Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

Form 9-330

U. S. LAND OFFICE Santa Fe
SERIAL NUMBER SF 077382
LEASE OR PERMIT TO PROSPECT Hargrave Gas Unit

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOCATE WELL CORRECTLY

LOG OF OIL OR GAS WELL

Company Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico
Lessor or Tract Hargrave Gas Unit Field Basin Dakota State New Mexico
Well No. 1 Sec. 4 T. 27N R. 10W Meridian N.M.P.M. County San Juan
Location 990 ft. {N. of S.} Line and 790 ft. {E. of W.} Line of Section 4 Elevation 6005 (KB)
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed [illegible]

Date February 27, 1961 Title Senior Petroleum Engineer

The summary on this page is for the condition of the well at above date.

Commenced drilling January 15, 1961 Finished drilling February 5, 1961

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 6380 to 6395 No. 4, from to
No. 2, from 6440 to 6444 No. 5, from to
No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to
No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8-5/8"	20	8rd	J-55	336	Guide				Surface
4-1/2"	9.5	8rd	J-55	6317	Guide				Oil String
4-1/2"	11.6	8rd	J-55	272	Guide				Oil String

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8"	347	295 sacks of cement	Halliburton 1 Plug.		
4-1/2"	6565	525 sacks of cement	Baker 2 Stage		

FOLD | MARK

PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set
Adapters—Material Size

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 6565 feet, and from feet to feet
Cable tools were used from feet to feet, and from feet to feet

DATES

Completed February 17, 1961 as Shut In Basin Dakota Field Development Gas Well. (Shut In for pipeline connection)

Put to producing February 17, 1961

The production for the first 24 hours was barrels of fluid of which % was oil; %
emulsion; % water; and % sediment. Gravity, °Bé.

Preliminary Test Cu. ft. per 24 hours 3205 Gallons gasoline per 1,000 cu. ft. of gas

Rock pressure, lbs. per sq. in. Potential test will be filed on Sundry Notice when [illegible]

EMPLOYEES

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Spudded 12-1/4" hole on January 15, 1961, and drilled to 345'. Set 8-5/8" casing at 347' with 205 sacks cement containing 2 percent calcium chloride. Circulated 20 sacks cement. After waiting on cement, tested 8-5/8" casing with 600 psi for 30 minutes, which held with no indication of pressure drop. Reduced hole to 7-7/8" at 348' and resumed drilling operations.

Total depth 6565' - Ran Electric Log. Set 4-1/2" casing at 6565' with 275 sacks 6 percent gel cement containing 1-1/2 pounds Tuf Plug per sack, followed by 100 sacks neat cement with 2 stage tool at 2092'. Cemented second stage with 150 sacks 6 percent gel cement. Tested 4-1/2" casing with 3000 psi on both stages which held with no indication of pressure drop. Drilled stage tool and cleaned out to 6523'. Displaced mud with water. Tested casing with 3000 psi for thirty minutes which held with no indication of pressure drop. Released rig February 8, 1961. Preparing for completion operations.

Plug back depth 6523' - Spotted 500 gallons 28%. Perforated 6389-6395, 6440-6444 with 6 shots per foot. Sandwater fracked with 40,000 gallons with 1 percent calcium chloride by weight with five pounds J-98 per 1000 gallons water and 40,000 pounds sand. Breakdown pressure 2300 psi, average treating pressure 2350 psi, average injection rate 46 barrels per minute. Landed 2-3/8" tubing at 6377'. Completed February 17, 1961, as Shut In Basin Dakota Field Development Well. Preliminary test 3205 MCF per day. Top pay Dakota 6379'.

Form 9-330

Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

U. S. LAND OFFICE Santa Fe
SERIAL NUMBER SF 077382
LEASE OR PERMIT TO PROSPECT Hargrave Gas Unit

X

LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico
Lessor or Tract Hargrave Gas Unit Field Basin Dakota State New Mexico
Well No. 1 Sec. 4 T. 27N R. 10W Meridian N.M.P.M. County San Juan
Location 990 ft. {N.} of S. Line and 790 ft. {E.} of W. Line of Section 4 Elevation 6305 (KB)
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed [illegible]

Date February 27, 1961 Title Senior Petroleum Engineer

The summary on this page is for the condition of the well at above date.

Commenced drilling January 15, 1961 Finished drilling February 5, 1961

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 6385 to 6395 No. 4, from to
No. 2, from 6444 to 6444 No. 5, from to
No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to
No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8-5/8"	20	8rd	J-55	336	Guide				Surface
4-1/2"	9.5	8rd	J-55	6317	Guide				Oil String
4-1/2"	11.6	8rd	J-55	272	Guide				Oil String

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8"	347	295 sacks of cement	Halliburton 1 Plug.		
4-1/2"	6565	525 sacks of cement	Baker 2 Stage		

PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set
Adapters—Material Size

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 6565 feet, and from feet to feet
Cable tools were used from feet to feet, and from feet to feet

DATES

Completed February 17, 1961 as Shut In Basin Dakota Field Development Gas Well. (Shut In for pipeline connection)
Put to producing February 17, 1961

The production for the first 24 hours was barrels of fluid of which % was oil; % emulsion; % water; and % sediment. Gravity, °Bé.

Preliminary Test, cu. ft. per 24 hours 3205 Gallons gasoline per 1,000 cu. ft. of gas
Rock pressure, lbs. per sq. in. Potential test will be filed on Sundry Notice when available.

EMPLOYEES

/s/ Pete Yates, Driller /s/ Donald Coleman, Driller
/s/ George Deal, Driller /s/ K. H. Wisener, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	650	650	Surface sands and shales.
650	1030	380	Kirtland sands and shales including Farmington sands.
1030	1625	595	Fruitland sands, shales, and coals.
1625	1995	370	Pictured Cliffs sand.
1995	3409	1414	Lewis shale.
3409	4570	1161	Mesaverde sands and shales.
4570	5410	840	Mancos shale.
5410	6200	790	Gallup sands and shales.
6200	6250	50	Greenhorn sands and shales.
6250	6315	65	Graneros sands and shales.
6315	6380	65	Dakota sands and shales.
6380	6565	185	Dakota pay sands and shales.
			(Tops from "D" Log)

FOLD | MARK

[OVER]

16—48094-4

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION

HISTORY OF OIL OR GAS WELL

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Spudded 12-1/4" hole on January 15, 1961, and drilled to 343'. Set 8-5/8" casing at 347' with 205 sacks cement containing 2 percent calcium chloride. Circulated 20 sacks cement. After waiting on cement, tested 8-5/8" casing with 800 psi for 30 minutes, which held with no indication of pressure drop. Reduced hole to 7-7/8" at 348' and resumed drilling operations.

Total depth 6565' - Ran Electric Log. Set 4-1/2" casing at 6565' with 275 sacks 6 percent gel cement containing 1-1/2 pounds Tuf Plug per sack, followed by 100 sacks neat cement with 2 stage tool at 2092'. Cemented second stage with 150 sacks 6 percent gel cement. Tested 4-1/2" casing with 3000 psi on both stages which held with no indication of pressure drop. Drilled stage tool and cleaned out to 6523'. Displaced mud with water. Tested casing with 3000 psi for thirty minutes which held with no indication of pressure drop. Released rig February 3, 1961. Preparing for completion operations.

Plug back depth 6523' - Spotted 500 gallons BDA. Perforated 6389-6395, 6440-6444 with 6 shots per foot. Sandwater fracked with 40,000 gallons with 1 percent calcium chloride by weight with five pounds J-98 per 1000 gallons water and 40,000 pounds sand. Breakdown pressure 2300 psi, average treating pressure 2350 psi, average injection rate 46 barrels per minute. Landed 2-3/8" tubing at 6377'. Completed February 17, 1961, as Shut In Basin Dakota Field Development Well. Preliminary test 320 MCF per day. Top pay Dakota 6379'.