	1.68
11M103111	100	.07726	100	3543	.0514	.67	30	8001	.1161	1.50
	506		75	5135	.0745	.96	20	8638	.1254	1.62
	1668		50	6728	.0976	1.26	10	9275	.1346	1.74
			40	7364	.1069	1.38	00	9912	.1438	1.86
13G203111	96	.09546	100	1035	.0150	.16	30	6972	.1012	1.06
	154		75	3155	.0458	.48	20	7820	.1135	1.19
	2061		50	5275	.0766	.80	10	8668	.1258	1.32
			40	6124	.0889	.93	00	9516	.1381	1.45
16B103111	100	.07725	100	2863	.0416	.54	30	7798	.1132	1.47
	409		75	4626	.0671	.87	20	8503	.1234	1.60
	1668		50	6388	.0927	1.20	10	9208	.1336	1.73
			40	7093	.1029	1.33	00	9912	.1438	1.86

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
17G213111	94	.10908	100	2034	.0295	.27	30	7132	.1035	.95
	309		75	3854	.0559	.51	20	7861	.1141	1.05
	2355		50	5676	.0824	.76	10	8589	.1246	1.14
			40	6404	.0929	.85	00	9318	.1352	1.24
19A173111	100	.15002	100	630	.0091	.06	30	7128	.1034	.69
	90		75	2951	.0428	.29	20	8056	.1169	.78
	3239		50	5271	.0765	.51	10	8984	.1304	.87
			40	6199	.0900	.60	00	9912	.1438	.96
20G 83111	100	.14548	100	30007	.4354	2.99	30	15941	.2313	1.59
	4286		75	24983	.3625	2.49	20	13931	.2022	1.39
	3141		50	19960	.2896	1.99	10	11922	.1730	1.19
			40	17950	.2605	1.79	00	9912	.1438	.99
21G 93111	100	.07726	100	4397	.0638	.83	30	8258	.1198	1.55
	628		75	5776	.0838	1.08	20	8809	.1278	1.65
	1668		50	7155	.1038	1.34	10	9361	.1358	1.76
			40	7706	.1118	1.45	00	9912	.1438	1.86
22G 43111	97	.05002	100	2261	.0328	.66	30	7409	.1075	2.15
	333		75	4100	.0595	1.19	20	8144	.1182	2.36
	1080		50	5938	.0862	1.72	10	8880	.1289	2.58
			40	6674	.0968	1.94	00	9615	.1395	2.79
23B 53111	97	.06818	100	3939	.0572	.84	30	7912	.1148	1.68
	580		75	5358	.0777	1.14	20	8480	.1231	1.81
	1472		50	6777	.0983	1.44	10	9047	.1313	1.93
			40	7345	.1066	1.56	00	9615	.1395	2.05
26L213111	95	.12728	100	2182	.0317	.25	30	7246	.1052	.83
	328		75	3990	.0579	.45	20	7970	.1157	.91
	2748		50	5799	.0842	.66	10	8693	.1262	.99
			40	6523	.0947	.74	00	9417	.1367	1.07
113027 6	100	.23853	100	4005	.0581	.24	30	8140	.1181	.50
	572		75	5482	.0795	.33	20	8731	.1267	.53
	5150		50	6959	.1010	.42	10	9322	.1353	.57
			40	7549	.1096	.46	00	9912	.1438	.60
57A 126 7	100	.23302	100	2702	.0392	.17	30	7749	.1125	.48
	386		75	4505	.0654	.28	20	8470	.1229	.53
	5031		50	6307	.0915	.39	10	9191	.1334	.57
			40	7028	.1020	.44	00	9912	.1438	.62
108G1927 6	100	.27739	100	3984	.0578	.21	30	8134	.1180	.43
	569		75	5466	.0793	.29	20	8727	.1266	.46
	5989		50	6948	.1008	.36	10	9320	.1352	.49
			40	7541	.1094	.39	00	9912	.1438	.52

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
125N2627 6	100	.18309	100	4502	.0653	.36	30	8289	.1203	.66
	643		75	5854	.0850	.46	20	8830	.1281	.70
	3953		50	7207	.1046	.57	10	9371	.1360	.74
			40	7748	.1124	.61	00	9912	.1438	.79
126N2727 6	100	.22191	100	6000	.0871	.39	30	8739	.1268	.57
	857		75	6978	.1013	.46	20	9130	.1325	.60
	4791		50	7956	.1155	.52	10	9521	.1382	.62
			40	8347	.1211	.55	00	9912	.1438	.65
127A2827 6	100	.27739	100	4103	.0595	.21	30	8169	.1186	.43
	586		75	5555	.0806	.29	20	8750	.1270	.46
	5989		50	7008	.1017	.37	10	9331	.1354	.49
			40	7589	.1101	.40	00	9912	.1438	.52
128L2827 6	100	.17197	100	12413	.1801	1.05	30	10663	.1547	.90
	1773		75	11788	.1711	.99	20	10413	.1511	.88
	3713		50	11163	.1620	.94	10	10162	.1475	.86
			40	10913	.1584	.92	00	9912	.1438	.84
129K2927 6	100	.21079	100	9690	.1406	.67	30	9846	.1429	.68
	1384		75	9745	.1414	.67	20	9868	.1432	.68
	4551		50	9801	.1422	.67	10	9890	.1435	.68
			40	9823	.1426	.68	00	9912	.1438	.68
130A3227 6	100	.34395	100	23692	.3438	1.00	30	14046	.2038	.59
	3384		75	20247	.2938	.85	20	12668	.1838	.53
	7426		50	16802	.2438	.71	10	11290	.1638	.48
			40	15424	.2238	.65	00	9912	.1438	.42
135B2927 6	100	.20528	100	8485	.1231	.60	30	9484	.1376	.67
	1212		75	8842	.1283	.63	20	9627	.1397	.68
	4432		50	9199	.1335	.65	10	9770	.1418	.69
			40	9342	.1356	.66	00	9912	.1438	.70
136A2327 7	100	.41606	100	5678	.0824	.20	30	8642	.1254	.30
	811		75	6736	.0978	.24	20	9066	.1316	.32
	8983		50	7795	.1131	.27	10	9489	.1377	.33
			40	8219	.1193	.29	00	9912	.1438	.35
137K2427 7	100	.22191	100	5181	.0752	.34	30	8493	.1232	.56
	740		75	6364	.0923	.42	20	8966	.1301	.59
	4791		50	7547	.1095	.49	10	9439	.1370	.62
			40	8020	.1164	.52	00	9912	.1438	.65
138A2527 7	102	.24084	100	7627	.1107	.46	30	9365	.1359	.56
	1068		75	8248	.1197	.50	20	9614	.1395	.58
	5200		50	8869	.1287	.53	10	9862	.1431	.59
			40	9117	.1323	.55	00	10111	.1467	.61

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	17
149N3027 6	100	.17754	100	8527	.1237	.70	30	9497	.1378	.78	
	1218		75	8874	.1288	.73	20	9635	.1398	.79	
	3833		50	9220	.1338	.75	10	9774	.1418	.80	
			40	9358	.1358	.76	00	9912	.1438	.81	
150A 626 6	100	.29402	100	6168	.0895	.30	30	8789	.1275	.43	
	881		75	7104	.1031	.35	20	9164	.1330	.45	
	6348		50	8040	.1167	.40	10	9538	.1384	.47	
			40	8415	.1221	.42	00	9912	.1438	.49	
151B1427 7	94	.08874	100	6772	.0983	1.11	30	8554	.1241	1.40	
	1029		75	7408	.1075	1.21	20	8809	.1278	1.44	
	1916		50	8045	.1167	1.32	10	9063	.1315	1.48	
			40	8299	.1204	1.36	00	9318	.1352	1.52	
155 11276											
156M1627 6	100	.07874	100	4117	.0597	.76	30	8174	.1186	1.51	
	588		75	5566	.0808	1.03	20	8753	.1270	1.61	
	1700		50	7015	.1018	1.29	10	9333	.1354	1.72	
			40	7594	.1102	1.40	00	9912	.1438	1.83	
158N2227 6	100	.13867	100	6147	.0892	.64	30	8783	.1275	.92	
	878		75	7088	.1029	.74	20	9159	.1329	.96	
	2994		50	8030	.1165	.84	10	9536	.1384	1.00	
			40	8406	.1220	.88	00	9912	.1438	1.04	
159G1827 6	100	.06105	100	4495	.0652	1.07	30	8287	.1203	1.97	
	642		75	5849	.0849	1.39	20	8829	.1281	2.10	
	1318		50	7204	.1045	1.71	10	9371	.1360	2.23	
			40	7745	.1124	1.84	00	9912	.1438	2.36	
167B1327 7	100	.12042	100	5909	.0857	.71	30	8711	.1264	1.05	
	844		75	6910	.1003	.83	20	9112	.1322	1.10	
	2600		50	7911	.1148	.95	10	9512	.1380	1.15	
			40	8311	.1206	1.00	00	9912	.1438	1.19	
171M2127 6	100	.22232	100	7043	.1022	.46	30	9052	.1314	.59	
	1006		75	7760	.1126	.51	20	9339	.1355	.61	
	4800		50	8478	.1230	.55	10	9625	.1397	.63	
			40	8765	.1272	.57	00	9912	.1438	.65	
173M2327 6	100	.09263	100	8359	.1213	1.31	30	9447	.1371	1.48	
	1194		75	8748	.1269	1.37	20	9602	.1393	1.50	
	2000		50	9136	.1326	1.43	10	9757	.1416	1.53	
			40	9291	.1348	1.46	00	9912	.1438	1.55	
2L273010	100	.10274	100	2387	.0346	.34	30	7655	.1111	1.08	
	341		75	4269	.0619	.60	20	8407	.1220	1.19	
	2218		50	6150	.0892	.87	10	9160	.1329	1.29	
			40	6902	.1002	.98	00	9912	.1438	1.40	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	18
11K183010	100	.07410	100	1967	.0285	.38	30	7529	.1093	1.48	
	281		75	3954	.0574	.77	20	8323	.1208	1.63	
	1600		50	5940	.0862	1.16	10	9118	.1323	1.79	
			40	6734	.0977	1.32	00	9912	.1438	1.94	
20G 827 8	100	.15285	100	4957	.0719	.47	30	8426	.1223	.80	
	708		75	6196	.0899	.59	20	8921	.1295	.85	
	3300		50	7435	.1079	.71	10	9417	.1367	.89	
			40	7930	.1151	.75	00	9912	.1438	.94	
2B303010	100	.10273	100	7253	.1053	1.03	30	9115	.1323	1.29	
	1036		75	7918	.1149	1.12	20	9381	.1361	1.32	
	2218		50	8583	.1245	1.21	10	9646	.1400	1.36	
			40	8849	.1284	1.25	00	9912	.1438	1.40	
4L303010	97	.19004	100	2961	.0430	.23	30	7619	.1106	.58	
	436		75	4624	.0671	.35	20	8284	.1202	.63	
	4103		50	6288	.0912	.48	10	8950	.1299	.68	
			40	6953	.1009	.53	00	9615	.1395	.73	
6H283010	100	.08730	100	2751	.0399	.46	30	7764	.1127	1.29	
	393		75	4542	.0659	.75	20	8480	.1231	1.41	
	1885		50	6332	.0919	1.05	10	9196	.1335	1.53	
			40	7048	.1023	1.17	00	9912	.1438	1.65	
8N283010	100	.11811	100	5342	.0775	.66	30	8541	.1239	1.05	
	763		75	6484	.0941	.80	20	8998	.1306	1.11	
	2550		50	7627	.1107	.94	10	9455	.1372	1.16	
			40	8084	.1173	.99	00	9912	.1438	1.22	
13M3328 9	105	.07425	100	5888	.0854	1.15	30	9052	.1314	1.77	
	801		75	7018	.1018	1.37	20	9504	.1379	1.86	
	1603		50	8148	.1182	1.59	10	9956	.1445	1.95	
			40	8600	.1248	1.68	00	10408	.1510	2.03	
14B2228 9	100	.15780	100	3599	.0522	.33	30	8018	.1164	.74	
	514		75	5177	.0751	.48	20	8650	.1255	.80	
	3407		50	6756	.0980	.62	10	9281	.1347	.85	
			40	7387	.1072	.68	00	9912	.1438	.91	
5A 727 4	100	.30018	100	2359	.0342	.11	30	7647	.1110	.37	
	337		75	4248	.0616	.21	20	8402	.1219	.41	
	6481		50	6136	.0890	.30	10	9157	.1329	.44	
			40	6891	.1000	.33	00	9912	.1438	.48	
7N 927 4	100	.30606	100	1029	.0149	.05	30	7247	.1052	.34	
	147		75	3250	.0472	.15	20	8136	.1181	.39	
	6608		50	5471	.0794	.26	10	9024	.1310	.43	
			40	6359	.0923	.30	00	9912	.1438	.47	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
14L1827 4	100	.27072	100	1659	.0241	.09	30	7436	.1079	.40
	237		75	3722	.0540	.20	20	8262	.1199	.44
	5845		50	5786	.0840	.31	10	9087	.1319	.49
			40	6611	.0959	.35	00	9912	.1438	.53
30N3227 4	100	.20380	100	7694	.1117	.55	30	9247	.1342	.66
	1099		75	8249	.1197	.59	20	9469	.1374	.67
	4400		50	8803	.1277	.63	10	9691	.1406	.69
			40	9025	.1310	.64	00	9912	.1438	.71
1P 427 5	100	.37730	100	2324	.0337	.09	30	7636	.1108	.29
	332		75	4221	.0613	.16	20	8395	.1218	.32
	8146		50	6118	.0888	.24	10	9154	.1328	.35
			40	6877	.0998	.26	00	9912	.1438	.38
59A 627 5	100	.37979	100	7274	.1056	.28	30	9121	.1324	.35
	1039		75	7934	.1151	.30	20	9385	.1362	.36
	8200		50	8593	.1247	.33	10	9649	.1400	.37
			40	8857	.1285	.34	00	9912	.1438	.38
33L1728 5	100	.16818	100	5545	.0805	.48	30	8602	.1248	.74
	792		75	6637	.0963	.57	20	9039	.1312	.78
	3631		50	7729	.1122	.67	10	9476	.1375	.82
			40	8165	.1185	.70	00	9912	.1438	.86
34M1828 5	100	.17415	100	4880	.0708	.41	30	8403	.1219	.70
	697		75	6138	.0891	.51	20	8906	.1292	.74
	3760		50	7396	.1073	.62	10	9409	.1365	.78
			40	7899	.1146	.66	00	9912	.1438	.83
35M1928 5	100	.21621	100	2926	.0425	.20	30	7817	.1134	.52
	418		75	4673	.0678	.31	20	8515	.1236	.57
	4668		50	6419	.0932	.43	10	9214	.1337	.62
			40	7113	.1033	.48	00	9912	.1438	.67
41A3228 5	100	.14414	100	7757	.1126	.78	30	9266	.1345	.93
	1108		75	8296	.1204	.84	20	9481	.1376	.95
	3112		50	8835	.1282	.89	10	9697	.1407	.98
			40	9050	.1313	.91	00	9912	.1438	1.00
42K3128 5	100	.37234	100	13218	.1918	.52	30	10904	.1582	.42
	1888		75	12392	.1798	.48	20	10574	.1534	.41
	8039		50	11565	.1678	.45	10	10243	.1486	.40
			40	11235	.1630	.44	00	9912	.1438	.39
44M2728 5	100	.20421	100	15375	.2231	1.09	30	11551	.1676	.82
	2196		75	14009	.2033	1.00	20	11005	.1597	.78
	4409		50	12643	.1835	.90	10	10459	.1518	.74
			40	12097	.1755	.86	00	9912	.1438	.70

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	20
94B3628 6	100	.20921	100	2331	.0338	.16	30	7638	.1108	.53	
	333		75	4227	.0613	.29	20	8396	.1218	.58	
	4517		50	6122	.0888	.42	10	9154	.1328	.63	
			40	6880	.0998	.48	00	9912	.1438	.69	
100N1328 6	100	.15285	100	10145	.1472	.96	30	9982	.1449	.95	
	1449		75	10087	.1464	.96	20	9959	.1445	.95	
	3300		50	10029	.1455	.95	10	9936	.1442	.94	
			40	10005	.1452	.95	00	9912	.1438	.94	
103K 727 6	99	.06021	100	7721	.1120	1.86	30	9186	.1333	2.21	
	1114		75	8244	.1196	1.99	20	9395	.1363	2.26	
	1300		50	8767	.1272	2.11	10	9604	.1394	2.32	
			40	8976	.1303	2.16	00	9813	.1424	2.37	
98G2927 7	100	.17652	100	1792	.0260	.15	30	7476	.1085	.61	
	256		75	3822	.0555	.31	20	8288	.1203	.68	
	3811		50	5852	.0849	.48	10	9100	.1321	.75	
			40	6664	.0967	.55	00	9912	.1438	.81	
125M1227 7	100	.15127	100	8268	.1200	.79	30	9419	.1367	.90	
	1181		75	8679	.1259	.83	20	9584	.1391	.92	
	3266		50	9090	.1319	.87	10	9748	.1415	.94	
			40	9255	.1343	.89	00	9912	.1438	.95	
126M 127 7	100	.06021	100	10327	.1499	2.49	30	10037	.1456	2.42	
	1475		75	10223	.1484	2.46	20	9995	.1450	2.41	
	1300		50	10120	.1468	2.44	10	9954	.1444	2.40	
			40	10078	.1462	2.43	00	9912	.1438	2.39	
32N2929 5	100	.03992	100	3221	.0467	1.17	30	7905	.1147	2.87	
	460		75	4893	.0710	1.78	20	8574	.1244	3.12	
	862		50	6566	.0953	2.39	10	9243	.1341	3.36	
			40	7236	.1050	2.63	00	9912	.1438	3.60	
33A1329 6	86	.06874	100	1445	.0210	.31	30	6401	.0929	1.35	
	240		75	3215	.0467	.68	20	7109	.1032	1.50	
	1484		50	4985	.0723	1.05	10	7817	.1134	1.65	
			40	5693	.0826	1.20	00	8525	.1237	1.80	
35M1529 6	100	.05586	100	7862	.1141	2.04	30	9297	.1349	2.41	
	1123		75	8375	.1215	2.18	20	9502	.1379	2.47	
	1206		50	8887	.1290	2.31	10	9707	.1409	2.52	
			40	9092	.1319	2.36	00	9912	.1438	2.57	
35A2232 7	100	.25474	100	7323	.1063	.42	30	9136	.1326	.52	
	1046		75	7970	.1157	.45	20	9395	.1363	.54	
	5500		50	8618	.1251	.49	10	9653	.1401	.55	
			40	8877	.1288	.51	00	9912	.1438	.56	

EL PASO NT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
EL PASO GP										
5A172611	100	.14238	100	28894	.4193	2.94	30	15607	.2265	1.59
	4127		75	24148	.3504	2.46	20	13709	.1989	1.40
	3074		50	19403	.2816	1.98	10	11811	.1714	1.20
			40	17505	.2540	1.78	00	9912	.1438	1.01
6K172611	100	.18526	100	49239	.7145	3.86	30	21710	.3151	1.70
	7033		75	39407	.5719	3.09	20	17778	.2580	1.39
	4000		50	29576	.4292	2.32	10	13845	.2009	1.08
			40	25643	.3721	2.01	00	9912	.1438	.78
1M 42611	100	.12946	100	9585	.1391	1.07	30	9814	.1424	1.10
	1369		75	9666	.1403	1.08	20	9847	.1429	1.10
	2795		50	9749	.1415	1.09	10	9880	.1434	1.11
			40	9781	.1419	1.10	00	9912	.1438	1.11
1M 32611	100	.22005	100	17685	.2566	1.17	30	12244	.1777	.81
	2526		75	15742	.2284	1.04	20	11467	.1664	.76
	4751		50	13799	.2002	.91	10	10690	.1551	.70
			40	13021	.1890	.86	00	9912	.1438	.65
1G 42611	100	.16827	100	20023	.2906	1.73	30	12946	.1879	1.12
	2860		75	17496	.2539	1.51	20	11935	.1732	1.03
	3633		50	14968	.2172	1.29	10	10924	.1585	.94
			40	13957	.2025	1.20	00	9912	.1438	.85
1P 92711	100	.21459	100	2492	.0362	.17	30	7686	.1115	.52
	356		75	4347	.0631	.29	20	8428	.1223	.57
	4633		50	6202	.0900	.42	10	9170	.1331	.62
			40	6944	.1008	.47	00	9912	.1438	.67
2D 92711	100	.19198	100	9662	.1402	.73	30	9837	.1428	.74
	1380		75	9724	.1411	.73	20	9862	.1431	.75
	4145		50	9787	.1420	.74	10	9887	.1435	.75
			40	9812	.1424	.74	00	9912	.1438	.75
3E 42711	100	.11857	100	12035	.1746	1.47	30	10549	.1531	1.29
	1719		75	11504	.1669	1.41	20	10337	.1500	1.27
	2560		50	10974	.1592	1.34	10	10125	.1469	1.24
			40	10761	.1562	1.32	00	9912	.1438	1.21
1D162711	100	.13552	100	7477	.1085	.80	30	9182	.1332	.98
	1068		75	8086	.1173	.87	20	9425	.1368	1.01
	2926		50	8695	.1262	.93	10	9669	.1403	1.04
			40	8938	.1297	.96	00	9912	.1438	1.06
2I 52711	100	.11293	100	4236	.0615	.54	30	8209	.1191	1.05
	605		75	5655	.0821	.73	20	8777	.1274	1.13
	2438		50	7074	.1027	.91	10	9345	.1356	1.20
			40	7642	.1109	.98	00	9912	.1438	1.27

EL PASO GP	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	22
1E 52711	100	.18633	100	6448	.0936	.50	30	8873	.1288	.69	
	921		75	7314	.1061	.57	20	9220	.1338	.72	
	4023		50	8180	.1187	.64	10	9566	.1388	.74	
			40	8527	.1237	.66	00	9912	.1438	.77	
10 42711	100	.11292	100	1638	.0238	.21	30	7430	.1078	.95	
	234		75	3707	.0538	.48	20	8258	.1198	1.06	
	2438		50	5775	.0838	.74	10	9085	.1318	1.17	
			40	6603	.0958	.85	00	9912	.1438	1.27	
1A 326 7	100	.18527	100	1505	.0218	.12	30	7390	.1072	.58	
	215		75	3607	.0523	.28	20	8231	.1194	.64	
	4000		50	5709	.0828	.45	10	9072	.1316	.71	
			40	6550	.0950	.51	00	9912	.1438	.78	
1H 82611	100	.11648	100	41335	.5998	5.15	30	19339	.2806	2.41	
	5904		75	33479	.4858	4.17	20	16197	.2350	2.02	
	2515		50	25624	.3718	3.19	10	13055	.1894	1.63	
			40	22481	.3262	2.80	00	9912	.1438	1.23	
2N 82611	100	.14887	100	29650	.4303	2.89	30	15834	.2298	1.54	
	4235		75	24716	.3587	2.41	20	13860	.2011	1.35	
	3214		50	19781	.2871	1.93	10	11886	.1725	1.16	
			40	17807	.2584	1.74	00	9912	.1438	.97	
1A202611	100	.20064	100	28138	.4083	2.03	30	15380	.2232	1.11	
	4019		75	23581	.3422	1.71	20	13557	.1967	.98	
	4332		50	19025	.2761	1.38	10	11735	.1703	.85	
			40	17203	.2496	1.24	00	9912	.1438	.72	
D W FALLS											
20112813	108	.12506	100	4817	.0699	.56	30	8939	.1297	1.04	
	637		75	6289	.0913	.73	20	9528	.1383	1.11	
	2700		50	7761	.1126	.90	10	10117	.1468	1.17	
			40	8350	.1212	.97	00	10705	.1554	1.24	
BERT FIELD											
1H2427 7	100	.12204	100	4600	.0667	.55	30	8319	.1207	.99	
	657		75	5928	.0860	.70	20	8850	.1284	1.05	
	2635		50	7256	.1053	.86	10	9381	.1361	1.12	
			40	7787	.1130	.93	00	9912	.1438	1.18	
FRONTIER											
1D 82711	100	.07341	100	5125	.0744	1.01	30	8476	.1230	1.68	
	732		75	6322	.0917	1.25	20	8955	.1299	1.77	
	1585		50	7519	.1091	1.49	10	9434	.1369	1.86	
			40	7997	.1161	1.58	00	9912	.1438	1.96	
1L282711	100	.07907	100	14198	.2060	2.61	30	11198	.1625	2.06	
	2028		75	13127	.1905	2.41	20	10770	.1563	1.98	
	1707		50	12055	.1749	2.21	10	10341	.1501	1.90	
			40	11627	.1687	2.13	00	9912	.1438	1.82	

FRONTIER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1H162711	100	.10727	100	5769	.0837	.78	30	8669	.1258	1.17
	824		75	6805	.0987	.92	20	9084	.1318	1.23
	2316		50	7841	.1138	1.06	10	9498	.1378	1.28
			40	8255	.1198	1.12	00	9912	.1438	1.34
2N152711	100	.10727	100	5258	.0763	.71	30	8516	.1236	1.15
	751		75	6421	.0932	.87	20	8982	.1303	1.21
	2316		50	7585	.1101	1.03	10	9447	.1371	1.28
			40	8051	.1168	1.09	00	9912	.1438	1.34
3B212711	100	.12422	100	28929	.4198	3.38	30	15617	.2266	1.82
	4132		75	24175	.3508	2.82	20	13716	.1990	1.60
	2682		50	19421	.2818	2.27	10	11814	.1714	1.38
			40	17519	.2542	2.05	00	9912	.1438	1.16
4A282711	100	.23719	100	5608	.0814	.34	30	8621	.1251	.53
	801		75	6684	.0970	.41	20	9052	.1314	.55
	5121		50	7760	.1126	.47	10	9482	.1376	.58
			40	8191	.1189	.50	00	9912	.1438	.61
2P192710	100	.17350	100	2779	.0403	.23	30	7773	.1128	.65
	397		75	4563	.0662	.38	20	8486	.1231	.71
	3746		50	6346	.0921	.53	10	9199	.1335	.77
			40	7059	.1024	.59	00	9912	.1438	.83
1P172711	100	.21459	100	7064	.1025	.48	30	9058	.1314	.61
	1009		75	7776	.1128	.53	20	9343	.1356	.63
	4633		50	8488	.1232	.57	10	9628	.1397	.65
			40	8773	.1273	.59	00	9912	.1438	.67
21 82711	100	.13552	100	2940	.0427	.32	30	7821	.1135	.84
	420		75	4683	.0680	.50	20	8518	.1236	.91
	2926		50	6426	.0933	.69	10	9215	.1337	.99
			40	7124	.1034	.76	00	9912	.1438	1.06
3L212711	100	.11857	100	29209	.4239	3.58	30	15701	.2278	1.92
	4172		75	24385	.3539	2.98	20	13772	.1998	1.69
	2560		50	19561	.2839	2.39	10	11842	.1718	1.45
			40	17631	.2559	2.16	00	9912	.1438	1.21
GREENBRIER										
2A233112	100	.17059	100	9844	.1428	.84	30	9892	.1435	.84
	1406		75	9861	.1431	.84	20	9899	.1436	.84
	3683		50	9878	.1433	.84	10	9906	.1437	.84
			40	9885	.1434	.84	00	9912	.1438	.84
GULF OIL										
8D 824 5	100	.17544	100	2898	.0421	.24	30	7808	.1133	.65
	414		75	4652	.0675	.38	20	8510	.1235	.70
	3788		50	6405	.0930	.53	10	9211	.1337	.76
			40	7107	.1031	.59	00	9912	.1438	.82

GULF OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	24
9D1724 5	100	.03511	100	6091	.0884	2.52	30	8766	.1272	3.62	
	870		75	7046	.1023	2.91	20	9148	.1328	3.78	
	758		50	8002	.1161	3.31	10	9530	.1383	3.94	
			40	8384	.1217	3.47	00	9912	.1438	4.10	
10J1824 5	100	.10023	100	2849	.0414	.41	30	7794	.1131	1.13	
	407		75	4615	.0670	.67	20	8500	.1233	1.23	
	2164		50	6381	.0926	.92	10	9206	.1336	1.33	
			40	7087	.1028	1.03	00	9912	.1438	1.43	
11J 824 5	100	.04632	100	6357	.0923	1.99	30	8846	.1284	2.77	
	908		75	7246	.1051	2.27	20	9201	.1335	2.88	
	1000		50	8135	.1180	2.55	10	9557	.1387	2.99	
			40	8490	.1232	2.66	00	9912	.1438	3.10	
12J1724 5	100	.07517	100	15620	.2267	3.02	30	11625	.1687	2.24	
	2231		75	14193	.2060	2.74	20	11054	.1604	2.13	
	1623		50	12766	.1853	2.47	10	10483	.1521	2.02	
			40	12195	.1770	2.35	00	9912	.1438	1.91	
13J 724 5	100	.17045	100	9004	.1307	.77	30	9640	.1399	.82	
	1286		75	9231	.1340	.79	20	9731	.1412	.83	
	3680		50	9458	.1372	.80	10	9822	.1425	.84	
			40	9549	.1386	.81	00	9912	.1438	.84	
14D1824 5	100	.10023	100	4173	.0606	.60	30	8190	.1189	1.19	
	596		75	5608	.0814	.81	20	8764	.1272	1.27	
	2164		50	7043	.1022	1.02	10	9338	.1355	1.35	
			40	7617	.1105	1.10	00	9912	.1438	1.43	
15D 724 5	100	.06016	100	2114	.0307	.51	30	7573	.1099	1.83	
	302		75	4064	.0590	.98	20	8353	.1212	2.01	
	1299		50	6013	.0873	1.45	10	9133	.1325	2.20	
			40	6793	.0986	1.64	00	9912	.1438	2.39	
1C212611	100	.17476	100	20920	.3036	1.74	30	13215	.1918	1.10	
	2988		75	18168	.2636	1.51	20	12114	.1758	1.01	
	3773		50	15416	.2237	1.28	10	11013	.1598	.91	
			40	14315	.2077	1.19	00	9912	.1438	.82	
1C202611	100	.19453	100	28166	.4087	2.10	30	15388	.2233	1.15	
	4023		75	23602	.3425	1.76	20	13563	.1968	1.01	
	4200		50	19039	.2763	1.42	10	11738	.1703	.88	
			40	17214	.2498	1.28	00	9912	.1438	.74	
1L363113	100	.05845	100	4243	.0616	1.05	30	8211	.1192	2.04	
	606		75	5660	.0821	1.40	20	8778	.1274	2.18	
	1262		50	7078	.1027	1.76	10	9345	.1356	2.32	
			40	7645	.1109	1.90	00	9912	.1438	2.46	

GULF OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
HUDSON W H										
1A142713	100	.16674	100	36637	.5317	3.19	30	17930	.2602	1.56
	5233		75	29956	.4347	2.61	20	15257	.2214	1.33
	3600		50	23275	.3378	2.03	10	12585	.1826	1.10
			40	20602	.2990	1.79	00	9912	.1438	.86
KAY KIMBEL										
1N222911	100	.21514	100	13631	.1978	.92	30	11028	.1600	.74
	1947		75	12701	.1843	.86	20	10656	.1546	.72
	4645		50	11772	.1708	.79	10	10284	.1492	.69
			40	11400	.1654	.77	00	9912	.1438	.67
1M2825 6	100	.05202	100	1428	.0207	.40	30	7367	.1069	2.05
	204		75	3549	.0515	.99	20	8216	.1192	2.29
	1123		50	5670	.0823	1.58	10	9064	.1315	2.53
			40	6519	.0946	1.82	00	9912	.1438	2.76
2M2725 6	100	.07429	100	2135	.0310	.42	30	7579	.1100	1.43
	305		75	4080	.0592	.80	20	8357	.1213	1.63
	1604		50	6024	.0874	1.18	10	9135	.1326	1.78
			40	6802	.0987	1.33	00	9912	.1438	1.94
1K 42912	100	.18383	100	4026	.0584	.32	30	8146	.1182	.64
	575		75	5497	.0798	.43	20	8735	.1268	.69
	3969		50	6969	.1011	.55	10	9324	.1353	.74
			40	7558	.1097	.60	00	9912	.1438	.78
1A 52510	100	.05743	100	1757	.0255	.44	30	7466	.1083	1.89
	251		75	3796	.0551	.96	20	8281	.1202	2.09
	1240		50	5835	.0847	1.47	10	9097	.1320	2.30
			40	6650	.0965	1.68	00	9912	.1438	2.50
1P222911	100	.12909	100	16033	.2327	1.80	30	11748	.1705	1.32
	2290		75	14503	.2105	1.63	20	11136	.1616	1.25
	2787		50	12973	.1883	1.46	10	10524	.1527	1.18
			40	12361	.1794	1.39	00	9912	.1438	1.11
1M2025 5	100	.11028	100	3417	.0496	.45	30	7964	.1156	1.05
	488		75	5040	.0731	.66	20	8613	.1250	1.13
	2381		50	6664	.0967	.88	10	9263	.1344	1.22
			40	7314	.1061	.96	00	9912	.1438	1.30
1P 525 7	100	.05011	100	1589	.0231	.46	30	7415	.1076	2.15
	227		75	3670	.0533	1.06	20	8248	.1197	2.39
	1082		50	5751	.0835	1.67	10	9080	.1318	2.63
			40	6583	.0955	1.91	00	9912	.1438	2.87
1H3425 6	100	.21547	100	3249	.0471	.22	30	7913	.1148	.53
	464		75	4914	.0713	.33	20	8580	.1245	.58
	4652		50	6580	.0955	.44	10	9246	.1342	.62
			40	7247	.1052	.49	00	9912	.1438	.67

KAY KIMBEL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	26
203525 6	100	.14858	100	12567	.1824	1.23	30	10709	.1554	1.05	
	1795		75	11903	.1727	1.16	20	10443	.1515	1.02	
	3208		50	11240	.1631	1.10	10	10178	.1477	.99	
			40	10974	.1593	1.07	00	9912	.1438	.97	
3P2625 6	100	.10403	100	4138	.0600	.58	30	8180	.1187	1.14	
	591		75	5581	.0810	.78	20	8757	.1271	1.22	
	2246		50	7025	.1019	.98	10	9335	.1355	1.30	
			40	7603	.1103	1.06	00	9912	.1438	1.38	
2M2625 6	100	.12631	100	3823	.0555	.44	30	8085	.1173	.93	
	546		75	5345	.0776	.61	20	8694	.1262	1.00	
	2727		50	6868	.0997	.79	10	9303	.1350	1.07	
			40	7477	.1085	.86	00	9912	.1438	1.14	
KINGWOOD											
1C182710	100	.08101	100	4614	.0670	.83	30	8323	.1208	1.49	
	659		75	5938	.0862	1.06	20	8853	.1285	1.59	
	1749		50	7263	.1054	1.30	10	9383	.1362	1.68	
			40	7793	.1131	1.40	00	9912	.1438	1.78	
LA PLATA											
1P2232 6	100	.10653	100	10775	.1564	1.47	30	10171	.1476	1.39	
	1539		75	10559	.1532	1.44	20	10085	.1463	1.37	
	2300		50	10344	.1501	1.41	10	9999	.1451	1.36	
			40	10257	.1488	1.40	00	9912	.1438	1.35	
1N2332 6	100	.10532	100	14247	.2068	1.96	30	11213	.1627	1.54	
	2035		75	13164	.1910	1.81	20	10779	.1564	1.48	
	2274		50	12080	.1753	1.66	10	10346	.1501	1.43	
			40	11646	.1690	1.60	00	9912	.1438	1.37	
2H2332 6	100	.12042	100	847	.0123	.10	30	7193	.1044	.87	
	121		75	3113	.0452	.38	20	8099	.1175	.98	
	2600		50	5380	.0781	.65	10	9006	.1307	1.09	
			40	6286	.0912	.76	00	9912	.1438	1.19	
1M2432 6	100	.12538	100	43379	.6295	5.02	30	19952	.2895	2.31	
	6196		75	35012	.5081	4.05	20	16606	.2410	1.92	
	2707		50	26646	.3867	3.08	10	13259	.1924	1.53	
			40	23299	.3381	2.70	00	9912	.1438	1.15	
2B2532 6	100	.10190	100	6168	.0895	.88	30	8789	.1275	1.25	
	881		75	7104	.1031	1.01	20	9164	.1330	1.31	
	2200		50	8040	.1167	1.15	10	9538	.1384	1.36	
			40	8415	.1221	1.20	00	9912	.1438	1.41	
2H2632 6	100	.11033	100	15550	.2256	2.04	30	11604	.1684	1.53	
	2221		75	14140	.2052	1.86	20	11040	.1602	1.45	
	2382		50	12731	.1847	1.67	10	10476	.1520	1.38	
			40	12167	.1766	1.60	00	9912	.1438	1.30	

LA PLATA	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
3C2632 6	100	.10653	100	20079	.2914	2.74	30	12962	.1881	1.77
	2868		75	17538	.2545	2.39	20	11946	.1734	1.63
	2300		50	14996	.2176	2.04	10	10929	.1586	1.49
			40	13979	.2029	1.90	00	9912	.1438	1.35
1A2732 6	100	.10189	100	1022	.0148	.15	30	7245	.1051	1.03
	146		75	3245	.0471	.46	20	8134	.1180	1.16
	2200		50	5467	.0793	.78	10	9023	.1309	1.28
			40	6356	.0922	.90	00	9912	.1438	1.41
MARATHON										
2P152811	100	.15215	100	29118	.4225	2.78	30	15674	.2275	1.50
	4159		75	24316	.3529	2.32	20	13754	.1996	1.31
	3285		50	19515	.2832	1.86	10	11833	.1717	1.13
			40	17595	.2553	1.68	00	9912	.1438	.95
2I232811	100	.15781	100	60651	.8801	5.58	30	25134	.3647	2.31
	8663		75	47966	.6961	4.41	20	20060	.2911	1.84
	3407		50	35282	.5120	3.24	10	14986	.2175	1.38
			40	30208	.4384	2.78	00	9912	.1438	.91
2E262811	100	.16211	100	63032	.9147	5.64	30	25848	.3751	2.31
	9003		75	49752	.7220	4.45	20	20536	.2980	1.84
	3500		50	36472	.5293	3.27	10	15224	.2209	1.36
			40	31160	.4522	2.79	00	9912	.1438	.89
3P262811	100	.18989	100	32689	.4744	2.50	30	16745	.2430	1.28
	4669		75	26994	.3917	2.06	20	14468	.2099	1.11
	4100		50	21300	.3091	1.63	10	12190	.1769	.93
			40	19023	.2760	1.45	00	9912	.1438	.76
MONSANTO										
1D162611	100	.13594	100	5356	.0777	.57	30	8545	.1240	.91
	765		75	6495	.0943	.69	20	9001	.1306	.96
	2935		50	7634	.1108	.82	10	9457	.1372	1.01
			40	8090	.1174	.86	00	9912	.1438	1.06
1A193013	100	.14544	100	1918	.0278	.19	30	7514	.1090	.75
	274		75	3917	.0568	.39	20	8314	.1206	.83
	3140		50	5915	.0858	.59	10	9113	.1322	.91
			40	6715	.0974	.67	00	9912	.1438	.99
N W PROD										
4H 626 4	100	.20139	100	2597	.0377	.19	30	7718	.1120	.56
	371		75	4426	.0642	.32	20	8449	.1226	.61
	4348		50	6255	.0908	.45	10	9181	.1332	.66
			40	6986	.1014	.50	00	9912	.1438	.71
1M 726 5	100	.15715	100	1001	.0145	.09	30	7239	.1050	.67
	143		75	3229	.0469	.30	20	8130	.1180	.75
	3393		50	5457	.0792	.50	10	9021	.1309	.83
			40	6348	.0921	.59	00	9912	.1438	.92

N W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1P 72912	100	.10213	100	3347	.0486	.48	30	7943	.1153	1.13
	478		75	4988	.0724	.71	20	8599	.1248	1.22
	2205		50	6629	.0962	.94	10	9256	.1343	1.31
			40	7286	.1057	1.03	00	9912	.1438	1.41
OCCIDENTAL										
4K 626 5	100	.19453	100	5685	.0825	.42	30	8644	.1254	.64
	812		75	6742	.0978	.50	20	9067	.1316	.68
	4200		50	7799	.1132	.58	10	9490	.1377	.71
			40	8221	.1193	.61	00	9912	.1438	.74
1A 626 5	100	.19643	100	2149	.0312	.16	30	7583	.1100	.56
	307		75	4090	.0594	.30	20	8360	.1213	.62
	4241		50	6031	.0875	.45	10	9136	.1326	.68
			40	6807	.0988	.50	00	9912	.1438	.73
PAN AMER										
1D272813	100	.18341	100	4222	.0613	.33	30	8205	.1191	.65
	603		75	5644	.0819	.45	20	8774	.1273	.69
	3960		50	7067	.1026	.56	10	9343	.1356	.74
			40	7636	.1108	.60	00	9912	.1438	.78
1B122713	100	.21936	100	17342	.2517	1.15	30	12141	.1762	.80
	2477		75	15484	.2247	1.02	20	11398	.1654	.75
	4736		50	13627	.1977	.90	10	10655	.1546	.70
			40	12884	.1870	.85	00	9912	.1438	.66
9M1025 5	100	.21556	100	924	.0134	.06	30	7216	.1047	.49
	132		75	3171	.0460	.21	20	8115	.1178	.55
	4654		50	5418	.0786	.36	10	9014	.1308	.61
			40	6317	.0917	.43	00	9912	.1438	.67
10N 925 5	100	.19550	100	19099	.2772	1.42	30	12668	.1838	.94
	2728		75	16802	.2438	1.25	20	11750	.1705	.87
	4221		50	14506	.2105	1.08	10	10831	.1572	.80
			40	13587	.1972	1.01	00	9912	.1438	.74
11K 425 5	100	.19551	100	651	.0094	.05	30	7134	.1035	.53
	93		75	2966	.0430	.22	20	8060	.1170	.60
	4221		50	5282	.0766	.39	10	8986	.1304	.67
			40	6208	.0901	.46	00	9912	.1438	.74
13J 925 5	100	.19916	100	5545	.0805	.40	30	8602	.1248	.63
	792		75	6637	.0963	.48	20	9039	.1312	.66
	4300		50	7729	.1122	.56	10	9476	.1375	.69
			40	8165	.1185	.59	00	9912	.1438	.72
9N1525 5	100	.20551	100	13379	.1942	.94	30	10952	.1589	.77
	1911		75	12512	.1816	.86	20	10606	.1539	.75
	4437		50	11646	.1690	.82	10	10259	.1489	.72
			40	11299	.1640	.80	00	9912	.1438	.70

PAN AMER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	29
13C1525 5	100	.20842	100	1120	.0163	.08	30	7275	.1056	.51	
	160		75	3318	.0482	.23	20	8154	.1183	.57	
	4500		50	5516	.0800	.38	10	9033	.1311	.63	
			40	6396	.0928	.45	00	9912	.1438	.69	
12K3226 5	100	.15285	100	2485	.0361	.24	30	7684	.1115	.73	
	355		75	4342	.0630	.41	20	8427	.1223	.80	
	3300		50	6199	.0900	.59	10	9170	.1331	.87	
			40	6942	.1007	.66	00	9912	.1438	.94	
13I3026 5	100	.18527	100	2716	.0394	.21	30	7754	.1125	.61	
	383		75	4515	.0655	.35	20	8473	.1230	.66	
	4000		50	6314	.0916	.49	10	9193	.1334	.72	
			40	7034	.1021	.55	00	9912	.1438	.78	
16E3026 5	100	.21769	100	6441	.0935	.43	30	8871	.1287	.59	
	920		75	7309	.1061	.49	20	9218	.1338	.61	
	4700		50	8177	.1187	.55	10	9565	.1388	.64	
			40	8524	.1237	.57	00	9912	.1438	.66	
1G3126 5	100	.18063	100	3165	.0459	.25	30	7888	.1145	.63	
	452		75	4851	.0704	.39	20	8563	.1243	.69	
	3900		50	6538	.0949	.53	10	9238	.1341	.74	
			40	7213	.1047	.58	00	9912	.1438	.80	
1M222812	100	.19541	100	2681	.0389	.20	30	7743	.1124	.58	
	383		75	4489	.0651	.33	20	8466	.1229	.63	
	4219		50	6297	.0914	.47	10	9189	.1334	.68	
			40	7020	.1019	.52	00	9912	.1438	.74	
1F273012	100	.08337	100	4292	.0623	.75	30	8226	.1194	1.43	
	613		75	5697	.0827	.99	20	8788	.1275	1.53	
	1800		50	7102	.1031	1.24	10	9350	.1357	1.63	
			40	7664	.1112	1.33	00	9912	.1438	1.72	
PIONEER PR											
1A 82913	100	.10653	100	1232	.0179	.17	30	7308	.1061	1.00	
	176		75	3402	.0494	.46	20	8176	.1187	1.11	
	2300		50	5572	.0809	.76	10	9044	.1312	1.23	
			40	6440	.0935	.88	00	9912	.1438	1.35	
2P 82913	100	.04632	100	595	.0086	.19	30	7117	.1033	2.23	
	85		75	2924	.0424	.92	20	8049	.1168	2.52	
	1000		50	5254	.0762	1.65	10	8981	.1303	2.81	
			40	6185	.0898	1.94	00	9912	.1438	3.10	
1N 72911	96	.19902	100	6150	.0892	.45	30	8506	.1234	.62	
	915		75	6991	.1015	.51	20	8843	.1283	.64	
	4297		50	7833	.1137	.57	10	9179	.1332	.67	
			40	8169	.1186	.60	00	9516	.1381	.69	

PIONEER PR	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	30
1K 62912	100	.07411	100	11503	.1669	2.25	30	10390	.1508	2.03	
	1643		75	11105	.1612	2.18	20	10231	.1485	2.00	
	1600		50	10708	.1554	2.10	10	10071	.1462	1.97	
			40	10549	.1531	2.07	00	9912	.1438	1.94	
1G293012	100	.07874	100	4061	.0589	.75	30	8157	.1184	1.50	
	580		75	5524	.0802	1.02	20	8742	.1269	1.61	
	1700		50	6987	.1014	1.29	10	9327	.1354	1.72	
			40	7572	.1099	1.40	00	9912	.1438	1.83	
1I283012	100	.08337	100	4915	.0713	.86	30	8413	.1221	1.46	
	702		75	6164	.0895	1.07	20	8913	.1293	1.55	
	1800		50	7414	.1076	1.29	10	9413	.1366	1.64	
			40	7913	.1148	1.38	00	9912	.1438	1.72	
1M 82811	104	.10143	100	23693	.3438	3.39	30	14324	.2079	2.05	
	3254		75	20347	.2953	2.91	20	12986	.1884	1.86	
	2190		50	17001	.2467	2.43	10	11647	.1690	1.67	
			40	15663	.2273	2.24	00	10309	.1496	1.47	
1J333012	100	.12969	100	9312	.1351	1.04	30	9732	.1412	1.09	
	1330		75	9462	.1373	1.06	20	9792	.1421	1.10	
	2800		50	9612	.1395	1.08	10	9852	.1430	1.10	
			40	9672	.1404	1.08	00	9912	.1438	1.11	
2L333012	100	.10653	100	5398	.0783	.74	30	8558	.1242	1.17	
	771		75	6526	.0947	.89	20	9010	.1307	1.23	
	2300		50	7655	.1111	1.04	10	9461	.1373	1.29	
			40	8107	.1176	1.10	00	9912	.1438	1.35	
1B242912	100	.16674	100	22215	.3224	1.93	30	13603	.1974	1.18	
	3173		75	19139	.2777	1.67	20	12373	.1795	1.08	
	3600		50	16064	.2331	1.40	10	11143	.1617	.97	
			40	14833	.2153	1.29	00	9912	.1438	.86	
1A322911	100	.17749	100	12980	.1884	1.06	30	10833	.1572	.89	
	1854		75	12213	.1772	1.00	20	10526	.1527	.86	
	3832		50	11446	.1661	.94	10	10219	.1483	.84	
			40	11140	.1617	.91	00	9912	.1438	.81	
1C222811	100	.16905	100	16663	.2418	1.43	30	11938	.1732	1.02	
	2380		75	14975	.2173	1.29	20	11262	.1634	.97	
	3650		50	13288	.1928	1.14	10	10587	.1536	.91	
			40	12613	.1830	1.08	00	9912	.1438	.85	
1C162811	100	.13525	100	11293	.1639	1.21	30	10327	.1499	1.11	
	1613		75	10948	.1589	1.17	20	10189	.1478	1.09	
	2920		50	10603	.1539	1.14	10	10050	.1458	1.08	
			40	10465	.1519	1.12	00	9912	.1438	1.06	

PIONEER PR	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
2P222811	100	.21977	100	25799	.3744	1.70	30	14678	.2130	.97
	3685		75	21828	.3167	1.44	20	13090	.1900	.86
	4745		50	17856	.2591	1.18	10	11501	.1669	.76
			40	16267	.2361	1.07	00	9912	.1438	.65
1E 42913	100	.19453	100	980	.0142	.07	30	7233	.1050	.54
	140		75	3213	.0466	.24	20	8126	.1179	.61
	4200		50	5446	.0790	.41	10	9019	.1309	.67
			40	6340	.0920	.47	00	9912	.1438	.74
41162811	100	.17471	100	28740	.4171	2.39	30	15561	.2258	1.29
	4105		75	24033	.3488	2.00	20	13678	.1985	1.14
	3772		50	19326	.2805	1.61	10	11795	.1712	.98
			40	17443	.2531	1.45	00	9912	.1438	.82
5N102811	103	.13432	100	13045	.1893	1.41	30	11060	.1605	1.19
	1809		75	12336	.1790	1.33	20	10777	.1564	1.16
	2900		50	11627	.1687	1.26	10	10493	.1523	1.13
			40	11344	.1646	1.23	00	10210	.1482	1.10
1M132912	100	.16340	100	19533	.2835	1.74	30	12799	.1857	1.14
	2790		75	17128	.2486	1.52	20	11837	.1718	1.05
	3528		50	14723	.2136	1.31	10	10874	.1578	.97
			40	13761	.1997	1.22	00	9912	.1438	.88
1L292911	100	.20195	100	19869	.2883	1.43	30	12899	.1872	.93
	2838		75	17380	.2522	1.25	20	11904	.1727	.86
	4360		50	14891	.2161	1.07	10	10908	.1583	.78
			40	13895	.2016	1.00	00	9912	.1438	.71
1J122913	100	.22510	100	5006	.0726	.32	30	8440	.1225	.54
	715		75	6232	.0904	.40	20	8931	.1296	.58
	4860		50	7459	.1082	.48	10	9422	.1367	.61
			40	7950	.1154	.51	00	9912	.1438	.64
1J 42912	100	.09703	100	2387	.0346	.36	30	7655	.1111	1.15
	341		75	4269	.0619	.64	20	8407	.1220	1.26
	2095		50	6150	.0892	.92	10	9160	.1329	1.37
			40	6902	.1002	1.03	00	9912	.1438	1.48
1E 32912	100	.14358	100	2730	.0396	.28	30	7758	.1126	.78
	390		75	4526	.0657	.46	20	8476	.1230	.86
	3100		50	6321	.0917	.64	10	9194	.1334	.93
			40	7040	.1022	.71	00	9912	.1438	1.00
PUBCO PET 9N 92912	100	.15827	100	3928	.0570	.36	30	8117	.1178	.74
	561		75	5424	.0787	.50	20	8715	.1265	.80
	3417		50	6920	.1004	.63	10	9314	.1352	.85
			40	7519	.1091	.69	00	9912	.1438	.91

PUBCO PET	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
5B 52912	100	.12255	100	9473	.1375	1.12	30	9780	.1419	1.16
	1353		75	9582	.1391	1.14	20	9824	.1426	1.16
	2646		50	9693	.1407	1.15	10	9868	.1432	1.17
			40	9736	.1413	1.15	00	9912	.1438	1.17
6B 62911	90	.13446	100	5999	.0870	.65	30	8044	.1167	.87
	952		75	6729	.0976	.73	20	8337	.1210	.90
	2903		50	7460	.1083	.81	10	8629	.1252	.93
			40	7752	.1125	.84	00	8921	.1295	.96
2L342810	100	.22186	100	21690	.3147	1.42	30	13446	.1951	.88
	3098		75	18745	.2720	1.23	20	12268	.1780	.80
	4790		50	15801	.2293	1.03	10	11090	.1609	.73
			40	14623	.2122	.96	00	9912	.1438	.65
10 12911	95	.14358	100	6571	.0954	.66	30	8563	.1243	.87
	988		75	7283	.1057	.74	20	8848	.1284	.89
	3100		50	7994	.1160	.81	10	9132	.1325	.92
			40	8279	.1201	.84	00	9417	.1367	.95
301363012	100	.12552	100	4383	.0636	.51	30	8254	.1198	.95
	626		75	5765	.0837	.67	20	8806	.1278	1.02
	2710		50	7148	.1037	.83	10	9359	.1358	1.08
			40	7701	.1117	.89	00	9912	.1438	1.15
26N362911	98	.17748	100	21201	.3077	1.73	30	13160	.1910	1.08
	3090		75	18329	.2660	1.50	20	12012	.1743	.98
	3832		50	15458	.2243	1.26	10	10863	.1576	.89
			40	14309	.2076	1.17	00	9714	.1410	.79
28B362910	100	.07874	100	12602	.1829	2.32	30	10719	.1556	1.98
	1800		75	11930	.1731	2.20	20	10450	.1516	1.93
	1700		50	11257	.1634	2.08	10	10181	.1477	1.88
			40	10988	.1595	2.03	00	9912	.1438	1.83
29N362910	100	.10190	100	19659	.2853	2.80	30	12836	.1863	1.83
	2808		75	17222	.2499	2.45	20	11862	.1721	1.69
	2200		50	14786	.2146	2.11	10	10887	.1580	1.55
			40	13811	.2004	1.97	00	9912	.1438	1.41
R&G DRILL										
47K3527 8	100	.09277	100	749	.0109	.12	30	7163	.1040	1.12
	107		75	3040	.0441	.48	20	8080	.1172	1.26
	2003		50	5331	.0774	.83	10	8996	.1305	1.41
			40	6247	.0907	.98	00	9912	.1438	1.55
42M2227 8	100	.11580	100	63	.0009	.01	30	6958	.1010	.87
	9		75	2525	.0366	.32	20	7943	.1153	1.00
	2500		50	4988	.0724	.63	10	8927	.1296	1.12
			40	5973	.0867	.75	00	9912	.1438	1.24

R&G DRILL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
RUDMAN M B										
102125 9	100	.09263	100	3872	.0562	.61	30	8100	.1175	1.27
	553		75	5382	.0781	.84	20	8704	.1263	1.36
	2000		50	6892	.1000	1.08	10	9308	.1351	1.46
			40	7496	.1088	1.17	00	9912	.1438	1.55
SKELLY OIL										
2L262611	100	.08416	100	1064	.0154	.18	30	7258	.1053	1.25
	152		75	3276	.0475	.56	20	8143	.1182	1.40
	1817		50	5488	.0796	.95	10	9028	.1310	1.56
			40	6373	.0925	1.10	00	9912	.1438	1.71
1A 224 6	107	.23774	100	11252	.1633	.69	30	10800	.1567	.66
	1502		75	11090	.1609	.68	20	10735	.1558	.66
	5133		50	10929	.1586	.67	10	10671	.1548	.65
			40	10865	.1577	.66	00	10606	.1539	.65
3K 224 6	107	.10403	100	4510	.0654	.63	30	8777	.1274	1.22
	602		75	6034	.0876	.84	20	9387	.1362	1.31
	2246		50	7558	.1097	1.05	10	9997	.1451	1.39
			40	8168	.1185	1.14	00	10606	.1539	1.48
20D3125 5	100	.10023	100	10670	.1548	1.54	30	10140	.1471	1.47
	1524		75	10480	.1521	1.52	20	10064	.1460	1.46
	2164		50	10291	.1493	1.49	10	9988	.1449	1.45
			40	10215	.1482	1.48	00	9912	.1438	1.43
22E 624 5	115	.13895	100	3857	.0560	.40	30	9136	.1326	.95
	479		75	5742	.0833	.60	20	9891	.1435	1.03
	3000		50	7628	.1107	.80	10	10645	.1545	1.11
			40	8382	.1216	.88	00	11399	.1654	1.19
1I2225 5	100	.16040	100	18329	.2660	1.66	30	12437	.1805	1.13
	2618		75	16225	.2354	1.47	20	11596	.1683	1.05
	3463		50	14121	.2049	1.28	10	10754	.1561	.97
			40	13279	.1927	1.20	00	9912	.1438	.90
6J2725 5	100	.09522	100	3620	.0525	.55	30	8025	.1164	1.22
	517		75	5193	.0754	.79	20	8654	.1256	1.32
	2056		50	6766	.0982	1.03	10	9283	.1347	1.41
			40	7395	.1073	1.13	00	9912	.1438	1.51
14A2725 5	100	.09523	100	32359	.4696	4.93	30	16647	.2416	2.54
	4622		75	26748	.3881	4.08	20	14402	.2090	2.19
	2056		50	21136	.3067	3.22	10	12157	.1764	1.85
			40	18891	.2741	2.88	00	9912	.1438	1.51
1G153013	100	.10069	100	1288	.0187	.19	30	7325	.1063	1.06
	184		75	3444	.0500	.50	20	8188	.1188	1.18
	2174		50	5600	.0813	.81	10	9050	.1313	1.30
			40	6463	.0938	.93	00	9912	.1438	1.43

SKELLY OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	34
1K123113	100	.10190	100	3599	.0522	.51	30	8018	.1164	1.14	
	514		75	5177	.0751	.74	20	8650	.1255	1.23	
	2200		50	6756	.0980	.96	10	9281	.1347	1.32	
			40	7387	.1072	1.05	00	9912	.1438	1.41	
S UNION PR											
1F 12713	100	.13548	100	14976	.2173	1.60	30	11431	.1659	1.22	
	2139		75	13710	.1989	1.47	20	10925	.1585	1.17	
	2925		50	12444	.1806	1.33	10	10419	.1512	1.12	
			40	11938	.1732	1.28	00	9912	.1438	1.06	
1A 22713	100	.13547	100	14836	.2153	1.59	30	11389	.1653	1.22	
	2119		75	13605	.1974	1.46	20	10897	.1581	1.17	
	2925		50	12374	.1796	1.33	10	10405	.1510	1.11	
			40	11882	.1724	1.27	00	9912	.1438	1.06	
S W PROD											
1N 33011	100	.15748	100	3410	.0495	.31	30	7962	.1155	.73	
	487		75	5035	.0731	.46	20	8612	.1250	.79	
	3400		50	6661	.0967	.61	10	9262	.1344	.85	
			40	7311	.1061	.67	00	9912	.1438	.91	
1N1326 8	100	.11116	100	6406	.0930	.84	30	8861	.1286	1.16	
	915		75	7283	.1057	.95	20	9211	.1337	1.20	
	2400		50	8159	.1184	1.07	10	9562	.1388	1.25	
			40	8510	.1235	1.11	00	9912	.1438	1.29	
2D1326 8	100	.10653	100	1876	.0272	.26	30	7502	.1089	1.02	
	268		75	3885	.0564	.53	20	8305	.1205	1.13	
	2300		50	5894	.0855	.80	10	9109	.1322	1.24	
			40	6698	.0972	.91	00	9912	.1438	1.35	
1I332913	100	.14507	100	2093	.0304	.21	30	7567	.1098	.76	
	299		75	4048	.0587	.40	20	8349	.1212	.84	
	3132		50	6003	.0871	.60	10	9131	.1325	.91	
			40	6785	.0985	.68	00	9912	.1438	.99	
1G252712	100	.06600	100	4649	.0675	1.02	30	8333	.1209	1.83	
	664		75	5965	.0866	1.31	20	8860	.1286	1.95	
	1425		50	7281	.1057	1.60	10	9386	.1362	2.06	
			40	7807	.1133	1.72	00	9912	.1438	2.18	
2A262712	100	.19291	100	9683	.1405	.73	30	9843	.1428	.74	
	1383		75	9740	.1413	.73	20	9866	.1432	.74	
	4165		50	9798	.1422	.74	10	9889	.1435	.74	
			40	9820	.1425	.74	00	9912	.1438	.75	
3K262712	100	.05586	100	1995	.0290	.52	30	7537	.1094	1.96	
	285		75	3975	.0577	1.03	20	8329	.1209	2.16	
	1206		50	5954	.0864	1.55	10	9121	.1324	2.37	
			40	6746	.0979	1.75	00	9912	.1438	2.57	

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	35
5A272712	100	.08800	100	3256	.0472	.54	30	7915	.1149	1.31	
	465		75	4920	.0714	.81	20	8581	.1245	1.41	
	1900		50	6584	.0955	1.09	10	9247	.1342	1.53	
			40	7250	.1052	1.20	00	9912	.1438	1.63	
1L 93011	100	.09263	100	4516	.0655	.71	30	8293	.1203	1.30	
	645		75	5865	.0851	.92	20	8833	.1282	1.38	
	2000		50	7214	.1047	1.13	10	9373	.1360	1.47	
			40	7754	.1125	1.21	00	9912	.1438	1.55	
1C272711	100	.19916	100	9627	.1397	.70	30	9827	.1426	.72	
	1375		75	9698	.1407	.71	20	9855	.1430	.72	
	4300		50	9770	.1418	.71	10	9884	.1434	.72	
			40	9798	.1422	.71	00	9912	.1438	.72	
2E342711	100	.07411	100	11321	.1643	2.22	30	10335	.1500	2.02	
	1617		75	10969	.1592	2.15	20	10194	.1479	2.00	
	1600		50	10617	.1541	2.08	10	10053	.1459	1.97	
			40	10476	.1520	2.05	00	9912	.1438	1.94	
3L262711	100	.09263	100	4362	.0633	.68	30	8247	.1197	1.29	
	623		75	5749	.0834	.90	20	8802	.1277	1.38	
	2000		50	7137	.1036	1.12	10	9357	.1358	1.47	
			40	7692	.1116	1.20	00	9912	.1438	1.55	
1G122712	100	.08629	100	588	.0085	.10	30	7115	.1033	1.20	
	84		75	2919	.0424	.49	20	8048	.1168	1.35	
	1863		50	5250	.0762	.88	10	8980	.1303	1.51	
			40	6183	.0897	1.04	00	9912	.1438	1.67	
2G 12712	100	.06600	100	1015	.0147	.22	30	7243	.1051	1.59	
	145		75	3239	.0470	.71	20	8133	.1180	1.79	
	1425		50	5464	.0793	1.20	10	9023	.1309	1.98	
			40	6354	.0922	1.40	00	9912	.1438	2.18	
3N 12712	100	.08629	100	2009	.0292	.34	30	7541	.1094	1.27	
	287		75	3985	.0578	.67	20	8332	.1209	1.40	
	1863		50	5961	.0865	1.00	10	9122	.1324	1.53	
			40	6751	.0980	1.14	00	9912	.1438	1.67	
4J152712	100	.11167	100	3011	.0437	.39	30	7842	.1138	1.02	
	430		75	4736	.0687	.62	20	8532	.1238	1.11	
	2411		50	6461	.0938	.84	10	9222	.1338	1.20	
			40	7152	.1038	.93	00	9912	.1438	1.29	
5G112712	100	.06091	100	3550	.0515	.85	30	8004	.1161	1.91	
	507		75	5140	.0746	1.22	20	8640	.1254	2.06	
	1315		50	6731	.0977	1.60	10	9276	.1346	2.21	
			40	7367	.1069	1.76	00	9912	.1438	2.36	

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	36
6M112712	100	.17258	100	9851	.1429	.83	30	9894	.1436	.83	
	1407		75	9866	.1432	.83	20	9900	.1437	.83	
	3726		50	9882	.1434	.83	10	9906	.1438	.83	
			40	9888	.1435	.83	00	9912	.1438	.83	
7P122712	100	.08124	100	1295	.0188	.23	30	7327	.1063	1.31	
	185		75	3449	.0501	.62	20	8189	.1188	1.46	
	1754		50	5604	.0813	1.00	10	9051	.1313	1.62	
			40	6466	.0938	1.15	00	9912	.1438	1.77	
1M 73011	102	.24469	100	18110	.2628	1.07	30	12510	.1815	.74	
	2536		75	16110	.2338	.96	20	11711	.1699	.69	
	5283		50	14110	.2048	.84	10	10911	.1583	.65	
			40	13310	.1932	.79	00	10111	.1467	.60	
1B103011	100	.15748	100	2905	.0422	.27	30	7810	.1133	.72	
	415		75	4657	.0676	.43	20	8511	.1235	.78	
	3400		50	6409	.0930	.59	10	9212	.1337	.85	
			40	7110	.1032	.66	00	9912	.1438	.91	
1K222711	100	.19916	100	28705	.4165	2.09	30	15550	.2257	1.13	
	4100		75	24007	.3484	1.75	20	13671	.1984	1.00	
	4300		50	19309	.2802	1.41	10	11792	.1711	.86	
			40	17429	.2529	1.27	00	9912	.1438	.72	
2M142711	100	.11579	100	9914	.1439	1.24	30	9913	.1438	1.24	
	1416		75	9913	.1439	1.24	20	9913	.1438	1.24	
	2500		50	9913	.1439	1.24	10	9913	.1438	1.24	
			40	9913	.1439	1.24	00	9912	.1438	1.24	
3A242711	100	.07874	100	5986	.0869	1.10	30	8734	.1268	1.61	
	855		75	6968	.1011	1.28	20	9127	.1324	1.68	
	1700		50	7949	.1154	1.47	10	9520	.1381	1.	
			40	8342	.1211	1.54	00	9912	.1438	1.83	
4A132711	100	.07411	100	10355	.1503	2.03	30	10045	.1458	1.97	
	1479		75	10244	.1487	2.01	20	10001	.1451	1.96	
	1600		50	10134	.1471	1.98	10	9957	.1445	1.95	
			40	10089	.1464	1.98	00	9912	.1438	1.94	
5K232711	100	.12505	100	12994	.1886	1.51	30	10837	.1573	1.26	
	1856		75	12224	.1774	1.42	20	10529	.1528	1.22	
	2700		50	11453	.1662	1.33	10	10221	.1483	1.19	
			40	11145	.1617	1.29	00	9912	.1438	1.15	
1A232611	100	.10208	100	6238	.0905	.89	30	8810	.1278	1.25	
	891		75	7157	.1039	1.02	20	9178	.1332	1.30	
	2204		50	8075	.1172	1.15	10	9545	.1385	1.36	
			40	8443	.1225	1.20	00	9912	.1438	1.41	

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1P 83011	100	.08801	100	3921	.0569	.65	30	8115	.1178	1.34
	560		75	5419	.0786	.89	20	8714	.1265	1.44
	1900		50	6917	.1004	1.14	10	9313	.1351	1.54
			40	7516	.1091	1.24	00	9912	.1438	1.63
1A 52611	100	.09708	100	31428	.4561	4.70	30	16367	.2375	2.45
	4489		75	26049	.3780	3.89	20	14216	.2063	2.13
	2096		50	20670	.3000	3.09	10	12064	.1751	1.80
			40	18519	.2687	2.77	00	9912	.1438	1.48
1G 62711	100	.23719	100	13050	.1894	.80	30	10854	.1575	.66
	1864		75	12266	.1780	.75	20	10540	.1530	.65
	5121		50	11481	.1666	.70	10	10226	.1484	.63
			40	11168	.1621	.68	00	9912	.1438	.61
2G182711	100	.13552	100	5083	.0738	.54	30	8464	.1228	.91
	726		75	6290	.0913	.67	20	8946	.1298	.96
	2926		50	7498	.1088	.80	10	9429	.1368	1.01
			40	7981	.1158	.85	00	9912	.1438	1.06
3K 62711	100	.13552	100	2653	.0385	.28	30	7735	.1122	.83
	379		75	4468	.0648	.48	20	8461	.1228	.91
	2926		50	6283	.0912	.67	10	9187	.1333	.98
			40	7009	.1017	.75	00	9912	.1438	1.06
4G 72711	100	.12422	100	1372	.0199	.16	30	7350	.1067	.86
	196		75	3507	.0509	.41	20	8204	.1191	.96
	2682		50	5642	.0819	.66	10	9058	.1315	1.06
			40	6496	.0943	.76	00	9912	.1438	1.16
5M 72711	100	.12423	100	6735	.0977	.79	30	8959	.1300	1.05
	962		75	7529	.1093	.88	20	9277	.1346	1.08
	2682		50	8324	.1208	.97	10	9595	.1392	1.12
			40	8641	.1254	1.01	00	9912	.1438	1.16
6K182711	100	.12422	100	5013	.0727	.59	30	8443	.1225	.99
	716		75	6238	.0905	.73	20	8932	.1296	1.04
	2682		50	7463	.1083	.87	10	9422	.1367	1.10
			40	7953	.1154	.93	00	9912	.1438	1.16
1A312711	100	.09726	100	5993	.0870	.89	30	8737	.1268	1.30
	856		75	6973	.1012	1.04	20	9129	.1325	1.36
	2100		50	7953	.1154	1.19	10	9520	.1382	1.42
			40	8345	.1211	1.25	00	9912	.1438	1.48
2I312711	100	.08337	100	39879	.5787	6.94	30	18902	.2743	3.29
	5696		75	32387	.4700	5.64	20	15906	.2308	2.77
	1800		50	24896	.3613	4.33	10	12909	.1873	2.25
			40	21899	.3178	3.81	00	9912	.1438	1.72

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	38
3A 62611	100	.07874	100	26149	.3795	4.82	30	14784	.2145	2.72	
	3735		75	22090	.3206	4.07	20	13160	.1910	2.43	
	1700		50	18031	.2617	3.32	10	11536	.1674	2.13	
			40	16407	.2381	3.02	00	9912	.1438	1.83	
4I 62611	100	.09264	100	16558	.2403	2.59	30	11906	.1728	1.87	
	2365		75	14896	.2162	2.33	20	11241	.1631	1.76	
	2000		50	13235	.1921	2.07	10	10577	.1535	1.66	
			40	12571	.1824	1.97	00	9912	.1438	1.55	
1A233012	100	.11579	100	1442	.0209	.18	30	7371	.1070	.92	
	206		75	3560	.0517	.45	20	8218	.1193	1.03	
	2500		50	5677	.0824	.71	10	9065	.1316	1.14	
			40	6524	.0947	.82	00	9912	.1438	1.24	
1A 73011	94	.07989	100	2126	.0308	.39	30	7160	.1039	1.30	
	323		75	3924	.0569	.71	20	7879	.1143	1.43	
	1725		50	5722	.0830	1.04	10	8598	.1248	1.56	
			40	6441	.0935	1.17	00	9318	.1352	1.69	
1G1126 8	100	.09727	100	203	.0029	.03	30	7000	.1016	1.04	
	29		75	2630	.0382	.39	20	7971	.1157	1.19	
	2100		50	5058	.0734	.75	10	8941	.1298	1.33	
			40	6029	.0875	.90	00	9912	.1438	1.48	
1P 43011	100	.16480	100	4278	.0621	.38	30	8222	.1193	.72	
	611		75	5686	.0825	.50	20	8785	.1275	.77	
	3558		50	7095	.1030	.63	10	9349	.1357	.82	
			40	7659	.1111	.67	00	9912	.1438	.87	
1J 52611	100	.11579	100	32268	.4683	4.04	30	16619	.2412	2.08	
	4609		75	26679	.3872	3.34	20	14384	.2087	1.80	
	2500		50	21090	.3061	2.64	10	12148	.1763	1.52	
			40	18855	.2736	2.36	00	9912	.1438	1.24	
1A302711	100	.09601	100	11650	.1691	1.76	30	10434	.1514	1.58	
	1664		75	11215	.1628	1.70	20	10260	.1489	1.55	
	2073		50	10781	.1565	1.63	10	10086	.1464	1.52	
			40	10607	.1539	1.60	00	9912	.1438	1.50	
2G292711	100	.09602	100	90273	.3100	13.64	30	34021	.4937	5.14	
	12894		75	70183	.0185	10.61	20	25985	.3771	3.93	
	2073		50	50093	.7269	7.57	10	17948	.2605	2.71	
			40	42057	.6103	6.36	00	9912	.1438	1.50	
3K292711	100	.12987	100	41972	.6091	4.69	30	19530	.2834	2.18	
	5995		75	33957	.4928	3.79	20	16324	.2369	1.82	
	2804		50	25942	.3765	2.90	10	13118	.1904	1.47	
			40	22736	.3299	2.54	00	9912	.1438	1.11	

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
4D332711	100	.13543	100	43365	.6293	4.65	30	19948	.2895	2.14
	6194		75	35002	.5079	3.75	20	16603	.2409	1.78
	2924		50	26639	.3866	2.85	10	13258	.1924	1.42
			40	23294	.3380	2.50	00	9912	.1438	1.06
50332711	100	.06776	100	21907	.3179	4.69	30	13511	.1961	2.89
	3129		75	18908	.2744	4.05	20	12311	.1787	2.64
	1463		50	15910	.2309	3.41	10	11112	.1612	2.38
			40	14710	.2135	3.15	00	9912	.1438	2.12
6B322711	100	.11579	100	25008	.3629	3.13	30	14441	.2096	1.81
	3572		75	21234	.3081	2.66	20	12932	.1877	1.62
	2500		50	17460	.2534	2.19	10	11422	.1657	1.43
			40	15951	.2315	2.00	00	9912	.1438	1.24
1M173112	100	.12450	100	17069	.2477	1.99	30	12059	.1750	1.41
	2438		75	15280	.2217	1.78	20	11344	.1646	1.32
	2688		50	13491	.1958	1.57	10	10628	.1542	1.24
			40	12775	.1854	1.49	00	9912	.1438	1.16
1K302711	100	.16378	100	7757	.1126	.69	30	9266	.1345	.82
	1108		75	8296	.1204	.74	20	9481	.1376	.84
	3536		50	8835	.1282	.78	10	9697	.1407	.86
			40	9050	.1313	.80	00	9912	.1438	.88
1L263012	100	.08337	100	2387	.0346	.42	30	7655	.1111	1.33
	341		75	4269	.0619	.74	20	8407	.1220	1.46
	1800		50	6150	.0892	1.07	10	9160	.1329	1.59
			40	6902	.1002	1.20	00	9912	.1438	1.72
1B263012	100	.08800	100	7092	.1029	1.17	30	9066	.1316	1.50
	1013		75	7797	.1131	1.29	20	9348	.1357	1.54
	1900		50	8502	.1234	1.40	10	9630	.1398	1.59
			40	8784	.1275	1.45	00	9912	.1438	1.63
1A183011	100	.21973	100	3466	.0503	.23	30	7978	.1158	.53
	495		75	5077	.0737	.34	20	8623	.1251	.57
	4744		50	6689	.0971	.44	10	9268	.1345	.61
			40	7334	.1064	.48	00	9912	.1438	.65
8B222711	100	.13895	100	5909	.0857	.62	30	8711	.1264	.91
	844		75	6910	.1003	.72	20	9112	.1322	.95
	3000		50	7911	.1148	.83	10	9512	.1380	.99
			40	8311	.1206	.87	00	9912	.1438	1.03
1K103011	100	.16211	100	3144	.0456	.28	30	7882	.1144	.71
	449		75	4836	.0702	.43	20	8559	.1242	.77
	3500		50	6528	.0947	.58	10	9236	.1340	.83
			40	7205	.1046	.65	00	9912	.1438	.89

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	40
1C322711	100	.10653	100	88796	.2886	12.10	30	33577	.4873	4.57	
	12683		75	69075	.0024	9.41	20	25689	.3728	3.50	
	2300		50	49354	.7162	6.72	10	17801	.2583	2.42	
			40	41466	.6017	5.65	00	9912	.1438	1.35	
1J123012	100	.18990	100	7785	.1130	.60	30	9274	.1346	.71	
	1112		75	8317	.1207	.64	20	9487	.1377	.73	
	4100		50	8849	.1284	.68	10	9700	.1408	.74	
			40	9062	.1315	.69	00	9912	.1438	.76	
1A223012	100	.05558	100	6791	.0985	1.77	30	8976	.1303	2.34	
	970		75	7571	.1099	1.98	20	9288	.1348	2.43	
	1200		50	8352	.1212	2.18	10	9600	.1393	2.51	
			40	8664	.1257	2.26	00	9912	.1438	2.59	
1N 83011	100	.09263	100	7792	.1131	1.22	30	9276	.1346	1.45	
	1113		75	8322	.1208	1.30	20	9488	.1377	1.49	
	2000		50	8852	.1285	1.39	10	9700	.1408	1.52	
			40	9064	.1315	1.42	00	9912	.1438	1.55	
1A 32712	100	.08337	100	3851	.0559	.67	30	8094	.1175	1.41	
	550		75	5366	.0779	.93	20	8700	.1263	1.51	
	1800		50	6882	.0999	1.20	10	9306	.1350	1.62	
			40	7488	.1087	1.30	00	9912	.1438	1.72	
2G102712	100	.12969	100	8913	.1293	1.00	30	9612	.1395	1.08	
	1273		75	9162	.1330	1.03	20	9712	.1409	1.09	
	2800		50	9412	.1366	1.05	10	9812	.1424	1.10	
			40	9512	.1380	1.06	00	9912	.1438	1.11	
1N143012	100	.05377	100	3046	.0442	.82	30	7852	.1139	2.12	
	435		75	4762	.0691	1.29	20	8539	.1239	2.30	
	1161		50	6479	.0940	1.75	10	9226	.1339	2.49	
			40	7166	.1040	1.93	00	9912	.1438	2.67	
1A172712	100	.06091	100	728	.0106	.17	30	7157	.1039	1.71	
	104		75	3024	.0439	.72	20	8076	.1172	1.92	
	1315		50	5320	.0772	1.27	10	8994	.1305	2.14	
			40	6239	.0905	1.49	00	9912	.1438	2.36	
1A143012	100	.10190	100	3438	.0499	.49	30	7970	.1157	1.14	
	491		75	5056	.0734	.72	20	8617	.1251	1.23	
	2200		50	6675	.0969	.95	10	9265	.1344	1.32	
			40	7322	.1063	1.04	00	9912	.1438	1.41	
1A162712	100	.14214	100	3200	.0464	.33	30	7899	.1146	.81	
	457		75	4878	.0708	.50	20	8570	.1244	.88	
	3069		50	6556	.0951	.67	10	9241	.1341	.94	
			40	7227	.1049	.74	00	9912	.1438	1.01	

S W PROD	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
SUNRAY DX										
1B 22913	100	.13896	100	5825	.0845	.61	30	8686	.1260	.91
	832		75	6847	.0994	.72	20	9095	.1320	.95
	3000		50	7869	.1142	.82	10	9504	.1379	.99
			40	8277	.1201	.86	00	9912	.1438	1.03
3D 12914	100	.11421	100	6056	.0879	.77	30	8755	.1271	1.11
	865		75	7020	.1019	.89	20	9141	.1327	1.16
	2466		50	7984	.1159	1.01	10	9527	.1382	1.21
			40	8370	.1215	1.06	00	9912	.1438	1.26
1J 22914	100	.04632	100	1106	.0161	.35	30	7271	.1055	2.28
	158		75	3308	.0480	1.04	20	8151	.1183	2.55
	1000		50	5509	.0799	1.72	10	9032	.1311	2.83
			40	6390	.0927	2.00	00	9912	.1438	3.10
SUNSHINE										
1B 32913	100	.22010	100	3438	.0499	.23	30	7970	.1157	.53
	491		75	5056	.0734	.33	20	8617	.1251	.57
	4752		50	6675	.0969	.44	10	9265	.1344	.61
			40	7322	.1063	.48	00	9912	.1438	.65
TENNECO										
1D 12912	100	.13895	100	8023	.1164	.84	30	9346	.1356	.98
	1146		75	8496	.1233	.89	20	9535	.1384	1.00
	3000		50	8968	.1301	.94	10	9724	.1411	1.02
			40	9157	.1329	.96	00	9912	.1438	1.03
2D232611	100	.19416	100	16208	.2352	1.21	30	11801	.1712	.88
	2315		75	14634	.2124	1.09	20	11171	.1621	.83
	4192		50	13060	.1895	.98	10	10542	.1530	.79
			40	12431	.1804	.93	00	9912	.1438	.74
31222611	100	.13594	100	5013	.0727	.53	30	8443	.1225	.90
	716		75	6238	.0905	.67	20	8932	.1296	.95
	2935		50	7463	.1083	.80	10	9422	.1367	1.01
			40	7953	.1154	.85	00	9912	.1438	1.06
4C222611	100	.16183	100	9305	.1350	.83	30	9730	.1412	.87
	1329		75	9456	.1372	.85	20	9791	.1421	.88
	3494		50	9608	.1394	.86	10	9852	.1430	.88
			40	9669	.1403	.87	00	9912	.1438	.89
50142611	100	.14238	100	8527	.1237	.87	30	9497	.1378	.97
	1218		75	8874	.1288	.90	20	9635	.1398	.98
	3074		50	9220	.1338	.94	10	9774	.1418	1.00
			40	9358	.1358	.95	00	9912	.1438	1.01
1J212611	100	.11005	100	2849	.0414	.38	30	7794	.1131	1.03
	407		75	4615	.0670	.61	20	8500	.1233	1.12
	2376		50	6381	.0926	.84	10	9206	.1336	1.21
			40	7087	.1028	.93	00	9912	.1438	1.31

TENNECO	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	42
18 22711	100	.10166	100	24833	.3604	3.55	30	14389	.2088	2.05	
	3547		75	21103	.3062	3.01	20	12897	.1871	1.84	
	2195		50	17373	.2521	2.48	10	11404	.1655	1.63	
			40	15881	.2305	2.27	00	9912	.1438	1.41	
1J272611	100	.11579	100	4453	.0646	.56	30	8275	.1201	1.04	
	636		75	5818	.0844	.73	20	8820	.1280	1.11	
	2500		50	7183	.1042	.90	10	9366	.1359	1.17	
			40	7729	.1122	.97	00	9912	.1438	1.24	
80272913	100	.17008	100	30056	.4362	2.56	30	15956	.2315	1.36	
	4293		75	25020	.3631	2.13	20	13941	.2023	1.19	
	3672		50	19984	.2900	1.71	10	11927	.1731	1.02	
			40	17970	.2608	1.53	00	9912	.1438	.85	
91282913	100	.18008	100	12917	.1874	1.04	30	10814	.1569	.87	
	1845		75	12166	.1765	.98	20	10513	.1526	.85	
	3888		50	11415	.1656	.92	10	10213	.1482	.82	
			40	11114	.1613	.90	00	9912	.1438	.80	
11F282913	100	.15507	100	1211	.0176	.11	30	7302	.1060	.68	
	173		75	3386	.0491	.32	20	8172	.1186	.76	
	3348		50	5562	.0807	.52	10	9042	.1312	.85	
			40	6432	.0933	.60	00	9912	.1438	.93	
12C332913	100	.15507	100	6238	.0905	.58	30	8810	.1278	.82	
	891		75	7157	.1039	.67	20	9178	.1332	.86	
	3348		50	8075	.1172	.76	10	9545	.1385	.89	
			40	8443	.1225	.79	00	9912	.1438	.93	
1D272913	100	.17600	100	13613	.0998	17.61	30	71023	.0306	5.86	
	30511		75	62688	.3608	13.41	20	50653	.7350	4.18	
	3800		50	11763	.6218	9.21	10	30282	.4394	2.50	
			40	91393	.3262	7.54	00	9912	.1438	.82	
10 12912	100	.16211	100	10957	.1590	.98	30	10226	.1484	.92	
	1565		75	10696	.1552	.96	20	10121	.1469	.91	
	3500		50	10435	.1514	.93	10	10017	.1454	.90	
			40	10330	.1499	.92	00	9912	.1438	.89	
1D102912	100	.16211	100	9053	.1314	.81	30	9654	.1401	.86	
	1293		75	9267	.1345	.83	20	9740	.1413	.87	
	3500		50	9482	.1376	.85	10	9826	.1426	.88	
			40	9568	.1389	.86	00	9912	.1438	.89	
1D142912	100	.13895	100	46509	.6749	4.86	30	20891	.3032	2.18	
	6643		75	37360	.5421	3.90	20	17232	.2501	1.80	
	3000		50	28211	.4094	2.95	10	13572	.1970	1.42	
			40	24551	.3563	2.56	00	9912	.1438	1.03	

TENNECO	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1D112912	100	.15285	100	5433	.0788	.52	30	8569	.1243	.81
	776		75	6553	.0951	.62	20	9017	.1308	.86
	3300		50	7673	.1113	.73	10	9464	.1373	.90
			40	8121	.1178	.77	00	9912	.1438	.94
1P252911	100	.16674	100	15116	.2193	1.32	30	11473	.1665	1.00
	2159		75	13815	.2005	1.20	20	10953	.1589	.95
	3600		50	12514	.1816	1.09	10	10433	.1514	.91
			40	11994	.1740	1.04	00	9912	.1438	.86
1D272611	100	.19416	100	19526	.2834	1.46	30	12797	.1857	.96
	2789		75	17123	.2485	1.28	20	11835	.1717	.88
	4192		50	14719	.2136	1.10	10	10874	.1578	.81
			40	13758	.1996	1.03	00	9912	.1438	.74
1E212913	100	.08800	100	833	.0121	.14	30	7189	.1043	1.19
	119		75	3103	.0450	.51	20	8097	.1175	1.34
	1900		50	5373	.0780	.89	10	9004	.1307	1.49
			40	6281	.0911	1.04	00	9912	.1438	1.63
1C192910	100	.10482	100	7092	.1029	.98	30	9066	.1316	1.26
	1013		75	7797	.1131	1.08	20	9348	.1357	1.29
	2263		50	8502	.1234	1.18	10	9630	.1398	1.33
			40	8784	.1275	1.22	00	9912	.1438	1.37
1A 927 9	100	.11579	100	5230	.0759	.66	30	8508	.1235	1.07
	747		75	6400	.0929	.80	20	8976	.1303	1.13
	2500		50	7571	.1099	.95	10	9444	.1370	1.18
			40	8039	.1167	1.01	00	9912	.1438	1.24
1C252911	100	.12371	100	15501	.2249	1.82	30	11589	.1682	1.36
	2214		75	14103	.2047	1.65	20	11030	.1601	1.29
	2671		50	12707	.1844	1.49	10	10471	.1520	1.23
			40	12148	.1763	1.43	00	9912	.1438	1.16
1D302910	100	.12042	100	15025	.2180	1.81	30	11446	.1661	1.38
	2146		75	13746	.1995	1.66	20	10935	.1587	1.32
	2600		50	12468	.1809	1.50	10	10424	.1513	1.26
			40	11957	.1735	1.44	00	9912	.1438	1.19
1I242911	100	.17749	100	13162	.1910	1.08	30	10887	.1580	.89
	1880		75	12350	.1792	1.01	20	10562	.1533	.86
	3832		50	11537	.1674	.94	10	10237	.1486	.84
			40	11212	.1627	.92	00	9912	.1438	.81
TEXACO INC										
1F123012	100	.16211	100	1337	.0194	.12	30	7340	.1065	.66
	191		75	3481	.0505	.31	20	8197	.1190	.73
	3500		50	5625	.0816	.50	10	9055	.1314	.81
			40	6482	.0941	.58	00	9912	.1438	.89

TEXACO INC	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1P353012	100	.13432	100	5370	.0779	.58	30	8550	.1241	.92
	767		75	6505	.0944	.70	20	9004	.1307	.97
	2900		50	7641	.1109	.83	10	9458	.1373	1.02
			40	8095	.1175	.87	00	9912	.1438	1.07
1M203012	100	.08337	100	5307	.0770	.92	30	8531	.1238	1.48
	758		75	6458	.0937	1.12	20	8991	.1305	1.57
	1800		50	7610	.1104	1.32	10	9452	.1372	1.65
			40	8070	.1171	1.40	00	9912	.1438	1.72
1M213012	100	.08068	100	2247	.0326	.40	30	7613	.1105	1.37
	321		75	4164	.0604	.75	20	8379	.1216	1.51
	1742		50	6080	.0882	1.09	10	9146	.1327	1.64
			40	6846	.0994	1.23	00	9912	.1438	1.78
TIDEWATER										
1E242911	100	.28443	100	15102	.2191	.77	30	11469	.1664	.59
	2157		75	13804	.2003	.70	20	10950	.1589	.56
	6141		50	12507	.1815	.64	10	10431	.1514	.53
			40	11988	.1740	.61	00	9912	.1438	.51
1F182910	100	.28444	100	7330	.1064	.37	30	9138	.1326	.47
	1047		75	7976	.1157	.41	20	9396	.1363	.48
	6141		50	8621	.1251	.44	10	9654	.1401	.49
			40	8880	.1289	.45	00	9912	.1438	.51
1A192910	100	.16966	100	13855	.2011	1.19	30	11095	.1610	.95
	1979		75	12870	.1868	1.10	20	10701	.1553	.92
	3663		50	11884	.1725	1.02	10	10307	.1496	.88
			40	11490	.1667	.98	00	9912	.1438	.85
1J122911	100	.11296	100	9053	.1314	1.16	30	9654	.1401	1.24
	1293		75	9267	.1345	1.19	20	9740	.1413	1.25
	2439		50	9482	.1376	1.22	10	9826	.1426	1.26
			40	9568	.1389	1.23	00	9912	.1438	1.27
1H132911	100	.23159	100	5783	.0839	.36	30	8674	.1259	.54
	826		75	6815	.0989	.43	20	9087	.1319	.57
	5000		50	7848	.1139	.49	10	9499	.1379	.60
			40	8261	.1199	.52	00	9912	.1438	.62
J G TURNER										
11D1526 9	100	.07874	100	3991	.0579	.74	30	8136	.1181	1.50
	570		75	5471	.0794	1.01	20	8728	.1267	1.61
	1700		50	6952	.1009	1.28	10	9320	.1353	1.72
			40	7544	.1095	1.39	00	9912	.1438	1.83
12J1526 9	100	.07873	100	10936	.1587	2.02	30	10219	.1483	1.88
	1562		75	10680	.1550	1.97	20	10117	.1468	1.86
	1700		50	10424	.1513	1.92	10	10015	.1453	1.85
			40	10322	.1498	1.90	00	9912	.1438	1.83

J G TURNER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	45
13E1426 9	100	.07874	100	6784	.0984	1.25	30	8974	.1302	1.65	
	969		75	7566	.1098	1.39	20	9287	.1348	1.71	
	1700		50	8348	.1211	1.54	10	9600	.1393	1.77	
			40	8661	.1257	1.60	00	9912	.1438	1.83	
14L1426 9	100	.07874	100	8380	.1216	1.54	30	9453	.1372	1.74	
	1197		75	8763	.1272	1.62	20	9606	.1394	1.77	
	1700		50	9146	.1327	1.69	10	9759	.1416	1.80	
			40	9300	.1350	1.71	00	9912	.1438	1.83	
1N172910	100	.19963	100	16222	.2354	1.18	30	11805	.1713	.86	
	2317		75	14644	.2125	1.06	20	11174	.1622	.81	
	4310		50	13067	.1896	.95	10	10543	.1530	.77	
			40	12436	.1805	.90	00	9912	.1438	.72	
1L 82910	100	.30439	100	7071	.1026	.34	30	9060	.1315	.43	
	1010		75	7781	.1129	.37	20	9344	.1356	.45	
	6572		50	8492	.1232	.40	10	9628	.1397	.46	
			40	8776	.1274	.42	00	9912	.1438	.47	
2G 82910	100	.13474	100	8296	.1204	.89	30	9428	.1368	1.02	
	1185		75	8700	.1263	.94	20	9589	.1392	1.03	
	2909		50	9104	.1321	.98	10	9751	.1415	1.05	
			40	9266	.1345	1.00	00	9912	.1438	1.07	
2H172910	100	.13974	100	9872	.1433	1.03	30	9900	.1437	1.03	
	1410		75	9882	.1434	1.03	20	9904	.1437	1.03	
	3017		50	9892	.1435	1.03	10	9908	.1438	1.03	
			40	9896	.1436	1.03	00	9912	.1438	1.03	
WESTERN NT											
1M322811	100	.15284	100	8226	.1194	.78	30	9407	.1365	.89	
	1175		75	8648	.1255	.82	20	9575	.1390	.91	
	3300		50	9069	.1316	.86	10	9744	.1414	.93	
			40	9238	.1341	.88	00	9912	.1438	.94	
1C102711	100	.15813	100	5671	.0823	.52	30	8640	.1254	.79	
	810		75	6731	.0977	.62	20	9064	.1315	.83	
	3414		50	7792	.1131	.72	10	9488	.1377	.87	
			40	8216	.1192	.75	00	9912	.1438	.91	
2M 32711	100	.13895	100	9802	.1422	1.02	30	9879	.1434	1.03	
	1400		75	9829	.1426	1.03	20	9890	.1435	1.03	
	3000		50	9857	.1430	1.03	10	9901	.1437	1.03	
			40	9868	.1432	1.03	00	9912	.1438	1.03	
WILSHIRE											
1D2725 9	102	.11116	100	2114	.0307	.28	30	7712	.1119	1.01	
	296		75	4113	.0597	.54	20	8511	.1235	1.11	
	2400		50	6112	.0887	.80	10	9311	.1351	1.22	
			40	6912	.1003	.90	00	10111	.1467	1.32	

WILSHIRE	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	46
2N2125 9	100	.09263	100	2891	.0420	.45	30	7806	.1133	1.22	
	413		75	4647	.0674	.73	20	8508	.1235	1.33	
	2000		50	6402	.0929	1.00	10	9210	.1337	1.44	
			40	7104	.1031	1.11	00	9912	.1438	1.55	
PAN AM PET											
960182912	100	.26563	100	22593	.3279	1.23	30	13717	.1990	.75	
	3227		75	19423	.2819	1.06	20	12448	.1806	.68	
	5735		50	16253	.2358	.89	10	11180	.1622	.61	
			40	14985	.2174	.82	00	9912	.1438	.54	
102C132913	100	.26401	100	5867	.0851	.32	30	8699	.1262	.48	
	838		75	6878	.0998	.38	20	9103	.1321	.50	
	5700		50	7890	.1145	.43	10	9508	.1380	.52	
			40	8294	.1204	.46	00	9912	.1438	.54	
106A242913	100	.26400	100	18392	.2669	1.01	30	12456	.1808	.68	
	2627		75	16272	.2361	.89	20	11608	.1685	.64	
	5700		50	14152	.2054	.78	10	10760	.1561	.59	
			40	13304	.1931	.73	00	9912	.1438	.54	
107D192912	100	.26401	100	6980	.1013	.38	30	9033	.1311	.50	
	997		75	7713	.1119	.42	20	9326	.1353	.51	
	5700		50	8446	.1226	.46	10	9619	.1396	.53	
			40	8740	.1268	.48	00	9912	.1438	.54	
108J132913	100	.26864	100	12581	.1826	.68	30	10713	.1555	.58	
	1797		75	11914	.1729	.64	20	10446	.1516	.56	
	5800		50	11247	.1632	.61	10	10179	.1477	.55	
			40	10980	.1593	.59	00	9912	.1438	.54	
109M182912	100	.26562	100	2359	.0342	.13	30	7647	.1110	.42	
	337		75	4248	.0616	.23	20	8402	.1219	.46	
	5735		50	6136	.0890	.34	10	9157	.1329	.50	
			40	6891	.1000	.38	00	9912	.1438	.54	
110G192912	100	.22696	100	20415	.2963	1.31	30	13063	.1896	.84	
	2916		75	17790	.2582	1.14	20	12013	.1743	.77	
	4900		50	15164	.2201	.97	10	10963	.1591	.70	
			40	14114	.2048	.90	00	9912	.1438	.63	
111K202912	100	.17600	100	13694	.1987	1.13	30	11047	.1603	.91	
	1956		75	12749	.1850	1.05	20	10669	.1548	.88	
	3800		50	11803	.1713	.97	10	10291	.1493	.85	
			40	11425	.1658	.94	00	9912	.1438	.82	
PAN AM PET											
1L 92611	100	.12506	100	28838	.4185	3.35	30	15590	.2262	1.81	
	4119		75	24106	.3498	2.80	20	13697	.1988	1.59	
	2700		50	19375	.2812	2.25	10	11805	.1713	1.37	
			40	17483	.2537	2.03	00	9912	.1438	1.15	

PAN AM PET	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
2N102611	100	.13895	100	1729	.0251	.18	30	7457	.1082	.78
	247		75	3775	.0548	.39	20	8276	.1201	.86
	3000		50	5821	.0845	.61	10	9094	.1320	.95
			40	6639	.0963	.69	00	9912	.1438	1.03
PAN AM PET										
11272911	100	.17137	100	13008	.1888	1.10	30	10841	.1573	.92
	1858		75	12234	.1775	1.04	20	10532	.1528	.89
	3700		50	11460	.1663	.97	10	10222	.1483	.87
			40	11151	.1618	.94	00	9912	.1438	.84
ASPEN CRUD										
1J 53113	100	.04169	100	532	.0077	.18	30	7098	.1030	2.47
	76		75	2877	.0418	1.00	20	8036	.1166	2.80
	900		50	5222	.0758	1.82	10	8974	.1302	3.12
			40	6160	.0894	2.14	00	9912	.1438	3.45
ATLANTIC										
1N162910	100	.08800	100	7764	.1127	1.28	30	9268	.1345	1.53
	1109		75	8301	.1205	1.37	20	9483	.1376	1.56
	1900		50	8838	.1283	1.46	10	9698	.1407	1.60
			40	9053	.1314	1.49	00	9912	.1438	1.63
1G362911	100	.17137	100	11734	.1703	.99	30	10459	.1518	.89
	1676		75	11278	.1637	.96	20	10277	.1491	.87
	3700		50	10823	.1571	.92	10	10095	.1465	.85
			40	10641	.1544	.90	00	9912	.1438	.84
AZTEC OIL										
7I142811	100	.21412	100	50289	.7298	3.41	30	22026	.3196	1.49
	7183		75	40195	.5833	2.72	20	17988	.2610	1.22
	4623		50	30101	.4368	2.04	10	13950	.2024	.95
			40	26063	.3782	1.77	00	9912	.1438	.67
8D142811	100	.18064	100	22355	.3244	1.80	30	13645	.1980	1.10
	3193		75	19244	.2793	1.55	20	12401	.1800	1.00
	3900		50	16134	.2341	1.30	10	11157	.1619	.90
			40	14889	.2161	1.20	00	9912	.1438	.80
9K162810	100	.24349	100	31918	.4632	1.90	30	16514	.2396	.98
	4559		75	26417	.3833	1.57	20	14314	.2077	.85
	5257		50	20915	.3035	1.25	10	12113	.1758	.72
			40	18715	.2716	1.12	00	9912	.1438	.59
10M152810	100	.27595	100	25610	.3716	1.35	30	14622	.2122	.77
	3658		75	21686	.3147	1.14	20	13052	.1894	.69
	5958		50	17761	.2577	.93	10	11482	.1666	.60
			40	16192	.2350	.85	00	9912	.1438	.52
11A152810	100	.31385	100	36413	.5284	1.68	30	17863	.2592	.83
	5201		75	29788	.4323	1.38	20	15213	.2208	.70
	6776		50	23163	.3361	1.07	10	12562	.1823	.58
			40	20513	.2977	.95	00	9912	.1438	.46

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	48
12A162810	100	.26863	100	26927	.3907	1.45	30	15017	.2179	.81	
	3846		75	22673	.3290	1.22	20	13315	.1932	.72	
	5800		50	18419	.2673	1.00	10	11614	.1685	.63	
			40	16718	.2426	.90	00	9912	.1438	.54	
15M3129 9	78	.08337	100	7798	.1132	1.36	30	7752	.1125	1.35	
	1428		75	7781	.1129	1.35	20	7745	.1124	1.35	
	1800		50	7765	.1127	1.35	10	7738	.1123	1.35	
			40	7758	.1126	1.35	00	7732	.1122	1.35	
16M3029 9	84	.06948	100	4964	.0720	1.04	30	7318	.1062	1.53	
	844		75	5804	.0842	1.21	20	7654	.1111	1.60	
	1500		50	6645	.0964	1.39	10	7990	.1159	1.67	
			40	6981	.1013	1.46	00	8326	.1208	1.74	
3L 62911	96	.15599	100	6419	.0931	.60	30	8587	.1246	.80	
	955		75	7193	.1044	.67	20	8896	.1291	.83	
	3368		50	7967	.1156	.74	10	9206	.1336	.86	
			40	8277	.1201	.77	00	9516	.1381	.89	
1H 72911	100	.16137	100	8485	.1231	.76	30	9484	.1376	.85	
	1212		75	8842	.1283	.80	20	9627	.1397	.87	
	3484		50	9199	.1335	.83	10	9770	.1418	.88	
			40	9342	.1356	.84	00	9912	.1438	.89	
4B182911	100	.19917	100	8436	.1224	.61	30	9470	.1374	.69	
	1205		75	8805	.1278	.64	20	9617	.1396	.70	
	4300		50	9174	.1331	.67	10	9765	.1417	.71	
			40	9322	.1353	.68	00	9912	.1438	.72	
6L182911	100	.19916	100	7302	.1060	.53	30	9129	.1325	.67	
	1043		75	7955	.1154	.58	20	9390	.1363	.68	
	4300		50	8607	.1249	.63	10	9651	.1401	.70	
			40	8868	.1287	.65	00	9912	.1438	.72	
1B202911	100	.16211	100	8289	.1203	.74	30	9426	.1368	.84	
	1184		75	8695	.1262	.78	20	9588	.1391	.86	
	3500		50	9101	.1321	.81	10	9750	.1415	.87	
			40	9263	.1344	.83	00	9912	.1438	.89	
3K 52910	100	.08800	100	3627	.0526	.60	30	8027	.1165	1.32	
	518		75	5198	.0754	.86	20	8655	.1256	1.43	
	1900		50	6770	.0982	1.12	10	9284	.1347	1.53	
			40	7398	.1074	1.22	00	9912	.1438	1.63	
4G 42910	100	.07874	100	5503	.0799	1.01	30	8590	.1246	1.58	
	786		75	6605	.0959	1.22	20	9031	.1310	1.66	
	1700		50	7708	.1118	1.42	10	9471	.1374	1.74	
			40	8149	.1182	1.50	00	9912	.1438	1.83	

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
11L 727 9	100	.12755	100	13897	.2017	1.58	30	11108	.1612	1.26
	1985		75	12901	.1872	1.47	20	10709	.1554	1.22
	2754		50	11905	.1728	1.35	10	10311	.1496	1.17
			40	11506	.1670	1.31	00	9912	.1438	1.13
12H 727 9	98	.08504	100	17942	.2604	3.06	30	12182	.1768	2.08
	2615		75	15885	.2305	2.71	20	11360	.1648	1.94
	1836		50	13828	.2007	2.36	10	10537	.1529	1.80
			40	13005	.1887	2.22	00	9714	.1410	1.66
13A122710	100	.09379	100	11685	.1696	1.81	30	10444	.1516	1.62
	1669		75	11242	.1631	1.74	20	10267	.1490	1.59
	2025		50	10799	.1567	1.67	10	10090	.1464	1.56
			40	10621	.1541	1.64	00	9912	.1438	1.53
14M122710	100	.12969	100	7127	.1034	.80	30	9077	.1317	1.02
	1018		75	7823	.1135	.88	20	9355	.1358	1.05
	2800		50	8520	.1236	.95	10	9634	.1398	1.08
			40	8798	.1277	.98	00	9912	.1438	1.11
15B 627 9	122	.07656	100	9472	.1375	1.80	30	11307	.1641	2.14
	1109		75	10128	.1470	1.92	20	11569	.1679	2.19
	1653		50	10783	.1565	2.04	10	11831	.1717	2.24
			40	11045	.1603	2.09	00	12093	.1755	2.29
16K 627 9	109	.07230	100	7677	.1114	1.54	30	9866	.1432	1.98
	1006		75	8459	.1228	1.70	20	10179	.1477	2.04
	1561		50	9241	.1341	1.85	10	10492	.1523	2.11
			40	9554	.1386	1.92	00	10805	.1568	2.17
17N 527 9	105	.10204	100	6815	.0989	.97	30	9330	.1354	1.33
	927		75	7713	.1119	1.10	20	9689	.1406	1.38
	2203		50	8611	.1250	1.23	10	10049	.1458	1.43
			40	8971	.1302	1.28	00	10408	.1510	1.48
18B 527 9	100	.08078	100	2933	.0426	.53	30	7819	.1135	1.41
	419		75	4678	.0679	.84	20	8517	.1236	1.53
	1744		50	6423	.0932	1.15	10	9215	.1337	1.66
			40	7121	.1033	1.28	00	9912	.1438	1.78
14K102910	100	.07410	100	4446	.0645	.87	30	8272	.1200	1.62
	635		75	5812	.0843	1.14	20	8819	.1280	1.73
	1600		50	7179	.1042	1.41	10	9366	.1359	1.83
			40	7726	.1121	1.51	00	9912	.1438	1.94
15M 32910	100	.06948	100	5328	.0773	1.11	30	8537	.1239	1.78
	761		75	6474	.0939	1.35	20	8996	.1305	1.88
	1500		50	7620	.1106	1.59	10	9454	.1372	1.97
			40	8079	.1172	1.69	00	9912	.1438	2.07

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	50
16H 32910	100	.06484	100	4719	.0685	1.06	30	8354	.1212	1.87	
	674		75	6017	.0873	1.35	20	8874	.1288	1.99	
	1400		50	7316	.1062	1.64	10	9393	.1363	2.10	
			40	7835	.1137	1.75	00	9912	.1438	2.22	
1B292810	100	.16674	100	18826	.2732	1.64	30	12587	.1826	1.10	
	2689		75	16598	.2409	1.44	20	11695	.1697	1.02	
	3600		50	14369	.2085	1.25	10	10804	.1568	.94	
			40	13478	.1956	1.17	00	9912	.1438	.86	
4J2927 9	100	.09356	100	6343	.0920	.98	30	8842	.1283	1.37	
	906		75	7235	.1050	1.12	20	9199	.1335	1.43	
	2020		50	8128	.1179	1.26	10	9555	.1387	1.48	
			40	8485	.1231	1.32	00	9912	.1438	1.54	
5C2927 9	100	.21459	100	2450	.0356	.17	30	7674	.1114	.52	
	350		75	4316	.0626	.29	20	8420	.1222	.57	
	4633		50	6181	.0897	.42	10	9166	.1330	.62	
			40	6928	.1005	.47	00	9912	.1438	.67	
2C232811	100	.20843	100	27095	.3932	1.89	30	15067	.2186	1.05	
	3870		75	22799	.3308	1.59	20	13349	.1937	.93	
	4500		50	18503	.2685	1.29	10	11631	.1688	.81	
			40	16785	.2436	1.17	00	9912	.1438	.69	
1P322911	98	.11834	100	13887	.2015	1.70	30	10966	.1591	1.34	
	2024		75	12844	.1864	1.58	20	10549	.1531	1.29	
	2555		50	11801	.1712	1.45	10	10131	.1470	1.24	
			40	11383	.1652	1.40	00	9714	.1410	1.19	
4K282911	100	.18526	100	8324	.1208	.65	30	9436	.1369	.74	
	1189		75	8721	.1266	.68	20	9595	.1392	.75	
	4000		50	9118	.1323	.71	10	9754	.1415	.76	
			40	9277	.1346	.73	00	9912	.1438	.78	
5I292911	100	.17138	100	5559	.0807	.47	30	8606	.1249	.73	
	794		75	6647	.0965	.56	20	9042	.1312	.77	
	3700		50	7736	.1123	.66	10	9477	.1375	.80	
			40	8171	.1186	.69	00	9912	.1438	.84	
14F232810	100	.18939	100	25722	.3733	1.97	30	14655	.2127	1.12	
	3674		75	21770	.3159	1.67	20	13074	.1897	1.00	
	4089		50	17817	.2586	1.37	10	11493	.1668	.88	
			40	16236	.2356	1.24	00	9912	.1438	.76	
15N142810	100	.22185	100	47559	.6902	3.11	30	21206	.3077	1.39	
	6793		75	38147	.5536	2.50	20	17442	.2531	1.14	
	4790		50	28736	.4170	1.88	10	13677	.1985	.89	
			40	24971	.3624	1.63	00	9912	.1438	.65	

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
16L242810	100	.11904	100	27347	.3968	3.33	30	15143	.2197	1.85
	3906		75	22988	.3336	2.80	20	13399	.1944	1.63
	2570		50	18630	.2703	2.27	10	11656	.1691	1.42
			40	16886	.2450	2.06	00	9912	.1438	1.21
17A242810	100	.11361	100	11230	.1630	1.43	30	10308	.1496	1.32
	1604		75	10900	.1582	1.39	20	10176	.1477	1.30
	2453		50	10571	.1534	1.35	10	10044	.1458	1.28
			40	10439	.1515	1.33	00	9912	.1438	1.27
18A132810	100	.14609	100	13687	.1986	1.36	30	11045	.1603	1.10
	1955		75	12743	.1849	1.27	20	10667	.1548	1.06
	3154		50	11800	.1712	1.17	10	10290	.1493	1.02
			40	11422	.1658	1.13	00	9912	.1438	.98
19G142810	100	.22232	100	41433	.6013	2.70	30	19369	.2811	1.26
	5918		75	33553	.4869	2.19	20	16217	.2353	1.06
	4800		50	25673	.3725	1.63	10	13064	.1896	.85
			40	22521	.3268	1.47	00	9912	.1438	.65
20N132810	100	.14821	100	16341	.2371	1.60	30	11841	.1718	1.16
	2334		75	14734	.2138	1.44	20	11198	.1625	1.10
	3200		50	13127	.1905	1.29	10	10555	.1532	1.03
			40	12484	.1812	1.22	00	9912	.1438	.97
1M172911	100	.19453	100	8359	.1213	.62	30	9447	.1371	.70
	1194		75	8748	.1269	.65	20	9602	.1393	.72
	4200		50	9136	.1326	.68	10	9757	.1416	.73
			40	9291	.1348	.69	00	9912	.1438	.74
1B192911	100	.19917	100	8387	.1217	.61	30	9455	.1372	.69
	1198		75	8769	.1272	.64	20	9607	.1394	.70
	4300		50	9150	.1328	.67	10	9760	.1416	.71
			40	9302	.1350	.68	00	9912	.1438	.72
1J 22912	100	.16210	100	5167	.0750	.46	30	8489	.1232	.76
	738		75	6353	.0922	.57	20	8963	.1301	.80
	3500		50	7540	.1094	.67	10	9438	.1370	.85
			40	8014	.1163	.72	00	9912	.1438	.89
8H192810	100	.20565	100	26156	.3796	1.85	30	14786	.2146	1.04
	3736		75	22095	.3206	1.56	20	13161	.1910	.93
	4440		50	18034	.2617	1.27	10	11537	.1674	.81
			40	16410	.2381	1.16	00	9912	.1438	.70
6M192810	100	.18397	100	13435	.1950	1.06	30	10969	.1592	.87
	1919		75	12554	.1822	.99	20	10617	.1541	.84
	3972		50	11674	.1694	.92	10	10265	.1490	.81
			40	11322	.1643	.89	00	9912	.1438	.78

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1B302810	101	.17137	100	16122	.2340	1.37	30	11845	.1719	1.00
	2280		75	14595	.2118	1.24	20	11234	.1630	.95
	3700		50	13067	.1896	1.11	10	10623	.1541	.90
			40	12456	.1808	1.06	00	10012	.1453	.85
18K1828 9	100	.13896	100	11587	.1681	1.21	30	10415	.1511	1.09
	1655		75	11168	.1621	1.17	20	10247	.1487	1.07
	3000		50	10750	.1560	1.12	10	10080	.1463	1.05
			40	10582	.1536	1.11	00	9912	.1438	1.03
19B1828 9	100	.11139	100	9242	.1341	1.20	30	9711	.1409	1.26
	1320		75	9409	.1365	1.23	20	9778	.1419	1.27
	2405		50	9577	.1390	1.25	10	9845	.1429	1.28
			40	9644	.1399	1.26	00	9912	.1438	1.29
20A1928 9	94	.10671	100	6713	.0974	.91	30	8536	.1239	1.16
	1020		75	7364	.1069	1.00	20	8797	.1277	1.20
	2304		50	8015	.1163	1.09	10	9057	.1314	1.23
			40	8276	.1201	1.13	00	9318	.1352	1.27
21L1928 9	94	.13460	100	18486	.2683	1.99	30	12068	.1751	1.30
	2809		75	16194	.2350	1.75	20	11151	.1618	1.20
	2906		50	13902	.2017	1.50	10	10235	.1485	1.10
			40	12985	.1884	1.40	00	9318	.1352	1.00
22N 728 9	108	.10208	100	6737	.0978	.96	30	9515	.1381	1.35
	891		75	7729	.1122	1.10	20	9912	.1438	1.41
	2204		50	8721	.1266	1.24	10	10309	.1496	1.47
			40	9118	.1323	1.30	00	10705	.1554	1.52
23L1728 9	100	.13923	100	6686	.0970	.70	30	8945	.1298	.93
	955		75	7493	.1087	.78	20	9267	.1345	.97
	3006		50	8299	.1204	.86	10	9590	.1392	1.00
			40	8622	.1251	.90	00	9912	.1438	1.03
2G323012	100	.08337	100	6406	.0930	1.12	30	8861	.1286	1.54
	915		75	7283	.1057	1.27	20	9211	.1337	1.60
	1800		50	8159	.1184	1.42	10	9562	.1388	1.66
			40	8510	.1235	1.48	00	9912	.1438	1.72
2M212911	100	.12908	100	14590	.2117	1.64	30	11316	.1642	1.27
	2084		75	13421	.1948	1.51	20	10848	.1574	1.22
	2787		50	12251	.1778	1.38	10	10380	.1506	1.17
			40	11784	.1710	1.32	00	9912	.1438	1.11
5G 827 9	100	.07657	100	4460	.0647	.84	30	8277	.1201	1.57
	637		75	5823	.0845	1.10	20	8822	.1280	1.67
	1653		50	7186	.1043	1.36	10	9367	.1359	1.77
			40	7731	.1122	1.47	00	9912	.1438	1.88

AZTEC OIL	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	53
6N 827 9	100	.06377	100	5167	.0750	1.18	30	8489	.1232	1.93	
	738		75	6353	.0922	1.45	20	8963	.1301	2.04	
	1377		50	7540	.1094	1.72	10	9738	.1370	2.15	
			40	8014	.1163	1.82	00	9912	.1438	2.25	
7K 927 9	100	.09357	100	2240	.0325	.35	30	7611	.1104	1.18	
	320		75	4158	.0603	.64	20	8378	.1216	1.30	
	2020		50	6076	.0882	.94	10	9145	.1327	1.42	
			40	6844	.0993	1.06	00	9912	.1438	1.54	
2M172711	100	.15812	100	6287	.0912	.58	30	8825	.1281	.81	
	898		75	7193	.1044	.66	20	9187	.1333	.84	
	3414		50	8100	.1175	.74	10	9550	.1386	.88	
			40	8462	.1228	.78	00	9912	.1438	.91	
1D 22912	100	.15285	100	6854	.0995	.65	30	8995	.1305	.85	
	979		75	7619	.1106	.72	20	9301	.1350	.88	
	3300		50	8383	.1217	.80	10	9607	.1394	.91	
			40	8689	.1261	.82	00	9912	.1438	.94	
BRIT-AMER											
2L272711	100	.11579	100	10614	.1540	1.33	30	10123	.1469	1.27	
	1516		75	10438	.1515	1.31	20	10053	.1459	1.26	
	2500		50	10263	.1489	1.29	10	9983	.1449	1.25	
			40	10193	.1479	1.28	00	9912	.1438	1.24	
3D262711	100	.12505	100	6966	.1011	.81	30	9029	.1310	1.05	
	995		75	7703	.1118	.89	20	9323	.1353	1.08	
	2700		50	8439	.1225	.98	10	9618	.1396	1.12	
			40	8734	.1267	1.01	00	9912	.1438	1.15	
5B152711	100	.11293	100	2429	.0353	.31	30	7668	.1113	.99	
	347		75	4300	.0624	.55	20	8416	.1221	1.08	
	2438		50	6171	.0895	.79	10	9164	.1330	1.18	
			40	6919	.1004	.89	00	9912	.1438	1.27	
9E232711	100	.13895	100	10173	.1476	1.06	30	9990	.1450	1.04	
	1453		75	10108	.1467	1.06	20	9964	.1446	1.04	
	3000		50	10043	.1457	1.05	10	9938	.1442	1.04	
			40	10017	.1454	1.05	00	9912	.1438	1.03	
CAULKINS											
204P 926 6	100	.47660	100	12364	.1794	.38	30	10648	.1545	.32	
	1766		75	11751	.1705	.36	20	10403	.1510	.32	
	10290		50	11138	.1616	.34	10	10158	.1474	.31	
			40	10893	.1581	.33	00	9912	.1438	.30	
244A1426 6	100	.32222	100	15046	.2183	.68	30	11452	.1662	.52	
	2149		75	13762	.1997	.62	20	10939	.1587	.49	
	6957		50	12479	.1811	.56	10	10426	.1513	.47	
			40	11966	.1736	.54	00	9912	.1438	.45	

CAULKINS	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	54
140A1126 6	100	.31959	100	12546	.1821	.57	30	10703	.1553	.49	
	1792		75	11888	.1725	.54	20	10439	.1515	.47	
	6900		50	11229	.1630	.51	10	10176	.1477	.46	
			40	10966	.1591	.50	00	9912	.1438	.45	
58A 326 6	100	.26178	100	3620	.0525	.20	30	8025	.1164	.44	
	517		75	5193	.0754	.29	20	8654	.1256	.48	
	5652		50	6766	.0982	.38	10	9283	.1347	.51	
			40	7395	.1073	.41	00	9912	.1438	.55	
83J 526 6	100	.28193	100	6301	.0914	.32	30	8829	.1281	.45	
	900		75	7204	.1045	.37	20	9190	.1334	.47	
	6087		50	8107	.1176	.42	10	9551	.1386	.49	
			40	8468	.1229	.44	00	9912	.1438	.51	
4A3327 6	100	.20255	100	5657	.0821	.41	30	8636	.1253	.62	
	808		75	6721	.0975	.48	20	9061	.1315	.65	
	4373		50	7785	.1130	.56	10	9487	.1377	.68	
			40	8210	.1191	.59	00	9912	.1438	.71	
8A3427 6	100	.18174	100	5083	.0738	.41	30	8464	.1228	.68	
	726		75	6290	.0913	.50	20	8946	.1298	.71	
	3924		50	7498	.1088	.60	10	9429	.1368	.75	
			40	7981	.1158	.64	00	9912	.1438	.79	
321M1526 6	100	.50949	100	21886	.3176	.62	30	13504	.1960	.38	
	3126		75	18892	.2742	.54	20	12307	.1786	.35	
	11000		50	15899	.2307	.45	10	11110	.1612	.32	
			40	14702	.2133	.42	00	9912	.1438	.28	
62A 226 6	100	.18527	100	8135	.1181	.64	30	9379	.1361	.73	
	1162		75	8580	.1245	.67	20	9557	.1387	.75	
	4000		50	9024	.1309	.71	10	9735	.1413	.76	
			40	9202	.1335	.72	00	9912	.1438	.78	
113M 226 6	100	.27790	100	8296	.1204	.43	30	9428	.1368	.49	
	1185		75	8700	.1263	.45	20	9589	.1392	.50	
	6000		50	9104	.1321	.48	10	9751	.1415	.51	
			40	9266	.1345	.48	00	9912	.1438	.52	
268H1626 6	100	.51685	100	5006	.0726	.14	30	8440	.1225	.24	
	715		75	6232	.0904	.17	20	8931	.1296	.25	
	11159		50	7459	.1082	.21	10	9422	.1367	.26	
			40	7950	.1154	.22	00	9912	.1438	.28	
233D1626 6	100	.47660	100	5769	.0837	.18	30	8669	.1258	.26	
	824		75	6805	.0987	.21	20	9084	.1318	.28	
	10290		50	7841	.1138	.24	10	9498	.1378	.29	
			40	8255	.1198	.25	00	9912	.1438	.30	

CAULKINS	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	55
COMPASS EX											
1B 42913	100	.30013	100	2702	.0392	.13	30	7749	.1125	.37	
	386		75	4505	.0654	.22	20	8470	.1229	.41	
	6480		50	6307	.0915	.30	10	9191	.1334	.44	
			40	7028	.1020	.34	00	9912	.1438	.48	
1M253013	100	.07411	100	10124	.1469	1.98	30	9976	.1448	1.95	
	1446		75	10071	.1461	1.97	20	9955	.1445	1.95	
	1600		50	10018	.1454	1.96	10	9934	.1442	1.95	
			40	9997	.1451	1.96	00	9912	.1438	1.94	
1M263013	100	.12307	100	5608	.0814	.66	30	8621	.1251	1.02	
	801		75	6684	.0970	.79	20	9052	.1314	1.07	
	2657		50	7760	.1126	.91	10	9482	.1376	1.12	
			40	8191	.1189	.97	00	9912	.1438	1.17	
2A263013	100	.07086	100	7610	.1104	1.56	30	9222	.1338	1.89	
	1087		75	8186	.1188	1.68	20	9452	.1372	1.94	
	1530		50	8761	.1271	1.79	10	9682	.1405	1.98	
			40	8992	.1305	1.84	00	9912	.1438	2.03	
CONGRESS											
4A352911	100	.15285	100	14002	.2032	1.33	30	11139	.1616	1.06	
	2000		75	12980	.1884	1.23	20	10730	.1557	1.02	
	3300		50	11957	.1735	1.14	10	10321	.1498	.98	
			40	11548	.1676	1.10	00	9912	.1438	.94	
CONSOL O G											
1K183112	100	.13371	100	9872	.1433	1.07	30	9900	.1437	1.07	
	1410		75	9882	.1434	1.07	20	9904	.1437	1.07	
	2887		50	9892	.1435	1.07	10	9908	.1438	1.08	
			40	9896	.1436	1.07	00	9912	.1438	1.08	
1H 43113	100	.09264	100	1638	.0238	.26	30	7430	.1078	1.16	
	234		75	3707	.0538	.58	20	8258	.1198	1.29	
	2000		50	5775	.0838	.90	10	9085	.1318	1.42	
			40	6603	.0958	1.03	00	9912	.1438	1.55	
1A253113	100	.09499	100	4096	.0594	.63	30	8167	.1185	1.25	
	585		75	5550	.0805	.85	20	8749	.1270	1.34	
	2051		50	7004	.1016	1.07	10	9331	.1354	1.43	
			40	7586	.1101	1.16	00	9912	.1438	1.51	
1M1526 7	100	.09264	100	1281	.0186	.20	30	7323	.1063	1.15	
	183		75	3439	.0499	.54	20	8186	.1188	1.28	
	2000		50	5597	.0812	.88	10	9049	.1313	1.42	
			40	6460	.0937	1.01	00	9912	.1438	1.55	
1J223113	100	.08337	100	3928	.0570	.68	30	8117	.1178	1.41	
	561		75	5424	.0787	.94	20	8715	.1265	1.52	
	1800		50	6920	.1004	1.20	10	9314	.1352	1.62	
			40	7519	.1091	1.31	00	9912	.1438	1.72	

CONSOL O G	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1K 93113	100	.06021	100	1442	.0209	.35	30	7371	.1070	1.78
	206		75	3560	.0517	.86	20	8218	.1193	1.98
	1300		50	5677	.0824	1.37	10	9065	.1316	2.19
			40	6524	.0947	1.57	00	9912	.1438	2.39
1N 73112	100	.09726	100	4964	.0720	.74	30	8428	.1223	1.26
	709		75	6201	.0900	.93	20	8923	.1295	1.33
	2100		50	7438	.1079	1.11	10	9418	.1367	1.41
			40	7933	.1151	1.18	00	9912	.1438	1.48
1B2426 8	100	.11830	100	4215	.0612	.52	30	8203	.1190	1.01
	602		75	5639	.0818	.69	20	8773	.1273	1.08
	2554		50	7064	.1025	.87	10	9343	.1356	1.15
			40	7633	.1108	.94	00	9912	.1438	1.22
2C1526 8	100	.06507	100	4803	.0697	1.07	30	8380	.1216	1.87
	686		75	6080	.0882	1.36	20	8890	.1290	1.98
	1405		50	7358	.1068	1.64	10	9401	.1364	2.10
			40	7869	.1142	1.76	00	9912	.1438	2.21
3A2626 8	100	.09264	100	1281	.0186	.20	30	7323	.1063	1.15
	183		75	3439	.0499	.54	20	8186	.1188	1.28
	2000		50	5597	.0812	.88	10	9049	.1313	1.42
			40	6460	.0937	1.01	00	9912	.1438	1.55
1G283113	100	.06947	100	3445	.0500	.72	30	7972	.1157	1.67
	492		75	5061	.0734	1.06	20	8619	.1251	1.80
	1500		50	6678	.0969	1.39	10	9266	.1345	1.94
			40	7325	.1063	1.53	00	9912	.1438	2.07
2G183112	100	.12506	100	12994	.1886	1.51	30	10837	.1573	1.26
	1856		75	12224	.1774	1.42	20	10529	.1528	1.22
	2700		50	11453	.1662	1.33	10	10221	.1483	1.19
			40	11145	.1617	1.29	00	9912	.1438	1.15
1H333113	100	.09263	100	3151	.0457	.49	30	7884	.1144	1.24
	450		75	4841	.0702	.76	20	8560	.1242	1.34
	2000		50	6531	.0948	1.02	10	9236	.1340	1.45
			40	7208	.1046	1.13	00	9912	.1438	1.55
1G103113	100	.10190	100	3067	.0445	.44	30	7859	.1140	1.12
	438		75	4778	.0693	.68	20	8543	.1240	1.22
	2200		50	6489	.0942	.92	10	9228	.1339	1.31
			40	7174	.1041	1.02	00	9912	.1438	1.41
1H 33113	100	.09726	100	4607	.0669	.69	30	8321	.1207	1.24
	658		75	5933	.0861	.89	20	8851	.1284	1.32
	2100		50	7260	.1053	1.08	10	9382	.1361	1.40
			40	7790	.1130	1.16	00	9912	.1438	1.48

CONSOL O G	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1H343113	100	.07874	100	7533	.1093	1.39	30	9199	.1335	1.70
	1076		75	8128	.1179	1.50	20	9437	.1369	1.74
	1700		50	8723	.1266	1.61	10	9674	.1404	1.78
			40	8961	.1300	1.65	00	9912	.1438	1.83
1K303112	100	.11987	100	6735	.0977	.82	30	8959	.1300	1.08
	962		75	7529	.1093	.91	20	9277	.1346	1.12
	2588		50	8324	.1208	1.01	10	9595	.1392	1.16
			40	8641	.1254	1.05	00	9912	.1438	1.20
1L 83112	100	.06948	100	9711	.1409	2.03	30	9852	.1430	2.06
	1387		75	9761	.1416	2.04	20	9872	.1433	2.06
	1500		50	9812	.1424	2.05	10	9892	.1436	2.07
			40	9832	.1427	2.05	00	9912	.1438	2.07
1J273113	100	.07873	100	4775	.0693	.88	30	8371	.1215	1.54
	682		75	6059	.0879	1.12	20	8885	.1289	1.64
	1700		50	7344	.1066	1.35	10	9399	.1364	1.73
			40	7857	.1140	1.45	00	9912	.1438	1.83
1D2226 7	100	.08801	100	2198	.0319	.36	30	7598	.1103	1.25
	314		75	4127	.0599	.68	20	8370	.1215	1.38
	1900		50	6055	.0879	1.00	10	9141	.1326	1.51
			40	6827	.0991	1.13	00	9912	.1438	1.63
1B203112	100	.10143	100	8275	.1201	1.18	30	9421	.1367	1.35
	1182		75	8685	.1260	1.24	20	9585	.1391	1.37
	2190		50	9094	.1320	1.30	10	9749	.1415	1.40
			40	9258	.1343	1.32	00	9912	.1438	1.42
1K 33113	100	.09866	100	1988	.0289	.29	30	7535	.1093	1.11
	284		75	3969	.0576	.58	20	8328	.1208	1.22
	2130		50	5950	.0863	.87	10	9120	.1323	1.34
			40	6743	.0978	.99	00	9912	.1438	1.46
1K353113	100	.12788	100	3431	.0498	.39	30	7968	.1156	.90
	490		75	5051	.0733	.57	20	8616	.1250	.98
	2761		50	6671	.0968	.76	10	9264	.1344	1.05
			40	7320	.1062	.83	00	9912	.1438	1.12
2H353113	100	.07308	100	5069	.0736	1.01	30	8459	.1228	1.68
	724		75	6280	.0911	1.25	20	8944	.1298	1.78
	1578		50	7491	.1087	1.49	10	9428	.1368	1.87
			40	7975	.1157	1.58	00	9912	.1438	1.97
3L263113	100	.07411	100	2191	.0318	.43	30	7596	.1102	1.49
	313		75	4122	.0598	.81	20	8368	.1214	1.64
	1600		50	6052	.0878	1.18	10	9140	.1326	1.79
			40	6824	.0990	1.34	00	9912	.1438	1.94

CONSOL O G	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1N153113	100	.09264	100	2611	.0379	.41	30	7722	.1121	1.21
	373		75	4437	.0644	.70	20	8452	.1227	1.32
	2000		50	6262	.0909	.98	10	9182	.1332	1.44
			40	6992	.1015	1.10	00	9912	.1438	1.55
1P343213	102	.08337	100	1757	.0255	.31	30	7604	.1104	1.32
	246		75	3845	.0558	.67	20	8440	.1225	1.47
	1800		50	5934	.0861	1.03	10	9275	.1346	1.61
			40	6769	.0982	1.18	00	10111	.1467	1.76
1K103113	100	.09726	100	1575	.0229	.24	30	7411	.1075	1.11
	225		75	3659	.0531	.55	20	8245	.1196	1.23
	2100		50	5744	.0834	.86	10	9079	.1317	1.35
			40	6578	.0954	.98	00	9912	.1438	1.48
1N243113	100	.09495	100	2086	.0303	.32	30	7565	.1098	1.16
	298		75	4043	.0587	.62	20	8347	.1211	1.28
	2050		50	5999	.0871	.92	10	9130	.1325	1.40
			40	6782	.0984	1.04	00	9912	.1438	1.51
1M193112	95	.11116	100	9438	.1370	1.23	30	9423	.1367	1.23
	1419		75	9433	.1369	1.23	20	9421	.1367	1.23
	2400		50	9427	.1368	1.23	10	9419	.1367	1.23
			40	9425	.1368	1.23	00	9417	.1367	1.23
2A193112	100	.12969	100	11496	.1668	1.29	30	10387	.1507	1.16
	1642		75	11100	.1611	1.24	20	10229	.1484	1.14
	2800		50	10704	.1553	1.20	10	10071	.1461	1.13
			40	10546	.1530	1.18	00	9912	.1438	1.11
1N133113	100	.11116	100	5293	.0768	.69	30	8527	.1237	1.11
	756		75	6448	.0936	.84	20	8989	.1304	1.17
	2400		50	7603	.1103	.99	10	9450	.1371	1.23
			40	8065	.1170	1.05	00	9912	.1438	1.29
1C273113	103	.07411	100	2171	.0315	.43	30	7798	.1132	1.53
	301		75	4180	.0607	.82	20	8602	.1248	1.68
	1600		50	6190	.0898	1.21	10	9406	.1365	1.84
			40	6994	.1015	1.37	00	10210	.1482	2.00
1B 93113	100	.08337	100	2058	.0299	.36	30	7556	.1097	1.32
	294		75	4022	.0584	.70	20	8342	.1210	1.45
	1800		50	5985	.0869	1.04	10	9127	.1324	1.59
			40	6771	.0983	1.18	00	9912	.1438	1.72
DELHI-TAY										
1C 42710	13	.14497	100	188	.0027	.02	30	959	.0139	.10
	207		75	463	.0067	.05	20	1069	.0155	.11
	3130		50	739	.0107	.07	10	1179	.0171	.12
			40	849	.0123	.08	00	1289	.0187	.13

DELHI-TAY	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	59
3M1827 9	100	.10653	100	6378	.0926	.87	30	8852	.1285	1.21	
	911		75	7262	.1054	.99	20	9206	.1336	1.25	
	2300		50	8145	.1182	1.11	10	9559	.1387	1.30	
			40	8499	.1233	1.16	00	9912	.1438	1.35	
4F1827 9	100	.10189	100	6357	.0923	.91	30	8846	.1284	1.26	
	908		75	7246	.1051	1.03	20	9201	.1335	1.31	
	2200		50	8135	.1180	1.16	10	9557	.1387	1.36	
			40	8490	.1232	1.21	00	9912	.1438	1.41	
KERN COUNT											
1N3625 6	100	.14859	100	10166	.1475	.99	30	9988	.1449	.98	
	1452		75	10102	.1466	.99	20	9963	.1446	.97	
	3208		50	10039	.1457	.98	10	9938	.1442	.97	
			40	10014	.1453	.98	00	9912	.1438	.97	
KINGWOOD											
1A132710	100	.12505	100	4411	.0640	.51	30	8262	.1199	.96	
	630		75	5786	.0840	.67	20	8812	.1279	1.02	
	2700		50	7162	.1039	.83	10	9362	.1359	1.09	
			40	7712	.1119	.89	00	9912	.1438	1.15	
1C312810	100	.14359	100	6273	.0910	.63	30	8821	.1280	.89	
	896		75	7183	.1042	.73	20	9185	.1333	.93	
	3100		50	8093	.1174	.82	10	9548	.1386	.97	
			40	8457	.1227	.85	00	9912	.1438	1.00	
D01M222810	100	.37336	100	16558	.2403	.64	30	11906	.1728	.46	
	2365		75	14896	.2162	.58	20	11241	.1631	.44	
	8061		50	13235	.1921	.51	10	10577	.1535	.41	
			40	12571	.1824	.49	00	9912	.1438	.39	
PAN AM PER											
1M282810	100	.18526	100	6427	.0933	.50	30	8867	.1287	.69	
	918		75	7298	.1059	.57	20	9215	.1337	.72	
	4000		50	8170	.1186	.64	10	9564	.1388	.75	
			40	8518	.1236	.67	00	9912	.1438	.78	
1H212810	100	.27791	100	39291	.5702	2.05	30	18726	.2717	.98	
	5612		75	31946	.4636	1.67	20	15788	.2291	.82	
	6000		50	24602	.3570	1.28	10	12850	.1865	.67	
			40	21664	.3144	1.13	00	9912	.1438	.52	
1H222810	100	.28137	100	33074	.4799	1.71	30	16861	.2447	.87	
	4724		75	27283	.3959	1.41	20	14545	.2111	.75	
	6075		50	21493	.3119	1.11	10	12229	.1775	.63	
			40	19177	.2783	.99	00	9912	.1438	.51	
1B202810	100	.21102	100	28453	.4129	1.96	30	15475	.2246	1.06	
	4064		75	23818	.3456	1.64	20	13620	.1977	.94	
	4556		50	19183	.2784	1.32	10	11766	.1707	.81	
			40	17329	.2515	1.19	00	9912	.1438	.68	

PAN AM PER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	60
1L172810	100	.27790	100	14646	.2125	.76	30	11333	.1645	.59	
	2092		75	13463	.1954	.70	20	10859	.1576	.57	
	6000		50	12279	.1782	.64	10	10386	.1507	.54	
			40	11806	.1713	.62	00	9912	.1438	.52	
1P 72810	100	.21644	100	10614	.1540	.71	30	10123	.1469	.68	
	1516		75	10438	.1515	.70	20	10053	.1459	.67	
	4673		50	10263	.1489	.69	10	9983	.1449	.67	
			40	10193	.1479	.68	00	9912	.1438	.66	
1K 22710	100	.11579	100	3858	.0560	.48	30	8096	.1175	1.01	
	551		75	5371	.0779	.67	20	8701	.1263	1.09	
	2500		50	6885	.0999	.86	10	9307	.1351	1.17	
			40	7491	.1087	.94	00	9912	.1438	1.24	
1H332810	100	.18527	100	10425	.1513	.82	30	10066	.1461	.79	
	1489		75	10297	.1494	.81	20	10015	.1453	.78	
	4000		50	10169	.1476	.80	10	9964	.1446	.78	
			40	10117	.1468	.79	00	9912	.1438	.78	
1G342810	100	.19916	100	14857	.2156	1.08	30	11396	.1654	.83	
	2122		75	13620	.1977	.99	20	10901	.1582	.79	
	4300		50	12384	.1797	.90	10	10407	.1510	.76	
			40	11890	.1725	.87	00	9912	.1438	.72	
1H322810	100	.18397	100	15571	.2260	1.23	30	11610	.1685	.92	
	2224		75	14156	.2054	1.12	20	11044	.1603	.87	
	3972		50	12742	.1849	1.01	10	10478	.1521	.83	
			40	12176	.1767	.96	00	9912	.1438	.78	
1L 12710	100	.12367	100	1211	.0176	.14	30	7302	.1060	.86	
	173		75	3386	.0491	.40	20	8172	.1186	.96	
	2670		50	5562	.0807	.65	10	9042	.1312	1.06	
			40	6432	.0933	.75	00	9912	.1438	1.16	
1N 62710	104	.08527	100	1005	.0146	.17	30	7518	.1091	1.28	
	138		75	3331	.0483	.57	20	8448	.1226	1.44	
	1841		50	5657	.0821	.96	10	9378	.1361	1.60	
			40	6587	.0956	1.12	00	10309	.1496	1.75	
1P222710	100	.12969	100	7358	.1068	.82	30	9146	.1327	1.02	
	1051		75	7997	.1160	.89	20	9402	.1364	1.05	
	2800		50	8635	.1253	.97	10	9657	.1401	1.08	
			40	8891	.1290	.99	00	9912	.1438	1.11	
1B 92710	100	.18526	100	5636	.0818	.44	30	8629	.1252	.68	
	805		75	6705	.0973	.53	20	9057	.1314	.71	
	4000		50	7774	.1128	.61	10	9485	.1376	.74	
			40	8202	.1190	.64	00	9912	.1438	.78	

PAN AM PER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
1N 32710	100	.19190	100	6658	.0966	.50	30	8936	.1297	.68
	951		75	7472	.1084	.56	20	9262	.1344	.70
	4143		50	8285	.1202	.63	10	9587	.1391	.72
			40	8611	.1250	.65	00	9912	.1438	.75
1M162710	100	.11940	100	3088	.0448	.38	30	7865	.1141	.96
	441		75	4794	.0696	.58	20	8547	.1240	1.04
	2578		50	6500	.0943	.79	10	9230	.1339	1.12
			40	7182	.1042	.87	00	9912	.1438	1.20
1M 42710	87	.20467	100	7035	.1021	.50	30	8147	.1182	.58
	1155		75	7432	.1079	.53	20	8306	.1205	.59
	4419		50	7829	.1136	.56	10	8465	.1228	.60
			40	7988	.1159	.57	00	8624	.1251	.61
1A 825 5	100	.09523	100	7778	.1129	1.19	30	9272	.1346	1.41
	1111		75	8312	.1206	1.27	20	9486	.1376	1.44
	2056		50	8845	.1284	1.35	10	9699	.1407	1.48
			40	9059	.1315	1.38	00	9912	.1438	1.51
2K 525 5	100	.11028	100	8009	.1162	1.05	30	9341	.1356	1.23
	1144		75	8485	.1231	1.12	20	9532	.1383	1.25
	2381		50	8961	.1300	1.18	10	9722	.1411	1.28
			40	9151	.1328	1.20	00	9912	.1438	1.30
3A 625 5	100	.10528	100	2401	.0348	.33	30	7659	.1111	1.06
	343		75	4279	.0621	.59	20	8410	.1220	1.16
	2273		50	6157	.0893	.85	10	9161	.1329	1.26
			40	6908	.1002	.95	00	9912	.1438	1.37
1H212710	100	.12506	100	11034	.1601	1.28	30	10249	.1487	1.19
	1576		75	10753	.1560	1.25	20	10137	.1471	1.18
	2700		50	10473	.1520	1.22	10	10025	.1455	1.16
			40	10361	.1504	1.20	00	9912	.1438	1.15
1A272810	100	.23811	100	16327	.2369	.99	30	11837	.1718	.72
	2332		75	14723	.2137	.90	20	11195	.1625	.68
	5141		50	13120	.1904	.80	10	10554	.1532	.64
			40	12478	.1811	.76	00	9912	.1438	.60
1A152710	100	.31385	100	4404	.0639	.20	30	8260	.1199	.38
	629		75	5781	.0839	.27	20	8811	.1279	.41
	6776		50	7158	.1039	.33	10	9362	.1358	.43
			40	7709	.1119	.36	00	9912	.1438	.46
1F242610	50	.23135	100	823	.0119	.05	30	3716	.0539	.23
	235		75	1856	.0269	.12	20	4129	.0599	.26
	4995		50	2889	.0419	.18	10	4543	.0659	.28
			40	3303	.0479	.21	00	4956	.0719	.31

PAN AM PER	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	62
1H203013	100	.06341	100	805	.0117	.18	30	7180	.1042	1.64	
	115		75	3082	.0447	.70	20	8091	.1174	1.85	
	1369		50	5359	.0778	1.23	10	9002	.1306	2.06	
			40	6269	.0910	1.44	00	9912	.1438	2.27	
1D102?10	100	.08527	100	3991	.0579	.68	30	8136	.1181	1.39	
	570		75	5471	.0794	.93	20	8728	.1267	1.49	
	1841		50	6952	.1009	1.18	10	9320	.1353	1.59	
			40	7544	.1095	1.28	00	9912	.1438	1.69	
5B362811	100	.15780	100	6469	.0939	.60	30	8879	.1289	.82	
	924		75	7330	.1064	.67	20	9224	.1338	.85	
	3407		50	8191	.1189	.75	10	9568	.1388	.88	
			40	8535	.1239	.79	00	9912	.1438	.91	
6M362811	100	.18526	100	11174	.1621	.87	30	10291	.1493	.81	
	1596		75	10858	.1576	.85	20	10165	.1475	.80	
	4000		50	10543	.1530	.83	10	10039	.1457	.79	
			40	10417	.1512	.82	00	9912	.1438	.78	
7H352811	100	.20852	100	21767	.3159	1.51	30	13469	.1955	.94	
	3109		75	18803	.2729	1.31	20	12283	.1782	.85	
	4502		50	15840	.2299	1.10	10	11098	.1610	.77	
			40	14654	.2127	1.02	00	9912	.1438	.69	
9N352811	100	.15215	100	12189	.1769	1.16	30	10595	.1538	1.01	
	1741		75	11620	.1686	1.11	20	10368	.1505	.99	
	3285		50	11051	.1604	1.05	10	10140	.1471	.97	
			40	10823	.1571	1.03	00	9912	.1438	.95	
10E 12711	100	.17508	100	7925	.1150	.66	30	9316	.1352	.77	
	1132		75	8422	.1222	.70	20	9515	.1381	.79	
	3780		50	8919	.1294	.74	10	9714	.1410	.81	
			40	9118	.1323	.76	00	9912	.1438	.82	
11M122711	100	.08472	100	3466	.0503	.59	30	7978	.1158	1.37	
	495		75	5077	.0737	.87	20	8623	.1251	1.48	
	1829		50	6689	.0971	1.15	10	9268	.1345	1.59	
			40	7334	.1064	1.26	00	9912	.1438	1.70	
12G122711	100	.06776	100	6546	.0950	1.40	30	8903	.1292	1.91	
	935		75	7388	.1072	1.58	20	9239	.1341	1.98	
	1463		50	8229	.1194	1.76	10	9576	.1390	2.05	
			40	8566	.1243	1.83	00	9912	.1438	2.12	
R&G DRILLI											
61A 63013	100	.05095	100	12126	.1760	3.45	30	10576	.1535	3.01	
	1732		75	11573	.1679	3.30	20	10355	.1503	2.95	
	1100		50	11019	.1599	3.14	10	10134	.1471	2.89	
			40	10798	.1567	3.08	00	9912	.1438	2.82	

R&G DRILLI	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
62A183013	100	.12505	100	20787	.3016	2.41	30	13175	.1912	1.53
	2969		75	18068	.2622	2.10	20	12087	.1754	1.40
	2700		50	15349	.2227	1.78	10	11000	.1596	1.28
			40	14262	.2070	1.66	00	9912	.1438	1.15
63A 73013	100	.06948	100	5055	.0734	1.06	30	8455	.1227	1.77
	722		75	6269	.0910	1.31	20	8941	.1297	1.87
	1500		50	7484	.1086	1.56	10	9427	.1368	1.97
			40	7969	.1156	1.66	00	9912	.1438	2.07
64M 53013	100	.07410	100	10621	.1541	2.08	30	10125	.1469	1.98
	1517		75	10444	.1516	2.05	20	10054	.1459	1.97
	1600		50	10267	.1490	2.01	10	9983	.1449	1.96
			40	10196	.1480	2.00	00	9912	.1438	1.94
65K 83013	100	.08337	100	5482	.0796	.95	30	8583	.1246	1.49
	783		75	6589	.0956	1.15	20	9026	.1310	1.57
	1800		50	7697	.1117	1.34	10	9469	.1374	1.65
			40	8140	.1181	1.42	00	9912	.1438	1.72
66L173013	100	.14359	100	15998	.2321	1.62	30	11738	.1703	1.19
	2285		75	14476	.2101	1.46	20	11129	.1615	1.12
	3100		50	12955	.1880	1.31	10	10521	.1527	1.06
			40	12347	.1792	1.25	00	9912	.1438	1.00
REDFERN										
1J1824 6	100	.13895	100	672	.0098	.07	30	7140	.1036	.75
	96		75	2982	.0433	.31	20	8064	.1170	.84
	3000		50	5292	.0768	.55	10	8988	.1304	.94
			40	6216	.0902	.65	00	9912	.1438	1.03
VAL REESE										
1C1924 6	100	.12042	100	3802	.0552	.46	30	8079	.1172	.97
	543		75	5329	.0773	.64	20	8690	.1261	1.05
	2600		50	6857	.0995	.83	10	9301	.1350	1.12
			40	7468	.1084	.90	00	9912	.1438	1.19
P RUTLEDGE										
1A1324 7	100	.07795	100	5769	.0837	1.07	30	8669	.1258	1.61
	824		75	6805	.0987	1.27	20	9084	.1318	1.69
	1683		50	7841	.1138	1.46	10	9498	.1378	1.77
			40	8255	.1198	1.54	00	9912	.1438	1.84
5N1224 7	100	.12473	100	6910	.1003	.80	30	9012	.1308	1.05
	987		75	7661	.1112	.89	20	9312	.1351	1.08
	2693		50	8411	.1221	.98	10	9612	.1395	1.12
			40	8712	.1264	1.01	00	9912	.1438	1.15
S UNION PR										
21P122811	100	.13525	100	18434	.2675	1.98	30	12469	.1809	1.34
	2633		75	16304	.2366	1.75	20	11617	.1686	1.25
	2920		50	14173	.2057	1.52	10	10765	.1562	1.15
			40	13321	.1933	1.43	00	9912	.1438	1.06

S UNION PR	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	64
20A242811	100	.25358	100	55792	.8096	3.19	30	23676	.3436	1.35	
	7969		75	44322	.6432	2.54	20	19088	.2770	1.09	
	5475		50	32852	.4767	1.88	10	14500	.2104	.83	
			40	28264	.4102	1.62	00	9912	.1438	.57	
1A152811	100	.16211	100	16096	.2336	1.44	30	11767	.1708	1.05	
	2299		75	14550	.2111	1.30	20	11149	.1618	1.00	
	3500		50	13004	.1887	1.16	10	10531	.1528	.94	
			40	12386	.1797	1.11	00	9912	.1438	.89	
1M183012	100	.07170	100	2800	.0406	.57	30	7779	.1129	1.57	
	400		75	4578	.0664	.93	20	8490	.1232	1.72	
	1548		50	6356	.0922	1.29	10	9201	.1335	1.86	
			40	7068	.1026	1.43	00	9912	.1438	2.01	
1J312911	100	.12909	100	32198	.4672	3.62	30	16598	.2409	1.87	
	4599		75	26627	.3864	2.99	20	14370	.2085	1.62	
	2787		50	21055	.3055	2.37	10	12141	.1762	1.36	
			40	18827	.2732	2.12	00	9912	.1438	1.11	
1M153013	100	.06711	100	1358	.0197	.29	30	7346	.1066	1.59	
	194		75	3497	.0507	.76	20	8202	.1190	1.77	
	1449		50	5635	.0818	1.22	10	9057	.1314	1.96	
			40	6491	.0942	1.40	00	9912	.1438	2.14	
2L343013	100	.22001	100	2233	.0324	.15	30	7609	.1104	.50	
	319		75	4153	.0603	.27	20	8377	.1216	.55	
	4750		50	6073	.0881	.40	10	9145	.1327	.60	
			40	6841	.0993	.45	00	9912	.1438	.65	
3B343013	100	.14358	100	2976	.0432	.30	30	7831	.1136	.79	
	425		75	4710	.0683	.48	20	8525	.1237	.86	
	3100		50	6444	.0935	.65	10	9219	.1338	.93	
			40	7138	.1036	.72	00	9912	.1438	1.00	
1M203112	100	.12450	100	7043	.1022	.82	30	9052	.1314	1.06	
	1006		75	7760	.1126	.90	20	9339	.1355	1.09	
	2688		50	8478	.1230	.99	10	9625	.1397	1.12	
			40	8765	.1272	1.02	00	9912	.1438	1.16	
2A342910	100	.15284	100	20422	.2964	1.94	30	13065	.1896	1.24	
	2917		75	17795	.2582	1.69	20	12014	.1743	1.14	
	3300		50	15167	.2201	1.44	10	10963	.1591	1.04	
			40	14116	.2048	1.34	00	9912	.1438	.94	
1A 13013	100	.04104	100	3907	.0567	1.38	30	8111	.1177	2.87	
	558		75	5408	.0785	1.91	20	8711	.1264	3.08	
	886		50	6910	.1003	2.44	10	9312	.1351	3.29	
			40	7510	.1090	2.66	00	9912	.1438	3.50	

S UNION PR	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	65
1K312910	100	.10653	100	6308	.0915	.86	30	8831	.1282	1.20	
	901		75	7209	.1046	.98	20	9192	.1334	1.25	
	2300		50	8110	.1177	1.10	10	9552	.1386	1.30	
			40	8471	.1229	1.15	00	9912	.1438	1.35	
2G312910	100	.08800	100	12112	.1758	2.00	30	10572	.1534	1.74	
	1730		75	11562	.1678	1.91	20	10352	.1502	1.71	
	1900		50	11012	.1598	1.82	10	10132	.1470	1.67	
			40	10792	.1566	1.78	00	9912	.1438	1.63	
2M313112	100	.08759	100	5776	.0838	.96	30	8671	.1258	1.44	
	825		75	6810	.0988	1.13	20	9085	.1318	1.50	
	1891		50	7844	.1138	1.30	10	9499	.1378	1.57	
			40	8258	.1198	1.37	00	9912	.1438	1.64	
14M102810	100	.26516	100	24847	.3606	1.36	30	14393	.2089	.79	
	3549		75	21113	.3064	1.16	20	12899	.1872	.71	
	5725		50	17380	.2522	.95	10	11406	.1655	.62	
			40	15886	.2305	.87	00	9912	.1438	.54	
15N332910	100	.20843	100	23587	.3423	1.64	30	14015	.2034	.98	
	3369		75	20168	.2927	1.40	20	12647	.1835	.88	
	4500		50	16750	.2431	1.17	10	11280	.1637	.79	
			40	15382	.2232	1.07	00	9912	.1438	.69	
16H332910	100	.20842	100	25813	.3746	1.80	30	14683	.2131	1.02	
	3687		75	21838	.3169	1.52	20	13093	.1900	.91	
	4500		50	17863	.2592	1.24	10	11503	.1669	.80	
			40	16273	.2361	1.13	00	9912	.1438	.69	
17M352910	[illegible]00	.18527	100	16803	.2438	1.32	30	11980	.1738	.94	
	3400		75	15080	.2188	1.18	20	11290	.1638	.88	
	4000		50	13358	.1938	1.05	10	10601	.1538	.83	
			40	12669	.1838	.99	00	9912	.1438	.78	
18M112810	102	.26401	100	11426	.1658	.63	30	10505	.1524	.58	
	1600		75	11097	.1610	.61	20	10374	.1505	.57	
	5700		50	10768	.1563	.59	10	10242	.1486	.56	
			40	10637	.1544	.58	00	10111	.1467	.56	
19N122810	100	.16211	100	18049	.2619	1.62	30	12353	.1793	1.11	
	2578		75	16015	.2324	1.43	20	11540	.1675	1.03	
	3500		50	13981	.2029	1.25	10	10726	.1557	.96	
			40	13167	.1911	1.18	00	9912	.1438	.89	
SW PROD CO											
11132712	100	.09263	100	1708	.0248	.27	30	7451	.1081	1.17	
	244		75	3759	.0546	.59	20	8272	.1200	1.30	
	2000		50	5810	.0843	.91	10	9092	.1319	1.42	
			40	6631	.0962	1.04	00	9912	.1438	1.55	

SW PROD CO	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	66
1L342910	100	.23455	100	16439	.2386	1.02	30	11870	.1723	.73	
	2348		75	14807	.2149	.92	20	11218	.1628	.69	
	5064		50	13176	.1912	.82	10	10565	.1533	.65	
			40	12523	.1817	.77	00	9912	.1438	.61	
SUNRAY DX											
1M2123 5	100	.03242	100	2240	.0325	1.00	30	7611	.1104	3.41	
	320		75	4158	.0603	1.86	20	8378	.1216	3.75	
	700		50	6076	.0882	2.72	10	9145	.1327	4.09	
			40	6844	.0993	3.06	00	9912	.1438	4.44	
1M173012	100	.15238	100	3655	.0530	.35	30	8035	.1166	.77	
	522		75	5219	.0757	.50	20	8661	.1257	.82	
	3290		50	6784	.0984	.65	10	9287	.1348	.88	
			40	7409	.1075	.71	00	9912	.1438	.94	
2A173012	100	.18823	100	4943	.0717	.38	30	8422	.1222	.65	
	706		75	6185	.0898	.48	20	8918	.1294	.69	
	4064		50	7428	.1078	.57	10	9415	.1366	.73	
			40	7925	.1150	.61	00	9912	.1438	.76	
3A183012	100	.11654	100	3480	.0505	.43	30	7983	.1158	.99	
	497		75	5088	.0738	.63	20	8626	.1252	1.07	
	2516		50	6696	.0972	.83	10	9269	.1345	1.15	
			40	7339	.1065	.91	00	9912	.1438	1.23	
4A 73012	100	.21065	100	8814	.1279	.61	30	9583	.1391	.66	
	1259		75	9089	.1319	.63	20	9693	.1407	.67	
	4548		50	9363	.1359	.65	10	9803	.1423	.68	
			40	9473	.1375	.65	00	9912	.1438	.68	
5M 73012	100	.05826	100	6784	.0984	1.69	30	8974	.1302	2.23	
	969		75	7566	.1098	1.88	20	9287	.1348	2.31	
	1258		50	8348	.1211	2.08	10	9600	.1393	2.39	
			40	8661	.1257	2.16	00	9912	.1438	2.47	
6M 63012	100	.15410	100	10446	.1516	.98	30	10072	.1462	.95	
	1492		75	10312	.1496	.97	20	10019	.1454	.94	
	3327		50	10179	.1477	.96	10	9966	.1446	.94	
			40	10126	.1469	.95	00	9912	.1438	.93	
SUNSET INT											
10G182810	100	.21644	100	33508	.4862	2.25	30	16991	.2466	1.14	
	4786		75	27609	.4006	1.85	20	14631	.2123	.98	
	4673		50	21710	.3150	1.46	10	12272	.1781	.82	
			40	19350	.2808	1.30	00	9912	.1438	.66	
1A282810	100	.28137	100	10152	.1473	.52	30	9984	.1449	.51	
	1450		75	10092	.1464	.52	20	9960	.1445	.51	
	6075		50	10032	.1456	.52	10	9936	.1442	.51	
			40	10008	.1452	.52	00	9912	.1438	.51	

SUNSET INT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R
11N202810	100	.17855	100	22957	.3331	1.87	30	13826	.2006	1.12
	3279		75	19696	.2858	1.60	20	12521	.1817	1.02
	3855		50	16435	.2385	1.34	10	11217	.1628	.91
			40	15130	.2196	1.23	00	9912	.1438	.81
12M212810	100	.10533	100	38114	.5531	5.25	30	18373	.2666	2.53
	5444		75	31064	.4508	4.28	20	15553	.2257	2.14
	2274		50	24013	.3485	3.31	10	12733	.1848	1.75
			40	21193	.3075	2.92	00	9912	.1438	1.37
13K332810	100	.15150	100	5811	.0843	.56	30	8682	.1260	.83
	830		75	6836	.0992	.65	20	9092	.1319	.87
	3271		50	7862	.1141	.75	10	9502	.1379	.91
			40	8272	.1200	.79	00	9912	.1438	.95
1K322810	100	.25433	100	13568	.1969	.77	30	11009	.1598	.63
	1938		75	12654	.1836	.72	20	10644	.1545	.61
	5491		50	11740	.1704	.67	10	10278	.1491	.59
			40	11375	.1651	.65	00	9912	.1438	.57
1G172810	100	.37336	100	21333	.3096	.83	30	13338	.1936	.52
	3047		75	18477	.2681	.72	20	12196	.1770	.47
	8061		50	15622	.2267	.61	10	11054	.1604	.43
			40	14480	.2101	.56	00	9912	.1438	.39
1H162710	100	.22172	100	7169	.1040	.47	30	9089	.1319	.59
	1024		75	7855	.1140	.51	20	9364	.1359	.61
	4787		50	8541	.1239	.56	10	9638	.1399	.63
			40	8815	.1279	.58	00	9912	.1438	.65
2H 42710	100	.14497	100	14892	.2161	1.49	30	11406	.1655	1.14
	2127		75	13647	.1980	1.37	20	10908	.1583	1.09
	3130		50	12402	.1800	1.24	10	10410	.1511	1.04
			40	11904	.1727	1.19	00	9912	.1438	.99
1L 92710	100	.20467	100	20268	.2941	1.44	30	13019	.1889	.92
	2895		75	17679	.2566	1.25	20	11984	.1739	.85
	4419		50	15090	.2190	1.07	10	10948	.1589	.78
			40	14055	.2040	1.00	00	9912	.1438	.70
2B 62710	100	.15350	100	1890	.0274	.18	30	7506	.1089	.71
	270		75	3896	.0565	.37	20	8308	.1206	.79
	3314		50	5901	.0856	.56	10	9110	.1322	.86
			40	6704	.0973	.63	00	9912	.1438	.94
2M272810	100	.18939	100	27704	.4020	2.12	30	15250	.2213	1.17
	3957		75	23256	.3375	1.78	20	13471	.1955	1.03
	4089		50	18808	.2729	1.44	10	11692	.1697	.90
			40	17029	.2471	1.30	00	9912	.1438	.76

SUNSET INT	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	68
1B 32710	100	.14071	100	25218	.3660	2.60	30	14504	.2105	1.50	
	3602		75	21392	.3104	2.21	20	12974	.1883	1.34	
	3038		50	17565	.2549	1.81	10	11443	.1661	1.18	
			40	16035	.2327	1.65	00	9912	.1438	1.02	
JG TURNER											
1L302911	98	.14358	100	5949	.0863	.60	30	8584	.1246	.87	
	867		75	6890	.1000	.70	20	8961	.1300	.91	
	3100		50	7831	.1136	.79	10	9338	.1355	.94	
			40	8208	.1191	.83	00	9714	.1410	.98	
AZTEC O G											
7D113112	95	.08800	100	6285	.0912	1.04	30	8477	.1230	1.40	
	945		75	7068	.1026	1.17	20	8790	.1276	1.45	
	1900		50	7851	.1139	1.29	10	9104	.1321	1.50	
			40	8164	.1185	1.35	00	9417	.1367	1.55	
5N243112	100	.11065	100	4747	.0689	.62	30	8363	.1214	1.10	
	678		75	6038	.0876	.79	20	8879	.1289	1.16	
	2389		50	7330	.1064	.96	10	9396	.1363	1.23	
			40	7846	.1139	1.03	00	9912	.1438	1.30	
6D233112	100	.13895	100	2191	.0318	.23	30	7596	.1102	.79	
	313		75	4122	.0598	.43	20	8368	.1214	.87	
	3000		50	6052	.0878	.63	10	9140	.1326	.95	
			40	6824	.0990	.71	00	9912	.1438	1.03	
7D143112	88	.10653	100	4510	.0654	.61	30	7459	.1082	1.02	
	732		75	5563	.0807	.76	20	7880	.1144	1.07	
	2300		50	6616	.0960	.90	10	8302	.1205	1.13	
			40	7038	.1021	.96	00	8723	.1266	1.19	
8P263112	100	.08337	100	2807	.0407	.49	30	7781	.1129	1.35	
	401		75	4584	.0665	.80	20	8491	.1232	1.48	
	1800		50	6360	.0923	1.11	10	9202	.1335	1.60	
			40	7070	.1026	1.23	00	9912	.1438	1.72	
9N253112	100	.08337	100	2324	.0337	.40	30	7636	.1108	1.33	
	332		75	4221	.0613	.74	20	8395	.1218	1.46	
	1800		50	6118	.0888	1.07	10	9154	.1328	1.59	
			40	6877	.0998	1.20	00	9912	.1438	1.72	
4D133011	100	.13483	100	3326	.0483	.36	30	7936	.1152	.85	
	475		75	4972	.0722	.54	20	8595	.1247	.92	
	2911		50	6619	.0961	.71	10	9254	.1343	1.00	
			40	7278	.1056	.78	00	9912	.1438	1.07	
2P143112	97	.13895	100	11185	.1623	1.17	30	10086	.1464	1.05	
	1647		75	10792	.1566	1.13	20	9929	.1441	1.04	
	3000		50	10400	.1509	1.09	10	9772	.1418	1.02	
			40	10243	.1486	1.07	00	9615	.1395	1.00	

AZTEC O G	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	69
100123011	100	.07874	100	959	.0139	.18	30	7226	.1049	1.33	
	137		75	3197	.0464	.59	20	8122	.1179	1.50	
	1700		50	5436	.0789	1.00	10	9017	.1309	1.66	
			40	6331	.0919	1.17	00	9912	.1438	1.83	
1A253112	100	.10190	100	2870	.0417	.41	30	7800	.1132	1.11	
	410		75	4631	.0672	.66	20	8504	.1234	1.21	
	2200		50	6391	.0927	.91	10	9208	.1336	1.31	
			40	7096	.1030	1.01	00	9912	.1438	1.41	
7J153112	97	.11579	100	13324	.1934	1.67	30	10728	.1557	1.34	
	1962		75	12397	.1799	1.55	20	10357	.1503	1.30	
	2500		50	11470	.1664	1.44	10	9986	.1449	1.25	
			40	11099	.1611	1.39	00	9615	.1395	1.20	
S UNION PR											
1A353112	100	.07411	100	3333	.0484	.65	30	7938	.1152	1.55	
	476		75	4977	.0722	.97	20	8596	.1247	1.68	
	1600		50	6622	.0961	1.30	10	9254	.1343	1.81	
			40	7280	.1057	1.43	00	9912	.1438	1.94	
1K293011	100	.08800	100	3977	.0577	.66	30	8132	.1180	1.34	
	568		75	5461	.0792	.90	20	8725	.1266	1.44	
	1900		50	6945	.1008	1.15	10	9319	.1352	1.54	
			40	7538	.1094	1.24	00	9912	.1438	1.63	
W DEVELOP											
1N 52911	100	.12371	100	7253	.1053	.85	30	9115	.1323	1.07	
	1036		75	7918	.1149	.93	20	9381	.1361	1.10	
	2671		50	8583	.1245	1.01	10	9646	.1400	1.13	
			40	8849	.1284	1.04	00	9912	.1438	1.16	
1J 22911	95	.20440	100	10083	.1463	.72	30	9617	.1396	.68	
	1516		75	9916	.1439	.70	20	9550	.1386	.68	
	4413		50	9750	.1415	.69	10	9483	.1376	.67	
			40	9683	.1405	.69	00	9417	.1367	.67	
1P 42911	96	.20843	100	3529	.0512	.25	30	7720	.1120	.54	
	525		75	5025	.0729	.35	20	8318	.1207	.58	
	4500		50	6522	.0946	.45	10	8917	.1294	.62	
			40	7121	.1033	.50	00	9516	.1381	.66	
1J 82911	100	.12505	100	7946	.1153	.92	30	9323	.1353	1.08	
	1135		75	8438	.1224	.98	20	9519	.1381	1.10	
	2700		50	8929	.1296	1.04	10	9716	.1410	1.13	
			40	9126	.1324	1.06	00	9912	.1438	1.15	
1F 92911	100	.12909	100	6868	.0997	.77	30	8999	.1306	1.01	
	981		75	7629	.1107	.86	20	9304	.1350	1.05	
	2787		50	8390	.1218	.94	10	9608	.1394	1.08	
			40	8695	.1262	.98	00	9912	.1438	1.11	

W	DEVELOP	A-D-R	%R	F%	AL	%AL	A/R	F%	AL	%AL	A/R	70
	1E102911	100	.15062	100	7855	.1140	.76	30	9295	.1349	.90	
		1122		75	8370	.1215	.81	20	9501	.1379	.92	
		3252		50	8884	.1289	.86	10	9707	.1409	.94	
				40	9090	.1319	.88	00	9912	.1438	.95	
	1E112911	100	.12908	100	8177	.1187	.92	30	9392	.1363	1.06	
		1168		75	8611	.1250	.97	20	9565	.1388	1.08	
		2787		50	9045	.1313	1.02	10	9739	.1413	1.09	
				40	9218	.1338	1.04	00	9912	.1438	1.11	
	2P112911	100	.23668	100	10250	.1487	.63	30	10014	.1453	.61	
		1464		75	10165	.1475	.62	20	9980	.1448	.61	
		5110		50	10081	.1463	.62	10	9946	.1443	.61	
				40	10047	.1458	.62	00	9912	.1438	.61	
	1P253011	100	.15479	100	5454	.0791	.51	30	8575	.1244	.80	
		779		75	6568	.0953	.62	20	9021	.1309	.85	
		3342		50	7683	.1115	.72	10	9467	.1374	.89	
				40	8129	.1180	.76	00	9912	.1438	.93	
	1P273011	100	.24470	100	13736	.1993	.81	30	11060	.1605	.66	
		1962		75	12780	.1855	.76	20	10677	.1549	.63	
		5283		50	11824	.1716	.70	10	10295	.1494	.61	
				40	11442	.1660	.68	00	9912	.1438	.59	
	1P263011	100	.17600	100	2303	.0334	.19	30	7630	.1107	.63	
		329		75	4206	.0610	.35	20	8391	.1218	.69	
		3800		50	6108	.0886	.50	10	9152	.1328	.75	
				40	6869	.0997	.57	00	9912	.1438	.82	
	10353011	100	.18527	100	6602	.0958	.52	30	8919	.1294	.70	
		943		75	7430	.1078	.58	20	9250	.1342	.72	
		4000		50	8257	.1198	.65	10	9581	.1390	.75	
				40	8588	.1246	.67	00	9912	.1438	.78	
	20343011	100	.16980	100	6168	.0895	.53	30	8789	.1275	.75	
		881		75	7104	.1031	.61	20	9164	.1330	.78	
		3666		50	8040	.1167	.69	10	9538	.1384	.82	
				40	8415	.1221	.72	00	9912	.1438	.85	
	1E 32911	91	.29582	100	8958	.1300	.44	30	9002	.1306	.44	
		1406		75	8973	.1302	.44	20	9008	.1307	.44	
		6387		50	8989	.1304	.44	10	9014	.1308	.44	
				40	8995	.1305	.44	00	9020	.1309	.44	

5
EXHIBIT 3

CONSOLIDATED OIL & GAS, INC.
NEW MEXICO OIL AND GAS CONSERVATION HEARING
March 14, 1962

BASIN DAKOTA GAS POOL

Comparison of distribution of total field deliverabilities and of total field allowable under existing rules (25% acreage, 75% acreage x deliverability).

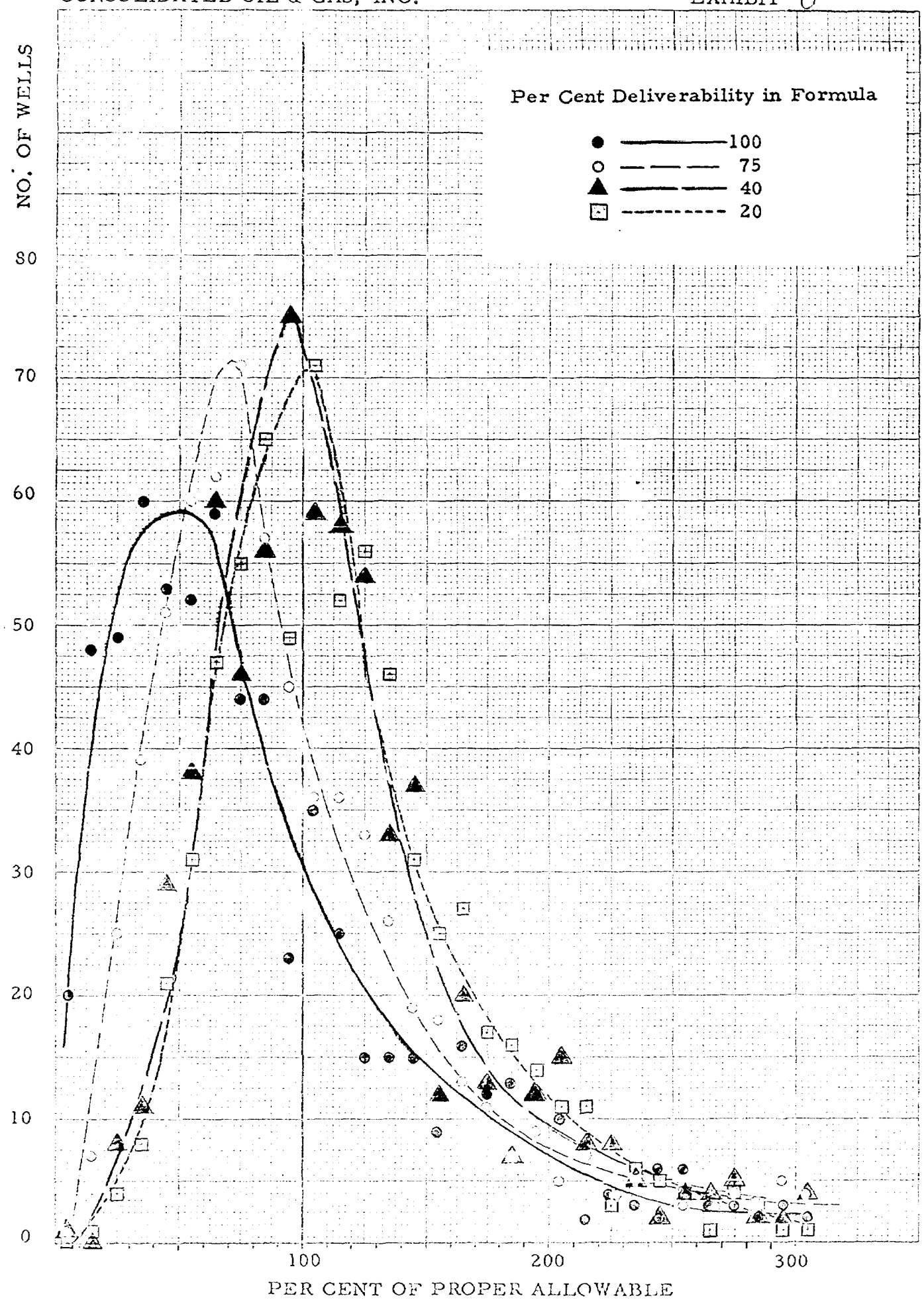
Deliverability Range	No. of El Paso Wells Studied	No. of Wells	% of Field Wells	Ave. Deliverability MCFD	Group % of Deliverability	Group % of Allowable	Ave. Well Allowable MCFD	El Paso Reserves Ave per Group
0-1000	243	278	58.8	472	19.8	29.2	7,980	3.02
1001-2000	121	103	21.8	1,458	22.6	22.5	16,620	3.69
2001-3000	46	37	7.8	2,410	13.4	12.0	24,600	3.52
3001-4000	18	20	4.2	3,501	10.6	9.2	34,100	4.19
4001-5000	17	19	4.0	4,450	12.7	10.6	42,300	3.90
5001-6000	2	6	1.3	5,580	5.1	4.1	52,100	1.98
Over 6000	4	10	2.1	10,536	15.8	12.4	94,700	4.20
Total	451	473	100.0	1,404	100.0	100.0	16,039	3.34
0-1404 (Below Ave.)		329	69.6	579	28.7	38.8	8,936	
1405-above (Above Ave.)		144	30.4	3,289	71.3	61.2	32,267	

% OF PROPER ALLOW.	NUMBER OF WELLS FOR VARIOUS PERCENTAGES OF DELIVERABILITY IN PRORATION FORMULA							
	100%	75%	50%	40%	30%	20%	10%	0%
1- 9	20	1	1	1	0	0	0	0
10- 19	48	7	1	0	1	1	1	1
20- 29	49	25	8	8	5	4	3	2
30- 39	60	39	17	11	11	8	8	10
40- 49	53	51	35	29	20	21	19	14
50- 59	52	60	45	38	40	31	22	31
60- 69	59	62	55	60	49	47	53	53
70- 79	44	71	49	46	52	55	52	63
80- 89	44	57	69	56	56	65	69	57
90- 99	23	45	72	75	60	49	65	54
100-109	35	36	63	59	67	71	42	53
110-119	25	36	39	58	65	52	65	53
120-129	15	33	48	54	55	56	46	49
130-139	15	26	39	33	41	46	40	33
140-149	15	19	30	37	25	31	42	39
150-159	9	18	14	12	31	25	28	32
160-169	16	13	15	20	15	27	31	20
170-179	12	11	10	13	12	17	17	30
180-189	13	7	11	7	16	16	17	21
190-199	12	9	9	12	13	14	16	17
200-209	10	5	11	15	10	11	6	13
210-219	2	7	7	8	8	11	8	6
220-229	4	4	7	8	8	3	11	7
230-239	3	5	7	5	7	6	6	8
240-249	2	6	6	2	7	5	3	3
250-259	6	3	1	4	5	4	6	6
260-269	3	3	2	4	0	1	1	1
270-279	3	4	3	5	2	4	4	2
280-289	2	3	3	2	4	3	3	2
290-299	3	5	2	2	0	1	3	0
300-309	2	4	2	4	2	1	1	2
310& UP	40	24	18	11	12	13	11	17
UNDER 100%	452	418	352	324	294	281	292	285
100% AND UP	247	281	347	375	405	418	407	414

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 5
CASE 2564

CONSOLIDATED OIL & GAS, INC.

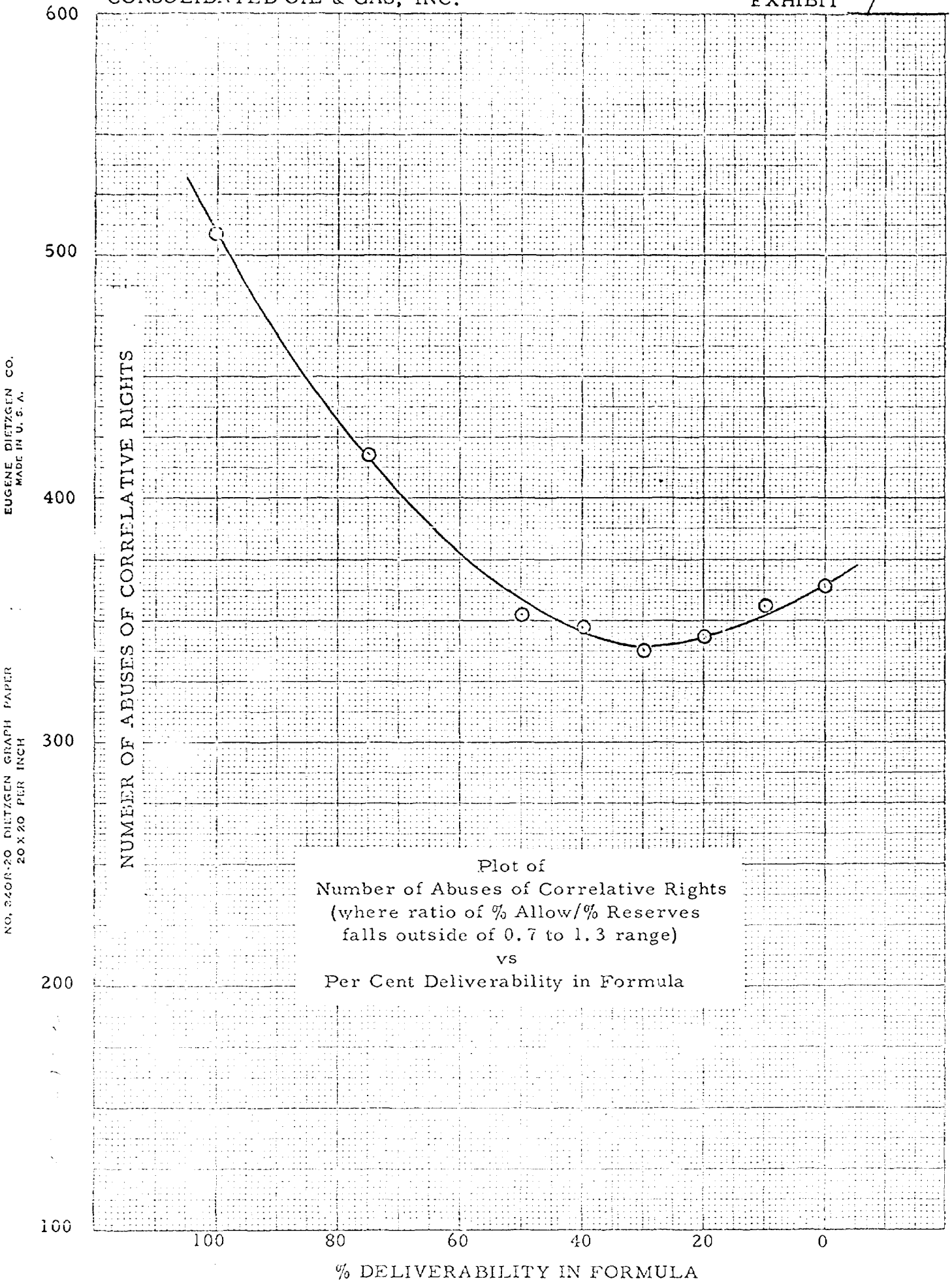
EXHIBIT 6



EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 340R20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

CONSOLIDATED OIL & GAS, INC.

EXHIBIT 7



EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

COMPARISON OF FIXED DEPLETION RATE AND ALTERNATE ALLOWABLE FORMULAS
EL PASO NATURAL GAS COMPANY
CASE 2504
EXHIBIT NO. 2

No. of Wells	Reserve MCF	Deliverability	1 Fixed Depletion Rate MCF	75% A X D - 25% Acreage 2 Projected Yearly Allowable MCF	75% A X D - 25% Acreage Projected Yearly Allowable Percent of Minimum Yearly Quantity	40% A X D - 60% Acreage 2 Projected Yearly Allowable MCF	40% A X D - 60% Acreage Projected Yearly Allowable Percent of Minimum Yearly Quantity
12	825,000	397	30,113	49,402	164	76,377	253
83	1,544,000	613	56,356	61,698	110	82,935	147
150	2,497,000	1,330	91,141	102,515	112	104,704	115
100	3,461,000	1,441	126,327	108,834	86	108,074	86
65	4,474,000	1,718	163,301	124,602	76	116,484	71
28	5,474,000	1,673	199,801	122,041	61	115,118	58
19	6,959,000	1,677	254,004	122,268	48	115,239	45

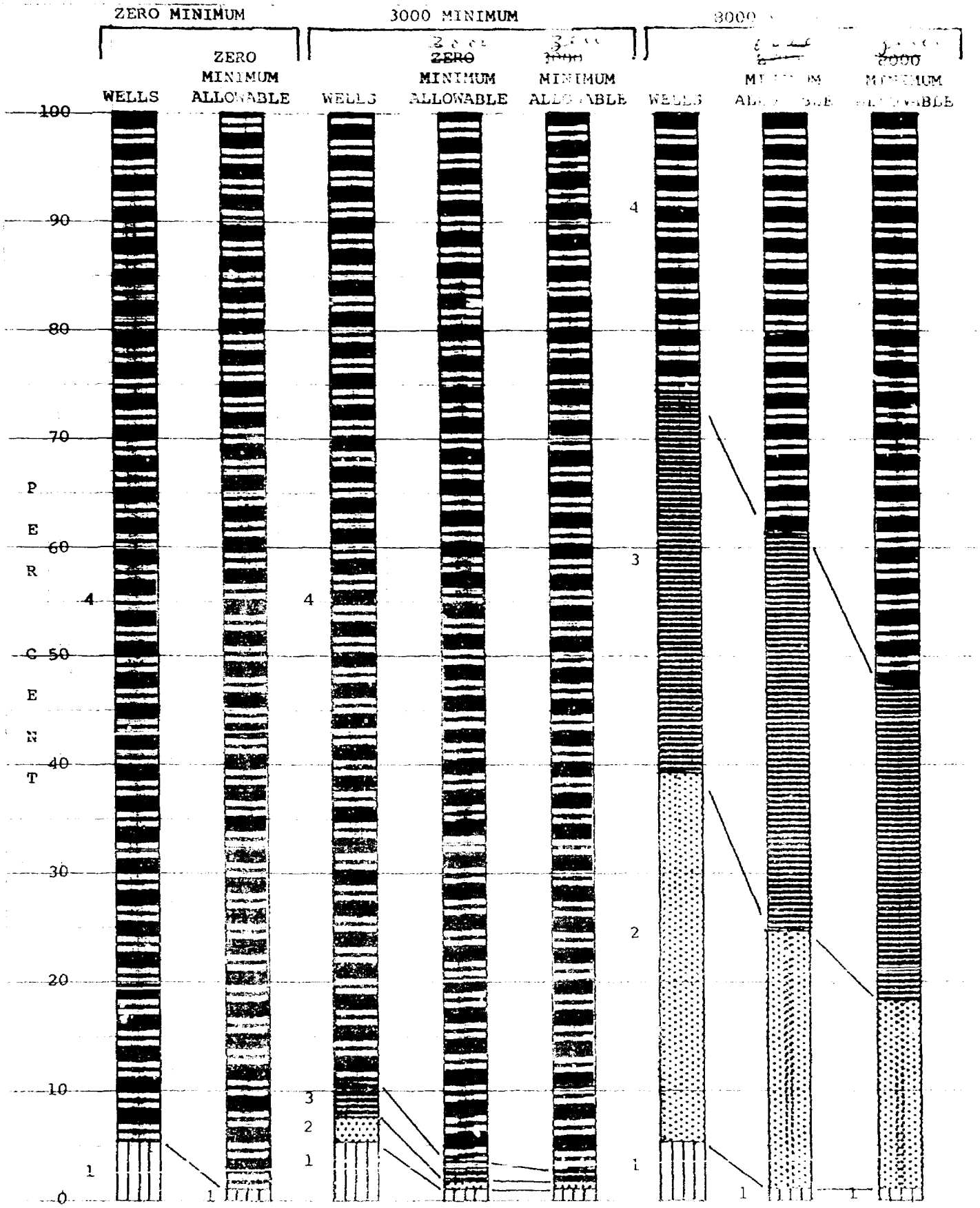
1 Depletion based on 1 million cubic feet per day for each 10 billion cubic feet of reserve.
2 Projected yearly allowables based on following assumptions:
- a. Total Basin Dakota allowable of 60 billion cubic feet per year
- b. Total participating number of wells - 600
- c. Total participating acreage factors N M - 559.67
- d. Total participating A x D factors N M - 790,487

4/16/62

BASIN DAKOTA GAS POOL
ESTIMATED EFFECT OF VARIOUS MINIMUM ALLOWABLES

Well Groups	0 - Minimum No. Wells	0 - Minimum Allowable	2500 Minimum No. Wells	2500 Minimum 0 - Min Allowable	2500 Minimum 2500 Min Allowable	3000 Minimum No. Wells	3000 Minimum 0 - Min Allowable	3000 Minimum 3000 Min Allowable	8000 Minimum No. Wells	8000 Minimum 0 - Min Allowable	8000 Minimum 8000 Min Allowable
1. Producing ability less than the 0 - Minimum breaking point (77 MCFD - 2342 MCF Mo)	24 5.5%	36,305 1.1%	24	36,305	36,305	24 5.5%	36,305 1.1%	36,305 1.1%	24 5.5%	36,305 1.1%	36,305 1.1%
2. Producing ability of more than 77 MCFD and less than minimum allowable			A Deliverability of 106 will calculate an allowable of 2500 MCFM All wells below this Deliverability are included in the 24 wells above. Therefore a 2500 minimum allowable would not be effective at current conditions of development & market demand			10 2.2%	26,598 .79%	27,583 .82% → + 985 .03%	150 34%	586,016 17.4%	797,010 23.7% → +210,994 11.8%
3. Producing ability of more than Minimum allowable but calculate less than minimums [illegible] and are assigned the minimum allowable						13 2.9%	34,294 1.02%	39,000 1.5% → + 4,706 .14%	153 35%	966,833 28.7%	1,224,000 36.4% → + 257,167 14.5%
4. Prorated on basis of formula	411 94.5%	3,330,067 98.9%				388 89.4%	3,269,175 97.1%	3,263,484 96.6%	108 24.8%	1,777,218 52.8%	1,309,057 38.8%
TOTALS	435	3,366,372	435	3,366,372	3,366,372	435	3,366,372	3,366,372	435	3,366,372	3,366,372

BASIS FOR COMPARISON OF EFFECT FOR VARIOUS MINIMUM ALLOWABLES



NEW MEXICO OIL CONSERVATION COMMISSION
CASE 2504 EXHIBIT NO. 2

EXHIBIT 4

EXAMPLE OF INCOME FOR VARIOUS MINIMUM ALLOWABLES
BASIN-DAKOTA GAS POOL

	2000 Minimum	2500 Minimum	3000 Minimum	8000 Minimum
Gas @ .13 MCF	$260.00	$325.00	$390.00	1040.00
Less Royalty @ .125	32.50	40.62	48.75	130.00
Less Well Operating cost	100.00	100.00	100.00	100.00
Gross Monthly Income	$127.50	$182.38	$241.25	$810.00

320 / 1 — 400 / 1 — 480 / 1 — 1280 / 1

ESTIMATED EFFECT OF 2500 MINIMUM ALLOWABLE
BASIN-DAKOTA GAS POOL

Deliverability Groups of Wells	No. Wells	Allowable Assigned Using 2500 Minimum	Allowable Assigned Using 0 Minimum (B.P. 74)	Actual Allowable Assigned Wells Based on Production History
0 - 74	11	16,698	16,698	13,164
74 to 113	3	7,421	7,264	5,997
113 to Total	421	3,342,253	3,342,372	3,347,398
	435	3,366,372	3,366,372	3,366,372

Maximum effect of 2500 minimum would be:

.005% of 1% of the allowable for 96.7% of the wells in the pool would go to .68% of the wells in the pool which would be assigned minimum allowables of 2500 MCF/Mo.

Actual effect based on 10 months production history of minimum wells would be:

Since deliverability group of 74 to 113 has a producing ability based on actual production of less than the allowable assigned, using zero minimums, the wells above 113 deliverability would not be effected.

ESTIMATED EFFECT OF 3000 MINIMUM ALLOWABLE
BASIN-DAKOTA GAS POOL

Deliverability Groups of Wells	No. Wells	Allowable Assigned Using 3000 Minimum	Allowable Assigned Using no Minimum (B.P. 74)	Actual Allowable Assigned Wells Based on Production History
0 - 74	11	16,698	16,698	13,164
74 to 214	32	95,715	81,517	83,103
214 to Total	392	3,253,958	3,268,359	3,270,105
	435	3,366,372	3,366,372	3,366,372

Maximum effect of 3000 minimum would be:

.43% of 1% of the allowable for 90.1% of the wells in the pool would go to 7.35% of the wells assigned a minimum of 3000 MCF/Mo.

Actual effect based on 10 months production history of minimum wells would be:

.04% of 1% the allowable for 90.1% of wells in the pool would go to 7.35% of the wells assigned a minimum of 3000 MCF/Mo.

ESTIMATED EFFECT OF 8000 MINIMUM ALLOWABLE
BASIN-DAKOTA GAS POOL

Deliverability Groups of Wells	No. Wells	Allowable Assigned Using 8000 Min. (breaking point 4202 Del.)	Allowable Assigned Using 0 Min. (breaking point 74 Del.)	Actual Allowable Assigned Wells Based on Production History
0 - 74	11	16,698	16,698	13,164
74 to 4202	395	3,031,166 (-1,299,039-)	2,533,679 (-801,552-)	1,732,127 (26 wells c/p
4202 to Total	29	318,508	815,995	1,621,071
	435	3,366,372	3,366,372	3,366,372

Maximum effect of 8000 minimum would be:

60.9 % of the allowable for 6.6% of the wells in the pool would go to 90.8% of the wells assigned a minimum of 8000 MCF/Mo.

Actual effect based on 10 month production history of minimum wells would be:

In the minimum group (74 to 4202 Del.) the production history shows this group to be incapable of producing the allowable assigned by either 0 or 8000 minimum method. The result would then be to assign less allowable to all wells above 1450 MCF/D Deliverability less allowable than the formula now provides. This would decrease allowables on 103 wells from 1450 to 4302 MCF/D Deliverability.

EXAMPLE OF INCOME FOR
VARIOUS MINIMUM ALLOWABLES

2000 x .12 MCF =		$240.00
Less .125 royalty	$30.00	
Less well operating costs	70.00	100.00
Gross monthly income		$ 140.00
2500 x .12 MCF =		$ 300.00
Less .125 royalty	37.50	
Less well operating costs	70.00	107.50
Gross monthly income		$ 192.50
3000 x .12 MCF =		375.00
Less .125 royalty	46.87	
Less well operating costs	70.00	116.87
Gross monthly income		$ 258.13
8000 x .12 MCF =		$ 960.00
Less .125 royalty	120.00	
Less well operating costs	70.00	190.00
Gross monthly income		$ 770.00

Consolidated Oil & Gas, Inc.

Executive Offices
912 UNITED STATES NATIONAL BANK BUILDING
DENVER 2, COLORADO
PHONE AMHERST 6-1306

September 29, 1959

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT NO. 4
CASE 2504

Ohio Oil Company
Post Office Box 120
Casper, Wyoming

Attention: Mr. R. W. McCanne
Division Manager

Re: Our jointly owned Government-Owens No. 1-7, SW/4 of Section 7, T31N-R12W, San Juan County, New Mexico

Gentlemen:

You will recall that subject well was drilled during the fall of 1957 and completed as a Mesa Verde gas producer. For details of the drilling and completion history, I refer you to the following two reports: (1) DRILLING AND COMPLETION HISTORY dated October 22, 1957, and (2) COMPLETION REPORT dated October 23, 1957.

In brief, we drilled with mud through the proven Mesa Verde and set 7 in. production casing at 5,000 ft. We then drilled with gas to a depth of 6695 ft., a point some 20 ft. above the top of the Dakota Formation. Because of the problems associated with a troublesome high pour point oil seep from the Greenhorn, it was necessary to mudup. We then drilled to an ultimate total depth of 6807 ft. which provided a Dakota penetration of 89 ft. We drill stem tested the whole Dakota interval establishing a stable natural flow of 10 to 15 MCFD.

Limited experience with the Dakota Formation in the San Juan Basin at that time indicated the need for considerably more natural potential before attempting a commercial completion. Accordingly, we abandoned the Dakota and proceeded with the Mesa Verde completion.

Subsequent experience in the area has pointed up two important factors: (1) If an effective frac can be accomplished, prolific production can be established from the Dakota in this area even in the face of zero natural flow: (2) Several Dakota sand stringers below our Owens penetration depth are productive.

In support of our analyses, we offer the following comments: The Dakota section penetrated in our Owens well is identical to that producing in several wells in the immediate area. In this respect, we call your attention to the Southern Union McCord in the SW/4 of Section 15-T30N-R13W, our Government Payne No. 1 in the SW/4 of Section 19-T31N-R12W, our Government-Cain No. 1 in the NE/4 of Section 25-T31N-R13W, Aztec's Thompson No. 1 in the NE/4 of Section 33-T31N-R12W. In addition, we have recently successfully completed our Government-Senter No. 1 in the same zone exposed in the Owens well, this well being located in the SW/4 of Section 24-T31N-R13W. At this time we are effecting a recompletion in this same and deeper zones in our Government Lea No. 1 in the SW/4 of Section 30-T31N-R13W.

All of these above mentioned wells are also productive from several sand stringers below our penetration depth in the Owens well.

Finally, we point out that the subject Owens well had a better natural indication even after being drilled with mud than most of these above listed wells had after being drilled with gas. Of course, they were all fraced.

We are confident that by deepening our Owens well some 50 ft. we can effect an into-the-line potential of 800 MCFD to 1500 MCFD along with 12 to 15 bbls. of condensate per MCFD. Gross reserves would be on the order of 5 to 8 billion cu. ft. along with 60 to 100 M bbls. of condensate. Since the Dakota is not prorated, relatively rapid payouts for the expenditures would be noted.

We propose to re-enter the Owens No. 1-7, build a simple sodium bentonite mud with a low water loss characteristic, drill the 7 in. casing plug, wash to the top of the cement plug opposite the Dakota Formation, drill the Dakota plug, and deepen to approximately 6860 ft. We then would run a 5 1/2 in. liner with turned down couplings as we have done in several instances in this area, hanging it from the base of the 7 in. and circulating cement around same. We would then after WOC run a collar log and perforate the prospective Dakota Formation. If necessary, we would selectively break down the various Dakota intervals with acid and then proceed with a sand-water frac utilizing some 60,000 lbs. of sand in 40 to 60,000 gals. of water.

The frac would be accomplished by running a squeeze packer to the top of the Dakota liner on either 3 1/2 in. tubing or 4 1/2 in. casing in order to get maximum frac effectiveness via high injection rates. The dual completion would essentially involve the setting of a Baker Model D permanent production packer in the liner. We would propose a string of 2 in. or 1 1/4 in. tubing to serve the Dakota and an annular string of 1 1/4 in. tubing to serve the Mesa Verde. We would probably wish to give the Mesa Verde a mud acid wash after the Dakota frac in order to resolve the adverse effects of mud contamination through the 7 in. casing perforations during the deepening operation.

We attach herewith an estimate of the cost for the proposed work and respectively urge early approval of your 51% share in order that the well may be recompleted and put on the line as rapidly as possible so that we may realize maximum production during the imminent winter withdrawal period.

It is probably unnecessary to amend our present operating agreement but a new communitization agreement covering the Dakota Formation would need to be prepared and filed. We would be happy to do this.

Very truly yours,

CONSOLIDATED OIL & GAS, INC.

J. B. Ladd
Vice President

JBL/mwk
Enclosure

RECEIVED
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
1959
CASE

October 23, 1959

Mr. J. B. Ladd, Vice President
Consolidated Oil & Gas, Inc.
312 United States National Bank Bldg.
Denver 2, Colorado

Dear Mr. Ladd:

Per the last several weeks we have been studying your proposal to deepen and attempt a dual completion in our jointly owned Government Owens Well No. 1-7 located in the SW¼ of Section 7, T. 31 N., R. 12 W., San Juan County, New Mexico.

We have come to the conclusion that we are not very much interested in this proposal; first, because this well has continued to be an excellent producer of Mesaverde gas; and second, there is no Dakota development within a mile and three quarters of this well, and we are not, therefore, suffering drainage.

As far as we are concerned we would much prefer to continue to produce the Mesaverde formation, which to date has made in excess of 100,000,000 cubic feet of gas, and not take a chance on injuring this formation by attempting a dual completion. A study of the existing Dakota completions indicates that the production varies considerably throughout the area, and it is possible that the economics of the majority of the Dakota wells may be marginal, at least resulting in long-term payouts.

Therefore, it is our thought that we should wait until more Dakota completions are made and we have more productive history before risking a recompletion of our Owens No. 1-7 well.

Yours very truly,

RMcC:MT
CC - E. L. Spieles
H. J. Brunt

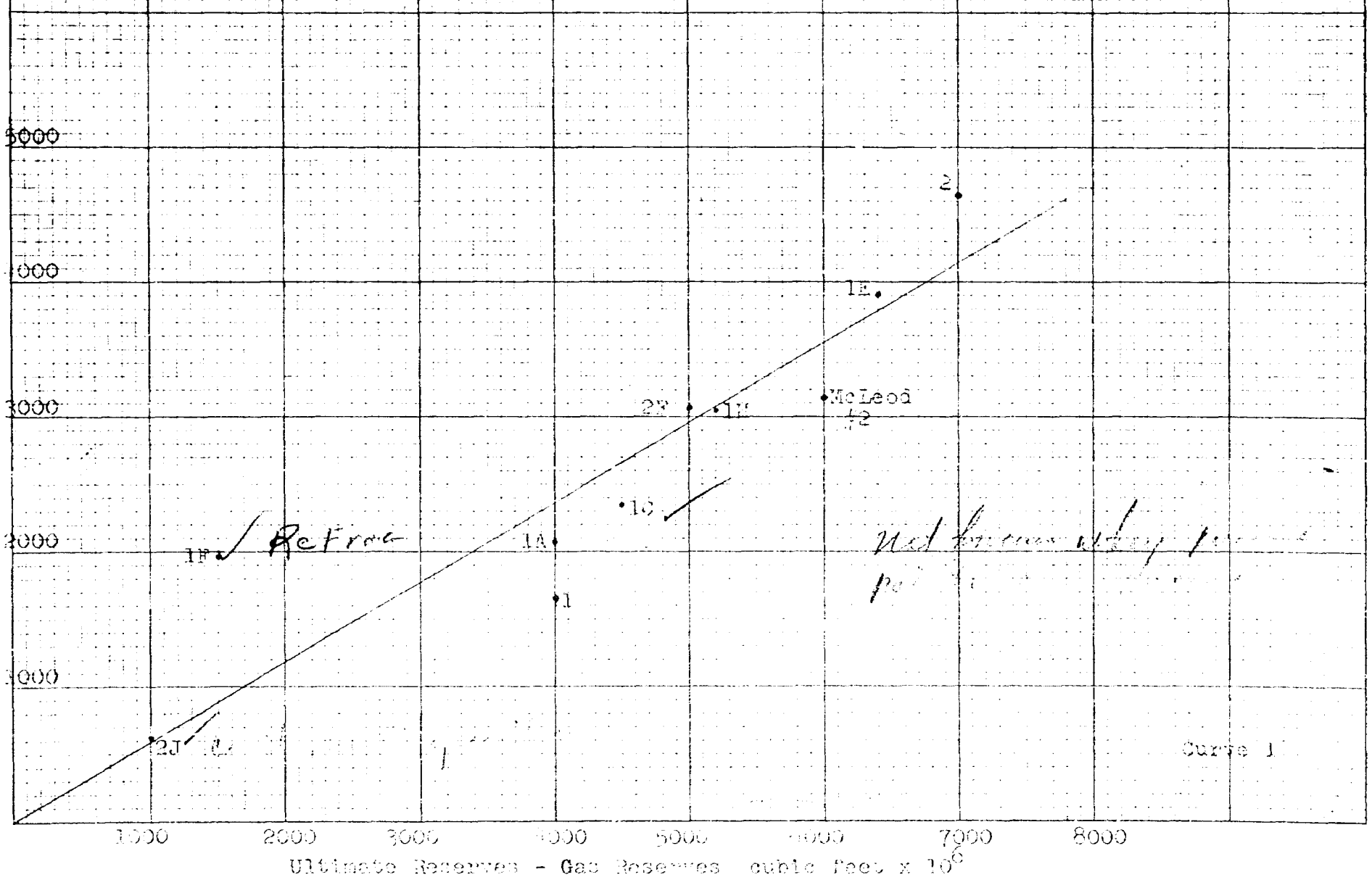
FO-27

K-E 10 X 10 TO THE INCH 359-5
KEUFFEL & ESSER CO.

Sunset #1

Sunset International Petroleum Corp.
Deliverability vs. Ultimate Recoverable Gas
Pressure Production Decline
Based on 10 wells with one year or more production history

Exhibit No. 1

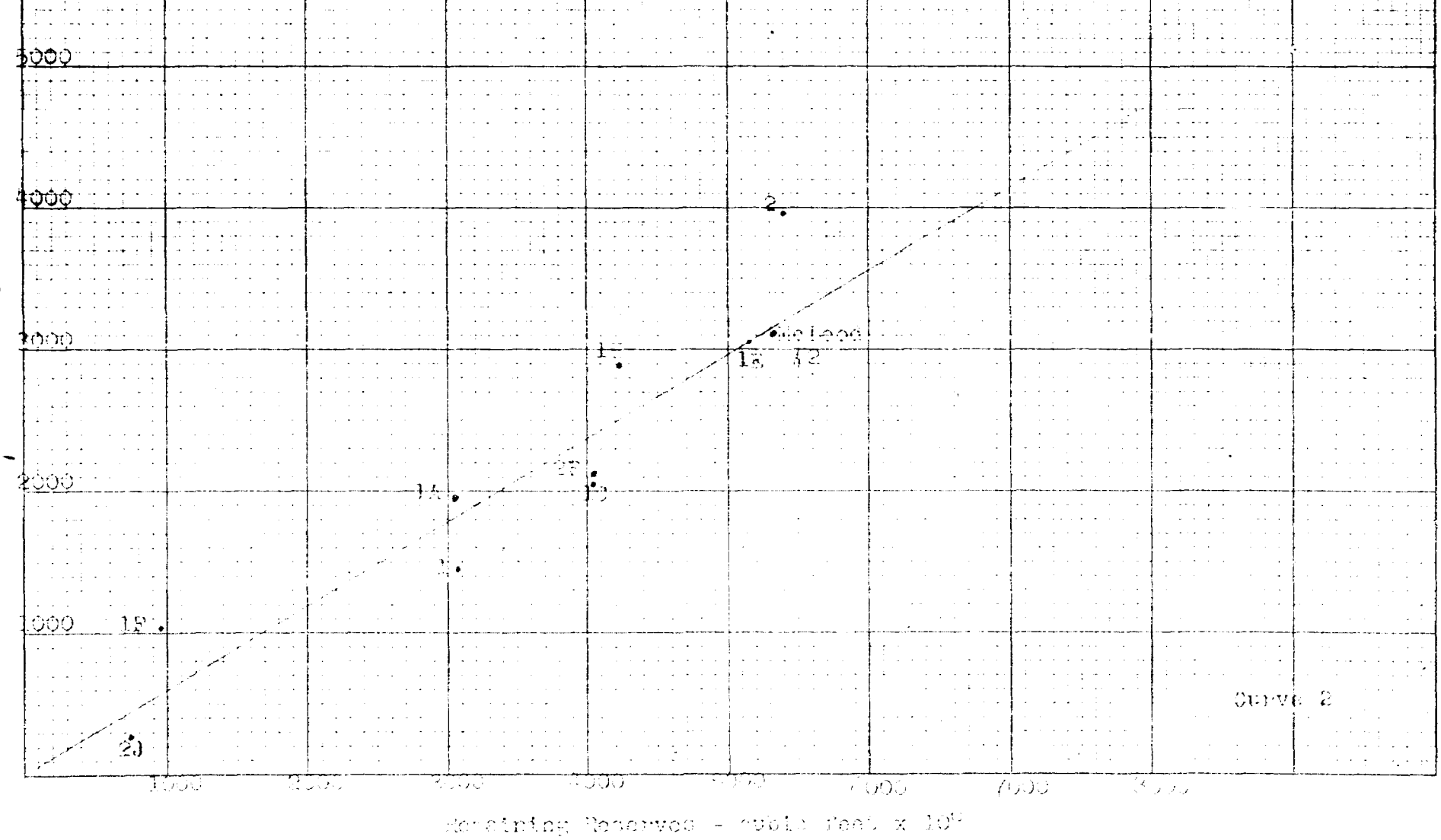


K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO. 359-5 MADE IN U.S.A.

Sunset #2

Sunset International Petroleum Corp.
Deliverability v. Remaining Recoverable Reserves
Pressure Production Decline
Based on 10 wells with one year or more production history

Exhibit No. 2



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EL 101

CAULKINS OIL COMPANY

BASIN DAKOTA POOL
RIO ARRIBA COUNTY, NEW MEXICO

NW SE 1-26-6 1953 Comp.
SE SE 1-26-6 1956

	Well A	Well B
Ultimate Gas Recovery-MCF	4,600,000	12,000,000
Deliverability-MCF	900	1,766

Ratio of Ultimate Gas Recovery	Well B / Well A =	12,000,000 / 4,600,000 =	2.61
Ratio of Deliverabilities	Well B / Well A =	1,766 / 900 =	1.96
Ratio of Assigned Allowables-April 1962	Well B / Well A =	16,099 MCF / 9,865 MCF =	1.63

Extra AZTEC #1

DELIVERABILITY vs. PERCENT RESERVES

A [illegible]

B [illegible]

IN THE [illegible]

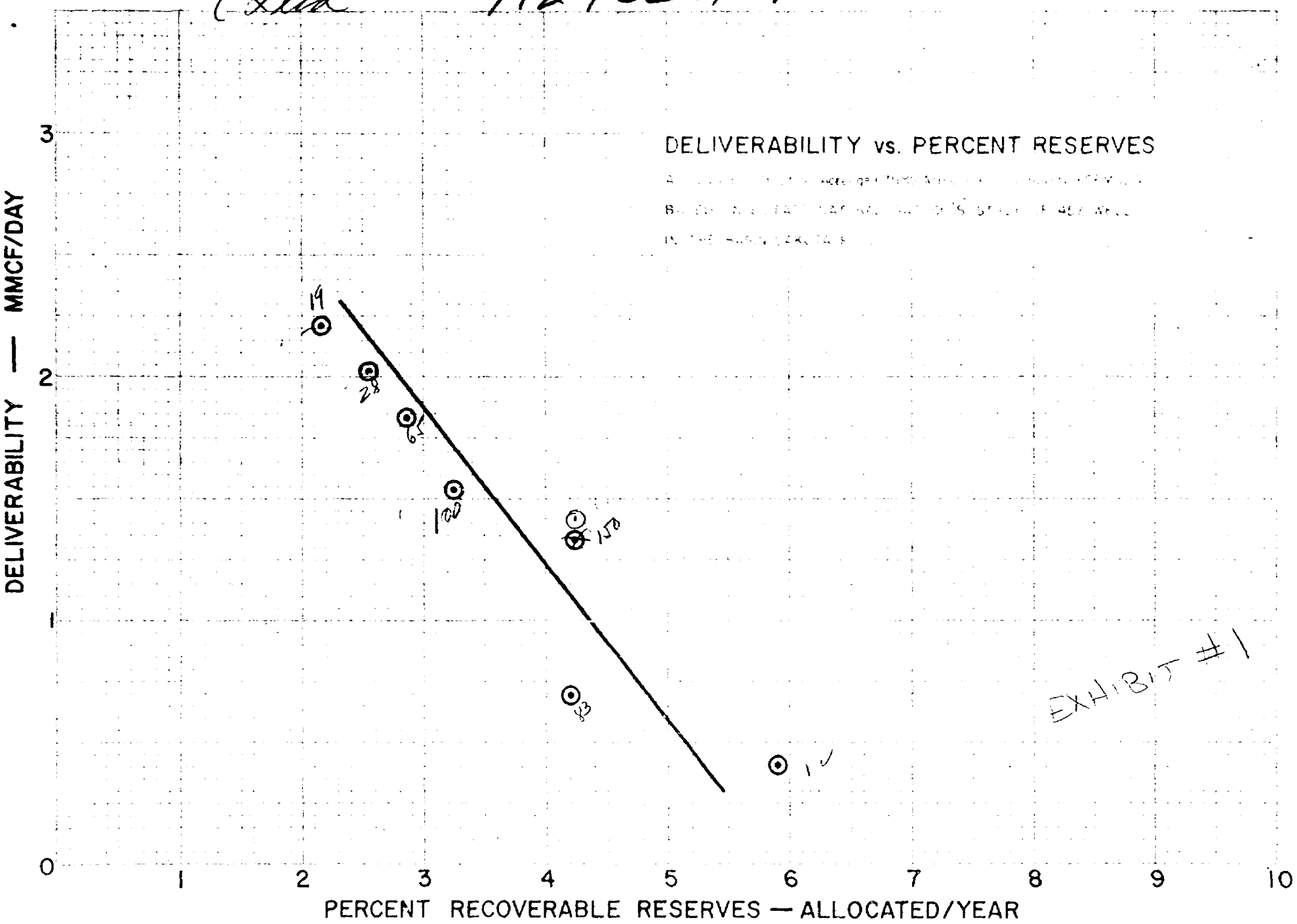

EXHIBIT #1

AZTEC #2

DELIVERABILITY vs. PERCENT RESERVES

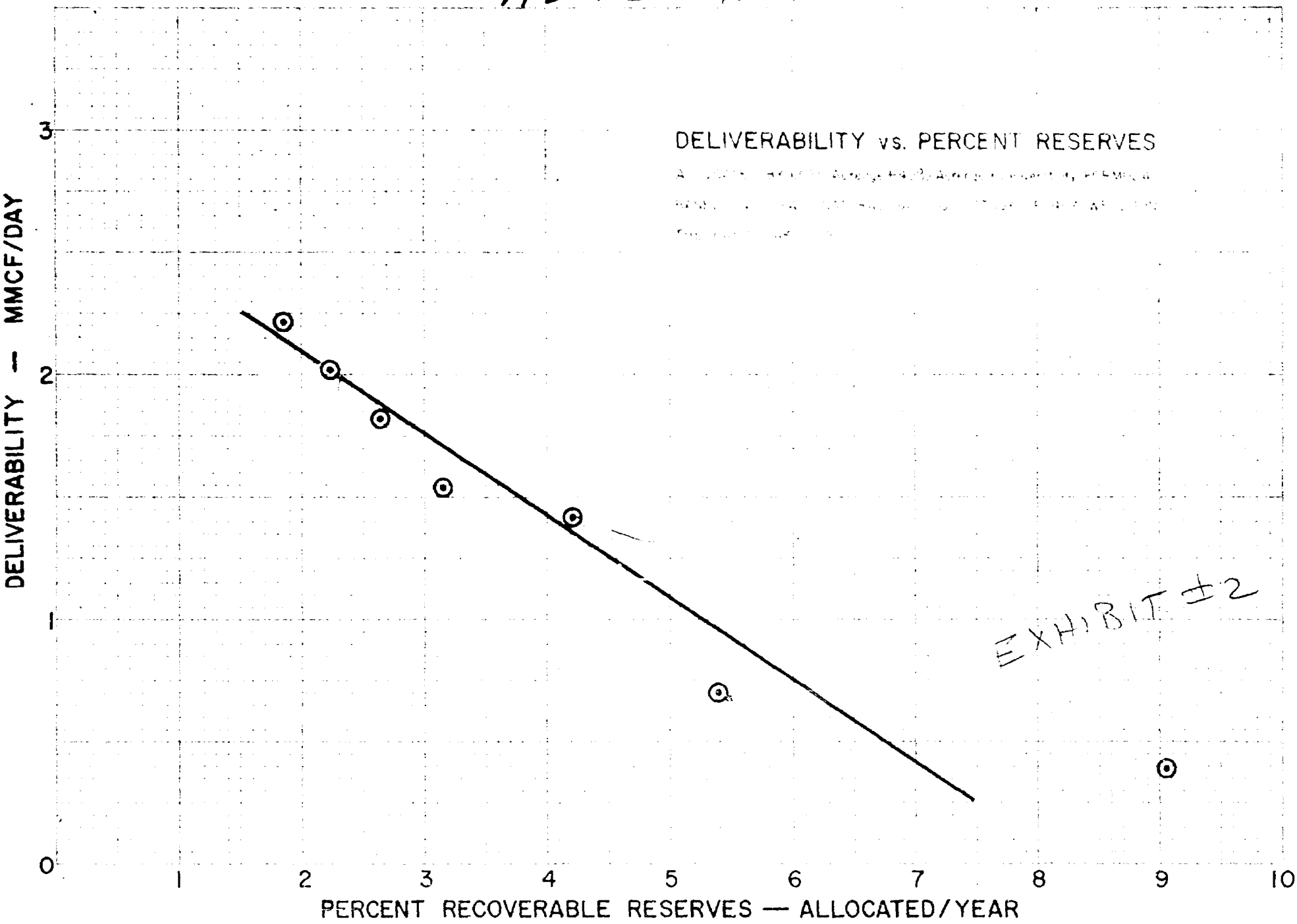

EXHIBIT #2

PUBCO'S EXHIBITS 1 to
10 - (extra copies)

R-1

C-2504

Basin Dakota Gas Reservoir
VOLUMETRIC CALCULATION OF GAS RESERVES

Pubco Petroleum Corporation Exhibit No._____ Case 2504

I. Definition of Reserves

A. Initial Recoverable Gas Reserve is that volume of gas to be recovered over a period of time beginning when production is first initiated and ending at some future time corresponding to a minimum producing rate of income equivalent to operating costs.

B. Present Recoverable Reserve is that volume of gas that is defined as Initial Recoverable Gas Reserve less the volume of gas which has been produced to the present time.

II. Volumetric Formula for Calculating Initial Recoverable Gas Reserve,

Initial recoverable gas reserve is,

(1) $gr = Go \times RF$

Where,

(2) $Go = 43560 A t \phi (1-Sw) \frac{P_o}{15.025} \frac{520}{T_r Z_o}$

(3) $RF = 1 - \frac{P_a / Z_a}{P_o / Z_o}$

= Fraction of original gas in place to be recovered to abandonment when producing rate of income is equivalent to operating costs. ($ 1130/year/well or 27 MCF/day /well)

and,

43560 = Constant, square feet per acre

A = Acres

t = Net pay thickness, feet

ϕ = Porosity, fraction

SW = Connate water saturation, fraction

P_o = Initial reservoir pressure, psia

T_r = Reservoir temperature (^oF + 460), degrees Rankin

Z_o = Initial gas compressibility, fraction

P_a = Abandonment pressure, psia

Z_a = Gas Compressibility at abandonment, fraction

Reference: Sylvain J. Pirson Oil Reservoir Engineering
Second Edition, 1958, pages 454 and 466

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PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER _____
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

INITIAL DELIVERABILITY RELATED TO INITAL RECOVERABLE RESERVES FOR 382 WELLS

Range of D. Curves Studied

#1 300,000 242,000 MCF
2 1,000,000 1,982,000 MCF
2,106,000 2,778,000 MCF

Initial Deliverability, MCF/Day

6000
5000
4000
3000
2000
1,000
0

2 — Grand Canyon Field
200 - 1560
1,358-1X60

44 59 57 53 44 35 30 23 9 6 5 3 2 1 1

Number of Wells Represented by Each Point

0 2 4 6 8 10 12 14 16 18 20

Initial Recoverable Reserves, Billion Cubic Feet

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CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR
1962 DELIVERABILITY
RELATED TO PRESENT RECOVERABLE
RESERVES FOR 357 WELLS

1962 Deliverability, MCF/Day

0
1000
2000
3000
4000
5000
6000

2
4
6
8
10
12
14
16
18
20

57 56 64 52 47 30 35 13 8 6 3 3 1 1 1

Number of Wells Represented by Each Point

Present Recoverable Reserves, Billion Cubic Feet (11-1-62)

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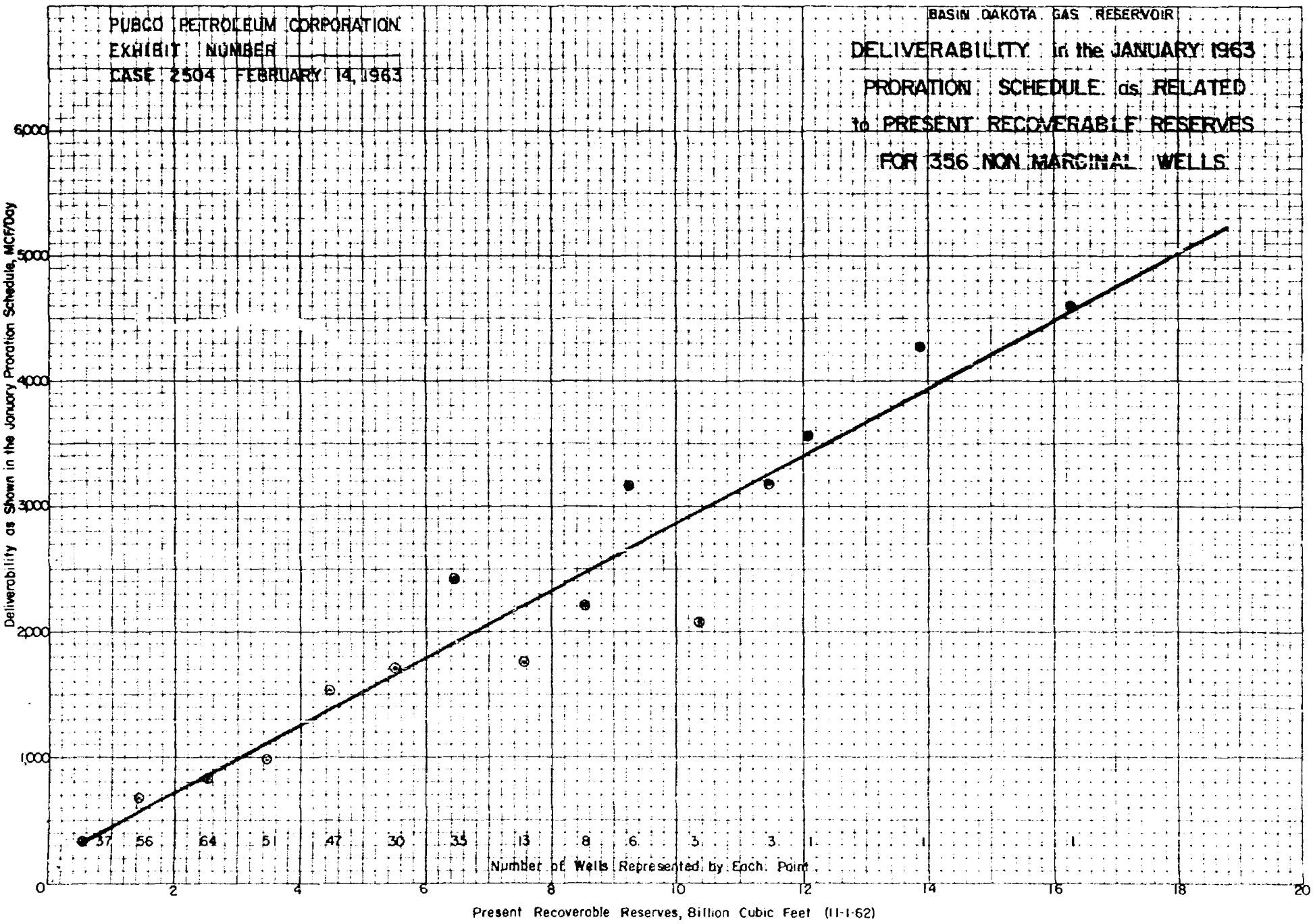
PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

DELIVERABILITY in the JANUARY 1963
PRORATION SCHEDULE as RELATED
to PRESENT RECOVERABLE RESERVES
FOR 356 NON MARGINAL WELLS



R-5

PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER _____
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

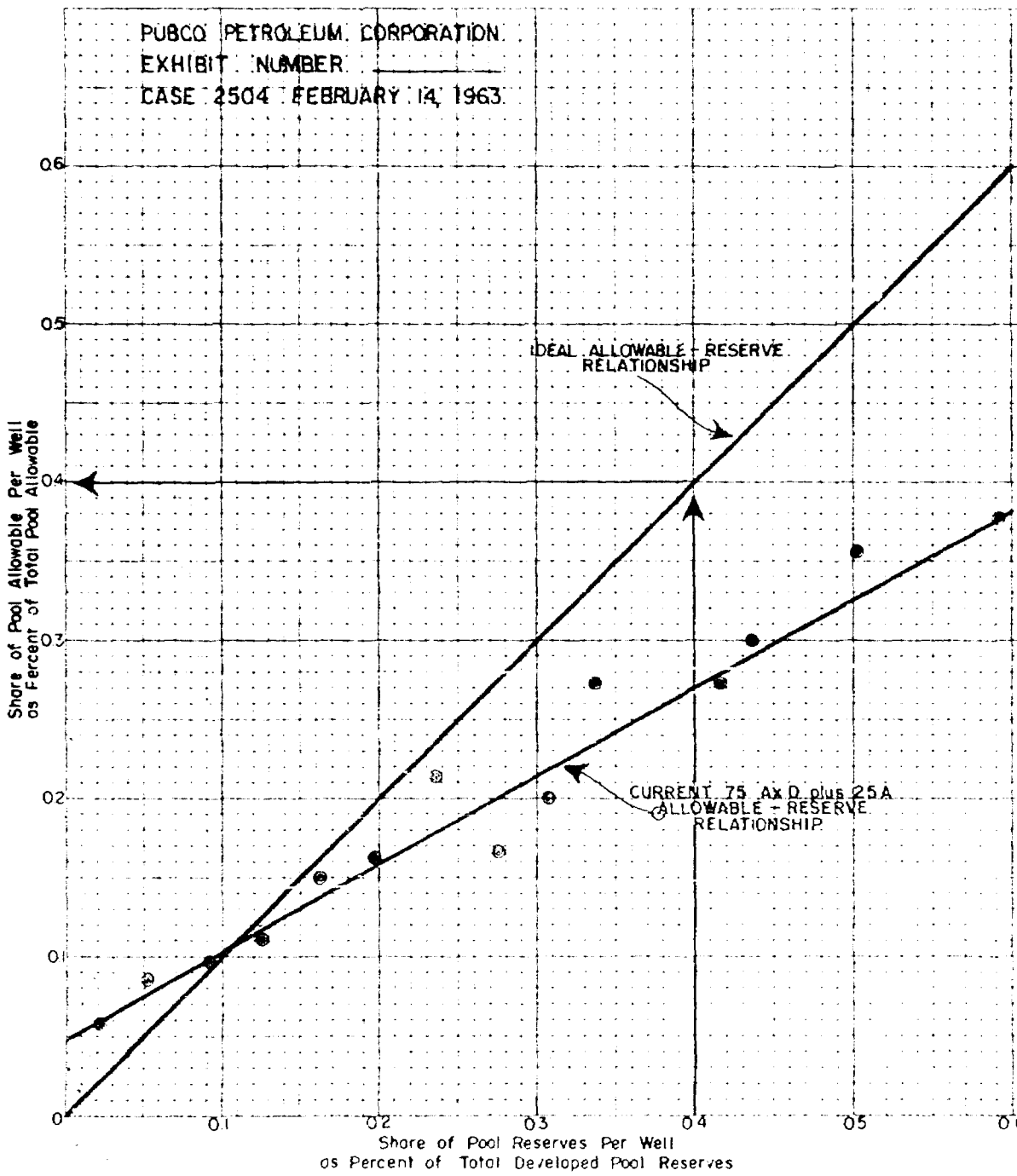
GAS WELLS SHARE of PRESENT POOL ALLOWABLE COMPARED TO ITS SHARE of PRESENT DEVELOPED POOL RESERVES UNDER CURRENT FORMULA 75% AxD plus 25% A

Based on a Study of 356 Wells.

A. Each point on the graph used to establish the slope of the 75-25 line represents an average well within a reserve group. Reserve groups range from 0-.1, .1-.2, etc., billion cubic feet of present reserves.

B. Horozonital Scale.
   1. Total Developed Pool Reserves, 2,754,061 MMCF

C. Vertical Scale
   1. Non Marginal Wells in the Pool with Deliverabilities as Shown in the January, 1963 Proration Schedule
      (a) Pool allowable, 3,700,250 MCF
      (b) Participation AxD factors; 1003.869
      (c) Acreage factors; 719.38
      (d) Deliverability factors, 1,005,054
      (e) Total non marginal wells; 723



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PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER _____
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

GAS WELL'S SHARE of PRESENT POOL ALLOWABLE COMPARED TO ITS SHARE of PRESENT DEVELOPED POOL RESERVES UNDER PROPOSED FORMULA

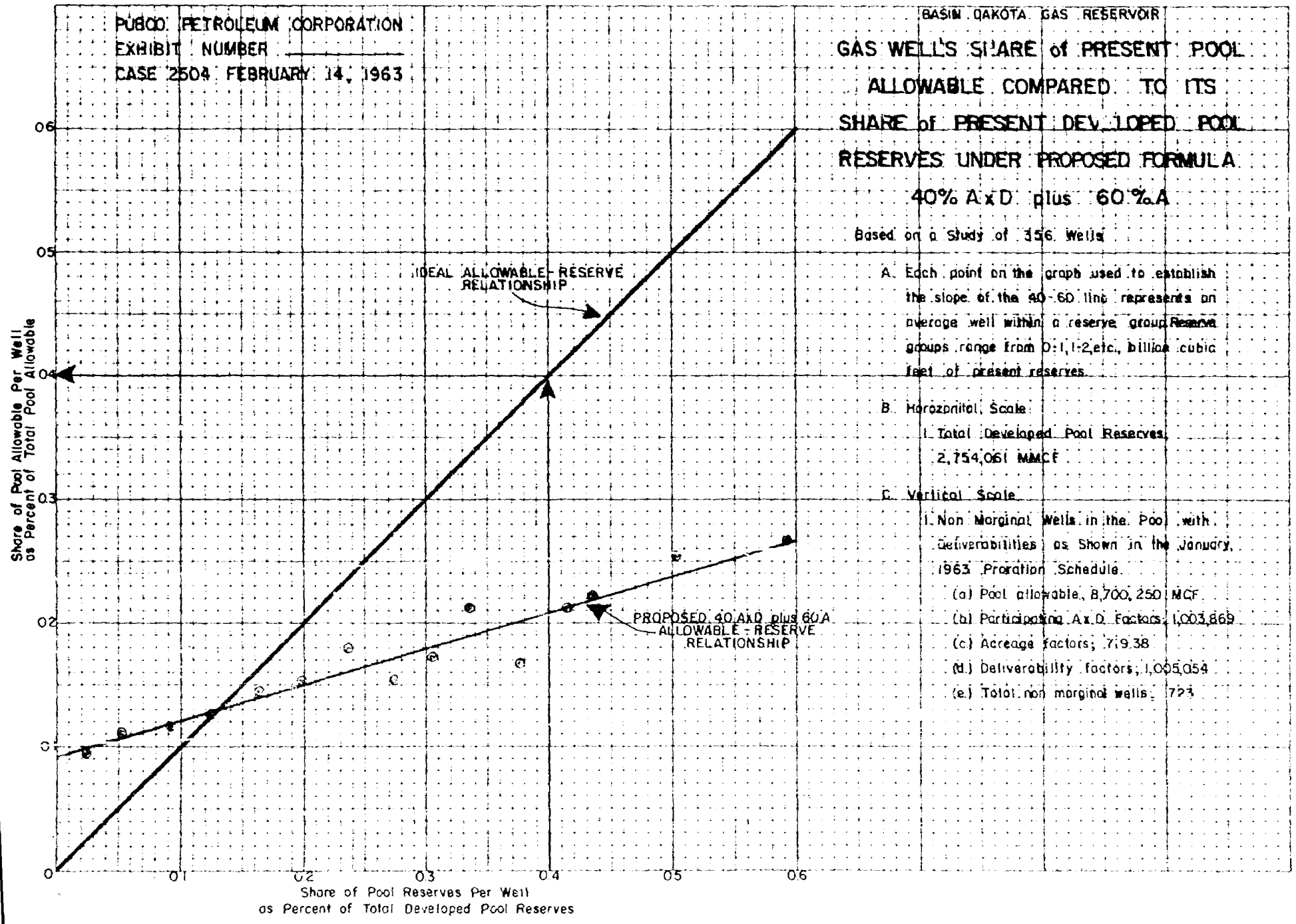
40% A x D plus 60 %A

Based on a Study of 356 Wells

A. Each point on the graph used to establish the slope of the 40-60 line represents an average well within a reserve group. Reserve groups range from 0-1, 1-2, etc., billion cubic feet of present reserves.

B. Horozontal Scale
   1. Total Developed Pool Reserves, 2,754,061 MMCF

C. Vertical Scale
   1. Non Marginal Wells in the Pool with Deliverabilities as Shown in the January, 1963 Proration Schedule.
      (a) Pool allowable, 8,700,250 MCF
      (b) Participating A x D Factors, 1,003,869
      (c) Acreage factors; 719.38
      (d.) Deliverability factors, 1,005,054
      (e.) Total non marginal wells, 723



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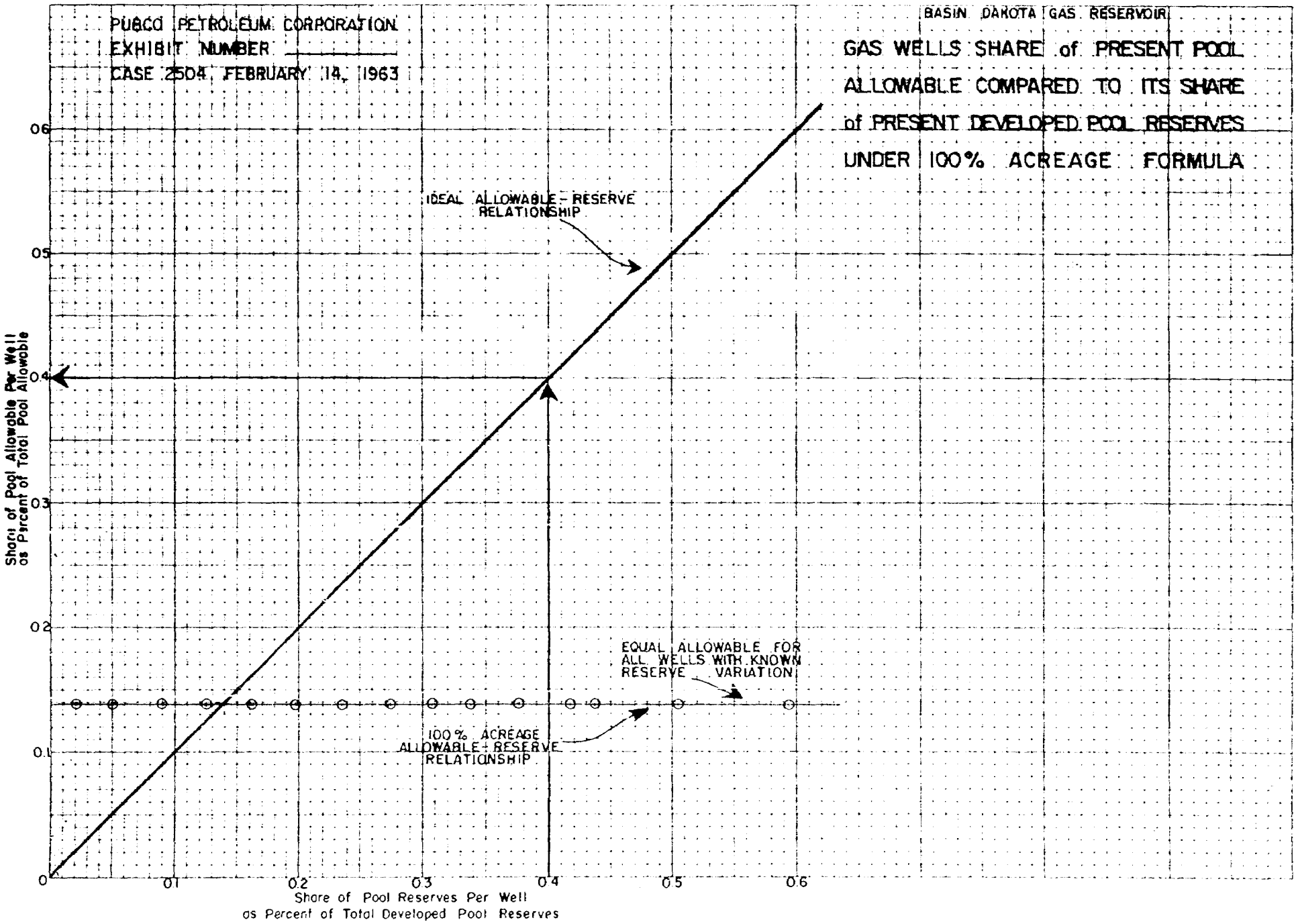
PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER _____
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

GAS WELLS SHARE of PRESENT POOL ALLOWABLE COMPARED TO ITS SHARE of PRESENT DEVELOPED POOL RESERVES UNDER 100% ACREAGE FORMULA



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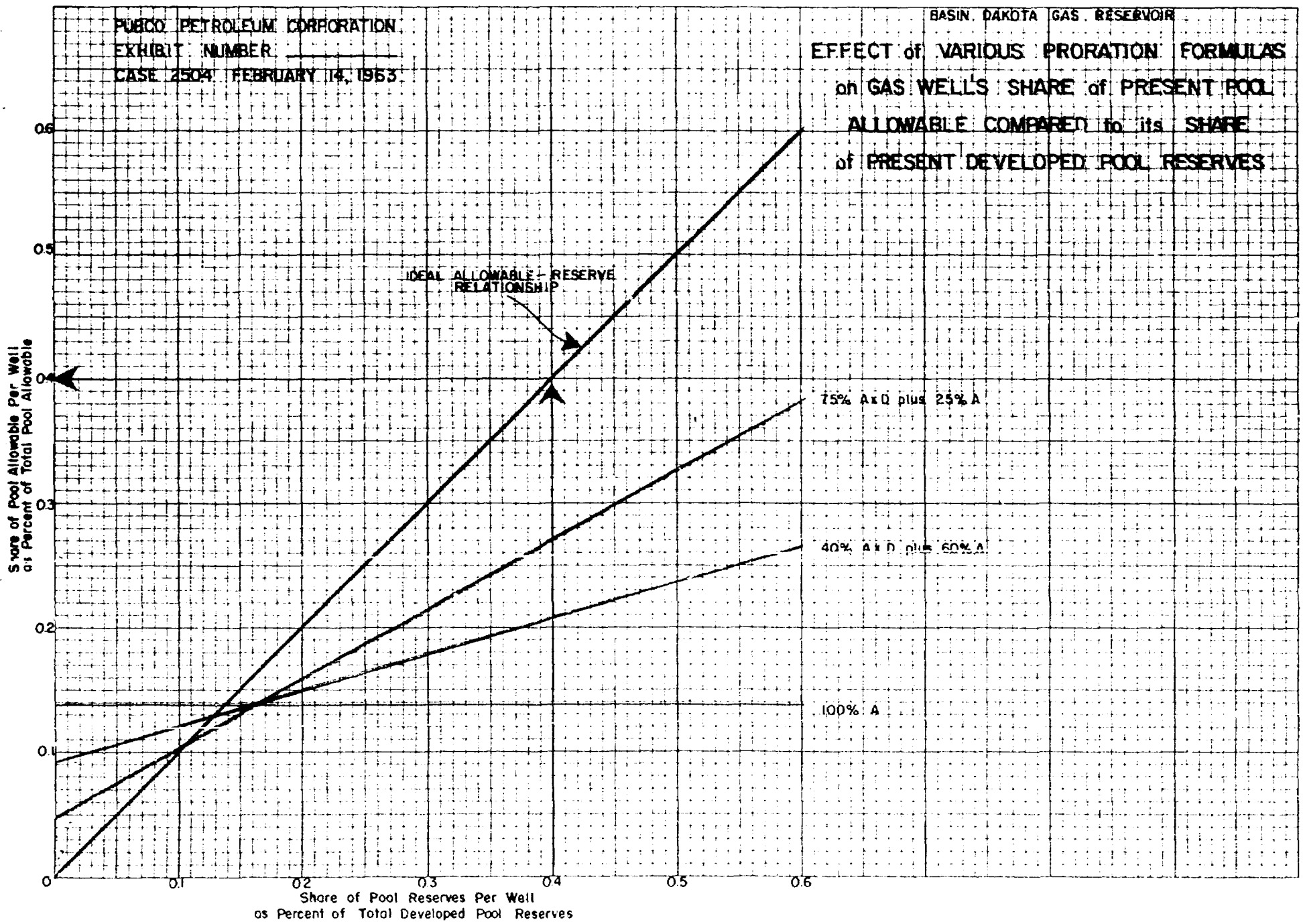
PUBCO PETROLEUM CORPORATION
EXHIBIT NUMBER _____
CASE 2504 FEBRUARY 14, 1963

BASIN DAKOTA GAS RESERVOIR

EFFECT of VARIOUS PRORATION FORMULAS on GAS WELL'S SHARE of PRESENT POOL ALLOWABLE COMPARED to its SHARE of PRESENT DEVELOPED POOL RESERVES



Consolidated Oil & Gas, Inc.

Executive Offices
332 UNITED STATES NATIONAL BANK BUILDING
DENVER 2, COLORADO
PHONE AMHERST 6-1306

September 29, 1959

Ohio Oil Company
Post Office Box 120
Casper, Wyoming

Attention: Mr. R. W. McCanne
Division Manager

Re: Our jointly owned Government-Owens No. 1-7, SW/4 of Section 7, T31N-R12W, San Juan County, New Mexico

Gentlemen:

You will recall that subject well was drilled during the fall of 1957 and completed as a Mesa Verde gas producer. For details of the drilling and completion history, I refer you to the following two reports: (1) DRILLING AND COMPLETION HISTORY dated October 22, 1957, and (2) COMPLETION REPORT dated October 23, 1957.

In brief, we drilled with mud through the proven Mesa Verde and set 7 in. production casing at 5,000 ft. We then drilled with gas to a depth of 6695 ft., a point some 20 ft. above the top of the Dakota Formation. Because of the problems associated with a troublesome high pour point oil seep from the Greenhorn, it was necessary to mudup. We then drilled to an ultimate total depth of 6807 ft. which provided a Dakota penetration of 89 ft. We drill stem tested the whole Dakota interval establishing a stable natural flow of 10 to 15 MCFD.

Limited experience with the Dakota Formation in the San Juan Basin at that time indicated the need for considerably more natural potential before attempting a commercial completion. Accordingly, we abandoned the Dakota and proceeded with the Mesa Verde completion.

Subsequent experience in the area has pointed up two important factors: (1) If an effective frac can be accomplished, prolific production can be established from the Dakota in this area even in the face of zero natural flow: (2) Several Dakota sand stringers below our Owens penetration depth are productive.

In support of our analyses, we offer the following comments: The Dakota section penetrated in our Owens well is identical to that producing in several wells in the immediate area. In this respect, we call your attention to the Southern Union McCord in the SW/4 of Section 15-T30N-R13W, our Government Payne No. 1 in the SW/4 of Section 19-T31N-R12W, our Government-Cain No. 1 in the NE/4 of Section 25-T31N-R13W, Aztec's Thompson No. 1 in the NE/4 of Section 33-T31N-R12W. In addition, we have recently successfully completed our Government-Senter No. 1 in the same zone exposed in the Owens well, this well being located in the SW/4 of Section 24-T31N-R13W. At this time we are effecting a recompletion in this same and deeper zones in our Government Lea No. 1 in the SW/4 of Section 30-T31N-R13W.

All of these above mentioned wells are also productive from several sand stringers below our penetration depth in the Owens well.

Finally, we point out that the subject Owens well had a better natural indication even after being drilled with mud than most of these above listed wells had after being drilled with gas. Of course, they were all fraced.

We are confident that by deepening our Owens well some 50 ft. we can effect an into-the-line potential of 800 MCFD to 1500 MCFD along with 12 to 15 bbls. of condensate per MCFD. Gross reserves would be on the order of 5 to 8 billion cu. ft. along with 60 to 100 M bbls. of condensate. Since the Dakota is not prorated, relatively rapid payouts for the expenditures would be noted.

We propose to re-enter the Owens No. 1-7, build a simple sodium bentonite mud with a low water loss characteristic, drill the 7 in. casing plug, wash to the top of the cement plug opposite the Dakota Formation, drill the Dakota plug, and deepen to approximately 6860 ft. We then would run a 5 1/2 in. liner with turned down couplings as we have done in several instances in this area, hanging it from the base of the 7 in. and circulating cement around same. We would then after WOC run a collar log and perforate the prospective Dakota Formation. If necessary, we would selectively break down the various Dakota intervals with acid and then proceed with a sand-water frac utilizing some 60,000 lbs. of sand in 40 to 60,000 gals. of water.

The frac would be accomplished by running a squeeze packer to the top of the Dakota liner on either 3 1/2 in. tubing or 4 1/2 in. casing in order to get maximum frac effectiveness via high injection rates. The dual completion would essentially involve the setting of a Baker Model D permanent production packer in the liner. We would propose a string of 2 in. or 1 1/4 in. tubing to serve the Dakota and an annular string of 1 1/4 in. tubing to serve the Mesa Verde. We would probably wish to give the Mesa Verde a mud acid wash after the Dakota frac in order to resolve the adverse effects of mud contamination through the 7 in. casing perforations during the deepening operation.

We attach herewith an estimate of the cost for the proposed work and respectively urge early approval of your 51% share in order that the well may be recompleted and put on the line as rapidly as possible so that we may realize maximum production during the imminent winter withdrawal period.

It is probably unnecessary to amend our present operating agreement but a new communitization agreement covering the Dakota Formation would need to be prepared and filed. We would be happy to do this.

Very truly yours,

CONSOLIDATED OIL & GAS, INC.

J. B. Ladd
Vice President

JBL/mwk
Enclosure

GOVERNMENT OWENS NO. 1-17
SW/4 OF SECTION 7, T31N, R12W,
SAN JUAN COUNTY, NEW MEXICO

ESTIMATED COST OF DEEPENING & RECOMPLETION AS A DUAL DAKOTA-MESA VERDE WELL

Intangibles:

Rig Time - 18 days @ $900	$16,200
Cement & Services	800
Log & Perforate	2,500
Water	3,000
Location	600
Frac Materials & Services	8,000
Trucking	2,000
Mud Materials	1,500
Miscellaneous Labor & Services	3,500
Sub-Total	$38,100

Tangibles:

2000' of Liner	$ 4,000
6800' of Tubing	5,100
Dual Downhole Equipment	2,000
Xmas Tree Adaptation	800
Separator	2,800
Miscellaneous Fittings, Etc.	400
Sub-Total	$15,100

GRAND TOTAL $53,200