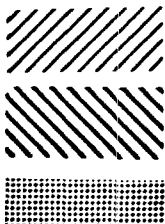


T
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LEGEND

ANTELOPE RIDGE UNIT



Initial Participating Area

Proposed First Enlargement
Initial Participating Area

Unit Boundary

Proposed First Enlargement
Initial Participating Area
Siluro-Devonian Formation

Scale: 1" = 2000'

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool Undesignated Formation Devonian County LeaInitial Annual Special Date of Test 3-22-63Company Shell Oil Company Lease Federal "BE" Well No. 1Unit B Sec. 4 Twp. 24 S Rge. 34 E Purchaser Casing * Wt. I.D. Set at Perf. To Tubing Wt. I.D. Set at Perf. To Gas Pay: From 14,660' To 14,900' L 14,833' xG Mix = .721 GL 10,694 Bar.Press. 13.2Producing Thru: Casing Tubing Type Well

Single-Bradenhead-G. G. or G.O. Dual

Date of Completion: Packer Reservoir Temp.

OBSERVED DATA

Tested Through (Packer) (Choke) (Meter) Type Taps Flange

No.	Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
	(Packer) (Line) Size	(Choke) (Orifice) Size	Press. psig	Diff. h _w	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
SI						4455		packer		3 hrs.
1.	4	2.500	380	34.0	54	3608				1 hr.
2.	4	2.500	600	44.0	58	2800				1 hr.
3.	4	2.500	750	55.0	68	1972				1 hr.
4.	4	2.500	810	67.0	77	1439				1 1/6 hr.
5.										

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w p_f}$	Pressure psia	Flow Temp. Factor F _t	Gravity Factor F _g	Compress. Factor F _{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	42.13	115.62	393.2	1.0058	.9498	1.044	4.858
2.	42.13	164.25	613.2	1.0019	.9498	1.068	7.033
3.	42.13	204.87	763.2	.9924	.9498	1.081	8.794
4.	42.13	234.85	823.2	.9840	.9498	1.081	9.996
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio 46,448 cf/bbl.
Gravity of Liquid Hydrocarbons 57.5 @ 60 deg.
P_c 1.750 (1-e^{-s}) .513Specific Gravity Separator Gas .665
Specific Gravity Flowing Fluid .7487
P_c 4468.2 P_c 19964.8

No.	P _t (psia)	P _t ²	F _c Q	(F _c Q) ²	(F _c Q) ² (1-e ^{-s})	P _w ²	P _c ² -P _w ²	Cal. P _w	P _w / P _c
1.	3621.2	13113.1	8.501	72.267	37.073	13150.2	6814.6	3626.3	81.1
2.	2213.2	7914.1	12.308	151.489	77.714	7991.8	11973.0	2827.0	63.3
3.	1985.2	3941.0	15.389	236.821	121.489	4062.5	15902.3	2015.6	45.1
4.	1452.2	2108.9	17.493	306.005	156.980	2265.9	17698.9	1505.3	33.7
5.									

Absolute Potential: 11,000 MCFPD; n .699COMPANY Shell Oil CompanyADDRESS Box 1858 Roswell, New MexicoAGENT and TITLE WITNESSED COMPANY

REMARKS

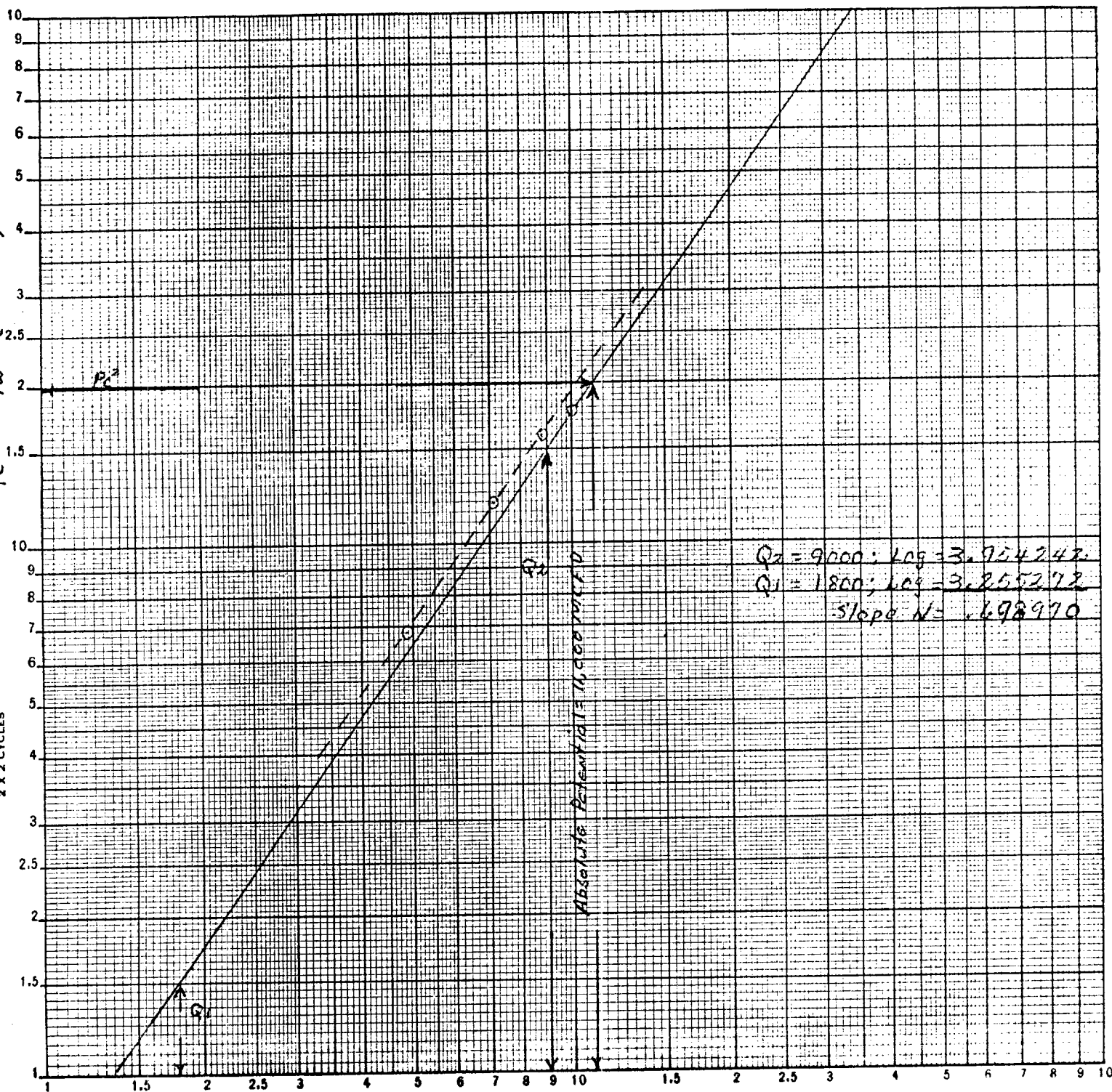
* DST taken through drill pipe gross open-hole interval 14,660-14,900'

GAS WELL BACK PRESSURE CURVE

County LEA Field UNDESIGNATED
Operator SHELL OIL COMPANY
Lease FEDERAL "BE" Well No. 1
Volume 11,000 MCF/24 hr.
Date MARCH 22, 1963

$P_c^2 - P_w^2$ (thousands)

K x W
LOGARITHMIC 359-110
KEUFFEL & ESSER CO. MADE IN U.S.A.
2 X 2 CYCLES



Q - MCFD - 15.025 psia



SHELL OIL COMPANY

P. O. Box 1858
Roswell, New Mexico

October 31, 1963

Subject: Antelope Ridge Unit (14-08-0001-8492)
Lea County, New Mexico
Application for Approval of
Initial Participating Area
Siluro-Devonian Formation

Effective 12-27-62

The Director
United States Geological Survey
Washington 25, D.C.

Commissioner of Public Lands
State of New Mexico
Santa Fe, New Mexico

Through:

Regional Director
United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico

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

Gentlemen:

Shell Oil Company as Unit Operator for the Antelope Ridge Unit Agreement, approved by the acting Director, United States Geological Survey, effective December 27, 1962, pursuant to the provisions of Section 11 thereof, respectfully submits for the approval of the Director the selection of the following described lands to constitute the Initial Participating Area for gas and associated liquid production from the Siluro-Devonian formation to wit:

All Sections 27, 28, 33 and 34, Township 23 South,
Range 34 East, N.M.P.M., Lea County, New Mexico,
totaling 2560.00 acres.

This application for approval of the Initial Participating Area for the Siluro-Devonian formation is predicated on the successful completion on September 12, 1963, of Shell et al Federal BE-1, located in the NW/4 NE/4 of Section 4, T-24-S, R-34-E, for a Calculated Absolute Open Flow Potential rate of 38.0 million cubic feet of gas per day from the lower Pennsylvanian formation at a depth of 12,898 to 13,153 feet. Further, it is the opinion of the Operator that Shell Harris Federal 1, SE/4 SW/4, Section 27, T-23-S, R-34-E, can be recognized as a Unit well according to the conditions set forth in the last paragraph of Section 9 of the Unit Agreement and that the effective date should be December 27, 1962, which coincides with the effective date of the Unit. Harris Federal 1 was successfully completed as a Siluro-Devonian producer during August, 1962, with a Calculated Absolute Open Flow Potential rate of 41.0 million cubic feet per day from the Siluro-Devonian formation at a depth of 14,655 to 14,832 feet. According to said Section 9 this well is to be dedicated to the unit contingent on the completion of Federal BE-1 as a

well capable of producing unitized substances in paying quantities. It is therefore concluded that a determination of the Initial Siluro-Devonian Participating Area is now in order and that the effective date should be December 27, 1962, the day on which Harris Federal 1 is to be recognized as a unit well.

In order to protect correlative rights of all concerned royalty interests it is proposed that each governmental section which is within the boundaries of the Antelope Ridge Unit and which is contiguous to Section 27, T-23-S, R-34-E, where Harris Federal 1 is located, be included in the Initial Participating Area.

In support of this application we are submitting the following exhibits:

1. A geological and engineering report giving data pertinent to Harris Federal 1.
2. An ownership plat showing tract numbers and indicating the area proposed as the Initial Participating Area for Siluro-Devonian production.
3. Calculated Absolute Open Flow Potential Test of the Siluro-Devonian formation in Harris Federal No. 1.
4. Schedule I, showing the participating percentage of each lease included in the Initial Participating Area.

For additional pertinent data please refer to geological exhibits accompanying the application for the First Enlargement of the Initial Participating Area for the Siluro-Devonian formation which is being forwarded concurrently with this application.


The establishment of the Initial Participating Area is intended to determine the percent of participation in gas and condensate sales from Harris Federal 1 from the effective date as a unit well until the date when Federal BE-1 is to be recognized as a well capable of producing unitized substances in paying quantities from the Siluro-Devonian reservoir.

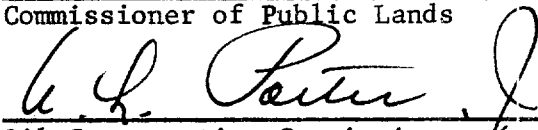
Yours very truly,



T. H. Dwyer
Division Production Manager

Approve: _____ Date: _____
Director, United States Geological Survey

Approve:  Date: December 18, 1963
Commissioner of Public Lands

Approve:  Date: 1-6-64
Oil Conservation Commission

Schedule I
Initial Siluro-Devonian Participating Area
Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing the Percentage of Participation
and Ownership of Leases in the Participating Area

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	LC 067715 (Tract 1)
Participating Acreage:	640.00 Acres
Percent of Participation:	25.00000
Description:	Section 28: All T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	LC 071949 (Tract 2)
Participating Acreage:	600.00 Acres
Percent of Participation:	23.43750
Description:	Section 27: E/2, E/2 W/2, SW/4 NW/4, W/2 SW/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	MM 0155160 (Tract 8)
Participating Acreage:	40.00 Acres
Percent of Participation:	1.56250
Description:	Section 27: NW/4 NW/4 T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	E-8078 (Tract 10)
Participating Acreage:	200.00 Acres
Percent of Participation:	7.81250
Description:	Section 34: SW/4 NE/4, SE/4 NW/4, NE/4 SW/4, SW/4 SW/4, NE/4 SE/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	OG-20 (Tract 11)
Participating Acreage:	440.00 Acres
Percent of Participation:	17.18750
Description:	Section 34: N/2 NE/4, SE/4 NE/4, N/2 NW/4, SW/4 NW/4, NW/4 SW/4, SE/4 SW/4, NW/4 SE/4, S/2 SE/4, T-23-S, R-34-E, N.M.P.M.

Schedule I

2

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	K-280 (Tract 12)
Participating Acreage:	320.00 Acres
Percent of Participation:	12.50000
Description:	Section 33: E/2 E/2, NW/4 T-23-S, R-34-E, N.M.P.M.

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	K-2149 (Tract 14)
Participating Acreage:	320.00 Acres
Percent of Participation:	12.50000
Description:	Section 33: W/2 E/2, SW/4 T-23-S, R-34-E, N.M.P.M.

Summary:

	<u>Acres</u>	<u>Percent</u>
Total Federal Lands	1280.00	50.00000
Total Indian Lands	0.00	0.00000
Total State Lands	1280.00	50.00000
Total Fee or Other Lands	<u>0.00</u>	<u>0.00000</u>
Subtotal	2560.00	100.00000
Uncommitted Acreage	<u>0.00</u>	
Total Productive Acreage	2560.00	

EXHIBIT NO. 1
ANTELOPE RIDGE UNIT
GEOLOGICAL AND ENGINEERING REPORT
IN SUPPORT OF INITIAL PARTICIPATING AREA
SILURO-DEVONIAN RESERVOIR

GENERAL

The structural feature underlying the Antelope Ridge Unit is postulated on the basis of seismic data to be an elongate southwest-northeast trending anticline. The crestal sector is located approximately over the common boundary of Section 33 and 34, T-23-S, R-34-E. The west flank slopes away from the crest at a gradient of about 500 feet per mile toward the west boundary of the Unit, where the structure is probably separated from the Bell Lake feature either by faulting or by abrupt reversal in dip. The east flank has a gradient of about 350 feet per mile. The southward plunge along the axis is about 300 feet per mile to about S/2 Section 9, where faulting is suggested by steepening dip. The north plunge of the axis is not well defined; seismic data indicate a dip of about 300 feet per mile, while dipmeter data at Pennsylvanian level suggests that the dip may be as much as 460 feet per mile.

The Siluro-Devonian reservoir rock is described as a white to gray or tan, fine to medium crystalline dolomite having intercrystalline and vuggy porosity with evidence of fracturing. Porosity is not uniformly developed through the productive interval but occurs at random positions in the column. The presence of fracturing suggests that fluids probably communicate throughout the gross interval although there may be localized vertical isolation of porosity to some small degree.

WELL DATA

The Antelope Ridge Siluro-Devonian pool was discovered by Shell Harris Federal 1 located 660' FSL and 1980' FWL, Section 27, T-23-S, R-34-E. The test was drilled to a total depth of 14,832 feet and completed on August 9, 1962, in the Siluro-Devonian formation from the open hole interval at a depth of 14,653 to 14,832 feet. The open hole interval in the Siluro-Devonian below 5 1/2-inch casing flowed gas on two drill stem tests while drilling operations were in progress. The maximum drill stem test rate was 3.45 million cubic feet per day through a 5/8-inch BHC and a 3/8-inch tubing choke. On the initial potential test following a 2000-gallon acid treatment the well flowed at a CAOF potential rate of 41 million cubic feet per day. The original bottom hole pressure at a datum of 11,100 feet subsea was 6397 psi.

Harris Federal 1 was designed for an open hole completion in the Siluro-Devonian. Accordingly, there was no attempt to locate a water level in this well. The top of the Siluro-Devonian was encountered 11,158 feet subsea. The well was completed at a total depth of 11,357 feet subsea which resulted in a gross productive interval of 199 feet. The well has supplied fuel and drilling gas for Federal BE-1. Cumulative production to date is 49,066 MCF of gas and 1638 barrels of condensate. There has been no evidence of water during the initial producing period.

Formation tops on Harris Federal are as follow:

Base Red Beds	852' (+2,631')
Delaware Ls.	5,025' (-1,542')
Delaware Ss.	5,095' (-1,612')
Bone Spring	8,556' (-5,073')
Wolfcamp	11,388' (-7,905')
Pennsylvanian	11,740' (-8,257')
Des Moines	11,801' (-8,318')
Atoka	11,973' (-8,490')
Mississippian Ls.	14,068' (-10,585')
Woodford Shale	14,424' (-10,941')
Siluro-Devonian	14,641' (-11,158')
Total Depth	14,840' (-11,357')

ECONOMIC CONSIDERATIONS

In addition to engineering and geological data included with this report, the Operator hereby submits for consideration a discussion of development and contractual aspects which are deemed pertinent to the determination of revenue participation which will be shared by the various unitized lands over the life of the unit.

1. Shell has contracted for gas sales from the Antelope Ridge Unit to commence prior to January 1, 1964. The initial guaranteed rate of take shall be 6.85 million cubic feet of gas per day until January 1, 1965. From January 1, 1965, to January 1, 1966, the guaranteed rate of take shall be 30.0 million cubic feet of gas per day. Beginning January 1, 1966, the guaranteed rate of take shall be governed by reserves based on a ratio of 1 million cubic feet of gas per day per 7.3 billion cubic feet of reserves, with a maximum rate of take of 40.0 million cubic feet per day. Reserves in excess of 292 billion cubic feet may be sold under separate contract.
2. Reserves are to be redetermined near the end of year 1965, at which time a comparison of reservoir pressures with cumulative withdrawals should provide a reasonably accurate evaluation of reserves attributable to the Siluro-Devonian reservoir. Geological and engineering data now available indicate that the Siluro-Devonian prospect is reasonably covered by the Unit boundaries. At the present time it appears that satisfactory deliverability can be realized with a well density less than one well per section. Therefore, the Operator proposes to rely on reservoir performance data for reserve determinations rather than to estimate reserves by the volumetric approach. The former method is considered to be more reliable in a carbonate reservoir such as the Siluro-Devonian.
3. The total capital expenditures for the two wells to date has been \$1,850,000. Harris Federal 1, a Siluro-Devonian test, was completed for a total cost of \$650,000. Federal BE-1, a pre-Cambrian test, was completed for a total cost of \$1,200,000.

It is anticipated that future development wells will cost in excess of \$600,000 per well. In order to prevent waste of capital assets the Operator proposes to drill no more wells than is necessary to fulfill contractual requirements and provide a safe margin of deliverability capacity for peak loads and emergency well shut-downs. In this respect it is important to recognize that sales from the Unit are to be based on reserves and not on number of wells.

4. In the interest of conservation of hydrocarbons, the withdrawal points from a continuous reservoir such as Siluro-Devonian, should be located as near the crest of the reservoir as is feasible. Accordingly, the Operator proposes to locate all Siluro-Devonian wells at high structural positions to assure maximum recovery from each location and from the reservoir as well.

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool Undesignated Formation Devonian County Lea

Initial X Annual _____ Special _____ Date of Test August 9, 1962

Company Shell Oil Company Lease Harris Federal Well No. 1

Unit N Sec. 27 Twp. 23S Rge. 34E Purchaser None

Casing 7 5/8" Wt. 33.7# I.D. 6.765 Set at 14,655' Perf. - To -

Tubing 2 3/8" Wt. 4.7# I.D. 1.995 Set at 14,636' Perf. - To -

Gas Pay: From 14,655' To 14,832' L 14,636 xGMix. .756 GL 11,065 Bar.Press. 13.2

Producing Thru: Casing _____ Tubing x Type Well Single

Date of Completion: August 9, 1962 Packer 14,620' Single-Bradenhead-G. G. or G.O. Dual Reservoir Temp. -

OBSERVED DATA

Tested Through <u>(Roadcock)</u> <u>(Stodcock)</u> <u>(Meter)</u>						Type Taps <u>Flange</u>				
No.	<u>(Roadcock)</u> (Line) Size	<u>(Stodcock)</u> (Orifice) Size	Press. psig	Diff. h _w	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	Duration of Flow Hr.
SI						4509				46 hrs.
1.	4	1.750	255	28.00	88	4363				3 hrs.
2.	4	1.750	255	73.00	68	4262				4 hrs.
3.	4	2.000	340	70.00	42	4119				2 hrs.
4.	4	2.500	375	58.00	58	3909				3 hrs.
5.	4	2.500	150	30.00	94	4319				24 hrs.

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w P_f}$	Pressure psia	Flow Temp. Factor F _t	Gravity Factor F _g	Compress. Factor F _{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	19.27	86.67	268.2	.9741	.9292	1.025	1,550
2.	19.27	139.92	268.2	.9924	.9292	1.029	2,558
3.	25.58	157.25	353.2	1.0178	.9292	1.048	3,935
4.	42.13	150.06	388.2	1.0019	.9292	1.047	6,161
5.	42.13	69.97	163.2	.9688	.9292	1.015	2,694

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio 43,041 cf/bbl.

Gravity of Liquid Hydrocarbons 56 deg. API

P_c 9.936 (1-e^{-s}) .533

Specific Gravity Separator Gas .695

Specific Gravity Flowing Fluid .7547

P_c 4522.2 P_c^2 20,450.3

No.	P_t (psia)	P_c^2	F _c Q	(F _c Q) ²	(F _c Q) ² (1-e ^{-s})	P_w^2	$P_c^2 - P_w^2$	Cal. P_w	$\frac{P_w}{P_c}$
1.	4376.2	19151.1	15.401	237.191	126.423	19277.5	1172.8	4390.6	97.1
2.	4275.2	18277.3	25.416	645.973	344.304	18621.6	1828.7	4315.3	95.4
3.	4132.2	17066.8	39.595	1567.764	835.618	17902.4	2547.9	4231.1	93.6
4.	3922.2	15383.6	61.216	3747.399	1997.364	17381.0	3069.3	4169.0	92.2
5.	4332.2	18767.9	26.767	716.472	381.879	19149.8	1300.5	4376.0	96.8

Absolute Potential: 41,000 MCFPD; n 1.000

COMPANY Shell Oil Company

ADDRESS P. O. Box 1858, Roswell, New Mexico

AGENT and TITLE A. L. Ellard - Gas Tester

WITNESSED _____

COMPANY _____

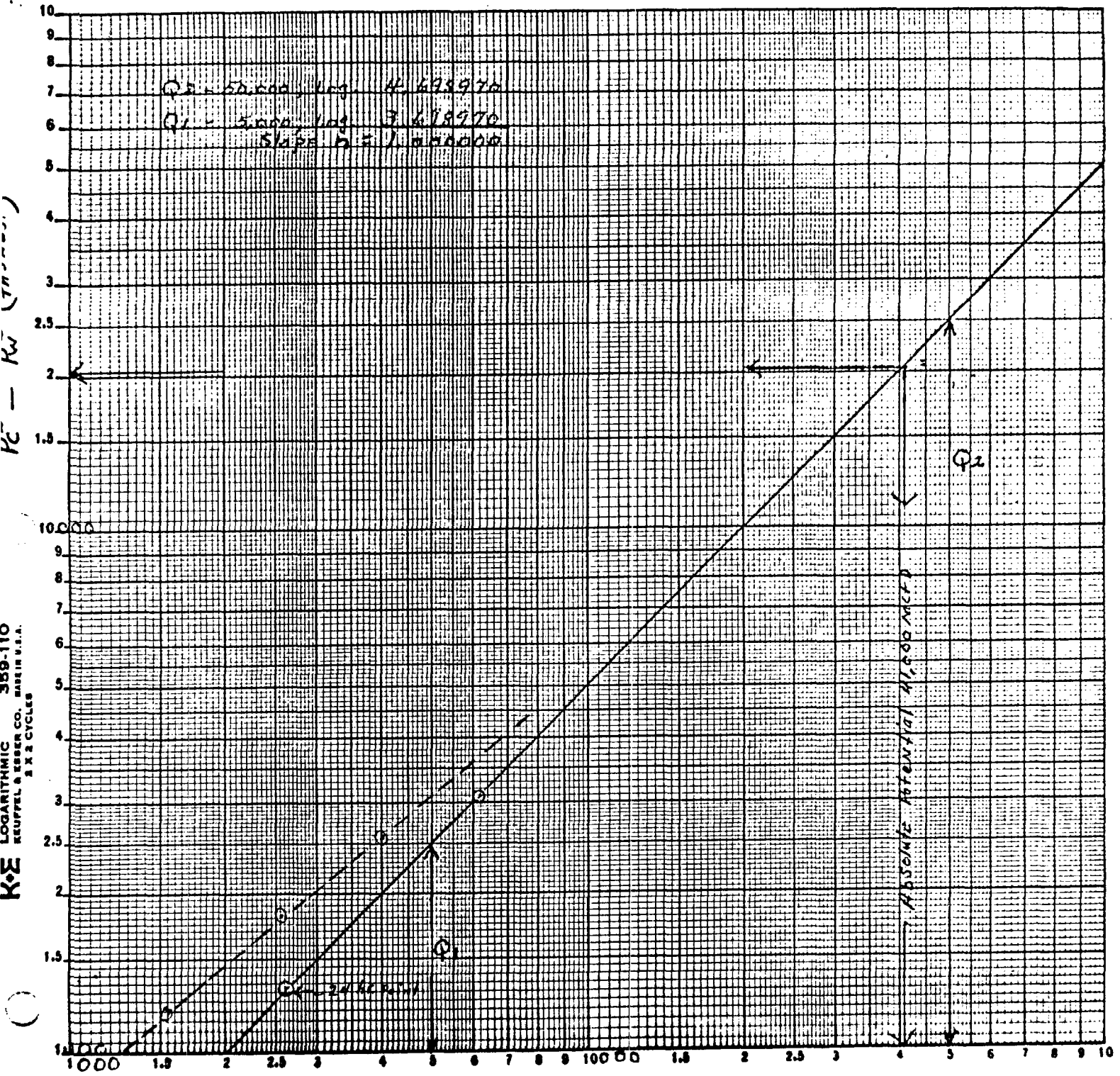
REMARKS

Slope greater than 1.000, a slope of 1.000 drawn through 24 hour rate of flow.

Copy to State
Land Office 1-9-63
dlg

GAS WELL BACK PRESSURE CURVE

County Le... Field Undesignated
 Operator SHELL OIL COMPANY
 Lease HARRIS FEDERAL Well No. 1
 Volume 46,000 MCF/24 hr.
 Date AUGUST 2, 1967



K₁ - K₂ (THIN)

LOGARITHMIC 359-110
 KEUFFEL & ESSER CO. MADE IN U.S.A.
 2 X 2 CYCLES

Q - MCFD - 15.025 psia



SHELL OIL COMPANY

P. O. Box 1858
Roswell, New Mexico

October 15, 1963

Subject: Antelope Ridge Unit (14-08-0001-8492)
Lea County, New Mexico
Application for Approval of
Initial Participating Area
Pennsylvanian Formation

The Director
United States Geological Survey
Washington 25, D.C.

Commissioner of Public Lands
State of New Mexico
Santa Fe, New Mexico

Through:

Regional Director
United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico

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

Gentlemen:

Shell Oil Company as Unit Operator of the Antelope Ridge Unit Agreement, approved by the acting Director, United States Geological Survey, effective December 27, 1962, pursuant to the provisions of Section 11 thereof, respectfully submits for the approval of the Director the selection of the following described lands to constitute the Initial Participating Area for gas and associated liquid production from the lower Pennsylvanian formation to wit:

The S/2 Section 33 and SW/4 Section 34, T-23-S,
R-34-E, NMPM; W/2 Section 3 and All Section 4,
T-24-S, R-34-E, NMPM, totaling 1439.71 acres.

This application for approval of the Initial Participating Area for the lower Pennsylvanian formation is predicated on the successful completion on September 12, 1963, of Shell et al Federal BE-1, located in the NW/4 NE/4 of Section 4, T-24-S, R-34-E, for a Calculated Absolute Open Flow Potential rate of 38.0 million cubic feet of gas per day from the Pennsylvanian formation at a depth of 12,898 to 13,153 feet. As set forth in Section 11 of the Unit Agreement, the date of this Initial Participating Area shall be effective on September 12, 1963, the date when Federal BE-1 was completed in the lower Pennsylvanian capable of producing unitized substances in paying quantities.

In support of this application we are submitting the following exhibits:

1. A geological and engineering report giving pertinent data acquired in development to date.

2. A structural map covering the Antelope Ridge Unit contoured on a Schlumberger log marker designated as P-2.
3. An ownership plat showing tract numbers and indicating the area proposed as the Initial Participating Area.
4. A copy of the Calculated Absolute Open Flow Potential test conducted in Federal BE-1 on the completion test.
5. A plot of BHP performance during CAOFTP.
6. Schedule I, showing the participating percentage of each lease included in the proposed participating area.

In addition, we respectfully request that you refer to a southwest-northeast cross-section through the Antelope Ridge Unit submitted with the application for approval of the First Enlargement to the Initial Participating Area for the Siluro-Devonian formation and designated as Exhibit No. 3. This section also covers the lower Pennsylvanian interval which is pertinent to this application.

The land listed hereinabove is unitized and constitutes all of the land which can be regarded as reasonably proved or indicated to be productive of unitized substances in paying quantities from the lower Pennsylvanian interval. Consequently, the applicant respectfully requests that the Director approve this application for the Initial Participating Area for the lower Pennsylvanian formation, to be effective on September 12, 1963.

Yours very truly,



T. H. Dwyer
Division Production Manager

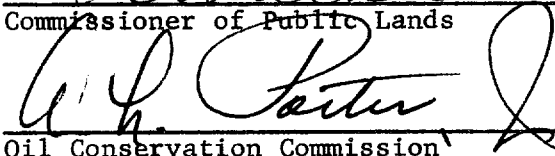
Enclosures

Approved: _____
Director, United States Geological Survey

Date: _____

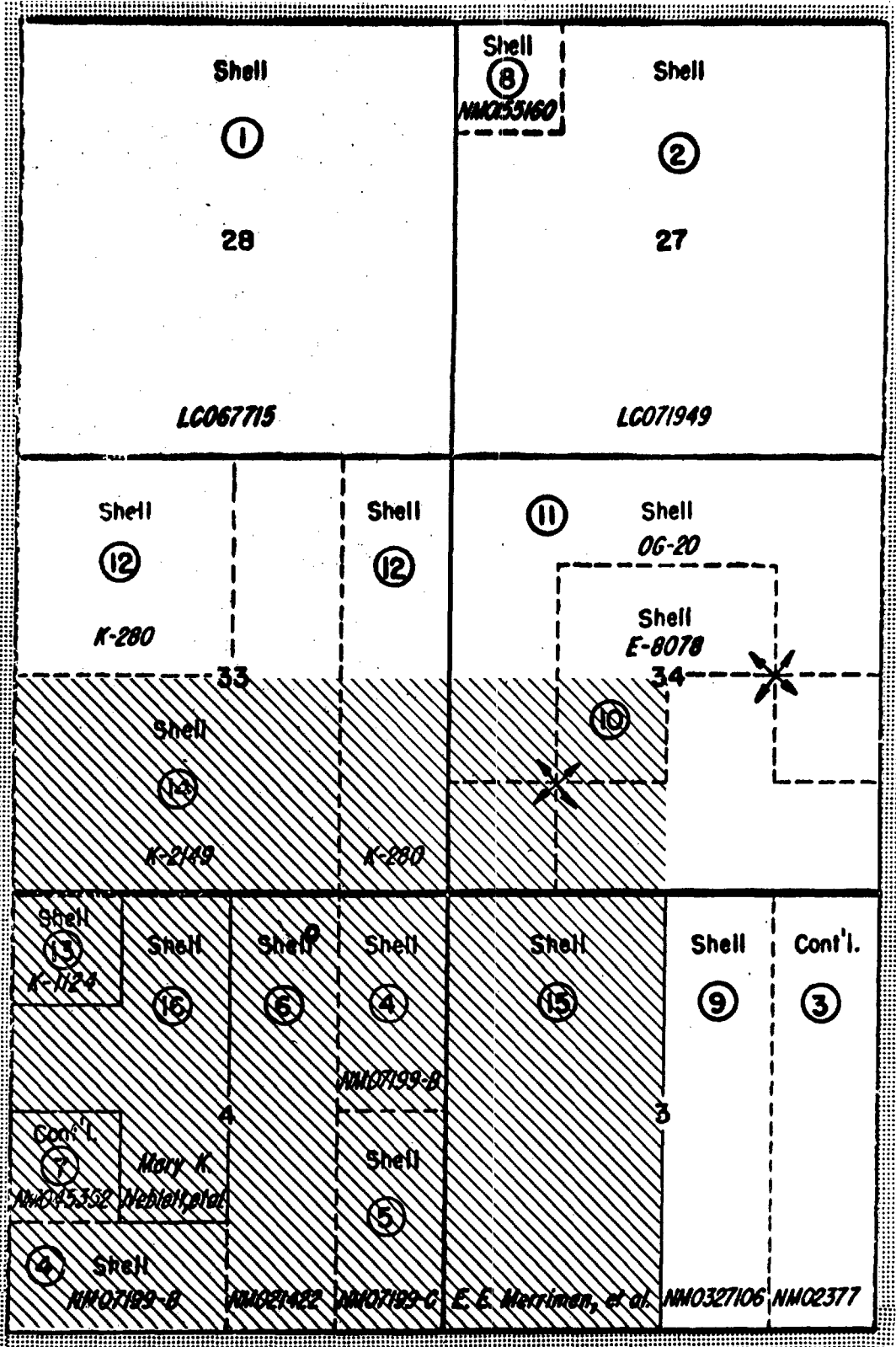
Approved: 
Commissioner of Public Lands

Date: December 18, 1963

Approved: 
Oil Conservation Commission

Date: 1-6-64

R - 34 - E



T
23
S

T
24
S

Legend

⑤ Tract Number

////// Proposed Participating Area

■ Unit Boundary

ANTELOPE RIDGE UNIT
Proposed Initial Participating Area
Lower Pennsylvanian Formation
Scale 1" = 2,000'

EXHIBIT NO. 3

Schedule I
Initial Lower Pennsylvanian Participating Area
Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing the Percentage of Participation
and Ownership of Leases in the Participating Area

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-B (Tract 4)
Participating Acreage:	159.98 Acres
Percent of Participation:	11.11196
Description:	Section 4: Lot 1, SE/4 NE/4, S/2 SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-C (Tract 5)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 4: E/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 021422 (Tract 6)
Participating Acreage:	159.94 Acres
Percent of Participation:	11.10918
Description:	Section 4: Lot 2, SW/4 NE/4, W/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Continental Oil Company
Working Interest Owner:	Continental Oil Company
Serial Number and Tract Number:	NM 045352 (Tract 7)
Participating Acreage:	40.00 Acres
Percent of Participation:	2.77833
Description:	Section 4: NW/4 SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	E-8078 (Tract 10)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NE/4 SW/4, SW/4 SW/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	OG-20 (Tract 11)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NW/4 SW/4, SE/4 SW/4, T-23-S, R-34-E, N.M.P.M.

Schedule I

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Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	K-280 (Tract 12)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 33: E/2 SE/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	K-1124 (Tract 13)
Participating Acreage:	39.86 Acres
Percent of Participation:	2.76861
Description:	Section 4: Lot 4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	K-2149 (Tract 14)
Participating Acreage:	240.00 Acres
Percent of Participation:	16.67002
Description:	Section 33: SW/4, W/2 SE/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	None (Tract 15)
Participating Acreage:	320.03 Acres
Percent of Participation:	22.22878
Description:	Section 3: Lots 3 and 4, S/2 NW/4, SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	None (Tract 16)
Participating Acreage:	159.90 Acres
Percent of Participation:	11.10640
Description:	Section 4: Lot 3, S/2 NW/4, NE/4 SW/4, T-24-S, R-34-E, N.M.P.M.

Summary:

	<u>Acres</u>	<u>Percent</u>
Total Federal Lands	439.92	30.55615
Total Indian Lands	0.00	0.00
Total State Lands	519.86	36.10867
Total Fee or Other Lands	<u>479.93</u>	<u>33.33518</u>
Subtotal	1439.71	100.00000
Uncommitted Acreage	<u>0.00</u>	
Total Productive Acreage	1439.71	

EXHIBIT NO. 1

ANTELOPE RIDGE UNIT GEOLOGICAL AND ENGINEERING REPORT LOWER PENNSYLVANIAN RESERVOIR

GENERAL

The Pennsylvanian structure in the Antelope Ridge Field is an elongate southwest-northeast trending anticlinal feature conforming approximately to the Siluro-Devonian structure. There may be less gross relief than at Siluro-Devonian level since there is evidence in the Bell Lake/Antelope Ridge area of depositional thickening of the several lower Pennsylvanian units at flank positions. This tends to impart a compensating or flattening attitude to the younger beds.

Gas accumulations, which appear to have no structural orientations, have been observed throughout the Antelope Ridge/Bell Lake area in a number of carbonate and sandstone layers from the Atoka through the Morrow series. These units are generally well defined and can be correlated over the entire area. Hydrocarbon detector logs indicate numerous gas shows throughout the gross interval, but tests and log analysis frequently show the quality of these zones to be of a marginal nature. Two completions have been effected in the Bell Lake Field, but performance thus far indicates that the ability of the zones to communicate fluids may be somewhat restricted in this sector.

Preliminary testing of the two major shows in Federal BE-1, however, indicate the quality of the porous zones may be improved considerably over that encountered thus far in the lower Pennsylvanian. Flowing capacity and pressure behavior show strong evidence of good reservoir communication. This will be discussed in greater detail later in the report. Because of the favorable early performance of this zone, it is recommended that a participating area large enough to protect correlative rights within one-half of a mile of the basic 160-acre state-wide gas unit should be established. The Initial Participating Area for the lower Pennsylvanian formation is therefore proposed to include the nine quarter sections comprising the 160-acre tract on which Federal BE-1 is located plus the eight quarter sections contiguous to this tract. This should provide an equitable share of income to lands adjacent to the well during the period when the reservoir will be evaluated over a sustained producing period. It is also proposed that the Initial Participating Area tentatively include all zones from the top Atoka through the Morrow sands until such time that it can be determined that separate commercial accumulations may be present.

WELL DATA

The Pennsylvanian gas accumulation in the Antelope Ridge Unit was discovered attendant to the drilling of Federal BE-1, a pre-Cambrian test located in the NW/4 NE/4 of Section 4, T-24-S, R-34-E. The first major gas show was evident while drilling with gas between 12,240 and 12,250 feet where a gas flow estimated at 23.0 MMCF per day was encountered. At this point the drill pipe became stuck, probably as a result of bridging. The well was

mudded up, drill pipe was recovered and drilling proceeded to a depth of 12,307 feet. A drill stem test with packers set in intermediate casing, which tested the open hole from 12,006 to 12,307 feet, resulted in a CAOF potential rate of 17.75 MMCF gas per day with an average liquid/gas ratio of 21.9 B/MMCF gas. After a 9-hour flow period the shut-in bottom hole pressure built up to the level of the pre-flow bottom hole pressure of 5780 psi. The tool was shut in 11 hours but total buildup occurred in 1.5 hours showing positive evidence of good reservoir communication within the reservoir. A second major gas flow occurred at 12,986 feet when the well blew out as 14#/gallon mud was being spotted prior to making a trip. The well was brought under control with 15#/gallon mud. While the well was being killed, the hole bridged and stuck the drill pipe. An extensive fishing operation followed, requiring 38 days to recover the drill string. Because of probable hole damage, no further drill stem tests were taken in the open hole through the lower Pennsylvanian interval. The hole was drilled to 14,181 feet in the Mississippian limestone where a 7 5/8-inch liner was run and cemented to cover the lower Pennsylvanian.

From this point the hole was continued to the pre-Cambrian without any unusual difficulties. The deeper objectives including Siluro-Devonian, Fusselman, Montoya, Simpson and Ellenburger were evaluated by a series of drill stem tests and production tests. Other than the Siluro-Devonian pay, which confirmed the presence of a major gas accumulation on the prospect, the other deep objectives proved to be either water bearing or too impermeable to produce in paying quantities.

It was the operator's intent to complete Federal BE-1 as a dual Pennsylvanian/Siluro-Devonian producer. The well was perforated opposite the lower Pennsylvanian with one jet per foot at the following depths: 12,898', 12,903', 12,909', 12,910', 12,913', 12,915', 12,916', 12,982', 12,983', 12,984', 12,986', 12,993', 12,994', 13,118', 13,119', 13,120', 13,147', 13,149', 13,141', 13,153'. After production equipment was installed the mud in the tubing was displaced with oil. When the well was opened, it flowed without swabbing or stimulation at a gauged rate of 12.0 MMCF per day with a flowing tubing pressure of 6000 psi. The well was shut in and a BHP bomb was run to observe bottom hole pressure behavior during a multi-point back pressure flow test. The well was opened after a 7-hour shut-in period and flowed at a CAOF potential rate of 38.0 MMCF gas per day with an average liquid to gas ratio of 9 B/MMCF gas.

The pressure data observed at bottom hole conditions showed excellent permeability qualities and an abnormally high bottom hole pressure. Because of the extreme formation pressure and the design limitations of the casing, the Operator has elected not to attempt a Siluro-Devonian completion until the pressure declines to a safe level which will permit production from both reservoirs.

Some comments concerning the formation pressure behavior during the test period are considered pertinent. The well was flowed at four different rates over a period of 9 hours to establish the CAOF parameters. The well was then choked back to a rate of 7.076 MMCF per day and was flowed for a period of 21 hours. During this period there was no draw down in reservoir flowing pressure. The well was then shut in for a 70-hour pressure build-up. Within 10 hours the pressure had reached a level of 8700 psi, only 16 psi below the maximum "infinite time" build-up pressure of 8716 psi (Gradient = .7 psi per

foot). The foregoing data are considered to be good evidence that the lower Pennsylvanian reservoir is capable of producing unitized substances in paying quantities from Federal BE-1.

Harris Federal 1 was completed as a Siluro-Devonian gas producer. There were no tests conducted in the lower Pennsylvanian interval. A hydrocarbon detector log was run through the interval and the usual "gas kicks" were observed opposite the sand and carbonate units in the Atoka/Morrow interval. Log analysis showed evidence of producible porosity but a production test will be required to confirm the quality of these zones. The lower Pennsylvanian interval was drilled with 14.4#/gallon mud to overcome expected abnormal pressures. Since the well was designed specifically as a Siluro-Devonian exploratory venture, the casing design does not permit a conventional dual completion. Testing of the Pennsylvanian in the north sector will be deferred pending evaluation of the performance of the lower Pennsylvanian in Federal BE-1.