Form 9-330

Form approved.
Budget Bureau No. 42-R355.4.

U. S. LAND OFFICE Jicarilla
SERIAL NUMBER Apache
LEASE OR PERMIT TO PROSPECT 116

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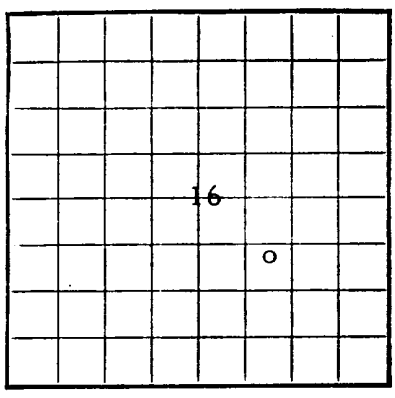
GEOLOGICAL SURVEY



LOCATE WELL CORRECTLY

LOG OF OIL OR GAS WELL

Company Consolidated Oil & Gas, Inc. Address 4150 East Mexico Ave., Denver 22, Colo

Lessor or Tract Apache Field Tapicito PC State New Mexico
Basin DK

Well No. 4-16 Sec. 16 T. 26N R. 3W Meridian NMPM County Rio Arriba

Location 1850 ft. {N./S.} of S Line and 1850 ft. {E./W.} of E Line of Sec. 16 Elevation 7137' 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 W. A. Williams

Date September 25, 1963 Title Chief Engineer

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

Commenced drilling March 8, 1963 Finished drilling April 9, 1963

OIL OR GAS SANDS OR ZONES

(*Denote gas by G*)

No. 1, from 3782 to 3840 No. 4, from ____ to ____

No. 2, from 8086 to 8258 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
9-5/8	38			306	guide				surface
7	23			5703	guide				production
4-1/2	11.6		J-55	2406					liner
4-1/2	10.5		J-55	272	float				

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
9-5/8	298	260			
7	5706	171	Pump & Plug		
4-1/2	8267	195	Pump & Plug		

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
Dakota - Sand Water Frac with 100,000 gals. and 90,000 lbs.						
Pictured Cliffs - Sand Water Frac with 100,000 gals and 100,000 lbs.						

TOOLS USED

Rotary tools were used from 0 feet to 8271 feet, and from ____ feet to ____ feet

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

DATES

____, 19____ Put to producing July 15, 1963

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

Gravity, °Bé. ____

If gas well, cu. ft. per 24 hours PC - 218 DK - 561 Gallons gasoline per 1,000 cu. ft. of gas ____

Rock pressure, lbs. per sq. in. PC - SICP 1015, SITP 1015; DK - SITP 1204

If gas well, cu. ft. per 24 hours PC - 218 DK - 561 Gallons gasoline per 1,000 cu. ft. of gas ____

Rock pressure, lbs. per sq. in. PC - SICP 1015, SITP 1015; DK - SITP 1204

EMPLOYEES

Huron Drilling Company, Driller ____, Driller

Contractor, Driller ____, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
PERFORATIONS			FORMATION TOPS
Pictured Cliffs			Pictured Cliffs 3740 (/3395)
3782	3790		Cliff House 5563 (/1572)
3798	3802		Point Lookout 5966 (/1135)
3816	3840		Gallup 6924 (/211)
Dakota			Dakota 8070 (-935)
8086	8094		
8161	8168		
8174	8184		
8206	8216		
8223	8228		
8248	8258		

FOR ADDITIONAL INFORMATION - SEE ATTACHED HISTORY

FOLD | MARK

(OVER)

FORMATION RECORD—Continued

16—43094-5

DRILLING & COMPLETION HISTORY
CONSOLIDATED OIL & GAS, INC.
APACHE NO. 4-16
Rio Arriba County, New Mexico
September 14, 1963

LOCATION: 1850' F/SL, 1850' F/EL, Section 16
T26N, R3W, NMPM

ELEVATIONS: 7125' GL
7137' KB - all measurements from KB

SPUD: March 8, 1963

DRILLING COMPLETED: April 9, 1963

WELL COMPLETED: July 10, 1963

TOTAL DEPTH: 8271'

CASING: Surface: 9 5/8" 38# set at 298'. Cemented with 260 sx regular 2% $CaCl_2$.

Production: 7" 23# intermediate string set at 5706' with 61 sx thru casing shoe, and 110 sx 50-50 Poz thru stage collar at 3960'. 4 1/2" 11.60 liner set from 5590' to 8266.5'. Cemented with 143 sx 20% Diacel "D" and 52 sx regular.

Tubing: 1 1/2" EUE set in Model "D" packer at 7980'.
1" EUE set at 3731.46'

LOGS: Welex Induction - Electric and Radioactivity Logs.

CORES & DRILLSTEM TESTS: None

FORMATION TOPS: (Log)

Pictured Cliffs:	3740 (+ 3395)
Cliff House:	5563 (+ 1572)
Point Lookout:	5966 (+ 1135)
Gallup:	6924 (+ 211)
Dakota:	8070 (- 935)

PRODUCING PERFORATIONS:

DK	PC
8086-94'	3782-90'
8161-68'	3798-3802'
8174-84'	3816-40'
8206-16'	
8223-28'	
8248-58'	

TREATMENT: DK - Sand-water frac in two stages with 90,000 lb. sand, and 100,000 gals water.
PC - Sand-water frac with 100,000 lb sand and 100,000 gals water.

INITIAL POTENTIAL: DK - Flow volume thru 3/4" choke - 561 MCFPD
PC - Flow volume thru 3/4" choke - 218 MCFPD
Calculated absolute open flow potential - 264 MCFPD

WELL: APACHE NO. 4-16

1850' F/SL, 1850' F/EL, Sec. 16, T26N-R3W

FIELD: Basin Dakota, Tapicito Pictured Cliffs

COUNTY: Rio Arriba STATE: New Mexico

ELEVATION: 7125' GL

7137' KB

3/8/63

Spudded in at 9:30 a.m.

3/9/63

Present operation WOC. Drilled 306' sand and shale. 15" hole. Dev. 3/4° at 103'. Pulled out of hole. Rig up and ran 10 joints 9 5/8" 38# casing. Total pipe ran 306' set at 298' KB. Cemented with 260 sx. reg cement, 2% calcium chloride. Plug down at 1:30 a.m. Good returns.

3/10/63

Depth 1230'. Drilled 924' shale and sand. Drilling with Bit 1. Mud wieght 8.9. Visc. 33. 1/2° Dev. at 550', 1/2° at 940'.

3/11/63

Depth 2103'. Drilled 878'. Mud weight 8.9. Visc. 34. Water loss 20. 1 1/2° at 940'. 3/4° at 1520'. 1 1/4° at 1836'. Drilling with Bit 2. Broke main shaft on mud pump. Waiting on repairs.

3/12/63

Depth 2457. Drilled 374' sand and shale. Present operation drilling with Bit 3. Mud weight 9.1. Visc. 36. Water loss 12. Dev. 1 1/2° at 2136'. 1 1/2° at 2457'. Lost approximately 100 barrels of mud at 2365. Have good returns now.

3/13/63

Depth 2757'. Drilled 300' sand and shale. Present operation drilling with Bit 4. Mud weight 9.6. Visc. 36, water loss 16. Dev. 1 1/2° at 2457'. 2° at 2600'.

WELL: APACHE NO. 4-16

3/14/63

Depth 3300'. Drilled 543' sand and shale. Present operation drilling with Bit 5. Mud weight 9.2. Visc. 38. Dev. 1 3/4° at 2900'. 1 1/2° at 3225'.

3/15/63

Depth 3820'. Drilled 520' sand and shale. Present operation drilling with Bit 6. Mud weight 9.3. Visc. 39. Water loss 10. Dev. 3° at 3525'. 3 1/4° at 3757'.

3/16/63

Depth 4033', drilled 263' sand and shale. Present operation working on mud pump. Bit 7 in hole. Mud weight 9.4, Visc. 40, water loss 9.5, cake 2/32, Ph. 8.5.

3/17/63

Depth 4243. Drilled 171' sand and shale. Present operation drilling with Bit 8. Mud weight 9.3, Visc. 40, water loss 11, cake 2/32, Ph. 8.5, Dev. 4°at 4132', 4 1/4° at 4175'.

3/18/63

Depth 4424'. Drilled 220' sand and shale. Present operation drilling with Bit 9. Mud weight 9.3. Visc. 39. Water loss 11. Dev. 4° at 4346'. 3 1/2° at 4408'.

3/19/63

Depth 4700'. Drilled 276' sand and shale. Present operation drilling with Bit 10. Mud weight 9.1. Visc. 35, water loss 11. 2 1/2° Dev. at 4575'.

3/20/63

Depth 4962'. Sand and shale. Present operation drilling with Bit 11. Mud weight 9.7. Visc. 37, water loss 11. Cake 2/32. Dev. 3°at 4710'.

3/21/63

Depth 5102'. Drilled 140' sand and shale. Present operation making trip for Bit 13. Mud weight 9.4. Visc. 41, water loss 8.4. Dev. 1 1/4° at 4988'.

WELL: APACHE NO. 4-16

3/22/63

Depth 5270'. Drilled 168' sand and shale. Present operation drilling with Bit 14. Mud weight 9.5. Visc. 40. Water loss 11. 1 1/4° Dev. at 5200'.

3/23/63

Depth 5350'. Drilled 80' of hole - sand and shale, twisted off above drill collars. Left 15 collars in hole. Came out of hole, went back in hole with overshot, could not get over fish (apparently top of fish is flared.) Came out of hole , put milling guide on overshot. Present operation going in hole with overshot.

3/24/63

Finished going in hole with overshot. Caught fish, recovered same. Present operation drilling at 5421'. Drilled 71' sand and shale. Drilling with Bit 16. Mud weight 9.4, Visc. 41. No mud loss.

3/25/63

Depth 5546'. Drilled 125' - drilling with Bit 17. Mud weight varying 8.8 to 9.2. Visc. 42, water loss 10. Presently injecting gas. Mud pump pressure 450#. 1 1/4° Dev. at 5200'. 3/4° at 5475'. No loss of mud to date.

3/26/63

Depth 5677'. Drilled 130' sand and shale. Mud weight 8.6 to 9. Visc. 44 water loss 7.8. 3/4° Dev. at 5475'. No loss of mud. Present operation making trip for Bit 19.

3/27/63

Depth 5677'. Got out of hole for Bit 19 and twisted off. Left 3 drill collars and bit in hole. Ran overshot in, hit bridge, plugged overshot. Came out of hole (keeping hole full) unplugged overshot went back in hole with overshot. Washed 60' to top of fish. Caught fish. Came out of hole with same. Present operation going in hole with Bit 19. Mud weight 9, visc. 42, water loss 19. Still injecting gas.

3/28/63

Depth 5724'. Drilled 47', circulated 1 1/2 hrs. Came out of hole, rigged up Welex, ran log. Present operation running 7" casing.

WELL: APACHE NO. 4-16

3/29/63

Plug down at 2 p.m. 3-28-63. Ran 150 joints of 7" 23# casing. (5703.05') plus guide shoe (1.00') and stage collar (2.00'). Set pipe at 5706.05'. Float collar - 5664.35' KB. Stage collar at 3960.32' KB. 1 centralizer on shoe joint. 1 cement basket at 3960.32' KB. 1 centralizer at 3991.40' KB, 1 centralizer at 3691.40' KB. Cemented first stage with 11 sx. of 40% Diacel, 25 sx of 50-50 Pozmix, 2% calcium chloride, 25 sx regular 2% calcium chloride. Plug down at 10:50 a.m. 3-28-63. Bumped plug with 2000#. Held okay. Good return on cement job. Second stage ... cemented with 110 sx 50-50 Pozmix, 2% calcium chloride. Plug down at 2:05 p.m., 3-28-63. Bumped plug with 2000#. Held okay. Good return on cement job. Nippled up, started in hole 2:00 a.m. 3-29-63. Top of cement 3948'. 12' cement to stage collar - 3960'. Present operation, drilling on stage collar. Pressured to 1300# on stage collar. Held okay.

3/30/63

Finished drilling stage collar at 3960'. After drilling stage collar, pressured to 1400#, held okay. Came out of hole. Rig up - started blowing down. Present operation, blowing down at 5021'.

3/31/63

Finished blowing hole down. Top cement at 5651', 13' above float collar. Drilled 10' of cement, plugged bit. Came out of hole, unplugged bit. Went back in hole, finished drilling cement on top of float. Drilled float collar. Drilled good cement in shoe joint. Drilled out from under shoe. Blew and dried hole up. Went to 5713'. Bit started torqueing up. Ran 2 hours at this depth. Present operation, coming out of hole to check bit.

4/1/63

Got out of hole with bit. All of the cones were off. First run with magnet recovered one cone. Second run with magnet recovered one cone and bearing. Third run with magnet recovered cone pens. Present operation, on bottom with magnet in attempt to recover last cone.

4/2/63

Depth 6405'. Drilled 681'. 1/4° dev. at 5840'. 1/2° at 6280'. Present operation, making trip for bit 22.

4/3/63

Depth 6770'. Drilled 368' sand and shale. Drilling with Bit 22. Had 12 3/4 hours drilling time. 1/2° dev. at 6280'. 2° dev. at 6580'. Well dusting good at 6770'.

WELL: APACHE NO. 4-16

4/4/63

Depth 7297'. Drilled 527'. Present operation, drilling with Bit 23. 6° dev. at 7200'. 6° at 7250'. 11 hours drilling. Made trip and had trouble with drilling ahead.

4/5/63

Depth 7376'. Drilled 79'. Present operation drilling with Bit 23 and blowing hole. Hit oil at 7362'. Gas pressure 250#. 7 1/4 hours tripped and checked drill pipe for wall cake. 16 3/4 hours drilling and blowing hole. Now getting a little dust.

4/6/63

Depth 7835'. Well started dusting at 7442'. Present operation, making trip for Bit 24. 6° dev. at 7560'.

4/7/63

Depth 8064'. Drilled 229' sand and shale. Bit 25 in hole. Present operation blowing hole, after trip. Have been blowing hole and washing pipe for 3 1/2 hours.

4/8/63

Total Depth 8271'. Drilled 207'. Logged well. Present operation, preparing to run liner.

4/9/63

Finished running log - rigged up and ran casing. Ran 78 joints 4 1/2" 11.60# J-55 casing, for a total of 2405.97'. Ran 9 joints 4 1/2" 10.5# J-55 casing for a total of 271.89'. Total casing 87 joints for a total of 2677.86'. Set at 8266.47' KB. Float collar at 8231.17' KB. Top of liner at 5589.61' KB. Overlap on liner 116.39'. Cemented with 143 sx 20% Diacel "D". Tailed in with 52 sx regular class "A" cement. Plug down at 5:40 p.m. 4-8-63. Present operation, tearing down rotary rig.

4/10/63

Moved out rotary rig.

4/11/63

Waiting on completion rig.

4/12/63

Waiting on completion rig.

WELL: APACHE NO. 4-16

4/13/63

Waiting on completion rig.

4/14/63

Waiting on completion rig.

4/15/63

Waiting on completion rig.

4/16/63

Will move in completion rig this a.m.

4/17/63

Moved in completion rig. Rigged up, picked up 2 3/8" tubing. Present operation, drilling cement bridge at 4000'. Top of liner 5990'. Pressured up on casing 1500#. Held okay.

4/18/63

Drilled 1500' cement stringers to top of liner. Pressured up to 1800#. Held okay. Came out of hole, put on 3 7/8" bit and have cleaned out to 40' of bottom.

4/19/63

Cleaned well out to 8252'. Rigged up Western Co. Pressured up on casing to 3500#. Held okay. Spotted 1000 gals acid on bottom. Came out of hole, rigged up PGAC. Present operation trying to perforate well, having trouble with gun.

4/20/63

Present operation, blowing well with gas at 1200', frac data follows:

First stage

Rig up PGAC. Perforated 4 per ft. from 8258'-8248', 8228'-8223', 8216'-8206'. Total holes 100. Rig up Western Co.(5 Frac Master 600.)

WELL: APACHE NO. 4-16

4/20/63 (frac information con't)

Break down 1 pump	1400#	Break down and fill	18 bbls
All pumps on	3400#	Overflush	16 bbls
Max. treatment press	3500#	20,000# 20-40 sand	
Min. treatment press	3200#	15,000# 20-40 sand	
Avg. treatment press	3400#	Avg. injection rate	33.7 BPM
Final treatment press	3450#	Rubber balls	10
Instant S.I.	2400#	Flush 11,114 gals	
5 min. S.I.	2200#		

Second Stage

Set Go bridge plug at 8190', perforated 4 per ft. from 8184'-8174', 8168'-8161', 8094'-8086', total holes 68. Rig up Western Co. (5 Frac Master 600)

Break down 1 pump	2600#	Break down and fill	16 bbls
All pumps on	3600#	Overflush	none
Max. treatment press	3600#	55,000# 20-40 sand	
Min. treatment press	3000#	Avg. injection rate	35 BPM
Avg. treatment press	3500#	Rubber balls	40
Final treatment press	2600#	Flush 11,000 gals	
Instant S.I.	2800#		
5 min. S.I.	2400#		

Third Stage

Pictured Cliffs - Rigged up PGAC, set Go bridge plug at 5900'. Perforated 2 per ft. from 3840'-3816', 3802'-3798', 3790'-3782'. Total holes, 72.

Break down 1 pump	2200#	Break down and fill	
All pumps on	2600#	Overflush	none
Max. treatment press	3400#	100,000#, 20-40 sand	
Min. treatment press	2100#	Avg. injection rate	37.9 BPM
Avg. treatment press	2700#	Rubber balls	30
Final treatment press	3400#	Flush 7,224 gals	
Instant S.I.	2200#		
5 min. S.I.	1700#		

4/21/63

Present operation - blowing hole at 6600'. Well making 1 1/2" stream of water and sand. Blew well down to top of plug at 5900', gauged PC, well making 200 MCFD with heavy spray of water. Drilled plug at 5900'. No increase in gas. Drilled bridge plug at 10 p.m.

WELL: APACHE NO. 4-16

4/22/63

Finished blowing hole and drilled plug down to 8190'. Well made lots of water and sand to this depth. Gauged well, well still making 200 MCFD. Still making some mud and water. Present operation - preparing to drill last bridge plug at 8190'.

4/23/63

Drilled top off of plug at 8190'. Water came up to 3500'. Blew back down to plug, bridged off. Started drilling on plug. Washed sand bridge out. Water and sand came back in. Pulled up to 4750'. Started blowing back down. Present operation - blowing well down at 6800'. Making lots of water and sand.

4/24/63

Blew well back down to 8190', bridge plug. Drilled plug, pushed on to clean to TD. Blew and cleaned well up. Well still making 200 MCFD. Laying 2 3/8" completion string down. Shut rig down this a.m. Will run 1 1/2" tubing back in with gas lift valves. Valves ordered.

4/25/63

Shut down rig, waiting for gas lift valves to get in to run back in on 1 1/2" tubing.

4/27/63

Gas lift valves got in. Will start in hole at 8:00 a.m. today.

4/28/63

Started in hole with 1 1/2" tubing. Dropped 7 joints (226'.) Went in hole with wireline, could not get over fish. In hole with 2 3/8" tubing, found top of fish at 5393'. Latched onto fish. Pulled out of hole, recovered fish. Present operation - laying down 2 3/8" tubing.

4/29/63

Finished laying down 2 3/8" completion string. Ran 1 1/2" tubing with gas lift valves. Finished nippling up 4 p.m. 2-28-63. Will have and send valve depths later.

WELL: APACHE NO. 4-16

5/1/63

Casing pressure builds up slowly from 355 to 460 lb. then unloads small amount of water with trace of oil scum. Gas too small to measure. Well unloading at rate of 48 BWPD.

5/2/63

Casing pressure 460 to 465 #. Unloading water with slight show of oil. Rate 85 BPD. Installed check valves and gas supply line and turned gas on. Line pressure 420#.

5/3/63

Line pressure 455#. Unloaded 72 bbls. Making 25% oil and 75% water.

5/4/63

Line pressure 480#. Unloading fluid at rate of 34 BPD.

5/6/63

Unloading okay. 460# line pressure, 430# casing pressure. 39 BWPD

5/7/63

Unloading okay, 477# line pressure, 450# casing pressure. 22 BWPD

5/8/63

Shut line gas off, casing pressure 430#, 260 MCFD.

5/8/63 to 5/21/63

Shut supply gas off. Produced well thru 1 1/2" tubing with gas lift valves. Performed over this period as follows: Avg. casing pressure 415 psig, avg. MCFPD 182 MCFPD, avg. BWPD 57 BWPD. Shut well in at noon 5/21/63.

5/28/63

7 day SIP - 975# casing, 975 tubing. Opened well thru 1 1/2" tubing, after 3 hours, casing pressure 485#, 219 MCFPD, 144 BWPD.

5/29/63

Casing pressure 485#, 196 MCFPD, 54 BWPD.

5/30/63

Well shut in, 800#/800#.

OPEN FLOW TEST DATA

DATE July 15, 1963

Operator: Consolidated Oil & Gas, Inc.		Lease: Apache 4-16	
Location: 1850 FSL & 1850 FEL, Sec. 16, T26N, R3W		County: Rio Arriba	State: New Mexico
Formation: Pictured Cliffs		Pool: Tapicito	
Casing: Diameter: 7"	Set At: Feet: 5706	Tubing: Diameter: 1"	Set At: Feet: 3731
Pay Zone: From: 3782	To: 3840	Total Depth: 8271	
Stimulation Method: Sand water frac		Flow Through Casing	Flow Through Tubing: X

Choke Size, Inches: 0.75	Choke Constant: C: 14.1605				
Shut-in Pressure, Casing, PSIG: 1003	- 12 = PSIA: 1015	Days Shut-in: 7	Shut-in Pressure, Tubing, PSIG: 1003	+ 12 = PSIA: 1015
Flowing Pressure: P, PSIG: 4	- 12 = PSIA: 16		Working Pressure: P_w, PSIG: 443	+ 12 = PSIA: 455
Temperature: T, °F: 34	n = 0.85		Fpv (From Tables): 1.013	Gravity: 0.70 (est.)

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

Q = 14.1605x16x1.0260x.9258x1.013 = 218 MCF/D

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

Aof = $\left(\frac{1015^2}{1015^2 - 455^2}\right)^n = 1.251^{.85} = 1.21$

Aof = 264 MCF D

TESTED BY Aubrey Prater

WITNESSED BY Clyde Phillips

Chief Engineer

WELL: APACHE NO. 4-16

6/20/63

SIP - 1010#/1010#

7/9/63

Moved in completion. Will pull 1 1/2" tubing and set Model "D" packer. Will run same back in hole, also, will run 1" tubing with gas lift valves.

7/10/63

Pulled 1 1/2" tubing. Ran 245 joints 1 1/2" EUE tubing - landed in Model "D" packer at 7980'. Ran 118 joints 1" EUE tubing, landed at 3731.46' KB. Gas lift valves at 848.6', 1228', 1606.6', 1984.3', 2361.7', 2707.8'

7/11/63

Dakota - 1045 tubing. Pictured Cliffs - 540/540.

7/13/63

Dakota - 1440 tubing. Pictured Cliffs - 500/500

7/14/63

Dakota - 1470 tubing. Pictured Cliffs - 790/790

7/16/63

Dakota - 1300 tubing. Pictured Cliffs - 1000/1000

7/20/63

Ran 3 hour test on Pictured Cliffs. Final tubing pressure - 4#. Casing 443#. Spray of oil and water.

7/22/63

Will test Dakota today.

7/23/63

Ran 3 hour test on Dakota. Final flow pressure, 30#. Heavy spray of water and oil.

OPEN FLOW TEST DATA

DATE July 22, 1963

Operator: Consolidated Oil & Gas, Inc.		Lease: Apache #4-16	
Location: 1850'FSL & 1850'FEL, Sec. 16, T26N, R3W		County: Rio Arriba	State: New Mexico
Formation: Dakota		Pool: Basin	
Casing: Diameter: 4-1/2" Liner	Set At: Feet: 5590-8266	Tubing: Diameter: 1-1/2"	Set At: Feet: 7980'
Pay Zone: From: 8086	To: 8258	Total Depth: 8271'	
Stimulation Method: Sand-water Frac		Flow Through Casing	Flow Through Tubing: X

Choke Size, Inches: 0.75	Choke Constant: C: 14.1605				
Shut-in Pressure, Casing, PSIG:	- 12 = PSIA:	Days Shut-in: 7	Shut-in Pressure, Tubing, PSIG: 1192	+ 12 = PSIA: 1204
Flowing Pressure: P, PSIG: 30	- 12 = PSIA: 42		Working Pressure: P_w, PSIG:	+ 12 = PSIA:
Temperature: T, °F: 53	n =		Fpv (From Tables): 1.013	Gravity: 0.70 (est)

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

Q = 14.1605x42x1.0068x.9258x1.013 = 561 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 Aubrey Prater

WITNESSED BY Clyde Phillips

W. H. Williams, Chief Engineer