

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil ☐ well gas ☒ well other ☐

2. NAME OF OPERATOR
Marathon Oil Company

3. ADDRESS OF OPERATOR
P.O. Box 2659 Casper, WY 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
1,350' FNL & 930' FWL Unit E

AT SURFACE:
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:

TEST WATER SHUT-OFF ☐
FRACTURE TREAT ☐
SHOOT OR ACIDIZE ☐
REPAIR WELL ☐
PULL OR ALTER CASING ☐
MULTIPLE COMPLETE ☐
CHANGE ZONES ☐
ABANDON* ☐
(other) ☐ Please see below

SUBSEQUENT REPORT OF:

☐
☐
☐
☐
☐
☐
☐
☐
☐

5. LEASE
Tract 251, Cont. 000154

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Jicarilla Apache

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Jicarilla Apache

9. WELL NO.
13E

10. FIELD OR WILDCAT NAME
Basin Dakota

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 33, T26N, R5W

12. COUNTY OR PARISH
Rio Arriba

13. STATE
New Mexico

14. API NO.
30-039-22446

15. ELEVATIONS (SHOW DF, KDB, AND WD)
6,598' GL, 6,610' KB

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

PROGRESS REPORT

See Attachments

From: 10-30-80 to 7-22-81



Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED M E Kaugh/4.04. TITLE Drilling Superintendent DATE 8-11-81

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE ACCEPTED FOR REG. FILE

CONDITIONS OF APPROVAL, IF ANY:

NMOCC

AUG 19 1981

*See Instructions on Reverse Side

BY FARMINGTON DISTRICT

JICARILLA APACHE #13E HISTORY

7-7-81 WORKING ON SURF EQUIP INSTALLATION.

7-8-81 LOCATION BEING CLEANED UP & SURF EQUIP INSTALLED.

7-9-81 MAKE LOCATION CLEANUP - SURF EQUIP INSTALLATION 90% COMPLETE.

7-10-81 SURF EQUIP INSTALLATION COMPLETE EXCEPT FOR FENCES & PAINTING.

7-11-81 WAITING ON PIPELINE CONNECTION, WILL DROP FROM REPORT.

7-12-81 NO REPORT.

7-13-81/

7-21-81 NO REPORT.

7-22-81 WELL COMPLETED 7-13-81. 24 HR TEST IN POINT LOOKOUT FORMATION - 16/64" CHOKE, 15 BCPD, 440 MCFPD, 0 BWPD, 300# TP, 530# CP, GRAVITY .680. 24 HR TEST IN DAKOTA FORMATION. 16/64" CHOKE, 9 BCPD, 460 MCFPD, 3 BWPD, 320# TP, 460# CP, GRAVITY .685. FINAL REPORT.



JICARILLA APACHE #13E HISTORY

5-9-81/
5-15-81 STATIC.

5-16-81/
5-22-81 STATIC.

5-23-81/
5-29-81 STATIC.

5-30-81 STATIC.

5-31-81 STATIC.

6-1-81 STATIC, TEFTELLER INC WILL PULL SEPARATION SLEEVE, SHIFT BAKER MODEL "L" SLIDING SLEEVE & CONDUCT PKR LEAKAGE TEST 6-2-81

6-2-81 STATIC.

6-3-81 STATIC, TEFTELLER DID NOT WORK ON WELLS IN JIC AS PLANNED.

6-4-81 WIRELINE UNIT RAN EQUALIZING PROBE, LEFT WELL TO EQUALIZE OVERNIGHT. WILL TRY TO PULL SEPARATION SLEEVE & SHIFT SLIDING SLEEVE THURSDAY IF TBG & CSG HAVE EQUALIZED.

6-5-81 TEFTELLER WL SERVICE HAS RUN EQUALIZING PROBE DOWN TBG TO SHEAR EQUALIZING BEAM FOR 2 DAYS, UNABLE TO DROP PROBE INTO SEPARATION SLEEVE TO SHEAR EQUALIZING BEAM. WILL RUN IMPRESSION BLOCK TO DETERMINE WHAT IS PREVENTING PROBE FROM ENTERING SLEEVE.

6-6-81 TEFTELLER WL SERVICE RAN IMPRESSION BLOCK DOWN TO SEPARATION SLEEVE. UNABLE TO DETERMINE IF ANYTHING OR WHAT IS PREVENTING PROBE FROM ENTERING SLEEVE & SHEARING EQUALIZING BEAM. RAN PROBE BACK DOWN TBG, ABLE TO ENTER SLEEVE & LATCH ONTO RETRIEVING HEAD. HOWEVER COULD NOT SHEAR EQUALIZING BEAM.

6-7-81 STATIC, WILL RESUME OPERATIONS 6-8 OR 6-9.

6-8-81 STATIC.

6-9-81 STATIC, WL WORK WILL RESUME TODAY.

6-10-81 TEFTELLER WL SERVICE RIH W/RELEASE PROBE & RETRIEVING HEAD & LATCH ONTO SEPARATION SLEEVE. WESTERN CO PUMP TRUCK LOADED TBG W/KCL WTR. RELEASED PRESS FROM CSG UNTIL SEP SLEEVE PULLED FREE. PULLED TOOLS IN SLEEVE UP HOLE 400" WHEN FLUID SURGE OR GAS BUBBLE HIT SLEEVE & BLEW UP HOLE & CAUGHT WL & JAMMED SLEEVE & TOOLS. COULD NOT JAR FREE, DROPPED WL CUTTER & CUT LINE. FISHED CUTTER & RETRIEVING TOOLS. WILL TRY TO DRIVE SEP SLEEVE DOWN HOLE.

6-11-81 STATIC, WAITING ON WL SERVICE.

6-12-81 STATIC.

6-13-81 STATIC.

6-14-81 STATIC.

6-15-81 STATIC.

6-16-81 STATIC, WAITING ON WL UNIT.

6-17-81 STATIC.

6-18-81 WL SERVICE RETRIEVED LINE, TOOLS & SEPARATION SLEEVE.

6-19-81 WL WORK COMPLETED, SHUT BOTH ZONES IN FOR PKR LEAKAGE TEST.

6-20-81/
6-26-81 SI FOR PKR LEAKAGE TEST.

6-27-81 RAN PKR LEAKAGE TEST ON TOP ZONE (POINT LOOKOUT) WELL WILL REMAIN SI FOR 7 DAYS TO COMPLETE TEST.

6-28-81/
7-1-81 SI FOR PKR LEAKAGE TEST.

7-2-81 PKR LEAKAGE TEST COMPLETED, WILL CLEANUP LOCATION & FIN SURFACE EQUIPMENT INSTALLATION.

7-3-81 ALL TESTS COMPLETED. WILL FIN LOCATION CLEANUP & SURF EQUIP INSTALLATION.



JICARILLA APACHE #13-E

- 4/16/81 Rigged up lubricator and Tefteller Wireline Service and went in hole to retrieve 1.81 circulating blanking plug from "F" nipple at 7,056' KB. Made two dry runs, but could not hook onto plug. Changed out retrievers and went back in hole and latched onto plug. Could not pull plug. Jarred on plug for 4 hrs. Plug would not come loose. Previously filled tubing with 16 bbls KCL 2% water. Tagged fluid level with level at 3,460'. After jarring fluid showed at surface. Tried to jar shear pins down and release plug retriever to come out of hole. Plug would not shear. Wireline, jars, retrieving head now stuck in area of sliding sleeve. Chain drive on wireline drum broke. SDON. Tubing pressure 200 psi, casing 700 psi, left tubing and casing shut in. Referred to Casper for further evaluation.
- 4/17/81 Repaired wireline unit. Jarred for 2 hrs. Unable to free tools & plug caught in Baker sliding sleeve. Dropped wireline shear tool. After 2 hrs. tool had not cutt wireline. Dropped second shear tool. Began jarring on line to help tool fall down hole. Wireline truck broke down. Power take off & drive line. SDN.
- 4/18/81 Repaired wireline truck. Dropped thire wireline shear tool. Cut line. POOH with wireline. RIH set 2" 'N' choke at 7,000'. Blew tbg down. Treed down. Installed BOP & began stripping tbg out of hole. SDN.
- 4/19/81 Finished stripping tbg. Sliding sleeve & packer seal assembly out of hole. Broke out seal assembly, sliding sleeve, removed wire tools, plug cutters, etc. Brought seal assembly, sliding sleeve to Baker packers for exam & repair. SDN.
- 4/20/81 Shut down for Sunday.
- 4/21/81 Stripped back in hole with packer seal assembly, "F" nipple, model "L" sliding sleeve open with separation sleeve set in sliding sleeve. Otis "W" choke set in tbg 45' above sleeve. Landed tbg in packer. Removed BOP. Treed up. Unable to pull "W" choke with wireline. Jarred for 4 hrs. Sheared off wireline ret. tool. Will strip out of hole, dress packer seal assembly on location & strip back in hole.
- 4/22/81 Removed xmas tree - installed BOP. Stripped tbg out of well. Had Baker packer man on location to redress seal assembly & inspect. Model "L" sliding sleeve with separation sleeve installed. Ran back in hole approx. 2,000'. Set Otis "W" choke. Landed tbg. Removed BOP. Treed up - pulled "W" choke w/wireline unit. Turned Point Lookout zone thru tbg. Left blowing to pit for cleanup. SDN.
- 4/23/81 Well died during night - loaded up with fluids downhole. Csg = 909# fluid level at approx 3300' swabbed well. Fluids recovered - black water - foam & cond. Well kicked off at 1:00 pm. Flowed well for 4 hrs. Shut well in at 5:00 pm. Well making large amount of cond. Rigged down comp. unit. Plan to move rig to Ohio "A" Gov't #2-E, Kutz Canyon. Will set test separator and produce 16-E P.L. thru separator after rig is moved.
- 4/25/81 Point Lookout - Set & connected up test separator - turned well thru separator to obtain accurate measurement of water, cond. & gas.
- 4/26/81 SICP = 1020. SITP = 800. FCP = 775. FTP = 550. Choke - 13/64". Cond = 10 bbls. Water = 4 bbls. MCF = 4 in. 13 hrs.
- 4/27/81 Point Lookout FCP = 575, FTP = 350, Choke = 16/64", Cond = 24 bbls, Water = 2 bbls, MCF = 460 24 hrs.
- 4/28/81 Point Lookout FCP = 530, FTP = 300, Choke = 16/64", cond = 15 bbls, water = 0 bbls, MCF = 440, 24 hrs.
- 5/1/81 Shut in for press buildup.
- 5/7/81 Point Lookout - Tefteller resv. eng. to obtain AOF.
- 5/8/81 Point Lookout - Tefteller resv. eng. ran AOF.



4/11/81 Well flowing from tubing to pits. (Point Lookout) 8:00 am pressures, tubing 50 psi, casing 160 psi, thru Demco 2" valve with 1-1/2" opening valve was full open. Well flaring at pits. Heavy mist and surges of frac fluid. Installed 1/2" choke nipple and recorded following pressures, tubing 60 psi, casing 190 psi. Same flow back of frac fluid. Observed well for cleanup. No frac sand at surface from returning frac fluid. 2:00 pm bled down 190 psi from casing. Dismantled tree, installed BOP and nipped up. Picked up 3 jts 2-3/8" tubing and WIH and tagged top of frac sand with retrieving head at 5150' KB. (Perfs 5126' - 5150' KB) (Rat hole 5150' - 5174' top of bridge plug.) Indicating 24 frac sand to clean off plug top before 7" Loc-Set BP can be retrieved. Pulled out 2 jts tubing, leaving bottom of retrieving head at 5107' KB, (above perfs 19'). Hooked up tubing to blow down line. Pressured casing to 250 psi and released tubing pressure to pits. 5:30 pm, casing pressure 250 psi, tubing 25 psi, and adjustable choke set on 3/8". Flaring at pits with heavy mist and surging frac fluids. SDON.

4/12/81 7:30 am tubing flowing to pits. Casing 180 psi, tubing 25 psi, medium mist of frac fluid, flaring thru 3/4" choke. Picked up 2 jts 2-3/8" tubing and retagged top of frac sand fillup at 5152' KB. Indicating sand top was 2' lower than 4/10/81 and an additional fillup from formation during night. Rigged up Western company and pumped nitrogen foam down 7" casing and up 2-3/8" tubing. Cleaned out 22' frac sand from 5152' to 5174' to top of retrievable bridge plug. Circulated top of RBP for 15 minutes and stung into RBP. Shut down nitrogen foam. Set down on RBP and equalized Dakota pressure from below RBP. Bled down 7" casing thru two 2" casing perfs. Pulled and stood back 2-3/8" tubing work string. Broke out and laid down retrievable bridge plug. Continued to flow 7" casing to pits. Both Dakota and Point Lookout producing. Floaring at pits with no frac fluid or sand as returns. Left well with 2" valve pinched holding 100 psi casing pressure and flaring. SDON.

4/13/81 Well Tender report 4/11/81 9:00 pm. Flaring to pit, slugging gas and frac fluid, hold back pressure of 80 psi.

Well Tender report 4/12/81 12:00 noon. Flaring to pit, slugging gas and condensate, holding back pressure of 80 psi.

4/14/81 7:30 am. Flaring at pits, condensate, 100 psi back pressure. Released 100 psi pressure to pits. Rigged up 7" - 50' lubricator and WIH with 6.062 gauge ring and junk basket. Ran gauge ring and junk basket thru stage collar at 4107' and continued down hole to 7200' KB. COH and laid down gauge ring and junk basket. Picked up and WIH with Baker 7", 29# model DB retrievematic production packer and McCullough wireline set packer at 7058' KB (top of packer). COH and rigged down McCullough. WIH with tubing, seal assembly, and best joints. Landed production string and donut with 14,000# compression.

Packer Setting:

Top of packer 7,058'

Packer middle seal 7,060.50'

Bottom of tail assembly 7,058 + 33 = 7,091'

Tail pipe above top perfs 7,107 - 7,091 = 16'

Production string ran in hole with 1.81 circulating plug in place below sliding seal assembly.

4/15/81 Point Lookout formation blowing and flaring dry gas at pits. 0 pressure on casing due to flowline being full open. Rigged down BOP and installed tree to well head. Installed additional flowline from tubing to pits. Jicarilla too windy for crew to rig down today. Baker making flow mandrel for sliding sleeve. Tefteller too busy to run downhole equipment today anyway. Rig crew cleaning on location and rig.

Wednesday proposed schedule: retrieve circulating blanking plug from "F" nipple, open sliding sleeve. Run and set separation sleeve (flow mandrel) rig down and move to Ohio Gov't #2E.



- 4/7/81 Finished stripping tbg out of hole. Rigged up Dresser Atlas and perforated Point Lookout formation with 3-1/2 select fire csg gun. Perforation interval- 5,126' - 28', 30', 32', 33', 34', 36', 38', 40'. 5,141' - 42', 44', 46', 48', 50' for a total of 13 shots. Tefteller resv. eng. obtained BHP & AOF 4/3/81. BHP = (1,862) at 1,200'. AOF = 2,872.
- 4/8/81 Hauled and mixed 225 bbls 2% KCL water. Western and Baker on location and rigged up. McCullough late to location due to mechanical problems with logging truck. Rigged up McCullough. Picked up 7", 23# Baker model "G" Lok-Set retrievable bridge plug, wire line set and WIH to set RBP at 5180' KB. Proceeded down hole slowly to establish location of stage collar at 4107' KB with McCullough collar locator. Gauge rings of RBP 23# became stuck in stage collar. Pulled RBP loose w/2800 lbs. COH and laid down RBP. Rigged down and released McCullough. Released Western acid crew. Ordered Baker to build Lok-Set retrievable bridge plug with 29# casing gauge rings. Due to previous running of 7" scraper and 7", 23# packer on tubing, and 7" cement retainer wireline set, 29# lubricated in and set above Morrison formation, decision was made not to run wireline gauge ring and junk basket. SDON.
- 4/9/81 8:00 am. Light blow of gas from tubing at pits. Released packer set at 4,924' KB and COH with tubing, packer and retrieving head. Broke out and laid down packer. WIH with 162 jts tubing, retrieving head, F nipple, 1-10' blest joint on top, landed bottom of retrieving head at 5,097.71' KB 28.29' above top perf at 5,126' KB. Installed tree and rigged up Western fox nitrogen-foam. Sand frac of Point Lookout formation. Fraced Point Lookout perforations 5,126-28-30-32-33,34-36-38-40-5141-42-44-46-47-50 (15 holes). Frac job went as per procedure. Please refer to Western treatment report for further information. Complete frac breakdown to follow. Flowing well to pits thru 1/2" choke.
- 4/10/81 Picked up 7" model "G" Lok-Set retrievable bridge plug in tandem with 7" retrievable packer, left hand set and went in hole with 165 jts 2-3/8" 8 rd tubing. Set top of RBP @ 5174'. Released from RBP and came up hole to 5165' and set packer. Pressured RBP to 2300 psi. Held pressure OK. Released packer at 5165'. Pumped KCL 2% water, 3 bbls 7-1/2% HCL acid and 180 lbs frac sand to cover perforated intervals with acid and top of RBP with sand. Come up hole and reset packer at 4924' KB. Rigged up Western for Nitrogen-Acid ball off at Point Lookout formation. Started KCL 2% breakdown and dropped 10 ball sealers, @ 5.4 BOP. Balls at perfs @ 2450 p at 5.6 BPM. Shut down to surge balls off at 2500 psi. ISPP @ 500 psi. Breakdown @ 1250 psi. Pumped acid and 15 - 7/8" ball sealers dropping 1 ball each 3 bbls acid pumped. Total acid pumped was 2000 gallons, 7-1/2% HCL. Injection rate of nitrogen was 3-1/2 to 4 bbls per minute. Started acid 0 psi and 5.0 BPM. Started ball sealers at 1250 psi and 5.0 BPM. AT balls away and pumping KCL 2% flush 2600 psi 5.2 BPM. All balls on format with flush at 2950 psi and 6.25 BPM. ISIP after acid-ball off 2000 psi. Max. rate of 2950 psi @ 6.25 BPM, fluids only, doesn't include nitrogen. Ball off action couldn't be seen off recorder chart. Injection rate of treating fluids 8.2 BPM. Final shut in pressure 1500 psi. Rigged down Western. Flowed well immediately to pits. SDON.
- Frac Prodedure: Move in Western frac equipment and rig up for frac. Test lines to 4000 psi, held pressure OK. Before starting frac, talked through procedure with treater. Western forgot IR-192 radioactive sand. Waited 2 hours for sand to arrive. Fractured Point Lookout formation. Perforate at 5126', 28', 30', 32', 33', 34', 36', 38', 40', 41', 42', 44', 46', 48', 50' KB (15 holes) with 45,000 gallons 70 quality foam, 36,000# 20-40 sand, 9,000# 10-40 sand, and 9 millicurries IR-192 sand. Foam contained 2% KCL with 1 gallon/1000 Aquaflo, 6 gallons/1000 foam agent, and 786,400 SCF nitrogen. Frac was pumped as follows down annulus:
- Stage 1: Pump 4,000 gallons to quality foam down annulus, loading tubing. then pump into formation @ 20 BPM and 2200 psi.
 - Stage 2: Pump 4,000 gallons 70 quality foam with .5 ppg 20/40 sand @ 20 BPM and 2200 psi.
 - Stage 3: Pump 9,000 gallons 70 quality foam with 1.0 ppg 20/40 sand @ 20 BPM and 2200 psi.
 - Stage 4: Pump 9,000 gallons 70 quality foam with 1.5 ppg 20/40 sand @ 20 BPM and 2200 psi.
 - Stage 5: Pump 9,000 gallons 70 quality foam with 2 ppg 20/40 sand (4,500# and 10/20 sand (4,500#) @ 20 BPM and 2200 psi.
 - Stage 6: Pump 7224 gallons 70 quality foam as flush to top perforation at 5126' KB at 20 BPM and 2300 psi. ISOP 2200 psi, 15 min. 1750 ps
- Max rate 20 BPM at 2300 psi max. Avg BPM at 2200 psi.
 NOTE: 20 BPM rate includes 6 BPM KCL 2% and 12,200 SCF/M N₂.
 NOTE: Sand concentrations based on 70 quality foam 1 millicurry IR 192 sa

- 3-16-81 9 a.m. 3/15/81 Well Tender Report:
CP 360 psi, 24/64" choke, large blue gas flare 12' - 15' no fluid.
Field estimate of gas = 1,265 MCF/day.
- 5:30 a.m. 3/16/81 Well Tender Report
CP 280 psi, 18/64" choke. Flare has now turned back to orange. CP
dropped between 1 - 5 a.m. this a.m. Field estimate of gas = 570 MCFD.
- 3-17-81 Released & tried to bleed down CP from 280 psi to 75 psi. Repaired BOP
& replaced stripping rubber. WIH w/mule shoe joint, profile nipple,
circ plug & 233 jts 2-3/8" tbgs. Tagged top of frac sand @ 7284.30' KB,
indicating 25.61' frac sand on top of cmt retainer & the lower 5 perfs
of Dakota formation covered w/sand. Pulled & stood back 12 jts 2-3/8"
tbgs from perf area. Set choke on 20/64" & turned over to Well Tender
for night. SDN. Ordered out Newsco for frac sand & perf ball cleanup
from cmt retainer top @ 7310' KB. PU tbgs string float from Baker Ser-
vice Tools. Ordered out B&R Wireline Service to retrieve circ plug.
Tuesday 3-17-81 5:30 a.m. Well Tender Report: CP cont to drop on
20/64" choke. Adjusted choke to 18/64" Monday eve @ 6:00 p.m. CP
this a.m. @ 5:30 was 270 psi.
- 3-18-81 Prepared to clean out frac sand after Graneros/Dakota sand CO₂ frac.
Tagged top of sand w/tbgs & string float. RU Newsco w/169,000 SCF
nitrogen. Pmpd down 2-3/8" tbgs @ rate of 1500 SCF/min & cleaned out
25' frac sand from 7284' KB to top of retainer @ 7310' KB. Also
brought back frac fluid & cond. Pulled tbgs to string float. Re-
leased press on tbgs & 7" csg. Landed tbgs & removed BOP. Installed
tree, valves, choke & blow down line. RU B&R Wireline Services &
lubricator to pull circulating blanking plug. RU Newsco to B&R
lubricator. Pmpd nitrogen in tbgs to equalize press between tbgs &
csg. B&R tagged & retrieved circ plug @ 7068' & COH. RD B&R & Newsco.
Total nitrogen used = 101,500 SCF. Tbg landed @ btm of mule shoe,
7,099' KB, which is 8' above top perf @ 7107' KB. Released TP to
pit for blowdown @ 2:00 p.m. Well producing gas, frac fluid, & large
amt of cond fluid. Well slugged off @ 6 p.m. & unloaded large amt of
cond. Well stabilized @ 7:00. 480 csg psi & 280 tbgs psi, 16/64"
choke.
3/18/81 5:30 Well Tender report: CP 480 psi, tbgs 280 psi, 16/64"
choke. Field estimate 430 MCFD. Well flaring @ pit. Orange flame -
cond.
- 3-19-81 RD completion unit & moved to Jic. Apache #16-E. Moved test separa-
tor from 16-E to 13-#. Turned 13-E on thru separator & obtained 12½
hr flow test. FCP 550, FTP 340, 16/64" choke, 0 wtr, 0 cond, 486 MCF.
- 3-20-81 FTP 350, FCP 540, 16/64" choke, 0 wtr, 17.6 BC, 486 MCF, 24 hrs.
- 3-21-81 Dakota. FTP 350, FCP 540, 16/64" choke, 0 wtr, 4.8 BC, 499 MCF, 24 hrs.
- 3-22-81 Dakota. FTP 340, FCP 520, 16/64" choke, 0 wtr, 5.5 BC, 499 MCF, 24 hrs.
- 3-23-81 FTP 320, FCP 520, 16/64" choke, 10 BW, 4.8 BC, 453 MCF, 24 hrs.
- 3-24-81 FTP 320, FCP 500, 16/64" choke, 10 BW, 15 BC, 453 MCF, 24 hrs.
- 3-25-81 FTP 330, FCP 490, 16/64" choke, 3 BW, 19 cond, 460 MCF, 24 hrs.
- 2-26-81 DK. FTP 320, FCP 460, 16/64" choke, 3 BW, 9 BC, 460 MCF, 24 hrs.
- 3-27-81 SI for press buildup.
- 3-28-81 SI for press build up.
- 3-29-81 SI for press build up.
- 3-30-81 SI for press buildup.
- 3-31-81 SI for press buildup.
- 4-3-81 Tefteller Resv. eng. will run B.H.P. and A.O.F. tests.
- 4-4-81 Tefteller resv. eng. ran BHP and AOF.
- 4-5-81 Rigged up unit over wellhead. Installed BOP, prepared to strip tbgs
out of well.
- 4-6-81 Shut down for Sunday.



JICARILLA APACHE #13-#

3-13-81 Swab report. TF to recover = 90 bbl treating fluid after acid treatment to Graneros & Basin Dakota fmn.

Run #	Time	FL	Swab Depth	Fld Swabbed	Gas	Total
3/11/81	1 6:10 pm	0	2500	8.25	No	8.25
	2 6:25 pm	1200	4000	8.25	No	16.50
3/12/81	3 9:15 am	1100	4000	8.25	No	24.75
	4 9:30	2200	5000	8.25	No	33.00
	5 9:50	3200	5000	2.75	No	35.75
	6 10:10	3200	5000	2.75	No	38.50
	7 10:30	3300	6500	2.75	Lt Gas	41.25
	8 11:00	3300	6500	2.75	"	44.00
	9 11:15	3500	6500	5.50	"	49.50
	10 11:35	3500	6500	2.75	"	52.25
	11 12:00	3500	6500	2.75	"	55.00
	12 12:20	3800	6500	1.38	"	56.38
	13 12:45	3800	6500	1.38	"	57.76
	14 1:30	3800	6500	1.38	"	59.14
	15 1:55	3800	6500	2.06	"	61.20
	16 2:15	4000	6500	1.38	"	62.58
	17 2:40	4500	6500	2.06	"	64.64
	18 3:10	4500	6500	2.75	"	67.39
	19 3:40	4500	6500	2.75	"	70.14
	20 4:00	4700	6500	2.75	"	72.89
	21 4:30	4750	6500	2.75	"	75.64

Total fluid of treatment swabbed back 75.64 bbls

Total treatment fluid not swabbed back 14.36 bbls

Csg 850 psi, tbg 100 psi. Bleed off both pressures. RD swab equip. Tank trucks filling frac tanks under adverse weather conditions. Preparing to CO₂ frac Graneros & Dakota formations tomorrow. Look out for good weather. Good Night!!

3-14-81

Csg 0 psi, tbg 200 psi. Released TP to pits. RIH w/swab & tagged FL @ 4000'. Made 1 swab run from 5000', swabbing back 3 bbls 2% KCl wtr, no acid. RD swab equip. Released 7" Baker retrievematic pkr @ 5395' & COH w/tbg, pkr & tailpipe. Western was late to location due to adverse weather conditions & bad creek crossing @ Largo wash. Lad Tankers finished filling up frac tanks w/wtr from Dead Cow. Moved in Western & RU to frac Graneros-Dakota formations. Was close to frac time, when Western sand truck, parked off location containing 20-40 frac sand, engine caught fire, making truck inoperable. Time 1:30 pm. Another sand truck from Farmington would tanke 3 hrs & Halliburton had frac trucks stuck in mud @ Largo wash. Decision made to postpone frac till Sat a.m. SDN & Helped haul frac crew back to town. Note: Friday 13th, Well 13-E, Frac equip: 13 trucks.

3-15-81

6" snow During night. CP 500 psi @ 7:30 a.m. All Western equip back on location & started all trucks @ 8:50 a.m. Press frac lines to 3500 psi. Started pmpg frac fluid & CO₂. Had to SD due to leak in liquid CO₂ line (union). After replacing union #5 pumper would not restart. Cont on w/frac w/4 pmprs. Fraced Graneros - 7107', 7111', 7112', 7115', 7117' (5 holes); Dakota 7,241' - 7,295' (14 holes). Fracture treatment was 55,000 gallons of Mini-Max III 30/2% HC/CO₂ gel & 110,000# sand.

Stage 1 - Pmpd 11,000 gal prepad, rate 45 BF to 6 bbl CO₂ = 51/min @ 2100 psi to establish rate.

Stage 2 - Pmpd 11,000 gal w/1 ppg 20-40 sand.

Stage 3 - Pmpd 11,000 gal w/2 ppg 20-40 sand @ 2150 psi.

Stage 4 - Pmpd 11,000 gal w/3 ppg 20-40 sand @ 2150 psi.

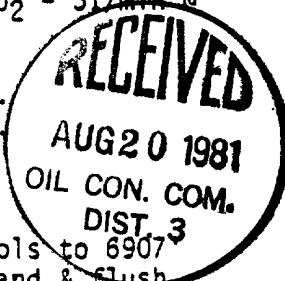
Stage 5 - Pmpd 5,500 gal w/4 ppg 20-40 sand @ 2100 psi.

Stage 6 - Pmpd 5,500 gal w/4 ppg 10-20 sand @ 2100 psi.

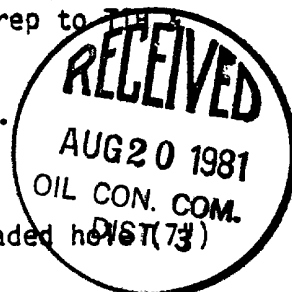
Stage 7 - Pmpd 420 gal flush w/CO₂ @ 2100 psi.

Stage 8 - Pmpd 236 bbls 2% KCl wtr & 35 bbl CO₂ = 271 bbls to 6907' as displacement, 200' above top perf @ 2100 psi. All sand & flush away @ 10:00 a.m. SD. Final rate 51 bbl/min @ 22500 psi. ISIP = 1650 psi. 15 min 1400 psi. 40 tons CO₂ total used. RD Western.

Left well SI for 4 hrs. Opened well to pits @ 2:00 p.m. Blowing down frac fluid, CO₂ gas, no frac sand. CP @ 2 p.m. was 375 psi & choke setting @ 28/46". Cont to blow well down & turned well over to well tender @ 4:30 p.m. Shut rig down.

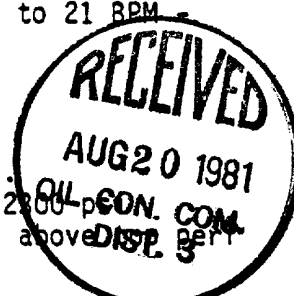


- 2-21-81 SITP 0, SICP 1200. Found FL @ 2800' w/swab. Swabbed approx 70 bbl gas cut fluid. Swabbed fluid down to 3800' - fluid contains gas, foam & small amt of cond. Well kicked off & started flowing @ 3:03 p.m. FTP 70, FCP 610, 28/64" choke. Had strong 20'-30' flare, heavy mist w/½" dribble of wtr. Well flowed 6½ hrs. Started dying @ 9:30 p.m. SDN.
- 2-22-81 SITP 20, SICP 800. Found FL @ 3500' w/swab. Swabbed approx 80 bbl gas cut fluid. Swabbed down to 3800' where FL remained. CP held @ 800 psi during swabbing. SDN.
- 2-23-81 SD for Sunday.
- 2-24-81 SICP 1200, TP 0. Blow well down to atmos, prep to COH w/2-3/8" tbg. COH w/234 jts, 2 8' subs, F-nipple, & mule shoe from 7355' KB. RU McCullough to set Baker CI cmt retainer. Retainer did not set on 1st run due to bad cap. On 2nd run, McCullough set CI cmt retainer @ 7310' KB. Rig down McCullough. Lay down collars, prep to TH. RD Drake Rig #21 on 2/24/81. SDN.
- 2-25-81 RIH w/tbg. Removed BOP. Set tree. RD completion unit.
- 2-26-81 Static
- 3-10-81 Moved completion unit on location, RU. POH w/tbg. Loaded hole w/2% HCl wtr. SDN.
- 3-11-81 LAD Tankers hauled & mixed 500 bbl 2% KCl wtr. Filled 7" csg w/250 bbls 2% KCl wtr & press 7" csg to 1200 psi. Held press for 5 min, testing cmt retainer set @ 7310' KB. Held press ok. Released CP to pits. RU Dresser-Atlas to perforate Graneros & Basin Dakota fms as follows: Correlated csg collar log to open hole log. Used Dresser Atlas 4" csg guns w/.45 diameter holes, Jumbo Jet charges. Ran tandem guns for less trips in & out of hole.
Run #1-Perf Basin Dakota (5 shots) 7235'-87'-89'-91'-95'. Gun #2 misfired - wet gun @ 7273'.
Run #2 - Gun #1 perforated Dakota (3 shots) 7251'-53'-55'. Gun #2 misfired - wet gun @ 7241'-42'-44'-46'-47'.
Run #3-Gun #1 (rerun) Perforated Dakota (1 shot) 7273'. Gun #2 Perforated Graneros (5 shots) 7107'-11'-12'-15'-17'.
Run #4-Gun #1 (rerun) Perforated Dakota 7241'-42'-44'-46'-47' (5 shots)
- Final perforating ending w/total of 19 holes & footages as per completion procedure 1/15/81. RD & released Dresser-Atlas. Closed in 7" csg. SDN.
- 3-12-81 Bad day; rain, snow, fog, muddy, slick roads. Started in hole w/rebuilt Baker Retrieomatic pkr. This pkr was redesigned from 23# to 27#. Baker installed wrong gauge rings & pkr would not start in 7" csg. Called Baker & ordered out 7" retrievomatic pkr for 23# csg. RIH w/172 jts 2-3/8" tbg, pkr & 48 jts 2-3/8" tbg, profile nipple as tail pipe. Set pkr @ 5395' KB & end of tail pipe was @ 6882' KB, 225' above top perf @ 7107' KB. RU Western after final arrival to location due to acidmaster sliding off road & being stuck in ditch. Acidized following perfs w/1800 gal 7½% HCl acid, inhibitor, aquaflo, claymaster III as additives & 40 7/8" RCN ball sealers. Graneros: 7107'-11'-12'-15'-17' 5 holes
Dakota: 7241'-42'-44'-46'-47'-51'-53'-55'-85'-87'-88'-89'-91'-95' 14 holes
Press backside to 1000 psi. Pmpd KCl 2% wtr down tbg to establish rate & breakdown. Breakdown was noted as 800-900 psi. Pmpd acid & ball sealers, rate 3.5 BPM @ 2200 psi. Max psi of 3000 psi was obtained & pump SD. Press decreased rapidly. Cont to pump acid & final KCl 2% displacement wtr. Final displacement rate 1.2 bbl/min @ 2400 psi. ISIP 900 psi, 5 min 800 psi. RD Western. Rigged to swab. Total treating fluid to recover = 90 bbls. Made 2 swab runs & recovered 16.5 bbls KCl 2% wtr. SD 6:30 p.m. due to darkness. Moved in 4 500 bbl



JICARILLA APACHE #13-E

2-14-81 Friday 8 a.m. TP 1650 psi, CP 125 psi. Bled TP to mud tank thru 1/2 open 2" ball valve in 40 min. Released Baker retrievematic pkr @ 7324' KB. Wtr & cond blew out of tbg to crown pulley. Lasted only 5 seconds & died. Ran pkr downhole past perfs to double check acid perf balls against formation @ 7353'-7358' to 7376'-7384'. COH w/pkr & 234 jts 2-3/8" 8R tbg. RU Western Services to frac Morrison: Fraced the Morrison down 7" csg 7353'-7358' & 7376'-7384' w/30,000 gallons Mini-Max III 40/2% HC gel containing 60,000# 20-40 sand. Breakdown of gel designed for 3 hr breakdown.
 Stage #1 - Started pad of 25 BPM - 2300 psi & adjusted to 21 BPM - 2100 psi.
 Stage #2 - Started 1 ppg 20-40 sand 21 BPM - 2100 psi.
 Stage #3 - Started 2 ppg 20-40 sand 21 BPM - 2150 psi.
 Stage #4 - Started 3 ppg 20-40 sand 21 BPM - 2200 psi.
 Stage #5 - Started 4 1/2 ppg 20-40 sand 21 BPM - 2200 psi.
 Stage #6 - Started 10 bbl Mini-Max III flush 20 BPM - 2200 psi.
 Stage #7 - Started 270 bbl KCl 2% displacement to 200' above perf at 7353' KB 20 BPM - 2350 psi.
 Final press, all sand & flush away = 2900 psi.
 ISIP 2600 psi, 15 min 2200 psi. Good frac job performed by Western. SWI overnight for fracture to heal. SDN.



2-15-81 Sat 8 a.m. Well was SI all night after frac. CP this a.m. was 1000 psi. Press bled off in 5 seconds. RIH w/mule shoe, 1.81 F nipple & circulating blanking plug & 237 jts 2-3/8" tbg. Tagged top of frac sand @ 7390' KB indicating 39' fillup. RU Nowsco & pmpd down tbg the nitrogen-foam cleanup method. Cleaned frac sand out of 7" from 7390' KB to 7429' PBD. Pmpd 14 bbl KCl 2% on top of circulating plug after foam cleanup. RU Bean Wireline & went in hole to retrieve circulating plug. Couldn't pull plug after hooking on to it. Pmpd 35 bbl 2% KCl to kill tbg. Appears plug jumped up hole & wrapped up in wireline. Jars not working. Worked w/tool & brake wireline. COH w/wireline, no tools. Retrieving tool, plug & possibly 6' wireline left in hole. Bled down csg of nitrogen & closed in well. RD B&R Wireline services & released. RD Nowsco & released. SDN.

2-16-81 SI.

2-17-81 SITP 275 psi, SICP 150 psi, FL 800' in a.m. RU B&R Wireline & RIH w/sinker bar & tagged stuck plug @ 7303' wireline depth. POH. RIH w/"W" choke on wireline & set @ 7276'. POH w/tbg. Recovered stuck plug in profile nipple w/5' of wire broken off above it. Recovered 'W' choke from tbg & RIH w/tbg, RIH w/234 jts & 2 8' subs to 7324' KB, a 1.81" profile nipple to 7325', & a mule shoed jt to 7355' KB. RU to swab & swabbed as follows:

	Time	FL	Depth of swab	Amt swabbed	CP
1	3:00 p.m.	800'	4000'	5 bbl	0 psi
2	3:25	900'	4500'	6 bbl	10 psi
3	3:45	900'	4500'	6 bbl	25
4	4:05	900'	4500'	6 bbl	25
5	4:25	900'	4500'	6 bbl	50
6	4:50	900'	4500'	6 bbl	60
				35 BW	

2-18-81 FL 900' in a.m. RU Nowsco for N2 blowdown. Completely unloaded hole of 250 bbl broken frac gel but could not get well to flow. Called in for another N2 truck. In the 2 1/2 hrs it took to get the 2nd N2 truck on location, the FL built up to 3500'. Completely unloaded well again of approx 150 bbl frac fluid. Well flowed a 10' flare of gas & 1 GPM frac fluid for 3 hrs before dying. @ 6 a.m. on 2/18 the TP=0 psi, CP=900 psi.

2-19-81 Csg 900. Found FL @ 1500' w/swab. Swabbed 100 bbl. FL @ 3500' after 20 runs. On final run for day FL 3500'. Pulled from 6300'. Fluid contains foam & small amt of cond. Slight gas blow after some runs.

2-20-81 SITP 400, SICP 1175. Found FL @ 2800' w/swab. Swabbed approx 100 bbl gas cut fluid. Swabbed fluid down to 3800' - FL holding @ 3300'. Fluid contains gas, foam & small amt of cond. Samples left w/Western prove to.

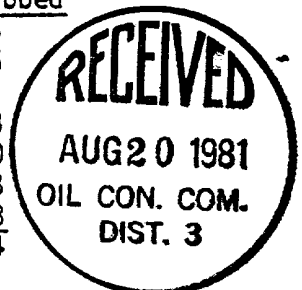
JICARILLA APACHE #13-E

2-10-81 Monday 8 a.m.: TP 1000 psi. Quick bleed off to pits. FL 7000'. Same Final level Sat. Made 2 swab runs from 7000' and swabbed back ½ bbl wtr, oil, & cond. Made contact w/Western for formation breakdown w/acid on Tues 8 a.m. Small amt of gas blow from tbg. Winter has arrived in the Jicarilla; rain & snow all day.

2-11-81 Tuesday: TP 520, csg 0 psi. TP bled down in 4 min thru full 2" opening. RU Western to acidize Morrison formation, 7353'-7358' & 7376'-7384'. Loaded tbg w/20 bbl KCl 2% Wtr & pump an additional 36 bbl KCl 2% @ rate of 6 BPM @ 2950 to break down formation. SD & released pkr. Circ 27 bbl 15% HCl acid down tbg, forcing 27 BW out of csg. Reset pkr - w/27 bbl acid in tbg. Cont to pump 10 more bbl acid 7 30 7/8" RCN balls into formation @ 4 BPM 2100 psi. Displaced tbg w/33 bbl KCl 2% wtr & watched ball off action from 2100 psi to 2950 psi. Ball off complete & final SD psi @ 2950 - rate 1 BPM. All perfs appeared to ball off. HCl 15% single inhibited acid was used this job. ISIP 1250 psi. RD Western Services. RU lubricator to swab. Total fluid to swab back is 97 bbl. Initial FL - Surface. Swab runs 15, Final FL 6500', total fluid swabbed back 63½ bbl, last hr swab rate 3½ bbl from 6500'. SD swabbing due to darkness.

2-12-81 Morrison perfs (7353'-7358', 7376'-7384'). Wed 8 a.m: TP 1550 psi, CP 200 psi. Blew tbg down to mud tank thru half open 2" ball valve. Blow down time took 10 min. Well blew back gas & acid cut KCl 2% wtr. RU to swab well. Well started to kick after 2nd swab run, then died down. Volume of gas from 2" appears to be too small for well to unload itself. Swab report:

Run	Time	Swab Depth	Fluid Level	Bbl swabbed
1	10:10	7100'	5000'	2.75
2	Swab run & flow test	7100'	6000	13.75
3	1:10	7100'	6000'	1.38
4	1:40	7100'	6000'	.70
5	2:40	7100'	6000	1.38
6	3:40	7100'	6000'	1.38
				21.34



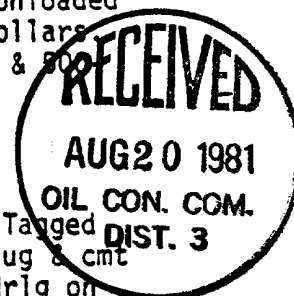
Load fluid pmpd into well 97 bbl
 Fluid swabbed back to date 84½
 Load fluid yet to swab 12½ bbls
 Final swab rate appears to be 1.38 bbl/hr acid cut KCl 2% wtr. Swabbing difficult due to wtr & gas pockets in tbg. Fluid dies down after each run in about 30 seconds.

2-13-81 Thurs: Overnight SITP 1650 psi. Overnight SICP 125 psi. Blew well down slowly to mud tank. Tried to get tbg to unload itself. Wouldn't. Pinched 2" valve ½ to release 1650 psi. Took 35 min to release press to 0 psi. RU to swab. Swab report: Previous total 84.6

Run	Time	FL	Swab depth	bbl	total
1	10:00	500'	7100	6.9	91.5
2	11:10	6000'	7100	1.38	92.88
3	12:10	6000'	7100	1.38	94.26

Tbg FL hard to define, due to mixture of fluid & gas. Tbg was probably close to unloading itself. Again established swab rate of 1.38 bbl/hr. Swab fluid was KCl 2% due to taste test. Approx 5 bbl load fluid to get back. Ceased swabbing operations. Installed orifice well tester to wellhead for gas flow rate test. Tried 3/4" orifice but tbg wouldn't pres. Installed 3/8" orifice & tbg maintained for 1 hr a 7 psi steady press. Tables from bank indicated 53 MCF/day. Decisions made to frac Morrison per procedure w/small revisions. Western moved in 4 500 bbl frac tanks. Filled & mixed 400 bbl KCl 2% wtr @ rig tank. L.A.D. tankers filling frac tanks this p.m. Western preparing for Morrison frac job. SDN.

- 1-31-81 Friday moved in & RU Drake Well Service Rig #21. Installed BOP to well head. Moved in mud pit & filled w/2% KCl wtr. SDN. B.F. Walker to deliver tbg Sat a.m.
- 2-1-81 Saturday: Finished RU pulling unit. Prepared location for tbg racks & tbg. Received tbg from B.F. Walker in late afternoon. Unloaded tbg. WIH w/6-1/8" bit, bit & collar sub, 4 3-1/8" drill collars. Tallied & run 12 jts 2-3/8" & tbg. SDN. Filled mud tank & 800 bbl frac tank w/KCL 2% wtr.
- 2-2-81 Sunday: Static. Rig shut down.
- 2-3-81 Finished running bit, tools & 126 jts 2-3/8" tbg in hole. Tagged top of rubber csg wiper plug @ 4080' KB. Drld out wiper plug & cmt (27') & tagged top of stage collar @ 4107' KB. Presently drlg on stage collar, drlg progress slow, approx 1/2 way thru collar.
- 2-4-81 Tues: Finished drlg out stage collar @ 4107' KB. Broke out & laid down power swivel. Picked up an additional 42 jts 2-3/8" tbg, totalling 168 jts & ran 6-1/8" bit to 5385' KB stopping 14' short of the top of 7"-2916 csg. COH w/tbg & tools. Changed bit sizes from 6 1/8" to 6" for 7"-2916 csg. Went back in hole w/tbg & tools to clean out to 7429' KB. SDN.
- 2-5-81 Wed: Finished GIH w/tbg, tools & 6" bit. Tagged top of float collar @ 7429' KB drlg measurement & 2-3/8" tbg tally measurement. COH w/ 2-3/8" tbg, drill collars & 6" bit. WIH w/6" bit, 7" scraper, 4 3-1/8" collars & 234 jts 2-3/8" tbg. Made several passes w/scraper @ 4107' (depths of drld out stage collar) & cont down hole w/scraper & tagged top of float collar @ 7429' KB. RU triplex pump & reverse circ 300 bbl 2% KCl wtr to clean up well bore of cmt & load csg w/KCl 2% wtr. SDN
Thursday proposed schedule: COH w/tbg, collars, scraper & bit. Dresser to run csg logs. Western to press test csg to 3000 psi.
- 2-6-81 Thursday: COH w/tbg, collars & 6" bit. RU Dresser Atlas to run csg logs. Logging run #1 was w/o press. Tagged btm w/logging tool centralizer @ 7419' KB. Logged from 7419'-5400' KB & 4200 - 3900' KB. Cmt bond looked very poor.
Log run #2 was made w/1000 psi CP. Started to log & cable head went wet. COH w/logging tools & replaced broken O ring on cable head. WIH w/logging tools & repressured csg to 1000 psi. Ran continuous log from 7419' to 3900' KB. RD Dresser Atlas, closed blind rams on BOP & press csg to 3000 psi & held for 5 min. No bleed off. RD Western. SDN.
- 2-7-81 Friday: Sent cmt bond to Casper for evaluation. Decision was made to perf the Morrison formation 7353' - 7358' KB & 7376' - 7384' KB, 1 shot/ft. Contacted & called out McCullough. RU McCullough. WIH w/dual 4" csg guns, 6' & 9' loaded w/4" Omega 2 charges .38" dia. Lined up guns w/12' KB & WIH. Located stage collar @ 4107' KB. Cont to btm & tagged top of float collar @ 7428' KB. Correlated GR & CBL, CCL to open hole log. Located 7" csg collar @ 7342' KB. Lowered gun down hole. Position btm gun & fired 9 shots perforating 7376' - 7384' KB w/1 SPF. Came up hole & located collar @ 7342' KB. Positioned top gun & fired 6 shots, perforating 7353' to 7358' KB w/1 SPF. COH w/guns. RD McCullough. All shots fired (15). Closed blind rams. SDN.
- 2-8-81 Saturday: WIH w/7". 29# Baker retrievematic pkr, 234 jts 2-3/8" tbg & profile nipple. Set pkr 7324.13' KB & profile nipple @ 7286.03' KB. RU lubricator to swab back KCl wtr.
- | Runs | Time | Fluid Depth | Swab Depth | BF | Gas |
|------|-------|-------------|------------|-------|----------|
| 1 | 12:40 | Surface | 3000 | 17.8 | No |
| 2 | 12:55 | 2300 | 3800 | 2.75 | No |
| 3 | 1:10 | 3800 | 5500 | 2.75 | No |
| 4 | 1:25 | 4000 | 5500 | 4.10 | No |
| 5 | 1:40 | 5000 | 6500 | 2.75 | Gas Blow |
| 6 | 2:30 | 6000 | 7000 | 1.38 | Gas Blow |
| 7 | 3:00 | 6000 | 7000 | .70 | Gas Blow |
| | | | | 32.23 | Bbls |
- 2-9-81 Sunday: Static. Rig SD.



11-18-80 7,470⁺ MADE 0⁺ IN MORRISON FORMATION. RU & RAN CSG CREW. RELEASED RIG @ 3:30 AM
 11-18-80. CSG RAN AS FOLLOWS:

<u>NO.</u> <u>JTS</u>	<u>SIZE</u>	<u>OVERALL</u> <u>LENGTH</u>	<u>EFFECTIVE</u> <u>LENGTH</u>	<u>SETTING</u> <u>FROM</u>	<u>DEPTH</u> <u>TO</u>
1	7 PATHFINDER SHOE	.99	.99	7,473.00	7,472.01
1	7 29# 8RD N-80 LTC R-3 C-1	41.69	41.39	7,472.01	7,430.62
1	7 PATHFINDER DIFF FILL FLT CLR	1.46	1.20	7,430.62	7,429.42
50	7 29# 8RD N-80 LTC R-3 C-1	2,045.83	2,030.83	7,429.42	5,398.59
30	7 23# 8RD K-55 STC R-3 C-1	1,297.58	1,289.78	5,398.59	4,108.81
1	7 PATHFINDER STAGE COLLAR	2.21	1.95	4,108.81	4,106.86
18	7 23# 8RD K-55 STC R-3 C-1	758.70	754.02	4,106.86	3,352.84
55	7 20# 8RD K-55 STC R-3 C-1	2,313.49	2,299.19	3,352.84	1,053.65
<u>27</u>	7 23# 8RD K-55 STC R-3 C-1	<u>1,082.38</u>	<u>1,075.36</u>	1,053.65	-21.71
181		7,539.67	7,490.57		

NO. CENTRALIZERS: 8; DEPTHS OR JTS: 2 CMT BSKT, #1-10⁺ UPSHOE JT NEXT 3-EVERY OTHER ONE, 1 CMT BSKT-20⁺ F/KV ON JT #83, NEXT BSKT-20⁺ UP ON JT #84 NEXT 3 CMT EVERY OTHER JT. LANDED SHOE @ 7,473⁺ KB. 1ST STAGE: CMTD CSG W/254 SKS OF BJ LITE W/.8% D-19, 1/4 PPG CELOFLAKE, FOLLOWED BY 162 SKS OF CLASS "B" W/SAME. USED 20% EXCESS VOLUME, PMPD 630 GAL MUD, THEN 5 BBLS WTR AHEAD, 289 BBLS BEHIND. MIXING TIME 20 MINS, PMPG TIME 45 MINS, TOTAL TIME 65 MINS. CIRC PRESS 800. DISPLACEMENT PRESS 1,200, MAX PRESS 1,800. DISPLACED CMT W/289 BBLS OF MUD W/BJ. BUMPED PLUG W/1,800 PSI. PLUG DOWN AT 5:30 PM 11-17-80. GOOD RETURNS WHILE CMTG. 2ND STAGE: CMTD CSG W/108 SKS OF BJ LITE W/SAME, FOLLOWED BY 475 SKS OF CLASS "B" W/SAME. USED 20% EXCESS VOLUME. PMPD 630 GAL MUD, THEN 5 BBLS WTR AHEAD, 164 BBLS BEHIND. MIXING TIME 20 MINS, PMPG TIME 41 MINS, TOTAL TIME 70 MINS. CIRC PRESS 500. DISPLACEMENT PRESS 1,800, MAX PRESS 2,500. DISPLACED CMT W/164 BBLS OF WTR W/BJ. BUMPED PLUG W/2,500 PSI. PLUG DOWN AT 9:30 PM 11-17-80. GOOD RETURNS WHILE CMTG. FLOAT EQUIPMENT CHECKED OK. WOC 3 HRS. LANDED CSG ON SLIPS W/100,000 LBS. EST⁺D CMT TOP IN ANNULUS 2,500 FT. WATER TRUCK W/CITY WTR BROKE DOWN W/200 SKS MIXED ON 2ND STAGE, FIN MIXING W/POND WTR F/RIG TANK.



- 11-12-80 6,447[±] MADE 227[±] IN NIOBRARA FORMATION. MW 9.0, VIS 36, YL 6.6, PH 9, PV 13, YP 10, 4/9 GELS, 6 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 4, 8-3/4" SEC, S86F, JETS 12/12/13, DEPTH IN 4,598[±], DEPTH OUT 6,250[±], 1,652 FT, 108-1/2 HRS, 15.2 FT/HR. OPER PULLED. BIT NO 5, 8-3/4", SMITH, F3, JETS 12/12, DEPTH 6,250[±], 197 FT, 12 HR, 16.4 FT/HR. OPER DRILL. RPM 60, WT ON BIT 48,000#. DEV DEPTH 6,250[±] INC 1-3/4°. TOTAL BHA 638.00[±]. TRIP F/BIT @ 6,250[±] WASH & REAM 20[±] TO BTM. PRESENTLY DRLG AHEAD @ 6,447[±] OK.
- 11-13-80 6,748[±] MADE 301[±] IN SANASTEE FORMATION. MW 9.0, VIS 34, WL 7, PH 9.5, PV 11, YP 8, 2/4 GELS, 5 SOLIDS, 400 CHLORIDE. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT 5, 8-3/4", SMITH, F3, JETS 12/12, DEPTH IN 6,250[±], 498 FT, 35-1/2 HRS, 14 FT/HR. RPM 60, WT ON BIT 42,000#. TOTAL BHA 638.00[±]. DRLD FROM 6,447[±]-6,748[±]. DRLG W/NO PROBLEMS.
- 11-14-80 7,057[±] MADE 303[±] IN GRANEROS FORMATION. MW 9.2, VIS 34, WL 7.2, PH 9.5, PV 12, YP 9, 2/7 GELS, 5 SOLIDS, 400 CHLORIDE. PUMP PRESS 1,800, TPM 282, ANNULAR VELOCITY 201/123. BIT NO 5, 8-3/4", SMITH, F3, JETS 12/12, DEPTH IN 6,250[±], 801 FT, 59 HRS, 14 FT/HR. OPER DRLG. RPM 60, WT ON BIT 44,000#. DEV DEPTH 6,805[±] INC 1-3/4°. TOTAL BHA 638,00[±]. DRLD 6,748[±]-7,051[±], DRLG AHEAD NO PROBLEMS.
- 11-15-80 7,312[±] MADE 261[±] IN DAKOTA FORMATION. MW 9.2, VIS 37, WL 7.4, PH 9.5, PV 10, YP 8, 2/4 GELS, 6-1/2 SOLIDS. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 5, 8-3/4", SMITH, F3, JETS 12/12. DEPTH IN 6,250[±], 1,062[±] 82-1/2 HRS, 12.9 FT/HR. OPER DRLG. RPM 55, WT ON BIT 44,000#. TOTAL BHA 638.00[±]. DRLD 7,051[±]-7,312[±]. NO PROBLEMS.
- 11-16-80 7,470[±] MADE 158[±] IN MORRISON FORMATION. MW 9.4, VIS 62, WL 6, PH 9.5, PV 14, YP 10, 3/10 GELS, 7 SOLIDS, 400 CHLORIDE. PUMP PRESS 1,900, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 5, 8-3/4", SMITH, F3, JETS 12/12, DEPTH IN 6,250[±], DEPTH OUT 7,470[±], 1,220 FT, 93-1/4 HRS, 13 FT/HR. OPER PULLED. RPM 50, WT ON BIT 45,000#. DEV DEPTH 7,470[±] INC 1-3/4°. TOTAL BHA 638.00[±]. DRLD 7,312[±]-7,470[±] 158[±] MADE. RU DRESSER ATLAS TO LOG. LOGGERS TD @ 7,471[±].
- 11-17-80 7,470[±] MADE 0[±] IN MORRISON FORMATION. MW 9.4, VIS 62, WL 6.8, PH 9.5, PV 26, YP 18, 20/45 GELS, 8 SOLIDS, 400 CHLORIDE. RAN SP-DIL, FDC, CNL LOGS 7,469[±]-422[±]. RIH TO 7,470[±] W/BHA & COND HOLE. POH LD DP. RU CSG CREW TO RUN 7" CSG.



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- 11-2-80 2,662⁺ MADE 675⁺ IN SAND & SHALE FORMATION. MW 8.6, VIS 32, WL 8, PH 9, PV 3, 0/2 GELS, 3 SOLIDS, 400 CHLORIDE, TRC CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 2, 8-3/4", SEC, S33, JETS 11/11/13, DEPTH IN 526⁺, DEPTH OUT 2,234⁺, 1,728⁺, 23 HRS, 74.3 FT/HR. OPER PULLED. BIT NO 3, 8-3/4", SMT, F2, JETS 12/11/13, DEPTH IN 2,234⁺, 428 FT, 11 HRS, 39.0 FT/HR., OPER DRLG. RPM 60, WT ON BIT 35,000#. DEV DEPTH 2,239⁺ INC 1°. TOTAL BHA 638.00⁺. DRLG BREAK @ 2,224⁺, LOST 70 BBLs OF MUD, DRILL TO 2,234⁺, POH FOR BIT #3, TITE SPOT @ 1,990⁺, TIH W/BIT #4, DRLG AHEAD NO PROBLEMS.
- 11-3-80 3,396⁺ MADE 734⁺ IN PICTURED CLIFFS FORMATION. MW 9.0, VIS 30, WL 7.4, PH 9, PV 6, YP 3, 0/1 GELS, 4 SOLIDS, 400 CHLORIDE, TRC CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 3, 8-3/4", SMT, F-2, JETS 12/11/13, DEPTH IN 2,234⁺, 1,162 FT, 34 HRS, 34.2 FT/HR. OPER DRLG. RPM 55, WT ON BIT 40,000#. DEV DEPTH 2,754⁺ INC 1°, DEV DEPTH 3,274⁺ INC 3/4°. TOTAL BHA 638.00⁺. DRLD FROM 2,662⁺-3,396⁺. NO PROBLEMS.
- 11-4-80 3,855⁺ MADE 459⁺ IN CHACRA FORMATION. MW 9.0, VIS 31, WL 6, PH 9.5, PV 6, YP 3, 0/1 GELS, 4.5 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 3, 8-3/4", STC, F-2, JETS 12/11/13, DEPTH IN 2,234⁺, 1,621 FT, 57 HRS, 28.4 FT/HR. OPER DRLD. RPM 50, WT ON BIT 40,000#. DEV DEPTH 3,767⁺ INC 1°. TOTAL BHA 638.00⁺. DRILL FROM 3,396⁺-3,855⁺, DRLG AHEAD NO PROBLEMS.
- 11-5-80 4,271⁺ MADE 416⁺ IN CHACRA FORMATION. MW 9.0, VIS 30, WL 6, PH 9.5, PV 8, YP 4, 0/1 GELS, 4 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 3, 8-3/4", STC, F-2, JETS 12/11/13, DEPTH IN 2,234⁺, 2,037 FT, 80 HRS, 25.5 FT/HR. OPER DRLD. RPM 50, WT ON BIT 45,000#. DEV DEPTH 4,259⁺ INC 1-1/4°. TOTAL BHA 638.00⁺. DRLD 3,355⁺-4,271⁺ (416⁺) PRESENTLY DRLG AHEAD W/NO PROBLEMS.
- 11-6-80 4,572⁺ MADE 301⁺ IN CLIFFHOUSE FORMATION. MW 9.0, VIS 33, WL 6.6, PH 9.5, PV 10, YP 7, 1/5 GELS, 5 SOLIDS, 400 CHLORIDE, TRC CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 3, 8-3/4", STC, F-2, JETS 12/11/13, DEPTH IN 2,234⁺, 2,238 FT, 102 HRS, 22.9 FT/HR. OPER DRLD. RPM 50, WT ON BIT 45,000#. RPM 50, WT ON BIT 45,000#. TOTAL BHA 638.00⁺. DRLED 4,271⁺-4,572⁺ (301⁺) NO PROBLEMS. RIG REPAIR DRANORES MOTOR.
- 11-7-80 4,846⁺ MADE 274⁺ IN CLIFFHOUSE FORMATION. MW 9.0, VIS 38, WL 6.4, PH 9, PV 12, YP 8, 2/8 GELS, 5 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 3, 8-3/4", STC, F2, JETS 12/11/13, DEPTH IN 2,234⁺, DEPTH OUT 4,598⁺, 2,364 FT, 103-1/4 HRS, 23 FT/HR. OPER PULLED. BIT NO 4, 8-3/4", SEC, S86F, JETS 12/12/13, DEPTH IN 4,598⁺, 248 FT, 13 HRS, 19 FT/HR. OPER DRLG. RPM 50, WT ON BIT 45,000#. DEV DEPTH 4,598⁺ INC 1-1/4°. TOTAL BHA 638.00⁺. DRLD 4,572⁺-4,846⁺. TRIP FOR BIT #4 @ 4,598⁺, 12⁺ FILL ON BTM.
- 11-8-80 5,182⁺ MADE 336⁺ IN CLIFFHOUSE FORMATION. MW 8.9, VIS 36, WL 6.0, PH 9, PV 12, YP 8, 2/8 GELS, 5-1/2 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 4, 8-3/4", SEC, S86F, JETS 12/12/13, DEPTH IN 4,598⁺, 5-3/4⁺, 36-1/2 HRS, 16 FT/HR. OPER DRILLED. TPM 50, WT ON BIT 45,000#. TOTAL BHA 638.00⁺. DRLD 4,846⁺-5,182⁺. DRLG AHEAD OK.
- 11-9-80 5,530⁺ MADE 348⁺ IN MANCOS FORMATION. MW 9.0, VIS 38, WL 6.4, PH 9.5, PV 12, YP 8, 1/5 GELS, 5 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 4, 8-3/4", SEC, S86F, JETS 12/12/13, DEPTH IN 4,598⁺, 932 FT, 59-3/4 HRS, 15-1/2 FT/HR. OPER DRLG. RPM 60, WT ON BIT 40,000#. TOTAL BHA 638.00⁺. DRLD 5,182⁺-5,530⁺. 348⁺ MADE.
- 11-10-80 5,852⁺ MADE 322⁺ IN MANCOS FORMATION. MW 9.1, VIS 34, WL 7.6, PH 9.5, PV 11, YP 9, 2/5 GELS, 6 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 252, ANNULAR VELOCITY 201, 123. BIT NO 4, 1,254 FT, 82-3/4 HRS, 15.2 FT/HR. OPER DRLD. RPM 60, WT ON BIT 40,000#. DEV DEPTH 5,549⁺ INC 1-1/2°. TOTAL BHA 638.00⁺. DRLD 5,530⁺-5,852⁺. 322⁺ MADE IN LAST 24 HRS.
- 11-11-80 6,220⁺ MADE 368⁺ IN MIOBRARA FORMATION. MW 9.0, VIS 36, WL 6.8, PH 9, PV 11, YP 8, 2/6 GELS, 6-1/2 SOLIDS, 400 CHLORIDE, TR CALCIUM. PUMP PRESS 1,800, GPM 282, ANNULAR VELOCITY 201/123. BIT NO 4, 8-3/4", SEC, S86F, JETS 12/12/13, DEPTH IN 4,598⁺, 1,622 FT, 106 HRS, 16 FT/HR. OPER DRILL. RPM 60, WT ON BIT 45,000#. DEV DEPTH 6,189⁺ INC 1-1/2°. TOTAL BHA 638.00⁺. DRLD 5,852⁺-6,220⁺, 368⁺ MADE, DRLG AHEAD NO PROBLEMS.

10-30-80 400' MADE 400' IN SURFACE FORMATION. MW 8.6, VIS 30. PUMP PRESS 1,650, GPM 323, ANNULAR VELOCITY 55. BIT NO 1, 13-3/4", SMT, DJJ, JETS 11/11/B, 400 FT, 8-1/4 HR, 48.5 FT/HR. OPER DRLG. RPM 100, WT ON BIT 14,000#. DEV DEPTH 258' INC 1/4°.

COMPONENT	LENGTH	O.D.	I.D.
BIT	1.00'	13-3/4"	
BIT SUB	4.00'	6-1/2"	2-1/4"
12 DC'S	382.61'	6-1/2"	2-1/4"

TOTAL BHA 387.61'. SPUD WELL AT 8:30 PM 10/29/80, DRLG AHEAD NO PROBLEMS. RIG REPAIR:PUMPS.

10-31-80 526' MADE 126' IN SURFACE FORMATION. MW 8.4, VIS 28. PUMP PRESS 1,650, GPM 323, ANNULAR VELOCITY 55. BIT NO 1, 13-3/4", SMT, DTJ, JETS 11/11/B, DEPTH IN 0, DEPTH OUT 530', 530 FT, 12 HRS, 44.1 FT/HR. OPER PULLED. RPM 100, WT ON BIT 14,000#. TOTAL BHA 387.61'. DRILLED 530'. WELD ON CSG HEAD, CSG HEAD CRACKED, CUT OFF, WAIT ON NEW CSG HEAD, WELDON, BEGIN N/U. CSG RAN AS FOLLOWS:

NO. JTS	SIZE	OVERALL LENGTH	EFFECTIVE LENGTH	SETTING FROM	DEPTH TO
1	9-5/8" BAKER	1.25	1.25	526.00	524.75
	GUIDE SHOE				
1	9-5/8" 8RD	40.93	40.67	524.75	484.08
	K-55 STC R-3 C-1				
1	9-5/8" BAKER	1.90	1.64	489.08	482.44
	FLOAT COLLAR				
12	9-5/8" 8RD	486.94	483.82	482.44	-1.38
	K-55 STC R-3 C-1				
13		527.87	524.49		

NO. CENTRALIZERS: 3; DEPTH OR JTS: 10' UP ON SHOE JT, & EVERY OTHER JT. LANDED SHOE AT 526' KB. 1ST STAGE: CMT CSG W/400 SKS OF CLASS "B" W/2% A-7, 1/4#/SK CELLOFLAKE. USED 100% ESCESS VOLUME, PUMPED 10 BBLS WTR AHEAD, 38 BBLS BEHIND. MIXING TIME 16 MIN, PUMPING TIME 11 MIN, TOTAL TIME 27 MIN. CIRC PRESS 200 PSI, DISPLACEMENT PRESS 500 PIS, MAXIMUM PRESS 1,100. DISPLACED CMT W/38 BBLS OF WTR W/BJ PUMP. BUMPED PLUG W/1,100 PSI. PLUG DOWN @ 2:30 PM 10-30-80. 100% FULL RETURNS WHILE CMTG. CIRC 20 BBLS CMT TO SURFACE. FLOAT EQUIPMENT CHECKED OK. WOC 12 HRS. EST'D CMT TOP IN ANNULUS SURFACE.

11-1-80 1,987' MADE 1,461' IN SAND & SHALE FORMATION. MW 8.4, VIS 28, WL 7.6, PV 6, YP 3, O/O GELS, 3 SOLIDS, 500 CHLORIDE, TRC CALCIUM. PUMP PRESS 1,800, GPM 265, ANNULAR VELOCITY 189/15. BIT NO 2, 8-3/4", SEC, S33, JETS 11/11/B, DEPTH IN 526', 1,461 FT, 16-1/2 HRS, 88.5 FT/HR. OPER DRLG. RPM 70, WT ON BIT 35,000#. DEV DEPTH 727' INC 3/4°, DEV DEPTH 1,250' INC 1°, DEV DEPTH 1,741' INC 1°.

COMPONENT	LENGTH	O.D.	I.D.
BIT	1.00'	8-3/4"	
BIT SUB	4.00'	6"	2-1/4"
20 DC'S	633.00'	6-1/2"	2-1/4"

TOTAL BHA 638.00'. FINISHED N/U BOPS, TEST BR'S, PR'S, MANIFOLD, VALVES TO 1,200 PSI-OK, DRILL CMT & SHOE, DRILL 5' OF HOLE, RUN LEAK OFF TEST, TEST TO 11.0 PPG EQUIVALENT-OK, DRLG AHEAD NO PROBLEMS.