DRILLING AND COMPLETION HISTORY

CONSOLIDATED OIL & GAS, INC.

FREEMAN NO. 1-11

San Juan County, New Mexico
December 28, 1961

Location: 1620' F/NL, 870' F/EL, Section 11 T31N-R13W, N.M.P.M.

Elevation: 5764' GD
5776' KB - all measurements from KB

Spud: July 17, 1961

Drilling Completed: August 7, 1961
Well Completed: November 30, 1961

Total Depth: 6825' Drilled
6690' Plug Back

Casing:

Surface: 10 3/4" 32.75# H-40 cemented at 191' w/175 sx. 2% $CaCl_2$ cement.

Production: 5 1/2" 15.5# J-55 S.T. & C. cemented at 6825' w/140 sx. 4% gel cement with 1/4 cu. ft. Strata-Crete per sack thru shoe and 170 sx. with 4% gel 50/50 Pozmix cement through stage collar at 4710'.

Tubing: MV - 1" Regular JW hung at 4374'
DK - 1 1/2" IJ J-55 set at 6526'
Baker Model "D" Packer at 6526'

Logs: BJ Simultaneous Nuclear Log

Cores & Drillstem Tests: None

Formation Tops: Log

Pictured Cliffs	1986'	(+3790)
Mesaverde	3569'	(+2207)
Cliffhouse	3612'	(+2164)
Menefee	3864'	(+1912)
Pt. Lookout	4412'	(+1364)
Mancos	4632'	(+1144)
Greenhorn	6439'	(- 663)
Dakota	6557'	(- 781)

Producing Perforations:

Mesaverde	Dakota
4420' - 4443'	6572' - 6587'
4463' - 4476'	6593' - 6600'
4498' - 4516'	6611' - 6616'
	6642' - 6650'
	6662' - 6666'
	Perfs Below Bridge Plug
	6752' - 6768'
	6774' - 6784'

Treatment: Sand-water frac:
Mesaverde: 100,000# (20-40 mesh) sand, 75,600 gal. water
Dakota: 90,000# (20-40 & 40-60 mesh) sand, 115,000 gal. slicked water, 750 gal. acid.

Initial Potential: MV Flow volume thru 3/4" choke: 1000 MCFD
Calculated Absolute Open Flow Potential: 2920 MCFD.

DK Flow volume thru 3/4" choke: 980 MCFD

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1620' FNL & 870' FEL Sec. 11-31N-13W

FIELD: Blanco Mesaverde - Basin Dakota

COUNTY: San Juan STATE: New Mexico

ELEVATIONS: 5764' GD

5776' KB

7/17/61

Rigging up.

7/18/61

Spudded in at 8 p.m. yesterday. Drilled 199' 15" hole. Ran 6 joints 10 3/4" - 180' - set at 191' KB. 175 sx reg 2% $CaCl_2$. Plug down 4:30 a.m. Dev. 1° at 110'.

7/19/61

Depth 899'. Drilled 700'. Sand and shale. Drilling with Bit No. 1, using water. Dev. 1/4° at 428'. Pressured up on surface pipe - 600# - for thirty minutes - held OK.

7/20/61

Depth 1845'. Drilled 946'. Sand and shale. Drilling with Bit 3. Mud 9.2. Vis. 32. Water loss 12. 6% oil. Dev. 3/4° at 1366'.

7/21/61

Depth 2610'. Drilled 765'. Sand and shale. Drilling with Bit 4. Mud 9.4. Vis. 33. Water loss 10. 8% oil.

7/22/61

Depth 3235'. Drilled 625'. Sand and shale. Trip for Bit 6. Mud 9.5. Vis. 36. Water loss 12. Dev. 2 1/2° at 2950', 2° at 3159'.

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7/23/61

Depth 3498'. Drilled 263'. Drilling with Bit 7. Sand. Mud 9.4. Vis. 35. Water loss 12. 6% oil.

7/24/61

Depth 3698'. Drilled 200'. Sand. Drilling with Bit 9. Mud 9.4. Vis. 35. Water loss 12. 6% oil.

7/25/61

Depth 4030'. Drilled 332'. Sand and shale. Drilling with Bit 11. Mud 9.3. Vis. 35. Water loss 13. Oil 6%. Dev. 1° at 3921'.

7/26/61

Depth 4403'. Drilled 373'. Sand and shale. Moving in, trip for Bit 12. Mud 9.3. Vis. 35. Water loss 12. 6% oil.

7/27/61

Depth 4623'. Drilled 216'. Sand and shale. Drilling with Bit 13. Mud 9.3. Vis. 37. Water loss 12. 6% oil. Lost circulation - lost approximately 45 bbls.

7/28/61

Depth 4832'. Drilled 212'. Sand and shale. Drilling with Bit 13. Mud 9.3. Vis. 38. Water loss 10. 5% oil. Lost approximately 250 bbls. of mud at 4638'.

7/29/61

Depth 5106'. Drilled 274'. Sand and shale. Trip for Bit 15. Mud 9.4. Vis. 38. Water loss 14. Dev. 1° at 4650'. Lost approximately 150 bbls. mud at 4925'.

7/30/61

Depth 5410'. Drilled 304'. Drilling with Bit 18. Sand and shale. Mud 9.4. Vis. 39. Water loss 12. Filter cake 1/32. 6% oil.

7/31/61

Depth 5760'. Drilled 350'. Sand and shale. Drilling with Bit 19. Mud 9.4. Vis. 39. Water loss 12. 5% oil. Dev. 1° at 5500'. Filter cake 2/32. Sand 1/4%.

8/1/61

Depth 6060'. Drilled 300'. Mud wt. 9.4. Vis. 38. Water loss 12. 5% oil. Lost approximately 200 bbls. mud at 5755'.

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8/2/61

Depth 6316'. Drilled 256'. Sand and shale. Drilling with Bit 21. Mud 9.5. Vis. 55. Water loss 13. 5% oil. Estimated top of Dakota 6585'.

8/3/61

Depth 6592'. Drilled 276'. Sand and shale. Trip for Bit 23. Mud 9.4. Vis. 60. Water loss 10. 6% oil.

8/4/61

Depth 6648'. Estimated top of DK 6575'. Drilled 56'. Trip for plug Bit. Mud 9.4. Lost approximately 400 bbls. mud at 6592' and 6598'. Vis. 56. Water loss 11. 6% oil.

8/5/61

Drilling @ 6699'.

8/6/61

Drilling @ 6821'.

8/7/61

TD 6825'. Running 5 1/2" casing. Logged-Gamma Ray-Neutron with BJ Service. Top of DK 6570'. TD logger 6818'.

8/8/61

WOC. Moving off rig.

Ran 209 joints 6828.03' of 15.5#-5 1/2" J-55-ST & C casing, set at 6825'. First stage, 140 sx. regular cement, 4% gel., 1/4 cu. ft. Strata-Crete #6 per sack. Tested plug 2000 PSIG, float held ok. Second stage, 170 sx. regular cement, 4% gel., 50/50 Pozmix. Tested stage collar 2250 PSIG - held OK. Full returns during both stage jobs. Stage collar at 4710'. Baskets at 4730' and 4431'. Centralized throughout Dakota and Mesaverde. Scratched throughout Dakota.

8/9/61

WOC

8/10/61

WOC

8/11/61

WOC. Pumping frac water.

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8/14/61

Will move on completion rig Friday the 18th.

8/15/61

Waiting on completion rig

8/16/61

Waiting on completion rig.

8/17/61

Waiting on completion rig.

8/18/61

Waiting on completion rig.

8/19/61

Waiting on completion rig.

8/20/61

Waiting on completion rig.

8/21/61

Moving in, rigging up completion rig.

8/22/61

Going on to clean out PBTD after drilling stage collar at 4711' KB.

8/23/61

Preparing to pressure up on casing. Drilled to PBTD of 6806' KB. After drilling stage collar tested to 2000 PSIG, held OK. Drilled float collar at 6744'. Found cement on top of collar at 6685' (59' of cement). Good cement below float collar.

8/24/61

Preparing to perform Upper Stage Dakota Frac.

Tested pipe to 3000 PSIG, held OK. Spotted 750 gal. mud acid, came out of hole. Ran correlation log and cement log. DK cement top 6084', MV cement top 3975'.

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8/24/61 Cont'd.

Lower Stage Dakota Frac:

Perforated 6752'-6768', 6774'-6784' with 2 bullets and 2 jets per foot. 4 torpedo jets at 6755', 6762', 6774', and 6782'. Soaked away mud acid in 3 stages, 1st stage 2050 PSIG, 3rd stage 2200 PSIG. Fraced with 13,500# 40-60 mesh sand, 33,800 gal. water with 1% $CaCl_2$ and 20# per 1,000 gal. of WAC-8 (water loss and slickum agent). Minimum pressure 3250 PSIG, maximum pressure 3450 PSIG. Average treating rate 18.3 BPM. Lubricated in Baker cast iron bridge plug against 2000 PSIG to 6700'.

Lower Dakota Stage Summary:

13,500# sand
33,800 gal. water
750 gal. 15% mud acid
18 BPM
3250-3450 PSIG

8/25/61

On plug at 4540', preparing to start drilling out and cleaning out.

Upper Stage Dakota Frac:

Perforated 6642'-6650',6662'-6666', also torpedo jets at 6646' and 6664'. Attempted to soak away acid, pressure went to 3500 PSIG. Bled pressure off and perforated with 2 bullets and 2 jets per foot, 6572'-6587', 6593'-6600', 6611'-6616'. Fraced with 76,500# sand, 81,700 gal. water with 1% $CaCl_2$ and WAC-8. First 36,500# of sand 40-60, followed by 40,000# of 20-40. Break down minimum pressure 1700 PSIG, maximum pressure 2650 PSIG. Minimum pressure during frac 2150 PSIG. Average injection rate 47.5 BPM. Dropped a total of 50 frac balls. Instant shut-in pressure 1800 PSIG, after 10 minutes 1500 PSIG. Set Guiberson Magnesium plug at 4540'.

Upper Dakota Stage Summary

76,500# sand
81,700 gal. water
50 balls
47.5 BPM
2300 PSIG

Mesaverde Frac:

Perforated with 2 jets per foot 4420'-4443', 4463'-4476', 4498'-4516'. Fraced MV 100,000# 20-40 sand, 75,600 gal. water. Minimum treating pressure 1900 PSIG, maximum treating pressure 3200 PSIG. Average injection rate 50.7 BPM. Dropped 45 frac balls. Instant shut-in pressure 800 PSIG, 10 minutes 150 PSIG. After 30 minutes well on vacuum.

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8/25/61 Cont'd.

Mesaverde Frac Summary:

100,000# sand
75,600 Gal. water
45 balls
51 BPM
2250 PSIG

8/26/61

Coming out of hole, laying down work-over string. PBTD 6804'. Lost approximately 150 bbls. water in MV while drilling plug at 4540'. Well flowed back gas and water and quite a bit of sand while cleaning to PBTD. Ran 207 joints 1 1/2" integral joint tubing 6508'. Baker Model "D" set at 6520'. Seal units and tool at 5.37, 2 subs 3' for total of 6516'. Landed 1 1/2" on Model "D" with 5000 PSIG wt.

8/27/61

Swabbing. Rig down for repairs at 10 p.m. last night. Ran 133 joints of 1" Jalcon weld, total of 4398', plus 8' KB set at 4406' KB. One 4/64 jet collar at 3704' KB, one 4/64 jet collar at 3207' KB. Swabbed Dakota approximately 7 hours before kicking off.

8/28/61

Rig released 12 p.m. last night. Flowing Dakota for clean up, no gages yet.

8/29/61

Turned DK into MV at 1160 PSIG, MV was not kicking. Took DK out and blew to atmosphere for 6 hours, turned back into MV.

8/30/61

Cycling DK through MV, making water and gas, 960 PSIGcasing pressure. Well would not start cycling until last night, took DK out of MV this a.m.

8/31/61

Blowing both zones for clean up. Gaged MV 720 MCFD, 880 PSIG casing pressure. MV flowing by itself since yesterday morning. DK 200 MCFD, very wet.

9/1/61

MV - Open 875 casing pressure, making 665 MCFD and a coarse stream of water.
DK - Making 98 MCFD, 1 3/4" stream of water. Shut-in both zones to pressure up.

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9/2/61

DK - flowing 100 MCFD, 1/4" stream of water, shut-in.
MV - flowing 712 MCFD, heavy spray, shut-in for 7 day test.

9/3/61

Both zones shut-in.

9/4/61

MV - casing pressure 1100 PSIG
DK - tubing pressure 1640 PSIG

9/6/61

MV - Shut-in casing pressure 1120 PSIG
DK - After 19 hours open making 322 MCFD, fairly dry.

9/7/61

MV and DK shut-in, going to open DK this a.m.

9/8/61

MV - Shut-in casing pressure, 1140 PSIG, going to run 3 hour potential today.
DK - Shut-in tubing pressure, 1550 PSIG, opened to atmosphere

9/9/61

Ran 3 hour test yesterday on MV following 7-day shut-in with following results:

Time After Open Min.	Casing Pressure PSIG	Tubing Pressure PSIG	Temp. ° F.
0	1106	1108	-
15	1043	98	31
30	1028	87	32
45	1017	79	32
60	1009	75	32
120	987	71	33
180	968	66 *	34

* Approximately 1100 MCFD, blowing fairly dry.

9/12/61

Shut-in.

9/13/61

Shut-in, treated Dakota with 1000 gal.15% mud acid yesterday.

WELL: FREEMAN NO. 1-11

9/14/61

MV - Shut-in
DK - Tubing pressure 270 PSIG, opened to atmosphere, no returns.

9/15/61

12 hour shut-in pressure 180 PSIG, on tubing, opened to atmosphere, dead.

9/16/61

Swabbed for 8 hours, shut-in. Opened to atmosphere Friday, dead.

9/17/61

Shut-in.

9/18/61

560 PSIG tubing pressure, opened to atmosphere, dead. Swabbing.

9/19/61

Swabbing, swabbed Dakota for 7 hours, fluid level 3600'. Shut-in 2 p.m. yesterday, dead.

9/20/61

Swabbing, still dead. Swabbing from 5000'.

9/21/61

Shut-in, going to run wire line to check fill up.

9/22/61

Ran wire line and found indication of sand fill up to 6529' or 9' below packer. Will clean out sand and obtain initial potential test.

10/10/61

Shut-in yesterday, will open today.

10/11/61

Open to atmosphere, after 12 hours open making 1/4" stream of water, gas too small to measure. Left open.

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10/12/61

Shut-in. Flowed yesterday. Gas too small to measure. Bringing no water.

10/13/61

22 hours shut-in tubing pressure 840 PSIG. Opened to atmosphere.

10/18/61

Ran wire line, could not get below 6529' KB. Could not tell whether went out end of tubing or not.

10/20/61

40 hour shut-in pressure on Dakota 1000 PSIG. Going to run sand pump this p.m. to check for tubing block.

10/21/61

Moving in swabbing rig.

10/22/61

Rigged up swabbing rig. Ran sand pump on line to 6557' (by depthometer measurement). Made three runs, recovered nothing, ran Halliburton wire line to check depth, line measured 6546'. Shut down at dark.

10/23/61

Dakota flowing at rate of 1250 MCFD. After 20 hours open making light spray of water and some sand. Ran tool to check bottom of tubing, ran 3 times unable to hook bottom of tubing. Ran impression block, results inconclusive. Re-ran tool to catch bottom of tubing, sat and knocked loose tubing obstruction. Well came in flowing strongly at 5:30 p.m. After 5 hours Dakota making approximately 1600 MCFD plus light spray of water.

10/24/61

Shut-in pressure on Dakota after 14 hours, 1450 PSIG. Opened this a.m., will blow through the day.

10/25/61

Shut-in. After 7 hour blowing, making 1020 MCFD plus light mist of water.

10/27/61

Shut-in, going to open later today. After 26 hours open making 520 MCFD, very fine spray of water.

WELL: FREEMAN NO. 1-11

11/4/61

Ran first half of Packer-Leakage. Flowed Dakota for 3 hours, rate at end of 3 hours approximately 1145 MCFD.

11/5/61

Ran Halliburton wire line to check for tubing obstruction. Ran line to 6655', attempted to pull line out. Line kept hanging up at 6536'. (Halliburton wire line measurements.) (Top of Packer at 6520' KB.) Worked line for two hours, would not come up past 6536'. Rigged down left line in hole waiting for orders.

11/9/61

Hooked Halliburton pump truck to tubing, pumped 20 bbls. water down tubing, went on vacuum. Wire line weight came loose, lowered wire line to 6630' and hung up. Could not go either way, worked for 2 hours, would not come loose. Dropped 1 1/4" wire line go devil, line came loose, pulled wire line and weights to 6437', wire line parted at reel leaving approximately 6450' of wire line and weights in the hole. Well had no pressure. Shut-in with idea of trying to blow out of hole, if unsuccessful, will attempt to fish for wire line.

11/10/61

Rigging up swabbing unit. Blew Dakota to air - did not blow out any wire line. Went in hole with wire line grapple - wire line spear. Hooked Halliburton line at 170'. Unable to pull loose with wire line truck. Will continue fishing with 9 1/16 line on small swabbing unit.

11/11/61

Fishing for grapple with 1 1/2" overshot. Pulled on 3/8" braided wire line with pulling unit. Jarred for 6 hours, pulled pin out of grapple at 164'. Fished with 1 1/4" overshot, latched on grapple, pulled slips out of overshot. Shut down at dark.

11/12/61

Shut-in, fished for grapple with 1 1/2" overshot. Wire balling up on top of fish, unable to latch on to it. Released rig, shut-in.

11/13/61

Shut-in.

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11/22/61

Going in hole with overshot on 2 7/8" tubing to try and latch on to remainder of fish. Killed MV, took strain on DK tubing approximately 23,000 PSIG. Tubing pulled in two, blew 13 joints out of the hole. Pumped down MV annulus and killed DK. Put on blow out preventer, pulled MV tubing, went in hole with grapple. Recovered approximately 400' of Halliburton wire line. In hole with overshot on 2 7/8" tubing, latched on to DK tubing with overshot, backed out 26 joints of 1 1/2", pulled 26 joints out of the hole. Went in hole with grapple, made three runs, recovered approximately 1000' of Halliburton wire line.

11/23/61

Coming out of hole with fish. Ran overshot to 1238', latched on to tubing, worked tubing for 15 minutes, tubing came free. Pulled 168 joints 1 1/2" tubing left 4' 2 3/8" tubing, fishing neck and packer seal assembly in packer. Ran overshot on tubing, latched on to fish, pulled 14,000 PSIG over tubing weight, fish came free.

11/24/61

Laying down 2 1/2" tubing. Recovered packer seal assembly, ran Baker milling tool, milled over and retrieved packer. Went back in hole with 4 1/2" wash over pipe to clear hole to bottom. Found bridge at 6589', drilled bridge, well started kicking, cleaned out to 6790'.

11/25/61

Running 1 1/2" tubing. Laid down 2 7/8" tubing, ran gage ring and junk basket, would not go below 6645'. Ran undersized plug, set plug at 6700'. Dropped 1 1/2 sx. cement on top of plug, ran Baker Model D packer, set packer at 6526' KB.

11/26/61

Swabbing DK, ran 207 joints (6510.07') of 1 1/2" tubing plus 12.85' of subs for a total of 6522.92' (plus 8' KB correction), set in Model D at 6526' KB, with 8000#. Also ran 4 joints of 1 1/2" tubing with seal assembly on bottom below packer as production tube, (total of 141.49'), bottom of production tube at 6667.5' KB. Ran 132 joints (4366') 1" tubing landed at 4374' KB. Jet collars at 3208' and 3672' KB. Started swabbing DK at 9 p.m.

11/27/61

Shut-in, moving off completion rig. Swabbed DK till noon, well kicking off, flowing for 15 to 30 minutes and dying. Released rig at noon, will build well head today and open DK to atmosphere.

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11/28/61

DK shut-in, dead. Moving on swabbing unit. Built well head, opened DK, had 200 PSIG tubing pressure, blew gas for 3 minutes and died. Left open for 4 hours and shut-in.

11/29/61

Swabbing, no further report. Moved on swaobing rig, swabbed for 2 hours. Fluid level 2500'. Gasing slightly after each run. Shut down at dark. Rig broke down.

11/30/61

Flowing back water. 98 MCFD, 1/2" stream of water. Swabbed for 4 hours, well kicked off at 11 a.m. After 5 hours open flowing 150 MCFD plus 1" stream of water.

12/1/61

Cycling. After 18 hours cycling making 196 MCFD plus 1" stream of water. Casing pressure 650 PSIG.

12/2/61

After cycling 24 hours making 670 MCFD, 750 PSIG casing pressure. Shut DK in, left MV open.

12/3/61

MV opened to atmosphere. After 6 1/2 hours open making 880 MCFD plus heavy spray of water, casing pressure 780 PSIG. DK open to atmosphere after 6 hours shut-in tubing pressure 1000 PSIG. Opened to atmosphere, after 1 hour open making 665 MCFD plus 1/2" stream of water.

12/4/61

Shut-in DK and MV. After 30 hours open MV 880 MCFD plus heavy spray of water, casing pressure 750 PSIG. DK making 60 MCFD plus 1/2" stream of water. Shut-in both zones to pressure up.

12/5/61

DK and MV shut-in. After 14 hours shut-in DK tubing pressure 1200 PSIG, MV 1000 PSIG. Opened MV for 8 hours. After 8 hours fairly dry, 800 PSIG casing pressure. Had flame, unable to get gage as gas was burning.

12/6/61

Both zones shut-in. After 38 hours shut-in DK tubing pressure 1340 PSIG, MV casing pressure 1000 PSIG. Opened DK to atmosphere after 5 hours open making 416 MCFD plus heavy spray of water.

WELL: FREEMAN NO. 1-11

12/5/61

Shut-in, will open DK later today. After 24 hours shut-in DK tubing pressure 1400 PSIG, opened to atmosphere, after 1.5 hours open making 660 MCFD plus heavy spray of water.

12/7/61

Shut-in. Opened DK after 24 hours shut-in. Shut-in tubing pressure 1480 PSIG, after 1 1/2 hours open making 675 MCFD plus heavy spray of water. Shut-in for Packer Leakage.

12/11/61

Ran Packer-Leakage test on MV.

Time After Opening Minutes	MV Tubing Pressure PSIG	MV Casing Pressure PSIG	DK Tubing Pressure PSIG	Temp. °F.
0	1103	1105	1464	
15	95	1040	1464	29
30	84	1020	1465	29
45	77	1012	1466	30
60	71	998	1466	30
120	65	980	1468	31
180	* 63	961	1470	31

* Approximately 1000 MCFD

Slight spray of water throughout test.

OPEN FLOW TEST DATA

DATE December 20, 1961

Operator: [illegible] Oil & Gas, Inc.		Lease: Freeman No. 1-11	
Location: [illegible] F/EL, Sec. 11-31N-13W	County: San Juan		State: New Mexico
Formation: [illegible]	Pool: Basin		
Casing: Diameter: 5 1/2	Set At: Feet: 6825	Tubing: Diameter: 1 1/2	Set At: Feet: 6526
Pay Zone: From: [illegible]	To: 6666	Total Depth: 6690 PBTD	
Stimulation Method: [illegible]		Flow Through Casing:	Flow Through Tubing: X

Choke Size, Inches: 0.750	Choke Constant: C: 14.1605				
Shut-in Pressure, Casing, PSIG: [illegible]	+ 12 = PSIA: 1707	Days Shut-in: 14	Shut-in Pressure, Tubing PSIG: 1695	+ 12 = PSIA: 1707
Flowing Pressure: P PSIG: 60	- 12 = PSIA: 72		Working Pressure: P_w PSIG: -	+ 12 = PSIA:
Temperature: T °F: 32	n = .75		Fpv (From Tables): 1.000	Gravity: .70

CHOKE VOLUME Q = C x P_t x F_t x F_g x F_{pv}

Q = 14.1605 X 72 X 1.0281 X .9258 = 980 MCF/D

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

Aof = $\left(\quad \right)^n$ =

Aof = _____ MCF/D

TESTED BY Pete Sanger

WITNESSED BY _____

OPEN FLOW TEST DATA

DATE December 13, 1961

Operator: Consolidated Oil & Gas, Inc.		Lease: Freeman	
Location: 1620' F/NL, 870' F/EL, Sec. 11-31N-13W	County: San Juan		State: New Mexico
Formation: Mesaverde	Pool: Blanco		
Casing: Diameter: 5 1/2	Set At: Feet: 6825	Tubing: Diameter: 1"	Set At: Feet: 4374
Pay Zone: From: 4420	To: 4516	Total Depth: 6526 Pkr.	
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: 1105	+ 12 = PSIA: 1117	Days Shut-in: 7	Shut-in Pressure, Tubing PSIG: 1103	+ 12 = PSIA: 1115
Flowing Pressure: P PSIG: 63	- 12 = PSIA: 75		Working Pressure: P_w PSIG: 961	+ 12 = PSIA: 973
Temperature: T °F: 31	n = 0.75		Fpv (From Tables): 1.000	Gravity: .70

CHOKE VOLUME = Q = C x P_t x F_t x F_g x F_{pv}

Q = 14.1605 X 75 X 1.0188 X .9258 = 1,000 MCF/D

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

Aof = $\left(\frac{1,250,000}{300,000} \right)^n$ = 2.92 Q

Aof = 2920 MCF/D

TESTED BY Clyde Phillips

WITNESSED BY _____

Lange E. Freeman