

DRILLING & COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

GOVERNMENT PAYNE NO.3-26
San Juan County, New Mexico

April 21, 1960

Location: 1650' FSL, 840' FWL
Section 26, T31N, R13W.

Elevation: 5789' Ground
5800' K.B.

Spud: 2-9-60

Drilling Completed: 3-6-60

Well Completed: 4-6-60

Total Depth: 6760' Drilled
6648' Plug Back

Casing:

Surface: 10 3/4" 32.75# H-40 set at 213'
cemented with 230 sacks cement.

Production: 5 1/2" 15.5# J-55 at 6757'
cemented with 250 sacks 6% gel. cement.
Top of cement 5050' by log.

Logs: McCullough - Gamma Ray - Neutron
McCullough - Cement Location.

Cores: None

Drill Stem Tests: None

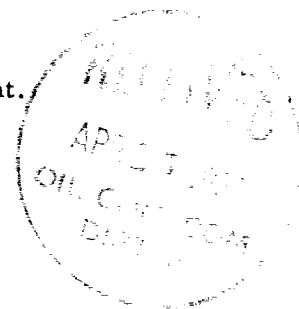
Formation Tops:

Pictured Cliffs	1952'	(+ 3848')
Mesa Verde	3487'	(+ 2313')
Cliff House	3700'	(+ 2100')
Menefee	3880'	(+ 1920')
Point Lookout	4330'	(+ 1470')
Mancos	4620'	(+ 1180')
Gallup	5702'	(+ 98')
Greenhorn	6395'	(- 595')
Ganeros	6470'	(- 670')
Dakota	6523'	(- 723')

Producing Perforations: 6540' - 6580' 6599' - 6601'
6589' - 6591' 6612' - 6618

Treatment: Sand-Water Frac - 67,500# Sand; 78,000 Gals. Water

Initial Potential: Flow Volume 1320 MCFD through 3/4" Choke.
Absolute Open Flow Potential 1492 MCFD(calculated)



WELL: GOVERNMENT PAYNE NO. 3 - 26 (1650' F/SL and 840' F/WL
of Section 26, T31N, R13W)

FIELD: Blanco

COUNTY: San Juan STATE: New Mexico

SPUD DATE: 2/9/60

ELEVATION: 5789' GD
5801' KB

2/8/60

Digging rat hole.

2/9/60

Drilling surface hole @ 85'.

2/10/60

WOC. Total depth 215'. Ran 200' 10-3/4", 32 lb. Csg - set at 213' KB. Circulated cement with 230 sacks with 2% gel. Plug down at 2:30 a.m.

2/11/60

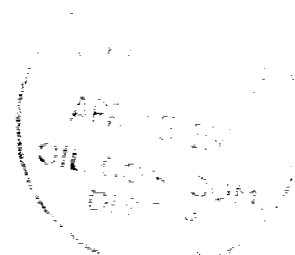
Total depth 655'. Drilled 440', Bit No. 1. Deviation 3/4° at 430'.

2/12/60

Total depth 1,778'. Made 1,083', Bit No. 2. Deviation 3/4° at 1,605'.

2/15/60

Drilling at 3224'. Drilled 232', sand and shale, Bit No. 5. Deviation 1/2° at 3190', mud weight 9.1 - 62.



WELL: GOVERNMENT PAYNE NO. 3 - 26

2/16/60

Total depth 3411'. Drilled 187', sand and shale, Bit No. 7. Mud 9.1 - 54.

2/17/60

Total depth 3602'. Drilled 191', sand and shale, Bit No. 9. Mud 9.1 - 54.

2/18/60

Total depth 3855'. Drilled 253' using Bit No. 10. Deviation $1\frac{1}{2}^{\circ}$ at 3720'.

2/19/60

Total depth 4143'. Drilled 303', sand and shale, Bit No. 11. Mud 9.5 - 50. Deviation $1\frac{1}{4}^{\circ}$ at 3780'.

2/20/60

Total depth 4387'. Drilled 244', sand and shale. Present operation tripping. Mud 9.5 - 58. Deviation $\frac{1}{2}^{\circ}$ at 4686'.

2/21/60

Total depth 4630'. Drilled 243', sand and shale. Present operation tripping. Mud 9.7 - 26. Deviation $\frac{3}{4}^{\circ}$ at 4600'.

2/22/60

Total depth 4800'. Drilled 170', sand and shale. Drilling with Bit No. 14. Mud 9 - 72.

2/23/60

Total depth 5086'. Drilled 286', sand and shale. Present operation drilling with Bit No. 15. Mud 9.8 - 71. Deviation $\frac{3}{4}^{\circ}$ at 5031'.

15 $\frac{1}{2}$ hrs. drilling

5 $\frac{1}{2}$ hrs. tripping

3 $\frac{1}{4}$ hrs. other

Bit No. 14 made 196' - 13 hours.

2/24/60

Total depth 5337'. Drilled 251', sand and shale. Present operation, tripping for Bit No. 17. Mud 9.9 - 68.

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2/25/60

Total depth 5585'. Drilled 248', sand and shale. Presently drilling with Bit No. 18. Mud 9.9 - 76.

2/26/60

Total depth 5870'. Drilled 285', sand and shale. Presently drilling with Bit No. 19. Mud 10 - 68. Deviation 1° at 5791'.

2/27/60

Total depth 6035'. Drilled 175', sand and shale. Present operation, drilling with Bit No. 20. Mud 9.8 - 75. Lost 200 bbls. mud.

2/28/60

Total depth 6270'. Drilled 235'. Presently drilling with Bit No. 22. Mud 9.7 - 67.

2/29/60

Total depth 6500'. Drilled 230', sand and shale. Drilling with Bit No. 23. Mud 9.8 - 67.

3/1/60

Total depth 6601'. Drilled 101', sand and shale. Present operation, drilling with Bit No. 16. Mud 9.8 - 60.

3/2/60

Total depth 6636'. Drilled 35', sand. Mud 9.7 - 66. Present operation reaming to bottom with Bit No. 26.

3/3/60

Estimated top of Dakota formation at 6510' or minus 709. Total Depth 6723'. Drilled 87', sand. Present operation tripping for Bit No. 28. Mud 9.6 - 96.

3/4/60

Total depth 6760'. Coming out to log. Drilled to 6757', came out of hole, attempted to log. Would not go, went back in to condition hole and drilled to total depth of 6760'. Drilling with Bit No. 29. Mud 9.7 - 98. Preparing to log.

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3/5/60

Preparing to run 5½" Csg. Total depth 6760' drillers, 6753' log total depth. Ran McCullough gamma ray-neutron log, found top of Dakota at 6525', or minus 724. Top of Point Lookout at 4330', or plus 1571'.

3/6/60

WOC. Ran 212 joints 5½" 15.5 lb. J-55 Csg. set at 6757' KB. Cemented with 250 sacks common cement with 6% gel added. Had good returns through-out cement job. Bumped plug with 2,000 lbs. Released and floats held. Repressed to 800 lbs. Four centralizers opposite Dakota, and one centralizer above and below Mesa Verde. Metal petal basket at 6400'.

3/7/60

Spotted break down acid on bottom opposite proposed Dakota perforations. WOC. Laid down drillpipe. Picked up 2-7/8" Tbg. Drilled out cement, plugs and float collar to a plug back depth of 6755'.

3/8/60

Sand-water fracing lower Dakota perforations. Shot McCullough Jet Cutter, which produces windows instead of holes, opposite Dakota formation at 6710'. Pumped in 7½% HCl break down acid at 2700 psi, which broke back to 2300 psi. Continued perforating windows at 6745' and 6691' and jet perforated six holes of 80 gram jet charges at 3 shots per foot from 6664' to 6666'. Rigged up to sand-water frac these lower Dakota perforations and windows. Ran McCullough correlation log and established cement top at 5050' KB.

3/9/60

Perforating upper Dakota section. Sand-water fraced lower Dakota perforations and windows with 20,000 lbs. sand mixed in 42,000 gallons gelled water. Initial pump-in rate was at 26 barrels per minute at a pressure of 2900 psi. The water was spearheaded by 1,000 gallons of break down acid still remaining on the bottom as it had not been displaced by previous pumping. Pressure rose gradually from 2900 to 3100 psi during fracing treatment, but the rate of injection was reduced slowly to prevent a greater increase in maximum pressure. Average rate during job was 19 barrels per minute. Shut well in at 3000 psi standing pressure. Pressure bled to 2400 psi in 40 minutes. Opened valve and backflowed well, gradually reducing pressure at approximate rate of 200 psi each 15 minutes. After two hours of backflowing, well was beginning to show foam in the water. Estimated 400 barrels flowed back during period. Set McCullough magnesium bridge plug at 6650'.

WELL: GOVERNMENT PAYNE NO. 3 - 26

3/10/60

Fishing for lost McCullough strip gun. Perforated with McCullough 80 gram charge strip gun with three shots per foot at 6589' to 6591' and 6599' to 6601', 6612' to 6614'. Unable to perforate large section at top of Dakota as gun did not fire. Gun stuck in Csg. while attempting to pull out of hole. Recovered approximately 7 feet of the 30-foot gun using an overshot. Dislodged gun with spear and shoved to bridge plug at 6650'. Recovered approximately 6 more feet with spear. Spotted 1,000 gallons acid on bottom opposite upper Dakota perforations while in the hole fishing for gun with spear, to allow acid to be working on Dakota during fishing job.

Bleeding back frac water after sand-water frac of upper Dakota. Attempted to fish for McCullough strip gun with two-pronged grab cable tool spear. Unable to recover same. Determined to drill out with "Clusterite" Milling Shoe after sand-water frac of upper Dakota. Pumped in 200 gallons of the previously spotted 1000 gallons of 15% HCl into the perforations open at that time, from 6589-6591, 6599-6601, 6612-6614'. Pump in pressure, 2000 psi, which bled immediately to 600 psi when pumping operations ceased. Continued perforating upper Dakota. Perforated with McCullough with four standard jet shots per foot at 6614'-6618', 6540'-6580'. Pumped in balance of 800 gallons acid at 1200 psi, bled to 0 immediately when pumping operations ceased. Rigged up to sand-water frac.

Established pumping rate at 41 barrels per minute at 1700 psi, using four HOWCO trucks. Began with 1/2 lb. sand per gallon, increasing to 1 lb. per gallon after approximately 5 minutes pumping, and maintained a steady rate of approximately 40 barrels per minute at 1800 psi. Commenced the program of dropping 10 balls each 3 minutes and by the time 50 balls had reached perforations, with 22,000 lbs. sand in formation, the pressure was 1950 psi. Discontinued dropping balls. Pressure gradually increased to 2100 psi. by the time 55,000 lbs. sand was in the formation. Dropped 10 more balls and increased sand slowly to 1 1/4 lbs. per gallon and to 1 1/2 lbs. per gallon, with pressure increasing slowly to 2400 psi. by the time the balance of the 67,500 lbs. of sand had been completed.

Started fishing operations and found that the frac had sanded out since pressure gradually rose to 3,000 lbs. with approximately 17 barrels left to pump in to clear perforations. Shut well in at 2,000 lbs. standing pressure, which bled to 800 psi after 30 minutes. Now releasing pressure slowly with water flowing back in a 1 inch stream.

JOB SUMMARY:

67,500 lbs. 20-40 mesh sand
78,000 gallons water

Overall injection rate 36 barrels per minute
Treating pressure 1800 psi to 2300 psi
Total balls dropped - 60

WELL: GOVERNMENT PAYNE NO. 3 - 26

3/11/60

Circulating on bottom after cleaning out to 6746' KB. (McCullough log measurement). Went in hole with Tbg. and Clusterite Shoe and cleaned out 200' frac sand, strip gun junk and drilled bridge plug at 6650'. Chased junk to bottom, leaving approximately 3' accumulation. Prior to going in hole with Tbg., well back-flowed after fracing for about six hours before dying off - returned some frac sand and balls.

3/12/60

Dakota flowing back frac water and cleaning up. Pulled Tbg. and Clusterite Shoe. Recovered all strip gun junk. Reran open-ended Tbg. and landed for final completion at 6510' Gd. depth. Nippled up Christmas tree and opened Tbg. to atmosphere. Well flowed 1/2 inch stream frac water overnight and blew in at 9:00 a.m. today.

3/13/60

Shut in. Moving off rotary rig. During period yesterday while well was flowing and unloading frac water, measured natural gas flow of 1300 to 2000 MCFD with good show condensate and green oil. Well killed itself because of heavy frac water inflow.

3/14/60

Shut in. Moving off rotary rig. It appears that it will be necessary to move on swab unit to aid well in unloading heavy frac water influx.

3/15/60

Shut in. Rigging up swabbing unit.

3/17/60

Blowing well to clean up frac water. Surface pressures after 20 hours shut in:
Tbg. 1740 psig.
Csg. 1865 psig.
Good show of green oil and distillate while blowing.

3/18/60

Shut in. Will test well tomorrow.

3/21/60

Shut in. Tested well 3/19/60 through 3/4-inch positive choke as follows:

WELL: GOVERNMENT PAYNE NO. 3 - 26

3/21/60 - (Continued)

<u>Time Interval in Minutes</u>	<u>Wellhead Gas Temperature</u>	<u>Tubing Pressure</u>	<u>Casing Pressure</u>
0	-	1863 psig	1889 psig
(After 20 hours shut-in)			
15	63	698 psig	1331 psig
30	75	427 psig	1019 psig
45	79	321 psig	927 psig
60	80	248 psig	747 psig
120	87	147 psig	580 psig
180	89	* 109 psig	561 psig

* 1400 MCFD with heavy water fog and water slugs throughout test.

3/22/60

Shut in. Preparing to run temperature survey in an effort to identify possible water productive zone from lower Dakota. Flowed well four hours yesterday - made heavy water fog and continuous water slugs throughout testing period, indicating settled 1300 MCFD at end of period. Secured water sample and analyses, which indicated possibility of one of the lower Dakota stringers being wet. This believed to be the basal sand, which we will identify by temperature and pressure profiles. If such is the case, it will be plugged off and dry gas production effected from the upper zones.

3/23/60

Shut in. Ran temperature survey indicating lower Dakota Sand, 6680-6720', is wet. Will plug off and return well to dry gas production. This not significant in that this zone has never before been fraced in the other wells in the area.

3/24/60

Rigging up rig to pull tubing^{and} set bridge plug to shut off lower Dakota water and return well to dry gas producing status.

WELL: GOVERNMENT PAYNE NO. 3 - 26

3/25/60

Shut in. Waiting for smaller 17 lb.-5½ inch casing bridge plug because of inability to get 15½ lb.-5½ inch bridge plug below 6580'.

3/26/60

Waiting on bridge plug.

3/27/60

Pulling tubing after setting HOWCO 17 lb.-5½ inch casing cast iron bridge plug at 6675' KB.

3/28/60

Running completion tubing. Dumped 27' Calseal on top bridge plug, making new PBTD 6648' KB. Have kept well dead with water throughout plug back operations.

3/29/60

Swabbing well in after plug back operation. Ran 2-1/2 inch EUE open ended tubing to 6512' KB.

3/30/60

Blowing well. Cleaning up frac water. Swabbed well in yesterday and shut in overnight. 1180 psig casing pressure after overnight shut-in. Noted 1 barrel green oil (56 degrees API gravity). Water analysis indicates 2200 PPM NaCl.

3/31/60

Shut in. Preparing to spot acid to aid in resolving water block. Shut in casing pressure after overnight period 1760 psig.

4/1/60

Running 1½ inch EUE tubing with jet holes to replace 2-7/8 inch EUE tubing. Killed well and displaced 500 gallons 15% HCl and staged into upper Dakota at 500 to 700 psig. After acid into formation, overflushed with 25 barrels water at 5 bpm at 900 psig. When pumping ceased, water went on vacuum.

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4/2/60

Swabbing. Landed 1½ inch EUE tubing at 6532' KB. Jet tubing collars at 5899', 5329' and 4855' KB.

4/3/60

Blowing and unloading frac water. Swabbed until 3:00 p.m. yesterday at which time well instigated natural flow. Had 1225 psig casing pressure this morning.

4/4/60

Blowing to clean up. Casing pressure 1850 psig after overnight shut-in.

4/5/60

Blowing for further cleanup. Will shut well in for testing tomorrow.

4/7/60

Shut in. Blew well yesterday through 3/4" choke with the following results:

<u>Minutes</u>	<u>Tubing Pressure</u>	<u>Casing Pressure</u>	<u>Temperature</u>
0	1935	1983	-
30	240	1350	62° F
60	120	994	67°
90	82	900	62°
120	72	851	64°
150	67	801	62°
180	56	730	63°

4/10/60

Shut in for 7-day pressure build up and subsequent potential test.

Shut in pressures: Tubing 1950 psig
 Casing 1990 psig

4/16/60

Well blowing fairly dry after 3 hours with 67 psig tubing pressure and 825 psig casing pressure. Temperature of flowing stream 63 degrees.

WELL: GOVERNMENT PAYNE NO. 3 - 26

4/17/60

Shut in awaiting hookup. Performed potential test yesterday following 7-day pressure build-up period. Blew well through 3/4" choke with the following results:

<u>Minutes</u>	<u>Tubing Pressure</u>	<u>Casing Pressure</u>	<u>Temperature</u>
0	2013	2013	-
15	358	1624	42° F
30	291	1405	42°
45	233	1219	44°
60	223	1122	47°
120	182	852	52°
180	101	775	52°

Flow rate at end of three hours 1350 MCFD. Anticipate well hookup within 2 weeks.

OPEN FLOW TEST DATA

DATE April 16, 1960

Operator CONSOLIDATED OIL & GAS, INC.		Lease PAYNE NO. 3 - 26	
Location 1650' F/SL and 840' F/WL Sec. 26, T31N-13W		County San Juan	State New Mexico
Formation Dakota		Pool Undesignated	
Casing: Diameter 5 1/2"	Set At: Feet 6757	Tubing: Diameter 1 1/2"	Set At: Feet 6532
Pay Zone: From 6540	To 6618	Total Depth: 6648 PB	
Stimulation Method Sand-Water Frac		Flow Through Casing	Flow Through Tubing X

Choke Size, Inches 3/4		Choke Constant: C 12,3650			
Shut-In Pressure, Casing, 2013	PSIG	- 12 = PSIA 2025	Days Shut-In 7	Shut-In Pressure, Tubing 2013	PSIG
Flowing Pressure: P 101	PSIG	- 12 = PSIA 113		Working Pressure: P _w 775	PSIG
Temperature: T 52	°F	n = .75		F _{pv} (From Tables) 1.015	Gravity .70

$$\text{CHOKE VOLUME} = Q = C \times P_r \times F_r \times F_g \times F_{pv}$$

$$Q = 12.365 \times 113 \times 1.0078 \times .9258 \times 1.015 = 1320 \text{ MCF/D}$$

$$\text{OPEN FLOW} - Aof = Q \left(\frac{P_c^2}{P_c^2 - P_w^2} \right)^n$$

$$Aof = Q \left(\frac{1.1779}{1} \right)^n = 1492$$

$$Aof = 1492 \text{ MCF/D}$$



TESTED BY Robert B. Tenison

WITNESSED BY _____

[Signature]