

DRILLING AND COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

MITCHELL NO. 1-5

San Juan County, New Mexico
November 17, 1961

Location: 790' F/SL, 1850' F/WL, Section 5
T31N-R12W, N.M.P.M.

Elevation: 5947' Ground
5959' KB - all measurements from KB

Spud: September 30, 1961

Drilling Completed: October 26, 1961
Well Completed: November 10, 1961

Total Depth: 7021' Drilled
6996' Plug Back

Casing:

Surface: 9 5/8" 32.30# H-40 cemented at 192'
w/90 sx. 2% CaCl₂ cement

Production: 5 1/2" 14# & 15.5# J-55 cemented
at 7020' w/125 sx. with 1/2 cu. ft.
Strata-Crete/sx. 4% gel cement. Thru
stage collar at 4915' with 114 sx.
50/50 Pozmix with 4% gel cement.

Tubing: 1 1/2" EUE hung at 6796'

Logs: Welex Induction Electric & Acoustic
Velocity Logs

Cores and Drillstem Tests: None

Formation Tops: (Log)

Pictured Cliffs	2317'	(+ 3642)
Mesaverde	3870'	(+ 2089)
Cliffhouse	3973'	(+ 1986)
Menefee	4125'	(+ 1834)
Pt. Lookout	4666'	(+ 1293)
Mancos	4917'	(+ 1042)
Gallup	6014'	(- 55)
B/Gallup	6304'	(- 245)
Greenhorn	6738'	(- 79)
Dakota	6836'	(- 877)

Producing Perforations: 6852' - 6866'
6873' - 6896'
6916' - 6918'
6924' - 6933'
6956' - 6972'

Treatment: Sand water frac w/140,000# 20-40 & 10-20
mesh sand, 133,000 gal. water treated
with slickum, 750 gal. acid in three
stages.

Initial Potential: Flow volume thru 3/4" choke: 1940 MCFD
Calculated Absolute Open Flow Potential:
2300 MCFD.

RECEIVED

NOV 21 1961

U.S. GEOLOGICAL SURVEY

WELL: MITCHELL NO. 1-5

790' F/SL & 1850' F/WL, Sec. 5, T31N, R12W NMPM

FIELD: BASIN DAKOTA

COUNTY: SAN JUAN STATE: NEW MEXICO

ELEVATIONS: 5959' KB

9/30/61

Rigging up Great Western Drilling Co. rig number 14.

10/1/61

WOC. Spudded at 9:30 p.m. Set 180' 9 5/8" surface at 192' KB. Cemented with 90 ex. regular cement 2% CaCl₂. Plug down 2 p.m.

10/2/61

Depth 2050'. Tested surface to 1000 PSIG, held OK. Started drilling ahead with 7 7/8" hole. Dev. 1 1/2° at 1370'. Sand and shale. Drilling fluid - water.

10/3/61

Depth 3395'. Drilling with Bit #5. Sand and shale. Water with some mud. Dev. 1/2° at 2192' and 1/2° at 2694'.

10/4/61

Depth 3845'. Sand and shale. Dev. 1/2° at 3402'. Drilling fluid - water.

10/5/61

Depth 4130'. Drilling with Bit 10. Sand and shale. Dev. 3/4° at 4033'. Drilling fluid - muddy water.

10/6/61

Mixing mud, lost returns at 4701'. Drilled sand and shale. Dev. 1° at 4480'.

10/7/61

Depth 4816'. Lost circulation. Mud 8.8. Vis. 42. Water loss 13. Dev. 1° at 4730'.

10/8/61

Depth 4888'. Drilling with Bit 14. Mud 8.8. Vis. 52. Plugged bit 3 times with lost circulation material.

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10/9/61

Depth 5210'. Sand and shale. Full returns. Drilling with Bit 16. Mud 9.0. Vis. 48.

10/10/61

Depth 5546'. Drilling with Bit 16. Dev. 1/4° at 5400'. Sand and shale. Mud 9.1. Vis. 48. Water loss 10. Mud cake 2/32.

10/11/61

Depth 5909'. Drilling with Bit 18. Lost circulation at 5749' lost 300 bbls. mud. Lost approximately 100 bbls. while drilling from 5749' to 5909'. Mud 8.9. Vis. 55. Water loss 10. Mud cake 2/32.

10/12/61

Depth 6325'. Drilling with Bit 20. Dev. 1/4° at 6243'. Mud 8.9. Vis. 45. Water loss 12. Mud cake 2/32. Lots throughout day's drilling (10/11/61) approximately 500 barrels of mud.

10/13/61

Depth 6725'. Drilling with Bit 20. Dev. 3/4° at 6521'. Sand and shale. Mud 9.2. Vis. 47. Water loss 10. Mud cake 2/32. Lost approximately 300 bbls. mud at 6400'.

10/14/61

Depth 6897'. Sand and shale. Mud 9.2. Vis. 50. Water loss 8. Mud cake 2/32.

10/15/61

Depth 6975'. Sand. Mud 9.2. Vis. 62. Water loss 8.5. Mud cake 2/32.

10/16/61

Circulating to condition hole to log at 7021'. Estimated top of Dakota 6884'. Reached TD of 7021' at 9:30 p.m. Circulated 1 1/2 hours, made short trip, found hole bridged over between 6700' and 6800'. Drilled back to bottom, will circulate 1 1/2 hours and make another short trip and then log. Mud 9.2. Vis. 90. Slight gas cut.

10/17/61

Logging, started logging at 3 a.m. TD 7012' log, top of Dakota by log 6850'.

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10/18/61

Moving off rotary rig. Ran logs, laid down drill pipe. Ran 222 joints new 5 1/2" 14# & 13.5# J-55 casing in following order from top to bottom: 3 joints (86.68') 13.5#, 131 joints (4435.79') 14#, 88 joints (2466.97') 15.5#; for total of 222 joints (7009.44') set at 7020.44 KB. Stage collar at 4915', float collars at 6982.53' and 7009.56' KB. Ran 9' notched short joint with Texas pattern shoe on bottom. Circulated and washed 35' to bottom, circulated for 45 minutes with good returns. Cemented Dakota with 125 ex. regular with 4% gel and 1/2 cu. ft. Strata-Crete per sack cement. Good returns throughout job, bumped plug with 2000 PSIG at 10:45 p.m., released pressure float held OK. Cemented MW through stage collar with 114 ex. 50/50 Pennix with 4% gel cement, good returns throughout job. Bumped plug with 2000 PSIG at 3 a.m. - held OK.

10/19/61

Waiting on frac water.

10/20/61

Pumping frac water, waiting on completion rig.

10/21/61

Waiting on completion rig.

10/22/61

Waiting on completion rig.

10/23/61

Moving on completion rig.

10/24/61

Rigging up to perforate. Cleaned out to TD of 6990'. Drilled stage collar at 4915', pressured up to 1500 PSIG, held OK. Drilled float collar at 6982', pressured up to 3000 PSIG, held OK. Spotted 75C gal. mud acid.

10/25/61

Tripping to change bits. Rigged up BJ perforator, ran correlation log, found PBD of 6996'. Perforated Dakota at 6956'-72', 6924'-73', 6916'-18' with 2 bullets and 2 jets per foot. Soaked away 750 gal. 15% mud acid in three separate stages 20 minutes apmt. Broke down and took acid at 1400 PSIG on all three stages. Fraced Dakota as follows:

First Stage Details:

All pumps on line 2400 PSIG and 36 BPM. Started sand at 1 1/2 lb. per gal. for 3 minutes, went to 1 lb. per gal. At 20,000# sand in,

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10/25/61 Cont'd.

pressure 2050 PSIG, rate 42 BPM, dropped 15 balls. Falls on perforations, pressure to 2100 PSIG. At 30,000# sand in, dropped 10 balls. Balls on perforations, pressure to 2250 PSIG, rate 30 BPM. Dropped 15 balls with 44,000# sand in. Balls on perforations, pressure to 2500 PSIG. At 54,000# sand in dropped 5 balls, pressure 2400 PSIG, rate 37 BPM. At 60,000# sand in dropped 5 more balls. At 64,000# sand in, first 5-ball drop hit, pressure from 2400 PSIG to 2600 PSIG. At 70,000# sand in dropped 5 more balls. Second 5-ball drop on perforations, pressure from 2600 PSIG to 2800 PSIG, when third 5-ball drop hit, pressure from 2800 PSIG to 3100 PSIG, rate 30 BPM, started flush. Overflush 20 bbls., pressure at end of flush 3450 PSIG. Instant shut-in pressure 1800 PSIG. 10 minute shut-in pressure 1100 PSIG.

Frac Summary:

80,000# 20-40 mesh sand
83,000 gal. water treated with slickum and water loss agent
55 Balls in 6 stages
2000 PSIG minimum pressure
3450 PSIG maximum pressure
37.1 BPM on frac
32 BPM on flush
35.9 BPM average rate

Set Otis bridge plug at 6908'. Perforated Granerous from 6852'-10' and 6873'-96', communication after perforating. Performed Granerous frac as follows:

Second Stage Details:

All pumps on line 1800 PSIG. Started sand 1 lb. per gal., 1900 PSIG. At 20,000# sand in, pressure 1900 PSIG. Dropped 40 balls. Balls on perforations, pressure from 1900 PSIG to 2000 PSIG. At 32,000# sand in, dropped 30 balls, pressure 2000 PSIG. At 40,000# sand in, dropped 20 balls, 2000 PSIG. At 45,000# sand in, dropped 30 balls, pressure 2100 PSIG. At 55,000# sand in, injected water for 2 minutes then tailed in with 5,000# 10-20 mesh sand. Started on flush, stopper pumps, bled back pressure to 1000 PSIG to drop balls off perforations. Resumed flush, flushed away sand at 2200 PSIG. Instant shut-in pressure 1400 PSIG. 10 minutes shut-in pressure 700 PSIG.

Frac Summary:

55,000# 20-40 mesh sand
5,000# 10-20 mesh sand
50,000 gal. water treated with slickum and water loss agent
103 Balls
1900 PSIG minimum pressure
2200 PSIG maximum pressure
45.1 BPM average rate.

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OPEN FLOW TEST DATA

DATE November 13, 1961

10/25/61 Cont'd.

Finished Granerous frac at 5 p.m., left well shut-in till 7 p.m. Pressure stabilized at 350 PSIG, opened up, well flowed back 160 bbls. before dying at 8:30 p.m. Went in hole with work over string, hit sand at 6830'. Circulated out sand, drilled on plug at 6908'. Plug came loose, chased down hole to 6960'. Plug hung in perforations, drilled on plug for 4 hours. Bit jumping, afraid of losing cone on bit, making trip to change bits. Dakota took 300 bbls. water during clean out and drilling.

10/26/61

Coming out of hole, laying down workover string. Pulled bit, found 2 cones locked and several teeth broken. After 6 hours down due to rig break down, ran new bit to 6963', drilled for 1 1/2 hours, bit jumping, torquing up and hanging up. Pulled bit, ran 4 1/2" wash-over shoe with cutrite on bottom. Ran to 6963', milled for 5 feet, then washed to bottom, circulating out sand and pieces of magnesium and steel. Lost 150 bbls. water to Dakota while drilling.

10/27/61

Swabbing, well kicks off and dies. Ran 208 joints 1 1/2" EUE tubing (6784.16') set at 6796.16' KB. Jet collars at 4383', 4905' and 5591'. Started swabbing at 6 p.m.

10/28/61

Swabbed till 3 p.m. Friday, well kicking and dying. Released rig at 3, left tubing open. Well kicked off at 6 p.m., left well open over night. At 10 a.m. flowing at rate of 880 MCFD, very wet, casing pressure 1300 PSIG.

10/29/61

Shut-in at 8 a.m. After 38 hours open flowing at rate of 1140 MCFD, 650 PSIG casing pressure, very wet.

10/30/61

23 1/2 hour shut-in pressure, 1375 PSIG on tubing, 1400 PSIG on casing. Opened well to atmosphere.

10/31/61

After 8 hours open producing at rate of 1187 MCFD, 650 PSIG casing pressure, very wet. Shut-in at end of 12 hours open, going to open later today.

Operator Consolidated Oil & Gas, Inc.		Lease Mitchell 1-5	
Location 790' F/SL, 1850' F/WL, Sec. 5-T31N-R12W		County San Juan	State New Mexico
Formation Dakota		Pool Basin	
Casing Diameter 5 1/2"	Set An Foot 7020'	Tubing Diameter 1 1/2" IJ	Set An Foot 6796'
Pay Zone: From 6852'	To 6972'	Total Depth 6990' PB	
Stimulation Method Sand-water Frac		Flow Through Casing	Flow Through Tubing X

Choke Size, inches 0.750	Choke Constant: C 14,1605		
Shut-in Pressure, Casing, PSIG 1682	PSIG - 12 = PSIA 1694	Days Shut-in 7	Shut-in Pressure, Tubing, PSIG 1682
Flowing Pressure: P, PSIG 130	PSIG - 12 = PSIA 142	Working Pressure: P _w , PSIG 749	PSIG - 12 = PSIA 761
Temperature: T 38	F 0.75	F _{pv} (From Tables) 1,019	Gravity 0.70

$$\text{CHOKE VOLUME} = Q = C \times P_1 \times F_1 \times F_2 \times F_3$$

$$Q = 14,1605 \times 142 \times 1.0218 \times .9258 \times 1.019 = 1960 \text{ MCF/D}$$

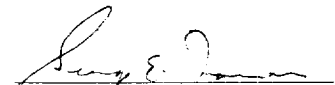
Time After Opening Minutes	Casing Pressure PSIG	Tubing Pressure PSIG	Temp. ° F.
0	1682	1682	
15	1423	443	30
30	1293	355	32
45	1191	320	34
60	1101	263	35
120	917	202	37
180	749	*130	38

$$Aof = 2300 \text{ MCF D}$$

* Approximately 1850 MCFD, bringing heavy frac water spray.

TESTED BY: Clyde Phillips

WITNESSED BY:



WELL:

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11/1/61

Shut-in, will open at 9 a.m. After 8 hours open very wet, making 970 MCFD, casing pressure 600 PSIG, shut-in to pressure up.

11/2/61

Flowing back frac water. After 12 hours, shut-in casing pressure 1200 PSIG, shut-in tubing pressure 1200 PSIG. Yesterday after 9 hours open, 600 PSIG casing pressure, producing at rate of 1030 MCFD, drier but still very wet.

11/3/61

After 8 hours open making 875 MCFD, 600 PSIG casing pressure. Shut-in for 7 day test.

11/4/61

Shut-in for 7-day test. After 40 hours shut-in tubing pressure 1450 PSIG, casing pressure 1450 PSIG.

11/5/61

Shut-in for 7-day test.

11/6/61

Shut-in for 7-day test.

11/7/61

Shut-in for 7-day test.

11/8/61

Shut-in for 7-day test.