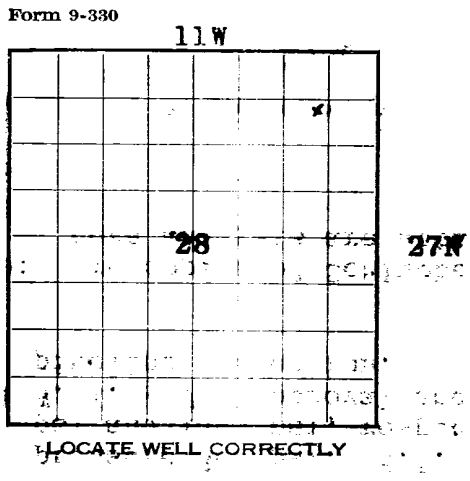
Form 9-330

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

U. S. LAND OFFICE Santa Fe
SERIAL NUMBER SF 078872
LEASE OR PERMIT TO PROSPECT



LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company The Frontier Refining Co. Address 4040 E. Louisiana Ave. Denver 22, Colorado

Lessor or Tract Bolack Field Basin Dakota State New Mexic

Well No. 4-D Sec. 28 T. 27N R. 11W Meridian N.M.P.M. County San Juan

Location 790 ft. [S.] of N. Line and 790 ft. [W.] of E. Line of Section 28 Elevation 6341' 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

Date March 29, 1961 Title Petroleum Engineer

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

Commenced drilling January 17, 1961 Finished drilling January 31, 1961

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from (G) 6446 to 6464 No. 4, from to

No. 2, from (G) 6487 to 6526 No. 5, from to

No. 3, from (G) 6555 to 6590 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"	24#	8Rd	Spang	209	None	-	-	-	Surface csg
4 ½"	11.6	STC 11.6#	CF&I	6644.19	Howco	-	6447	6461	Prod. csg.
							6487	6505.5	
							6558	6567	
2 3/8"	4.7	8Rd	CF&I	6429'			-	-	Tubing

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8 5/8"	221' KB	200 sax +2% CaCl	circ. cmt. to surf.	water	water
4 ½"	6656.19	250 sax	plug	9.7 #/gal	-

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 6655 feet, and from feet to feet

Cable tools were used from feet to feet, and from feet to feet

DATES

, 19 Put to producing March 18, 1961

The production for the first 24 hours was 46.76 barrels of fluid of which 100 % was oil; % emulsion; % water; and % sediment. Gravity, °Bé. 65° @ 60° F

* If gas well, cu. ft. per 24 hours 2,190 MCF/D Gallons gasoline per 1,000 cu. ft. of gas

Rock pressure, lbs. per sq. in.

* Measured against 500# back pressure 24/64 choke; pitot, uncorrected.

EMPLOYEES

Alex Cowan, Driller P. C. Seale, Driller

J. W. Baker, Driller Doc Seale, Driller

FORMATION RECORD

FROM	TO	TOTAL FEET	FORMATION
			From the Schlumberger Induction-Electric Log:
			Kirtland 964'
			Fruitland 1663'
			Pictured Cliffs 1878'
			Chacra 2803'
			Pt. Lookout 4301'
			Mancos 4677'
			Gallup 5474'
			Huerfano 5848'
			Tocito 5978'
			Greenhorn 6332'
			Graneros Shale 6392'
			1st Graneros S.S. 6418'
			2nd Graneros S.S. 6446'
			Dakota "A" 6487'
			Dakota "B" 6555'
			P.B.T.D. 6625'
			T.D. 6658'

FOLD MARK

(OVER)

FORMATION RECORD—Continued

FROM—	TO—	TOTAL FEET	FORMATION

Spudded 7:30 Pm 1-17-61.
Drilled 12¼" hole to 227' and set 8 5/8" casing @ 221' KB. Cemented w/ 200 sax regular cement plus 2% CaCl. Circulated cement.
Drilled 7 3/8" hole to 4083', 6 3/4" hole to 6480', cored (6 11/16") 6480 to 6540', drilled 6 3/4" hole to 6658'.
Ran Schlumberger I-E log and Sonic - Gamma Ray log @ T.D. of 6625', then drilled to 6658'.
Set 4½", J-55 casing (premium tested to 4900#), 11.6# @ 6656.19' KB w/HOWCO two stage cementing tool @ 2164' and baffle collar @ 6629.11 KB. Cemented 1st stage w/125 sax 50/50 Pozmix S, 12½% gilsonite, 4% gel, followed by 50 sax 50/50 Pozmix S, 2% gel, 2nd stage w/75 sax 50/50 Pozmix S, 4% gel. Indicated cement top 1st stage 5210', 2nd stage 1925' KB. Centralizers run on joints 1,2,3,4,6,7,8, and on joints above and below D.V. tool. Rotating scratchers run @ selected intervals from T.D. over Dakota section and up for 250'.
Moved completion rig on location 2-3-61. Picked up tubing and 4 drill collars, drilled D.V. tool and cleaned out to P.B.T.D. of 6625' KB. Pressure tested casing to 3500 psi, held Ok.
Ran PDC log (Mercury). Milled out 4½" casing w/Servco 4½" casing mill 6558-6564, changed cutters and milled out 6564-6567 cut notch @ 6565' and 6561' KB, jetting w/Howco pump truck. Pump 2½ hours @ each notch. Initial jetting pressure and pump rate 2500 psi and 2.7 B/M. Increase pressure 500 psi each succeeding ½ hour to maximum of 4500 psi and 3.7 B/M. Jetting water contained 1% CaCl. w/tubing in hole broke formation down w/1 truck (through casing) @ 2.5 B/M, 2200 psi to 2000 psi.
Pulled tubing and fraced interval 6558-6567' (Howco) w/4300 gal pad water and 37,300 gal water and 30,000# 20/40 sand. Water treated w/2% CaCl and 20# WAC 8/1000 gal water. Start sand @ ½#/gal increase to 1½#/gal. Average treatment rate 35 B/M @ maximum pressure of 3250 psi, decreasing to 2900 psi. Flushed w/111 bbls water @ 37 B/M, 3000 psi. I.S.I.P. 1650 psi, 5 min 1500 psi. Went in hole w/tubing and bit and cleaned out to P.B.T.D. Swabbed well in and blew for 15 hours, gauged w/pitot tube @ rate of 2310 MCF/D, casing pressure 410 psi. Killed well w/ water.
Set Guiberson top drillable B.P. @ 6539' KB, pressure tested to 3500#. Held OK. Milled casing out 6487' to 6505.5' KB, jet cut notches @ 6498', 6494.5, and 6490, jet each notch 3 hours. Broke down Dakota "A" zone w/1 pump 1300 psi to 1275 psi.
Pulled tubing and fraced zone using HOWCO "Frac Plan". Injected 10,500 gal pad water @ 34.3 B/M @ 3200 psi, followed by 11,300 # 20/40 sand @ ½ #/gal increase to 3/4 #/gal, @ 36 B/M @ 2700 psi, followed by 1500 # 12/20 walnut hulls @ ¼ #/gal @ 36 B/M @ 2600 psi. * Displaced w/4700 gal water @ 33 B/M @ 2900 psi. I.S.I.P. 1750 psi, 5 min. 1475 psi. Pad and fracture water treated w/1600# WG-4 (gelling agent) 800# CW-1 (Ph control agent and breaker for WG-4 (gelling agent) ~~800# CW-1 (Ph control agent and breaker for WG-4)~~, 800# WLC-2 (fluid loss additive) and 2% CaCl. water used as follows: 475 gal. prime pumps and test lines, 10,500 gal for pad, 28,330 for treatment, 4700 gal displacement.
Set Baker magnesium drillable bridge plug @ 6475' KB. Pressure tested casing to 3500#, held OK. Perforated 2nd Graneros S.S. 6447-6461 w/3 per 2 feet, 72 gram shot jets (Mercury).
Broke formation down @ 4400 psi and fraced section using 4,000 gal pad water, 23,900 gal water and 10,000# 20/40 sand, starting @ ¼ #/gal @ 30 B/M @ 4400 psi decreasing to 3300 psi, increased sand to ½ #/gal @ 30 B/M @ 3250 psi, increased sand to 3/4 #/gal @ 30 B/M @ 3250 psi. Flushed w/4700 gal water @ 30 B.M. @ 3250 psi. I.S.I.P. 1750 psi, 5 min 1475 psi.

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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.

Drilled Baker B.P. @ 6475'. Cleaned out to Guiberson BP. @ 6539. Swabbed well in. Guaged w/pitot tube @ rate of 1,020 MCF/D, casing pressure 410 psi.
Killed well w/water and ran RTTS packer set @ 6476' KB to test Dakota "A" zone individually. Gauged 734 MCF/D, 10# tubing pressure.
Performed emulsion breakingtreatment on Dakota "A" zone utilizing 1095 gal. #1 Diesel fuel and 40 gal Howco Hi-Flow. Injected @ ½ B/M @ 2000 psi. Left well S.I. for 4 hours and 15 min. Swab well, alternately flow a small amount of water and die. Estimated gas @ 500 MCF/D. Pulled tubing and packer.
Re-fraced, Dakota "A" zone and 2nd Graneros S.S. using 4 Dowell Allison pumpers. Used 32 bbls water to load lines and prime pumps, 1300 bbls water w/37,500# 20/40 sand starting @ ½ #/gal increase to 1½ #/gal, average injection pressure 3,000 psi @ 32 B/M. Flush w/100 bbls water. Water contained 1% CaCl and 25# J-101 /1,000 gal water. I.S.I.P. 1750 #, 5 min 1400 psi, 40 min 1150 psi. Bleed pressure off slowly, well flowed water, sand, and hulls for 3½ hours. Went in w/tubing and bit, found sand fill-up @ base of Dakota "A" zone cut @ 6505.5' KB.
Drilled Guiberson B.P. cleaned out to bottom, landed tubing @ 6439.5' KB and installed well head. Swabbed well in, blew to clean up, and shut-in for hook-up.
Tested 3-18-61 through 3-19 24/64 choke, 500 psi back pressure to simulate deliverability. S.I. tubing 2000 psi, S.I. casing 1800 psi. Recovery gauged 2,060 MCF/D (uncorrected pitot tube) and 46.76 bbls distillate in 24 hours (65.0° @ 60° F). Estimate water @ 2 B.P.D. stabilized casing pressure 700 psi, tubing pressure 600 psi. S.I. tubing and casing pressures were 1750 psi and 1800 psi, respectively, 24 hours after end of test.
Well S. I. - FPC approval and gas sales contract received. Waiting on pipeline connection.

Note: Two copies of Schlumberger I-E log, Sonic- Gamma Ray log and core analysis are attached.

* followed by 1000# 9/20 hulls @ ¼#/gl. @ 36 b/m & 2500 psi.