DRILLING REPORT
Chalk Bluff Federal #2

9-09-92 MIRU EUNICE WELL SERVICE. SDFN.

9-10-92 RU KILL TRUCK. PUMP 52 BBL. 2% KCL TO LOAD TUBING. ND TREE. NU BOP. RELEASE PKR. POOH W/ 2-78 TUBING AND PERMA-LATCH PACKER. LAY DOWN 7 JTS. TUBING. RU JARRELL WIRELINE. RUN 4.343" GAUGE RING TO 9990'. SET 5-1/2" ALPHA CIBP @ 9970'. DUMP 35' CEMENT ON CIBP, PBTD @ 9935'. SDFN @ 6:30 PM. DC $5300.00 TWC $5300.00

9-11-92 PICK UP PACKER ASSEMBLY. TEST TO 7000#. TIH WITH PACKER ASSEMBLY AND TBG. TESTED TBG TO 8000#. TBG STRING IS AS FOLLOWS:

1- RE-ENTRY GUIDE	0.42'
1- 2 7/8" "XN" NIPPLE W/2.313" ID AND 2.205" NO-GO	1.32'
1- 2 7/8" N-80 EUE 8rd TBG SUB	8.12'
1- 2 7/8" X 5 1/2" OTIS PERMA-LATCH PACKER W/ 40,000# SHEAR	4.07'
1- 2 7/8" X 5 1/2" ON-OFF TOOL W/2.313" I.D. "X" PROFILE	1.30'
316 JTS - 2 7/8" N-80 EUE 8RD TBG W/ A.B. CPLGS	9701.09'
TOTAL TBG	9716.32'
KB CORR	15.00'
TBG SETTING	9731.32'

SET PACKER WITH 15 PTS COMPRESSION. RELEASED ON-OFF TOOL. DISPLACED HOLE WITH 230 BBL 2% KCL WATER. RD BOP. LATCHED ONTO ON-OFF TOOL. FLANGED UP TREE. TESTED ANNULUS TO 2000#. HELD OK. TESTED TBG TO 2500#. HELD OK. RU SWAB. SWABBED WELL DOWN TO 5000'. SHUT WELL IN AND SDFD.
DC: $6500 TWC: $11800

9-12-92 SWABBED WELL DOWN TO 9000'. RU JARREL SERVICES. RIH WITH 2" STRIP GUN. PERFORATED LOWER MORROW ORANGE SAND FROM 9850'-9860' AND 9864'-9876' WITH 2 SPF. PERFORATED 22' NET WITH 2 SPF FOR A TOTAL OF 46 HOLES. RD JARREL SERVICES. HAD 350# TBG PRESSURE AFTER RIGGING DOWN LUBRICATOR. OPENED WELL TO PIT ON 24/64" CHOKE. AT 5:00 PM HAD 20# FTP ON 24/64" CHOKE. EST GAS RATE 400 MCFPD. UNLOADING LIGHT MIST OF WATER. LEFT ELL FLOWING TO PIT.

DC: $4100 TWC: $15,900

9-13-92 FTP: 18# ON 3/4" CHOKE. EST GAS RATE OF 400 MCFPD. RU WESTERN COMPANY TO ACIDIZE LOWER MORROW PERFORATIONS (9850'-9860', 9864'-9876') WITH 2800 GALLONS 7 1/2% HCL ACID PLUS ADDITIVES CONTAINING 1000 SCF/BBL NITROGEN AND 60 BALL SEALERS. FLUSH WITH 2% KCL CONTAINING 1000 SCF/BBL NITROGEN. PRESSURED ANNULUS TO 1500# AND PUMPED AS FOLLOWS:
2 BBL @ 3 BPM AND 700#
30000 SCF N2 @ 2000#
35 BBL W/63000 SCF N2 @ 3.5 BPM. LOADED AND BROKE AT 7000#
69 BBL W/ 97000 SCF N2 @ 3.5 BPM AND 6550#. START FLUSH
106 BBL W/ 134000 SCF N2 @ 3.5 BPM AND 6520#
ISDP: 5600# (5 MIN: 4500#) (10 MIN: 4000) (15 MIN: 3800#). HAD SLIGHT BALL ACTION. LOAD TO RECOVER IS 106 BBL. RD WESTERN COMPANY. OPEN WELL TO PIT ON 16/64" CHOKE. AT 7:00 PM HAD 30# FTP ON 3/4" CHOKE. HAD 10' FLARE. UNLOADING MIST OF TREATING FLUID. EST GAS RATE 400 MCFPD. LEFT WELL FLOWING TO PIT. RECOVERED EST 60 BBL.
DC: $8100 TWC: $24000

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9-14-92 FTP: 10# ON 3/4" CHOKE. NO FLUID. EST GAS RATE 200 MCFPD. SHUT WELL IN.

9-15-92 SITP: 2000#. OPENED WELL TO PIT ON 16/64" CHOKE. IN ONE HOUR HAD 1000# FTP. OPENED CHOKE TO 32/64". IN ONE HOUR HAD 5' FLARE. NO FLUID TO SURFACE. RU SWAB. INITIAL FLUID LEVEL AT 3600' AND SCATTERED. SWABBED WELL DRY IN 2 RUNS. HAD GOOD SHOW OF CONDENSATE ON FIRST RUN. BEGAN MAKING ONE RUN EVERY TWO HOURS. AT 4:00 PM HAD 1500' SCATTERED FLUID ENTRY EVERY TWO HOURS. FLOWING TBG PRESSURE 20# ON 3/4" CHOKE. EST GAS RATE OF 500 MCFPD. NO FLUID. HAD SLIGHT SHOW OF CONDENSATE WITH EACH RUN. RECOVERED EST 10 BBL. SHUT IN AND SDFN.
DC: $1700 TWC: $25700

9-16-92 SITP: 2300# OPENED WELL TO PIT ON 16/64" CHOKE. IN ONE HOUR HAD 1500# FTP. OPENED TO 26/64" CHOKE. IN ONE HOUR HAD 80# FTP. HAD 20' FLARE. RU SWAB. FLUID LEVEL AT 3000' AND SCATTERED. HAD GOOD SHOW OF CONDENSATE ON FIRST RUN. BEGAN MAKING ONE RUN EVERY TWO HOURS. AT 4:00 PM HAD 200-300' SCATTERED FLUID ENTRY EVERY 2 HOURS. HAD 20# FTP ON 3/4" CHOKE. EST GAS RATE OF 00 MCFPD. SHUT WELL IN. WILL FRAC THIS A.M.
DC: $1700 TWC: 27400

9-17-92 SITP: 2700#. RU WESTERN COMPANY TO FRAC LOWER MORROW ORANGE SAND (PERFS: 9850'-9860', 9864'-9878') DOWN 2 7/8" TBG WITH 40,000 GALLONS BINARY FOAM CARRYING 30,000# 20/40 INTERPROP. PRESSURED ANNULUS TO 2000# AND PUMPED AS FOLLOWS:

20,000 GALS 70 DHSQ BINARY FOAM @ 12 BPM AND 8000#
3000 GALS 70 DHSQ BINARY FOAM W/ 0.5 PPG @ 12 BPM AND 8050#
5000 GALS 70 DHSQ BINARY FOAM W/ 1.0 PPG @ 12 BPM AND 8120#
5000 GALS 70 DHSQ BINARY FOAM W 1.5 PPG @ 12 BPM AND 8150#
5000 GALS 70 DHSQ BINARY FOAM W 2.0 PPG @ 12 BPM AND 8200#
2000 GALS 70 DHSQ BINARY FOAM W/ 3.0 PPG @ 12 BPM AND 8390#
2400 GALS 60 BHSQ BINARY FOAM FLUSH @ 12 BPM AND 8300#

ISDP: 5400# (5 MIN: 4600#) (10 MIN: 4350#) (15 MIN: 4150#). AVG RATE: 12 BPM, AVG PSI: 8100# MAX RATE: 12 BPM, MAX PSI: 8400# JOB COMPLETE AT 11:30 AM. LOAD TO RECOVER IS 318 BBL. AT 3:00 PM SITP: 2300#. OPENED WELL TO PIT ON 12/64" CHOKE. AT 8:00 PM FTP: 1450# ON 13/64" CHOKE. NO FLARE. NOT PROPPANT. LEFT WELL FLOWING TO PIT.
DC: $49,000 TWC: $76,400

9-18-92 RDMO WELL SERVICE UNIT. AT 10:00 AM FTP: 1400# ON 16/64" CHOKE. UNLOADING HEAVY MIST OF TREATING FLUID. EST GAS RATE OF 1.5 MMCFPD. SHUT WELL IN TO HOOK UP TEST UNIT. TURNED WELL ON AT 3:00 PM AT 8:00 PM HAD 1600# FTP ON 14/64" CHOKE. GAS RATE OF 1.5 MMCFPD. LEFT WELL FLOWING THRU TEST UNIT.
DC: $1600 TWC: $78000

9-19-92 1700 MCF RATE. MADE 48 BBL WATER AND 2 BBL CONDENSATE IN 24 HOURS. FTP: 1400# ON 14/64" CHOKE. SHUT WELL DOWN TO WORK ON GAS UNIT. PUT WELL DOWN SALES LINE AT 5:00 PM. INITIAL RATE OF 1.5 MMCFPD

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9-20-92	8 BO 20 BW 930 MCF 1700# FTP. 14/64" CHOKE. 15 HOURS PRODUCTION. PRODUCING AT 1.5 MMCFPD RATE. OPENED CHOKE TO 16/64".
9-21-92	2 BO 6 BW 1650 MCF FTP: 1575# 16/64" CHOKE.
9-22-92	7 BO 3 BW 1677 MCF 1510# FTP 16/64 CHOKE.
9-23-92	3 BC 3 BW 1,811 MCF 1425# FTP 16/64" CHOKE.
9-24-92	0 BW 6 BW 1.847 MMCF FTP 1425# 16/64" CHOKE.
9-25-92	7 BO 0 BW 1.818 MMCF FTP 1425# 16/64" CHOKE.
9-26-92	S.I. FOR 72 HR. BUILD UP.
9-29-92	13 BO O BW 1857 MCF 1950 FTP 16/64 CHOKE.
9-30-92	16 BO 3 BW 1.901 MMCF FTP 1660# 16/64" CHOKE.
10-1-92	15 BO 3 BW 1.854 MMCF FTP 1600#.
10-2-92	16 BO 3 BW 1855 MCF 1575 FTP 16/64" CHOKE.
10-3-92	11 BO 2 BW 1854 MCF 1575# FTB 12/64" CHOKE.
10-4-92	14 BO 2 BW 1854 MCF 1560# FTB 12/64" CHOKE.
10-5-92	20 BO 3 BW 1783 MCF 1560# FTB 14/64" CHOKE.
10-6-92	21 BO 3 BW 1799 MCF 1550# FTB 14/64" CHOKE.
10-7-92	21 BO 0 BW 1.803 MMCF FTP 1550# 15/64" CHOKE.
10-08-92	21 BO 3 BW 1.821 MCF FTP 1525# 16/64" CHOKE.
10-9-92	21 BO 3 BW 1.821 MMCF FTP 1525# 16/64" CHOKE.
10-10-92	20 BO O BW 1824 MCF 1510# FTP 16/64" CHOKE.
10-11-92	20 BO O BW 1854 MCF 1510# FTP 16/64" CHOKE.
10-12-92	9 BO 0 BW 1868 MCF 1500# FTP 16/64" CHOKE.

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Drilling Report
CHALK BLUFF FEDERAL #1
Sec. 1-18S-27E CASE NO.
Eddy County, New Mexico

8-12-92 Loaded casing with 2 BBL 2% KCL water. Pressured to 2000# held OK.

8-13-92 SITP: 250# RU HLS. RIH with 1 11/16" OD DYNA cap strip perforating gun. Perforated middle Morrow Green Sand from 9861'-9868' and 9879'-9882' with 2 spf. perforated 10' net for a total of 22 holes. Had 300# on tbg after rigging down hls. Left well shut in for 2 1/2 hours. Opened well up to pit with 640# tbg pressure. Unloaded heavy mist of condensate for 30 minutes on open choke with 150# FTP. Put well down line at 2:00 pm at 3:00 pm well flowing at 450 MCFPD rate on open choke. Had 510# flowing tbg pressure and 480# line pressure.
DWC: $2600 TWC: $2600

8-14-92 Well dead. TP: 500# LP: 500# RU Western Company to acidize middle Morrow Green perfs (9961'-9968', 9979'-9882') with 3500 gallons 7 1/2% HCL acid plus additives, containing 1000 SCF/BBL nitrogen and carrying 80 ball sealers. Flushed with 2% KCL water containing 1000 SCF/BBL nitrogen. Pressured annulus to 1600# and pumped as follows:

15,000 SCF N2 @ 1.8 BPM and 1200#
12 BBL w/ 12000 SCF N2 @ 1.8 BPM and 1600#. Dropped 50 ball sealers
20,000 SCF N2 @ 1.8 BPM and 1600#
84 BBL w/170,000 SCF N2 @ 4.0 BPM and 5400#. Start flush
119 BBL w/205,000 SCF N2 @ 3.8 and 5600#.

No break or ball action. ISDP: 4300# (5 min: 3800#) (10 min: 3400#) (15 min: 2800#). RD Western Company. Load to recover is 119 BBL. Avg. rate: 3.7 BPM, Avg PSI: 5000#, Max Rate: 4.5 BPM, Max PSI: 5600#. Opened well to pit on 16/64" choke. Unloaded EST 30 BBL and well died. Shut well in for 2 hours. Pressure built to 400#. Opened well to pit. Unloaded light mist for 30 minutes and died. Shut well in and SDFD.
DC: $8,400 TWC: $11,000

8-15-92 MIRU Halliburton logging services, run seismic fracture dimension survey at static conditions. FL at 2100'. Pump 150 bbls. filtered delaware fluid to load hole. Pump rate 2-1/2 BPM @1250 psi, total fluid 200 bbls. SD pumping operations due to ring gasket failure. Run

Drilling Report
Chalk Bluff Federal #1

seismic survey after injection procedures. SDFN @ 11:30 p.m.
DWC $23,100 TWC: $34,760

8-16-92 SITP 475#. Blew well down.

8-17-92 SDFN SITP 520#.

8-19-92 SITP 650#. RDMO swab unit. MIRU well service unit. RU Otis Wireline. Set "PN" blanking plug in "N" profile nipple at 9789'. Blew well down. Loaded tubing w/54 bbls. 2% KCL water. Pressured to 2000#, held ok. RD Otis. Removed tree. Released On-Off tool. RU BOP. RU swab. Swabbed well down to 5300'. Shut well in and SDFD.
DC: $4,270 TWC: $19,170

8-20-92 Swabbed well down to 6500'. Latched onto packer. Released packer. RIH w/4 jts. of tbg. Set pkr. @ 9923', top of On-Off tool w/"PN" blanking plug @ 9906'. Set pkr. w/15 pts. compression. Released On-Off tool. POOH w/tbg. and top half of On-Off tool. RU Hydrostatic Testers. TIH w/new pkr. assembly and 200 jts. tubing. Tested tbg. to 8000#. Shut well in and SDFD.
DC: $8,700 TWC: $27,870

8-21-92 Continued testing tbg. in hole. Set pkr. @ 9902'. Loaded tbg. w/30 bbls. 2% KCL water. Pressure tested lower packer assembly to 3000#, held ok. Released On-Off tool. Equalized wellbore. Latched onto pkr. Released pkr. Laid down 5 jt. of tbg. Tubing in string as follows:

1 - Mule-shoed re-entry guide	0.36'
1 - 2-3/8" "X" nipple w/1.875" I.D.	1.20'
1 - 2-3/8" N-80 EUE 8rd tbg. sub	8.12'
1 - 2-3/8" x 4-1/2" Otis perma-latch pkr. w/ 40,000# shear & 10,000# elements	3.98'
1 - 2-3/8" x 4-1/2" On-Off tool w/1.875" I.D. "X" profile	1.23'
34 jts. 2-3/8" N-80 EUE 8rd tbg. w/A.B. cplgs	1110.22'
1 - 2-3/8" x 2-7/8" cross-over	0.41'
278 jts. 2-7/8" N-80 EUE 8rd tbg. w/A.B. cplgs	8601.16'
Total tubing:	9726.68'
KB Corr	14.00'
Tubing set @	9740.68'

RD BOP. Set pkr. w/15 pts. compression. Flanged up wellhead. Loaded annulus w/110 bbls. 2% KCL water. Pressured to 2000#, held ok. RU swab. FL @ 3500' on 1st. run. Swabbed well down to X-over @ 8615'. Had

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light blow of gas. Waited 1 hr. Had 50-100' fluid entry. Had light blow of gas after run. Shut well in and SDFD.
DC: $4,450 TWC: $122,835.00

8-22-92 SITP: 150# Blew Well Down to Pit. RU Swab. Fluid level at 8000'. Swabbed well dry in 2 runs. No show of gas. RU Western Company to acidize middle morrow green sand (9861' - 9868' and 9879'-9882') with 1500 gallons 7 1/2% HCL Acid plus additives, containing 1000 SCF/BBL Nitrogen and carrying 35 Ball Sealers. Flushed with 2% KCL water. Pressured annulus to 1500# and pumped as follows:
6 BBL @ 4.0 BPM and 500#
30,000# SCF N2 @ 1000#
36 BBL w/ 60,000 SCF N2 @ 4.0 BM and 5100#. Start flush.
61 BBL w/ 86,000 SCF N2 @ 4.0 BPM and 5250#.

ISDP: 4000# (5Min: 3700#) (10Min: 3700#) (15 Min: 3600#) Load to recover is 61 BBL. Avg rate: 4.0 BPM, Avg PSI: 5100#, Max rate 4.0 BPM, Max PSI: 5400#, RD Western Company. Opened well to pit on 12/64" choke. Well flowed for 2 hrs. and died. RU swab. Fluid level at 7000' on first run. Swabbed well dry in 5 runs. Began making one run per hour. AT 7:00 p.m. had 200' fluid entry per hour. No show of oil or gas. Last sample was live acid. Recovered EST 40 BBL. Load minus 21 BBL.
DC: $7,850 TWC: $46,170

8-23-92 SITP: 200# Had flare while blowing down to pit. RU Swab. Fluid level at 7000' on first run. Swabbed well dry in 3 runs. Began making one run every hour. At 10:00 a.m. had 100' fluid entry per hour. Had 5' lazy flame with

8-23-92 run. No gas after run. No gas after run. Began making one run every 2 hours. At 5:00 pm had 200' fluid entry every 2 hours. Had 5' laxy flame with run and no gas after run. Last sample spent acid. Recovered 10 BBL. Load Minus 11 Bbl. DC: $1,600 TWC: $47,770.

8-24-92 SDFN. SITP: 250#

8-25-92 SITP: 300#. RU Western to frac Middle Morrow Green Sand (9861'-9868', 9879'-9882') down 2 7/8" & 2 3/8" tbg with 38,000 gallons binary foam carrying 30,000# 20/40 interprop. Pressured annulus to 2000# and pumped as follows:
18,000 gals 70 DHSQ binary foam @14 BPM and 7800#
3,000 gals 70 DHSQ binary foam w/0.5 ppg @ 14 BPM and

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7840#
5,000 gals 70 DHSQ binary foam w/1.0 ppg @ 14 BPM and 7960#
5,000 gals 70 DHSQ binary foam w/ 1.5 ppg @ 14 BPM and 8050#
5,000 gals 70 DHSQ binary foam w/2.0 ppg @ 14 BPM and 8110#
2,000 gals 70 DHSQ binary foam w/3.0 ppg @ 14 BPM and 8230#
2,350 gals binary foam flush @ 14 BPM and 8600#

ISDP: 4650# (5 min:4010#) (10min:3880#) (15min:3800#). Avg rate: 14 BPM, Avg PSI: 7800# Max rate: 14.8 BPM, Max PSI: 8600#, JOB complete at 12:00 noon. RD Western Company. Load to recover is 320 bbl. Shut well in for 3 hours. At 3:00 pm SITP: 3000#. Opened well to pit on 12/64" choke. At 5:00 pm FTP: 2300#. Installed 14/64" positive choke. At 7:30 pm FTP: 1250#. Unloading treating fluid. No flare. No proppant. Left well flowing to pit. DC: $48,420 TWC: $96,190

8-26-92 FTP: 400# on 14/64" choke. Unloading light mist of treating fluid. No flare. Opened choke to 24/64". At 5:00 pm had light blow on open choke. Unloading small amount of treating fluid. No flare.

8-27-92 Light blow in tbg. No flare. RU swab unit. Initial fluid level at 6150'. Swabbed well dry to change over at 8615' in 6 runs. Began making one run every half hour. At 6:00 pm had 400' fluid entry every half hour. Had flare during swab run and no flare after run. Recovered 11 bbl. Shut well in and SDFD.
DC: $700 TWC: $96,890

8-28-92 SITP 480 PSI @ 7:00 AM, Tool 18 minutes to blow well with strong 20' flare. Fluid level at 6000' and scattered to 8400', three minute light flare after run. Total of 14 runs made during the day, recovered 12 bbl of fluid. No fluid entry during the last three runs, tubing dry below 8400'. Well has lazy continous 2' flare. SDFN @ 6:00 pm.
DC: $700 TWC: $97590

9-02-92 SITP: 1450#. PUT WELL DOWN LINE ON 12/64" CHOKE.

9-04-92 0 BO 0 BW 14 MCF 450 # FTP 450 # LP SPIKED CHART 1 HR.

9-05-92 590# WELL SHUT IN.

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9-06-92	800# SITP.
9-07-92	925# SITP.
9-08-92	1050# SITP.
9-09-92	1150# S.I.
9-10-92	SITP 1200#.
9-11-92	SITP 1300#.
9-15-92	1500# SITP.
9-16-92	TP 1550# S.I.
9-17-92	SITP 1550#. PUT WELL DOWN LINE.

DRILLING REPORT
CHALK BLUFF FEDERAL #1
EDDY COUNTY, NEW MEXICO

9-18-92 MIRU WELL SERVICE UNIT. BLEW WELL DOWN. LOADED TBG WITH 35 BBL 2% KCL WATER. RU BOP. RELEASED PACKER. POOH WITH TBG AND PACKER. TIH WITH TOP HALF OF ON-OFF TOOL, PERFORATED NIPPLE AND 316 JTS OF TBG. TAGGED FILL AT 9850'. POOH WITH 8 JTS OF TBG. SHUT WELL IN AND SDFD AT 6:30 PM.
DC: $2300 TWC: $100,600

9-19-92 TIH WITH 8 JTS OF TBG. RU REVERSE UNIT. UNABLE TO MAKE HOLE WITH NOTICED OVERSHOT. POOH WITH TBG STRING. TIH WITH 3 7/8" BIT, BIT SUB AND TBG. CLEANED OUT SAND TO 9905'. CIRCULATE TBG CLEAN. POOH WITH TBG. SHUT WELL IN AND SDFD.
DC: $3700 TWC: $104300

9-20-92 TIH WITH OVERSHOT AND TBG STRING. CLEANED OUT REMAINING SAND AND BALL SEALERS TO TOP OF PACKER ASSEMBLY AT 9907'. CIRCULATED TBG CLEAN. LATCHED ONTO AND OFF OF ON-OFF TOOL. POOH WITH 8 JTS OF TBG. SWABBED WELL DOWN TO 5000'. TIH WITH 8 JTS OF TBG. LATCHED ONTO PACKER ASSEMBLY. UNABLE TO RELEASE PACKER. RELEASED ON-OFF TOOL. HAD DIFFICULTY LATCHING ONTO AND OFF OF ON-OFF TOOL. POOH WITH 8 JTS OF TBG. SHUT WELL IN AND SDFN.
DC: $3000 TWC: $107300

9-21-92 SWABBED WELL DOWN TO 6500'. TIH WITH 8 JTS OF TBG. LATCHED ONTO PACKER. UNABLE TO RELEASE OR SHEAR PACKER. RELEASED ON-OFF TOOL. RU WIRELINE TRUCK. TIH WITH RETRIEVING TOOL AND PULLED EQUALIZING PRONG OUT OF "PN" PLUG. POOH WITH PRONG. TIH WITH RETRIEVING TOOL. PULLED "PN" PLUG OUT OF "N" NIPPLE. POOH WITH PLUG. RD WIRELINE TRUCK. POOH WITH TBG STRING. SHUT WELL IN AND SDFD.
DC: $3000 TWC: 110300

9-22-92 TIH WITH PACKER ASSEMBLY. RD BOP. SET PACKER WITH 13 PTS COMPRESSION. FLANGED UP WELL HEAD. TBG STRING IS AS FOLLOWS:

1-MULE-SHOED RE-ENTRY GUIDE	0.36'
1-2 3/8" "XN" NIPPLE W/1.875" I.D. AND 1.791" NO-GO	1.20'
1-2 3/8" N-80 EUE 8RD TBG SUB	8.12'
1-2 3/8" X 4 1/2" OTIS PERMA-LATCH PACKER W/40,000# SHEAR & 10,000# ELEMENTS	3.98'
1-2 3/8" X 4 1/2" ON-OFF TOOL W/ 1.875" I.D. "X" PROFILE	1.23'
34 JTS- 2 3/8" N-80 EUE 8RD TBG W/ A.B.	1110.22'

CPLGS	
1- 2 3/8" X 2 7/8" CROSS-OVER	0.41'
278 JTS- 2 7/8" N-80 EUE 8RD TBG W/ A.B.	8601.16'
CPLGS	
TOTAL TBG	9726.68'
KB CORR	14.00'
TBG SETTING	9740.68'

LOADED ANNULUS WITH 170 BBL 2% KCL WATER. PRESSURED TO 2000#. HELD OK. RDMO WELL SERVICE UNIT. MIRU SWAB UNIT. INITIAL FLUID LEVEL AT 5300'. AT 6:00 PM FLUID LEVEL AT 8400' HAD 15' FLARE WITH RUN AND 3' FLARE AFTER RUN. RECOVERED EST 25 BBL. SHUT WELL IN AND SDFN.
DC: $2500 TWC: $112800

9-23-92 SITP: 640# BLEW WELL DOWN TO PIT. RU SWAB. FLUID LEVEL AT 6500' ON FIRST RUN. SWABBED WELL DOWN TO 8600'. BEGAN MAKING ONE RUN EVERY HALF HOUR. AT 7:00 PM HAD 1400' SCATTERED FLUID ENTRY EVERY HALF HOUR. HAD 4' FLARE BEFORE RUN AND 15-20' FLARE WITH RUN. RECOVERED 33 BBL. SHUT WELL IN AND SDFD.
DC: $1200 TWC: $114,000

9-24-92 SITP: 660# BLEW WELL DOWN. RU SWAB. FLUID LEVEL AT 6800' ON FIRST RUN. SWABBED WELL DOWN TO 8500'. BEGAN MAKING ONE RUN EVERY HOUR. AT 5:30 HAD 1500' SCATTERED FLUID ENTRY EVERY HOUR. HAD 6' FLARE BEFORE RUN AND 15-20' FLARE WITH RUN. BEGAN MAKING CONTINUOUS RUNS. HAD 1000' SCATTERED FLUID ENTRY EACH RUN. HAD 6' FLARE BEFORE RUN AND 15-20' FLARE WITH RUN. SHUT WELL IN AND SDFD. RECOVERED 35 BBL.
DC: $1200 TWC: $115,200

9-25-92 SITP: 680# BLEW WELL DOWN TO PIT. RU SWAB. INITIAL FLUID LEVEL AT 5200'. AT 3:00 PM FLUID LEVEL AT 7500' AND SCATTERED TO 8600' WHILE SWABBING CONTINUOUSLY. BEGAN MAKING ONE RUN EVERY HALF HOUR. AT 7:00 PM HAD FLUID LEVEL AT 6500'. HAD 1700' SCATTERED FLUID ENTRY EVERY HALF HOUR. HAD 6-7' FLARE BEFORE RUN AND 15-20' FLARE WITH RUN. SHUT WELL IN AND SDFD. REC 53 BBL.
DC: $1200 TWC: $11640

9-26-92 SITP: 810# BLEW WELL DOWN TO PIT, RU SWAB. INITIAL FLUID LEVEL AT 5500'. SWABBED WELL DOWN TO 8600' AND BEGAN MAKING ONE RUN EVERY HOUR. AT 7:00 PM HAD 500' FLUID ENTRY EVERY HOUR. HAD 7-8' FLARE BEFORE RUN AND 15-20' FLARE AFTER RUN. UNLOADING FLUID FOR 15 MINUTES AFTER RUN. SHUT WELL IN AND SDFD.
DC: $1200 TWC: $116400

9-27-92 SDFW

9-28-92 SDFW

9-29-92 SITP: 840# BLEW WELL DOWN IN ONE HOUR ON 3/4" CHOKE. RU SWAB. INITIAL FLUID LEVEL AT 5300' AND SCATTERED. AT 12:00 NOON FLUID LEVEL AT 8000' AND SCATTERED TO 8600'. HAD 8-10' FLARE BEFORE RUN AND 15-20' FLARE WITH RUN. UNLOADING HEAVY MIST WITH 15' FLARE FOR 10-15 MINUTES AFTER RUN. SHUT WELL IN. RDMO SWAB UNIT AT 12:30 PM.
DC: $700 TWC: $117100

9-30-92 TRANSFERED COMP #1477 FROM RED LAKE STATE #1 TO LOCATION, FINISHED COMP. TIE IN AND T.O. WELL. 820# SITP PUT WELL ON LINE THROUGH COMP. @ 3:00 PM 354 MCF/D RATE ON 14/64 CHOKE.

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CHALK BLUFF FEDERAL #1

10-1-92 0 BO 0 BW 164 MCF FTP 160# 64/64" CHOKE.

10-2-92 0 BO 0 BW 143 MCF 100# FTP OPEN CHOKE.

10-3-92 0 BO 18 BW 157 MCF 75# FTP OPEN CHOKE.

10-4-92 0 BO 15 BW 164 MCF 75# FTP OPEN CHOKE.

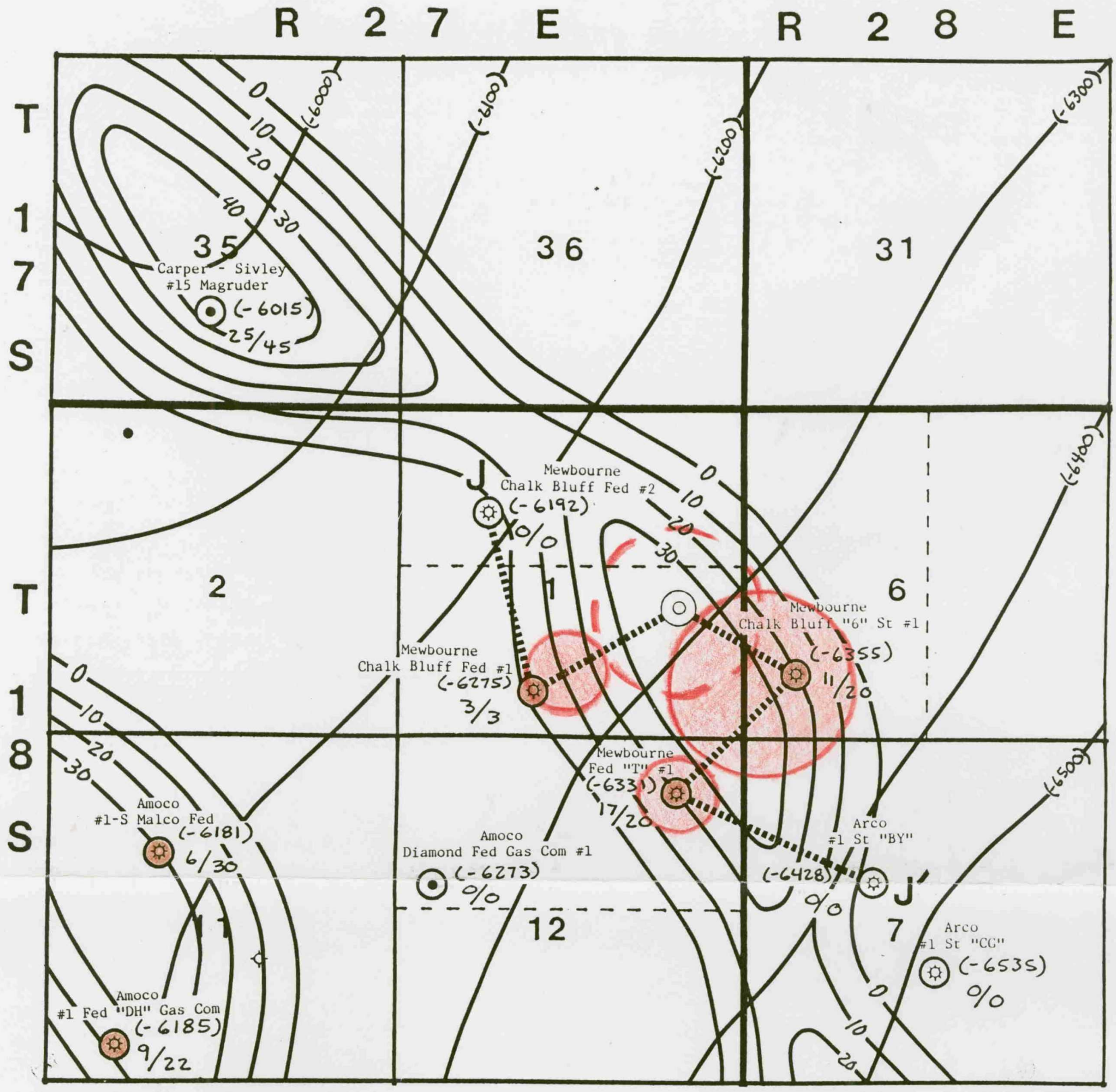
10-5-92 0 BO 15 BW 152 MCF 75# FTP OPEN CHOKE.

10-6-92 0 BO 22 BW 166 MCF 175# FTP OPEN CHOKE.

10-7-92 0 BO 12 BW 130 MCF FTP 160#.

10-08-92 0 BO 10 BW 133 MCF FTP 160# OPEN CHOKE.

10-09-92 0 BO 7 BW 133 MCF FTP 160# OPEN CHOKE. WELL HAS STABILIZED WILL DELETE FROM REPORT.



Wells deeper than 7,000'

○ Morrow Penetration

● PRODUCER

NET $\emptyset_c \geq 8\%$
GROSS SAND

EDDY CO., N.M.

MEWBOURNE OIL COMPANY

MIDLAND, TEXAS DISTRICT

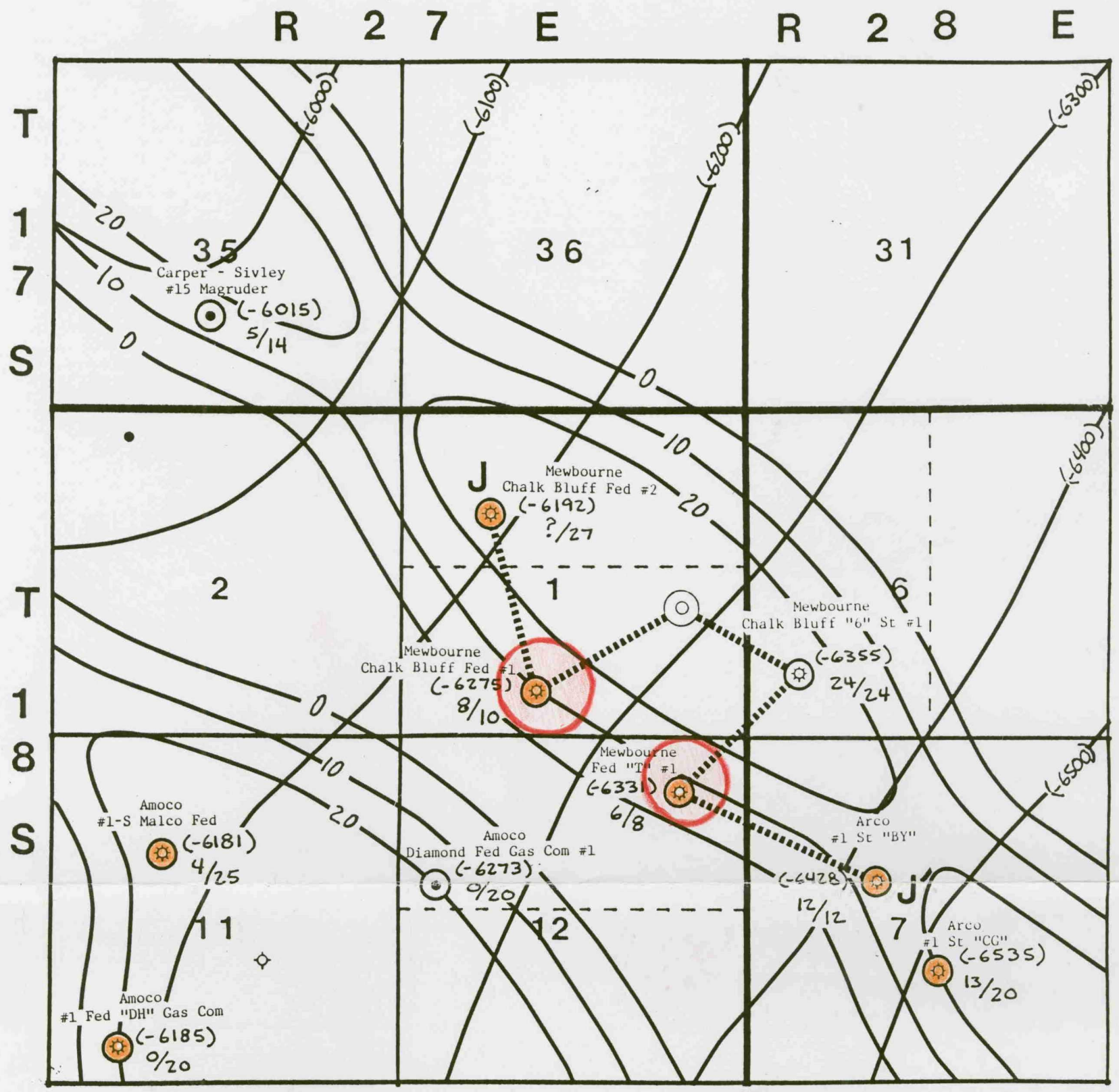
CHALK BLUFF DRAW PROSPECT
EDDY COUNTY, NEW MEXICO

TOP/LOWER MORROW STRUCTURE
C. I. = 100'

GROSS LOWER MORROW BROWN SAND ISOPACH
C. I. = 10'

SEPTEMBER 1992 | 1" = 2000' | DEXTER HARMON

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. 10
CASE NO. _____



Wells deeper than 7,000'

○ Morrow Penetration

● PRODUCER

NET $\emptyset_p \geq 8\%$
GROSS SAND

EDDY CO., N.M.

MEWBOURNE OIL COMPANY

MIDLAND, TEXAS DISTRICT

CHALK BLUFF DRAW PROSPECT
EDDY COUNTY, NEW MEXICO

TOP/LOWER MORROW STRUCTURE
C.I. = 100'

GROSS LOWER MORROW ORANGE SAND ISOPACH
C.I. = 10'

SEPTEMBER 1992 | 1" = 2000' | DEXTER HARMON

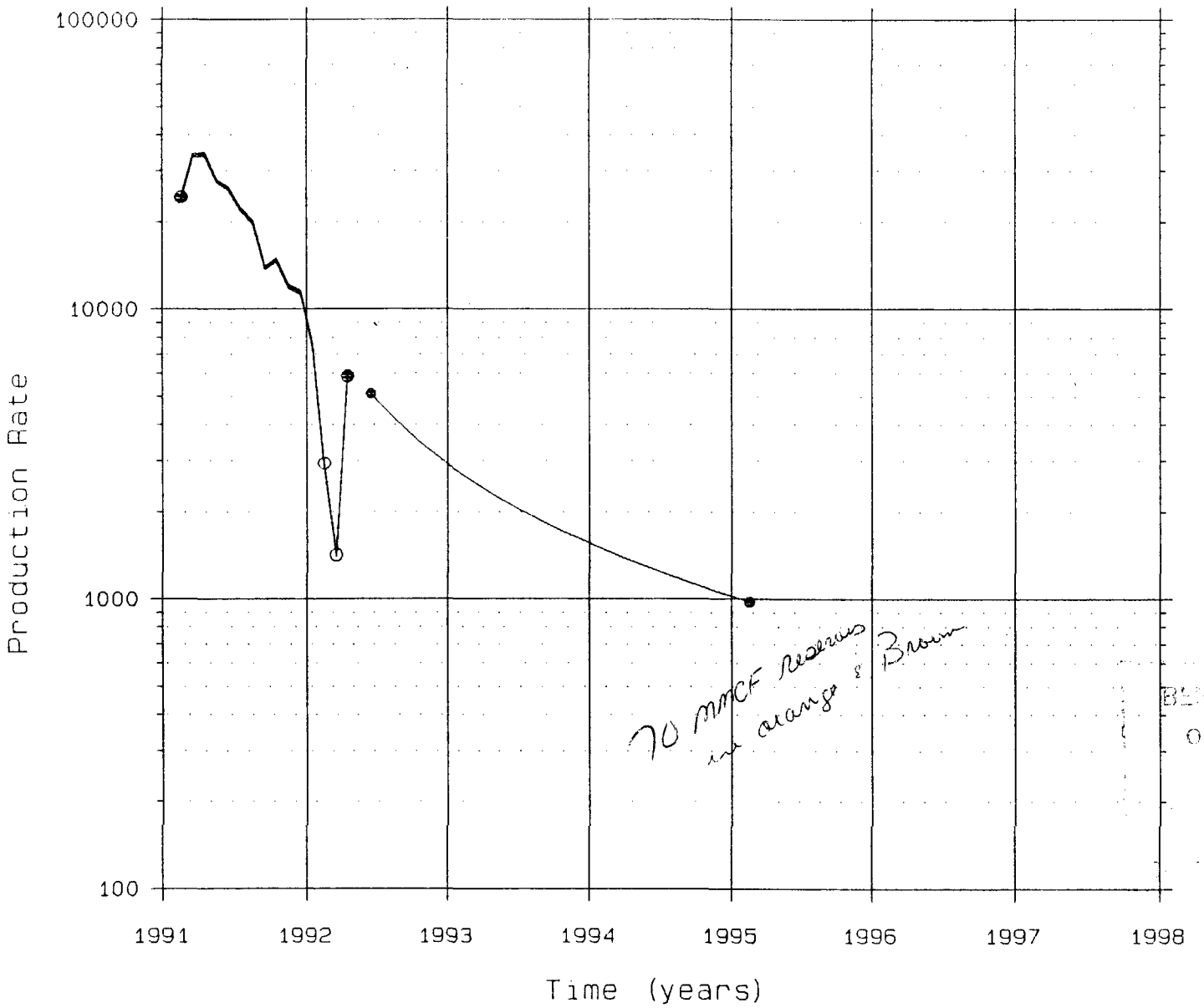
BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. //
CASE NO. _____

CHALKB3.DMP
Multiphase Curve Analysis
Rate vs Time

FEDERAL T #1

MOC (12A-18S-27E)
ILLINOIS CAMP NORTH (MORROW) PM

9/14/1992
Property:
250.015.18S27E12A0[illegible]PM



70 MMCF reserves in Morrow & Brown

Production Curves

GAS: • GAS DATA
0 History 2/91 - 4/92
• HYPERBOLIC DECLINE
Hyperbolic 6/92 - 2/95
Qi : 5400.000 MCF/M
Di : 60.000 %
n : 0.800
Qe : 962.467 MCF/M
De : 25.982 %
Np : 69.902 MMCF

4/92 Cum Prod:	**258 MMCF**
Future Proj:	**70 MMCF**
Total Prod:	**328 MMCF**

RECEIVED
OIL CONSERVATION DIVISION

12

VOLUMETRIC CALCULATIONS

LEASE INFORMATION

Well Name: **Federal T #1 (Mewbourne Oil)**
Legal Location: 12A-T18S-R27E, Eddy County, New Mexico
Producing Zone: 10,008-10,0054 (Morrow)

DATA

Net Height : 23'
Initial Pressure/Z: 4000 psi
Abandon Pressure/Z: 800 psi
BHT: 154°f/614°R
ø: 7%
Sw: 28%

RESERVE ESTIMATES

From Decline Analysis

2/91-4/92 Cummulative to Date:	258	MMCF
Projected Remaining Reserves:	70	MMCF
Total Recoverable Reserves:	328	MMCF

TOTAL RECOVERABLE RESERVES= 328 MMCF

VOLUMETRIC AREA CALCULATIONS:

$Bg = (35.5xP)/(Z)(Tf+460)$

$Rec\ Res = 43.560(A)(h)(ø)(1-Sw)(Bgi-Bga)$

$Bgi = (35.35x\ 4000)/(.92x\ 614) = 250$ scf/cu ft
$Bga = (35.35x\ 800)/(.92x\ 614) = 50$ scf/cu ft

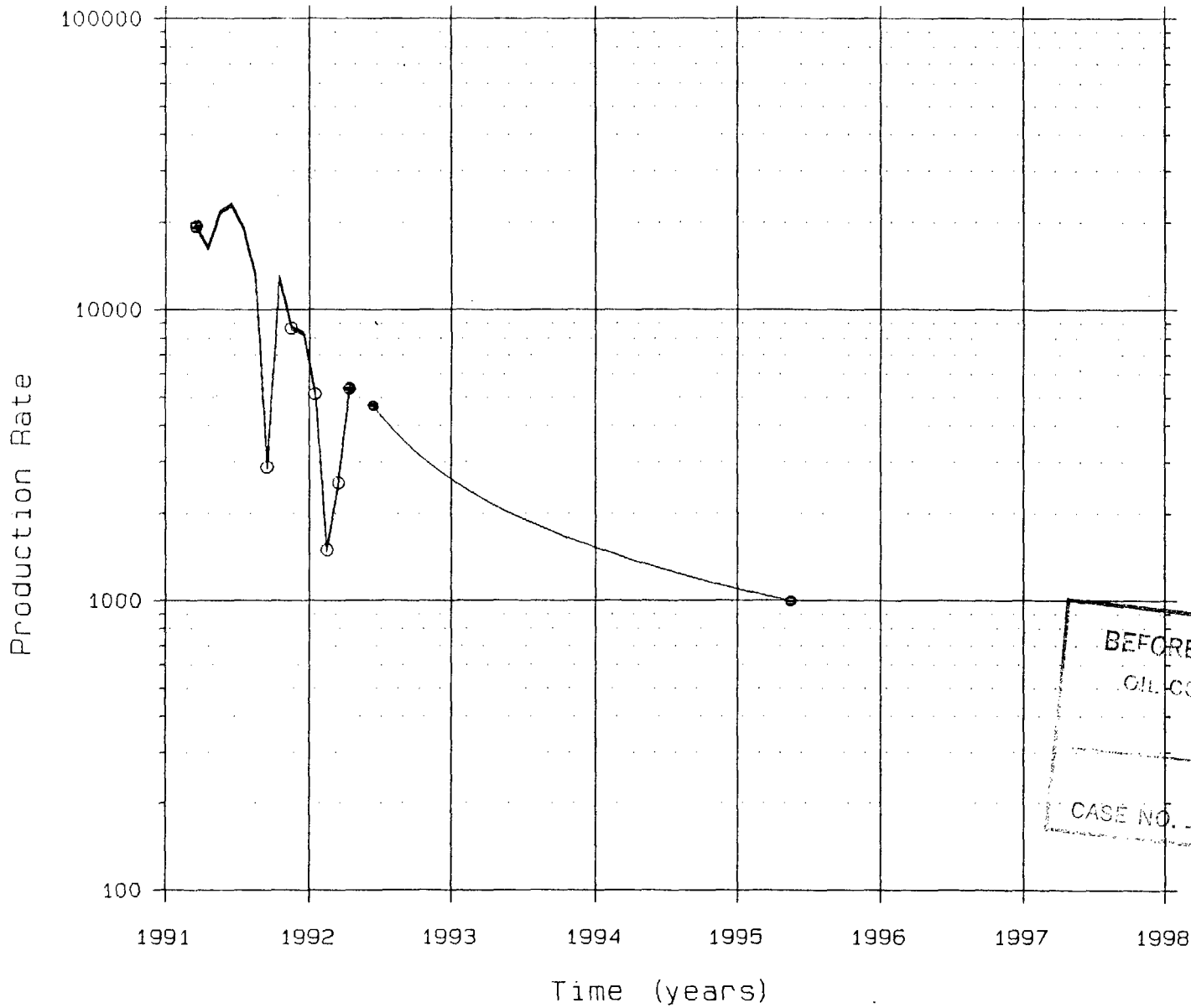
$Acres = 328{,}000/\ 43.560(23)(.07)(1-.28)x(250-50)$
$= 32$ ac

DRAINAGE AREA= 32 ACRES

CHALKB3.DMP
Multiphase Curve Analysis
Rate vs Time

CHALK BLUFF FED 1
MOC (1N-18S-27E)
ILLINOIS CAMP NORTH (MORROW) PM

9/14/1992
Property:
250, 015, 18S27E01N00PM



Production Curves

GAS: • GAS DATA
0 History 3/91 - 4/92
• HYPERBOLIC DECLINE
Hyperbolic 6/92 - 5/95

Qi :	5000.000 MCF/M
Di :	60.000 %
n :	1.200
Qe :	986.929 MCF/M
De :	18.898 %
Np :	68.881 MMCF

4/92 Cum Prod: **160 MMCF**
Future Proj : **69 MMCF**
Total Prod: **229 MMCF**

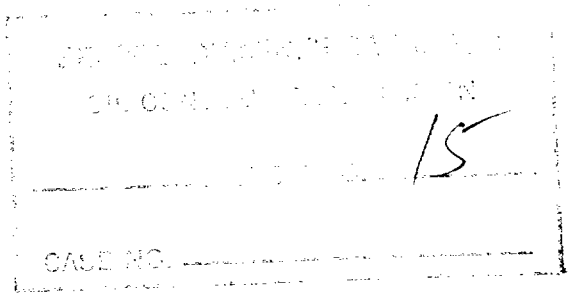
VOLUMETRIC CALCULATIONS

LEASE INFORMATION

Well Name: **Chalk Bluff Fed 1 (Mewbourne Oil)**
Legal Location: 1N-T18S-R27E, Eddy County, New Mexico
Producing Zone: 9936-9967 (Morrow)

DATA

Net Height : 11'
Initial Pressure/Z: 4000 psi
Abandon Pressure/Z: 800 psi
BHT: 154°f/614°R
ø: 9%
Sw: 28%



RESERVE ESTIMATES

From Decline Analysis

3/91-4/92 Cummulative to Date:	160 MMCF
Projected Remaining Reserves:	69 MMCF
Total Recoverable Reserves:	229 MMCF

TOTAL RECOVERABLE RESERVES= 229 MMCF

VOLUMETRIC AREA CALCULATIONS:

$Bg = (35.5xP)/(Z)(Tf+460)$

$Rec\ Res = 43.560(A)(h)(\phi)(1-Sw)(Bgi-Bga)$

$Bgi = (35.35x\ 4000)/(.92x\ 614) = 250$ scf/cu ft
$Bga = (35.35x\ 800)/(.92x\ 614) = 50$ scf/cu ft

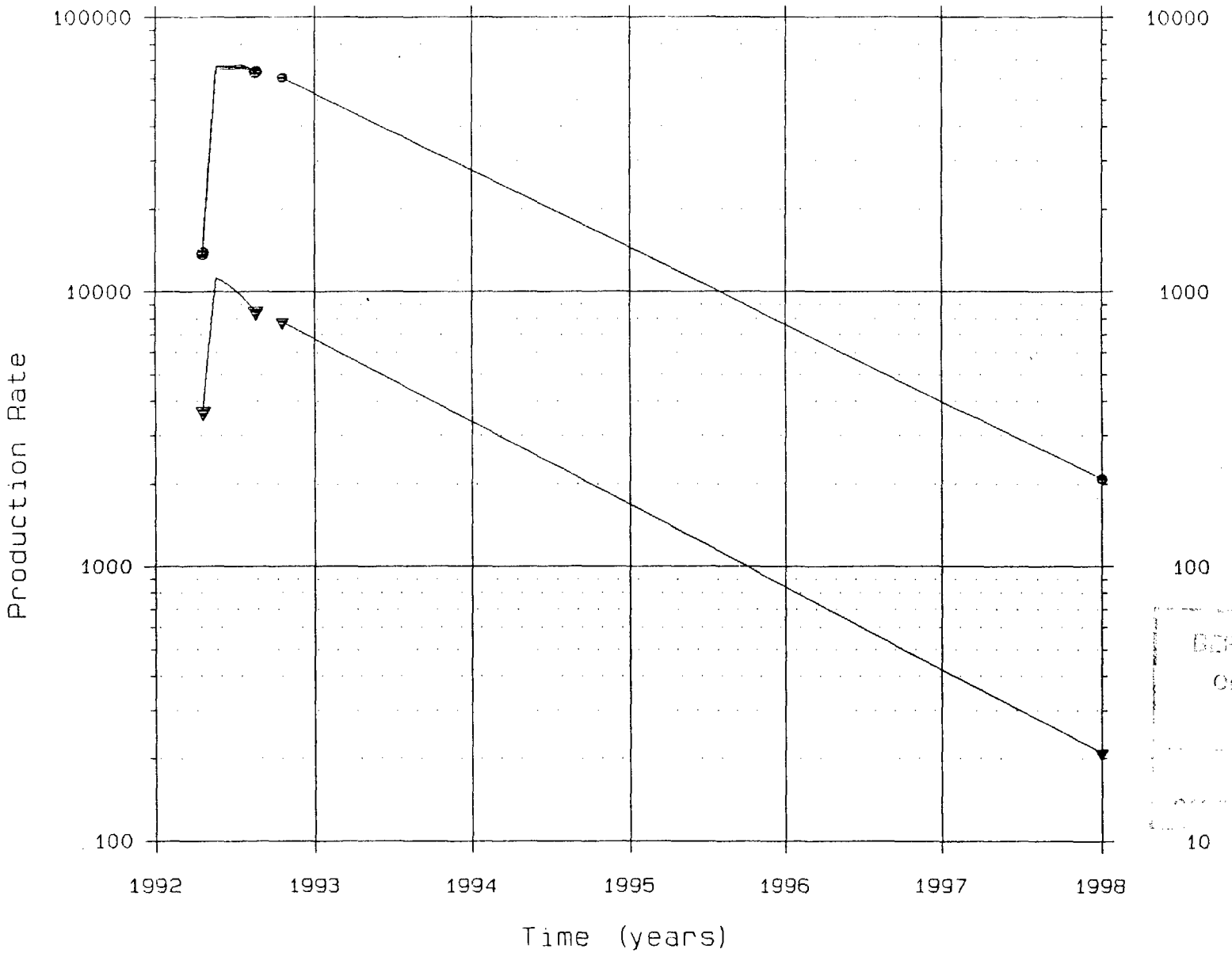
$Acres = 229{,}000/\ 43.560(11)(.09)(1-.28)x(250-50)$
$= 37$ ac

DRAINAGE AREA= 37 ACRES

CHALKB3.DMP
Multiphase Curve Analysis
Rate vs Time

CHALK BLUFF 6 ST 1
MOC (6-18S-28E)
ILLINOIS CAMP NORTH

9/15/1992
Property:
111, 111, CHALKBLUFF651



Production Curves

GAS: • GAS DATA
0 History 4/92 - 8/92
• EXPONENTIAL DECL
CPD 10/92 - 3/99
Qi : 62000.000 MCF/M
Di : 47.600 %
Qe : 929.070 MCF/M
Np : 1133.845 MMCF

CND: ▼ CONDENSATE DATA
0 History 4/92 - 8/92
▼ EXPONENTIAL DECLINE
CPD 10/92 - 10/67
Qi : 800.000 BBL/M
Di : 50.000 %
Qe : 0.000 BBL/M
Np : 13.848 MBBL

8/92 Cum Prod: 275 MMCF
Future Proj: 1,134 MMCF
Total Prod: 1,409 MMCF

BEFORE EXAMINER [illegible]
OIL CONSERVATION [illegible]

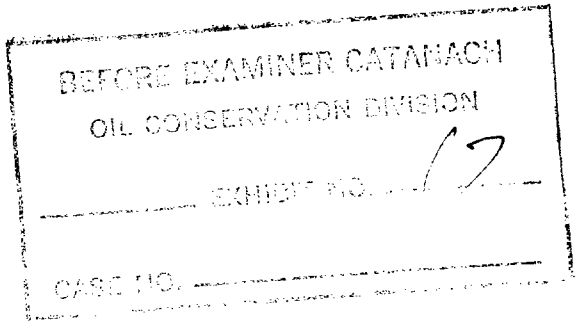
VOLUMETRIC CALCULATIONS

LEASE INFORMATION

Well Name: **Chalk Bluff "6" State #1 (Mewbourne Oil)**
Legal Location: 1N-T18S-R27E, Eddy County, New Mexico
Producing Zone: 10,084-10,092 (Morrow)

DATA

Net Height : 11'
Initial Pressure/Z: 4000 psi
Abandon Pressure/Z: 800 psi
BHT:154°f/614°R
ø: 14%
Sw: 24%



RESERVE ESTIMATES

From Decline Analysis

4/92-8/92 Cummulative to Date:	275 MMCF
Projected Remaining Reserves:	1,134 MMCF
Total Recoverable Reserves:	1,409 MMCF

Eldorn Sand only

TOTAL RECOVERABLE RESERVES= 1,409 MMCF

VOLUMETRIC AREA CALCULATIONS:

$Bg = (35.5xP)/(Z)(Tf+460)$

$Rec\ Res = 43.560(A)(h)(\phi)(1-Sw)(Bgi-Bga)$

$Bgi = (35.35x\ 4000)/(.933x\ 614) = 247$ scf/cu ft
$Bga = (35.35x\ 800)/(.933x\ 614) = 50$ scf/cu ft

$Acres = 1,409,000/\ 43.560(11)(.14)(1-.24)(247-50)$
$= 140$ ac

DRAINAGE AREA= 140 ACRES

AUTHORS - LARRY FOSTER AND BILL HALEPESKA

Through 1971, there were fewer than 100 Morrow completions on record in the area of interest. Increased activity brought about by market demand and more favorable pricing has resulted in nearly twice that number of completions during the two years 1972 and 1973. The number of active Morrow projects in early '72 averaged around 25 with the number increasing to 36 by late 1973. This increase in activity only served to emphasize the need for improvements in overall completion - stimulation techniques.

Attempts in the past to determine the basic mechanism or cause of the damage have been directed primarily at the clay materials known or suspected to occur in these sands. The overriding tendency has been to minimize the amounts of aqueous fluids lost to these zones during drilling and subsequently injected for treatment purposes. Special pains were taken in fluid preparation for clay control, especially where larger volumes were involved. Results noted from these efforts did not especially indicate significant progress. Additionally, experience has shown that "fluid damage" is not necessarily limited to aqueous fluids alone, as similar results were noted where liquid hydrocarbons were employed.

Initial breakdown and/or clean-up fluids consisted of the more common "mud acid" conversions employing hydrofluoric acid (3 to 6 percent strength) with HCl, solutions of straight hydrofluoric acid, mixtures of mud acid or regular HCl with alcohol, alcohol-CO_2 mixtures, specially prepared brine waters, and others. The selection of fracturing fluids has been equally varied, ranging from assorted, modified brine waters to distillate and kerosene or diesel. Most of the fluid systems tried met with limited success at best. The modified brine water fracturing fluids did provide some of the more encouraging programs in the past; however, the frequent occurrence of resultant reduced flow and poor clean-up characteristics still persisted. The unusually poor response to acid treatment had for a time prompted a general feeling that acid as a basic stimulation fluid should be avoided in the Morrow completion program.

A new stimulation approach has been developed around a special surfactant system which seems to have effectively bridged the gap. Results to date have been especially good with the most encouraging aspect being the almost total absence of cases where flow was reduced following treatment. The surfactant treatment approach used in an acid base has been successfully employed for well bore damage removal, true stimulation by fracturing, and restoration of production following well work (including other types of treatments) where fluid lost to the formation has not been recovered.

FORMATION CHARACTERISTICS

Sedimentation during Morrow - Atoka time consisted primarily of clastic deposition, although limestone is present in the interval (especially Atoka) in certain areas. The clastics here consist of coarse to fine grained quartz sands and gray to black silty shales. These sands appear to have been deposited in lenses aligned roughly parallel to ancient shore lines bordering the depositional basin to the northwest. Sand lenses are of highly variable extent, thickness, and occurrence.

The Morrow sands themselves are described as well consolidated, white, angular to sub-angular, coarse grained, slightly glauconitic and calcareous. With some exceptions, the average Morrow productive interval consists of several separate sand bodies covering 100 to 300 feet. Few of the individual sands exceed 15 to 20 feet in thickness. Net productive sand is highly variable, ranging from a low of 8 or 10 to more than 60 feet, with the average being more on the order of 30 feet. Porosity is equally varied, ranging from around 8 to near 20 percent. Earlier studies reported permeability values of 10 to 50 md., but some more recent completions have indicated permeabilities of less than 1 md. based on pressure build-up data.

Few cores from the Morrow have been available for special mineralogical study; however, X-ray diffraction analysis data taken from two cores is given in Table I. On the basis of these analyses, the sands represented contain at most a trace of montmorillonite and, therefore, would not be expected to be highly water sensitive. The amount of kaolinite present in these cores is somewhat more than normally encountered and might be considered as a possible reason for some of the observed fluid sensitivity. When contacted by aqueous fluids with which it is not in equilibrium, kaolinite is subject to particle disassociation. Subsequent movement of these fines then can cause permeability damage.

Additional sample studies have indicated the presence of materials which are readily soluble in HCl. While total solubility most often appears to fall below 2%, a maximum of 5 to 6% has been

empirical equation:

$$\frac{Qv = CEC\ (1-\phi)\rho m}{\phi \cdot 100}$$

when ϕ = porosity

ρm = grain density

The importance of utilizing CEC and Qv data for certain rock types and formations primarily relates to resistivity log calculations of Sw using older empirical formulas (e.g., Archie equation), which do not include exchange capacity, versus more recent formulas (e.g., Waxman-Smits equation) which do. Given similar log/formation parameters, a calculated Archie Sw of 32% would compare with calculated Waxman-Smits Sw of 15% to 28% (Qv ranging from 3.0 to 0.2, respectively).

SIGNIFICANCE OF ANALYTICAL RESULTS TO RESERVOIR QUALITY/EXPOLITATION

Analysis of these 24 Morrow sandstone samples supplied to Reservoirs, Inc. by Getty Oil Company of Midland, Texas leads to the following conclusions and recommendations for exploitation of this sandstone reservoir interval:

1. In general, two sandstone rock types ("facies") are present within this 24-foot interval: (a) a sandstone rock type with abundant grain (pore wall) coating chlorite/illite clay crystals plus significant amounts of kaolinite clays filling intergranular areas. The reservoir intervals represented by this rock type include 12,935-37' and 12,954-58'. Abundant micropore space appears to be present on the sand grain surfaces within the intergrown chlorite and illite clay crystal platelets. This micropore space has the potential to contain immobile water, and this rock type has relatively high Qv values. Although some relatively open intergranular pore space was observed in a few of these samples, in general this sandstone rock type would appear to have a very low permeability in relation to its particular porosity value; (b) the sandstone rock type reflected by those samples from 12,939-12,952' consist of a quartz-rich sandstone containing extensive development of vermicular kaolinite crystals filling the intergranular areas. The quartz sand grains are extensively cemented with silica cement in the form of intergrown quartz overgrowth crystals. The pore system appears to consist of a few scattered, remaining intergranular pores developed between intersecting quartz overgrowth crystals plus a large amount of micropore space developed within the aggregates of kaolinite crystals developed within the intergranular areas. This sandstone rock type has lower Qv values than the sands above and below this interval due to both greater amounts of kaolinite (lower CEC) plus the general absence of grain-coating clay crystal development. It should be noted, however, that small amounts of diagenetic illite and chlorite were also detected in these quartz and kaolinite-rich sands on the scanning electron microscope.

2. Attempts at completion/acidization/stimulation of this sandstone reservoir interval should take into account the great abundance of diagenetic vermicular kaolinite cyrstals. Kaolinite is very stable from a chemical aspect in that it reacts with acid in nearly the same way as quartz. Hence acid treatment has no real affect on kaolinite. -Kaolinite can impose production problems, however, due to its loose attachment to sand grain surfaces within the pore system, causing it to potentially behave as a mobil "fines" particle during fluid flow through the pore system. Fluid turbulence within the rock pore system during production, particularly around the wellbore, can cause fines movement to the degree that existing pore throats become "choked off" with kaolinite fines and formation damage can be the result. This migration of fines problem can be dealt with by the use of a clay stabilization agent which helps to "tie down" the individual kaolinite crystals.