N/R

WF 30-015-26484

devon
ENERGY CORPORATION

20 North Broadway, Suite 1500
Oklahoma City, Oklahoma 73102-8260

Telephone 405/235-3611
FAX 405/552-4550

February 16, 1995


State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

**RE: EAST SHUGART #2, #33, #41, & #42**
**ORDER NO. WFX-664**
**SEC 34-T18S-R31E**
**EDDY COUNTY, NEW MEXICO**

Gentlemen:

On November 4, 1994 you issued Administrative Order No. WFX-664 permitting us to to convert the four above wells to injection. Attached are copies of sundry notices showing this work has been done.

Step Rate Tests were run on these wells and witnessed by a representative from your Artesia office. Copies of the Step Rate Tests are attached. Devon Energy Corporation respectfully request that the maximum wellhead injection pressures be increased to 50 psi below the formation parting pressure. The formation parting pressures determined by the tests are as follows:

| Well | PARTING PRESSURE | MAY |
|---|---|---|
| #2 | 1080 PSI | 1090 |
| #33 | 1405 PSI | 1370 |
| #41 | 900 PSI | 900 |
| #42 | 1040 PSI | 1020 |

If you have any questions, please give me a call at 405-552-4509.

Very truly yours,

E. L. Buttross Jr.

Ernie L. Buttross, Jr.
District Engineer

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires March 31, 1993

**SUNDRY NOTICES AND REPORTS ON WELLS**

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

***SUBMIT IN TRIPLICATE***

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other WIW

2. Name of Operator
**DEVON ENERGY CORPORATION (NEVADA)**

3. Address and Telephone No.
**20 NORTH BROADWAY, SUITE 1500, OKLAHOMA CITY, OKLAHOMA 73102 (405) 235-3611**

4. Location of Well (Footage. Sec., T., R., M., or Survey Description)
**990' FNL & 1650' FEL Sec. B-34-18S-31E**

5. Lease Designation and Serial No.
NM10190

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA, Agreement Designation
14-08-001-11572

8. Well Name and No.
East Shugart Unit #2

9. API Well No.
30-015-05668

10. Field and Pool, or Exploratory Area
Shugart (Y-SR-Q-G)

11. County or Parish, State
Eddy, NM

## CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | |
|---|---|---|
| ☐ Notice of Intent | ☐ Abandonment | ☐ Change of Plans |
| ☒ Subsequent Report | ☐ Recompletion | ☐ New Construction |
| ☐ Final Abandonment Notice | ☐ Plugging Back | ☐ Non-Routine Fracturing |
| | ☐ Casing Repair | ☐ Water Shut-Off |
| | ☐ Altering Casing | ☒ Conversion to Injection |
| | ☐ Other ____ | ☐ Dispose Water |

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

As authorized by Order No. WFX-664, the following work was completed to convert the ESU #2 to injection:
01-22-95 thru 01-27-95 Pulled rods and pump. Ran 4 3/4" bit to 3100'. **Ran Baker CIBP, set at 3050'.** Ran Baker full bore packer, set at 2900'. Pressure tested CIBP to 1000 psi, held OK. Pulled packer to 2500' and reset. Pumped into Yates perfs at 2 1/2 BPM w/400 psi. POH w/packer. Ran Baker cement retainer.
**Dowell sqzd Yates perfs at 2632-2782'** w/400 sx Class "C" cement + 1% D-60 (FL) + 2% $CaCl_2$ + .2% D-46 (defoamer); mixed at 14.8 ppg= 1.32 cf/sx yield. Staged last 10 bbls cement at 1/2 bbl/stage. Pumped 4 1/2 bbls cement and press came up to 2100 psi. Pulled out of retainer. Reversed out 5 1/2 bbls cement. Drld cement retainer at 2500' and cement from 2611-2790'. Pressure tested sqzd Yates perfs at 2632-2782' to 500 psi, held OK. Drld CIBP at 3050'. Pushed CIBP to 3936'. Circ'd hole clean.
Ran nickel-plated Baker Loc-set packer, set at 3200'. Ran stainless steel on-off tool w/"F" profile nipple (1.81") to 3100' on 106 jts 2 3/8" Star 2000 psi FG tbg.
01-28-95 Circ'd hole w/90 bbls packer fluid (fresh water + corr inhib). Engaged on-off tool. Pressure tested csg to 500 psi, held OK for 30 mins. Notified Ray w/NMOCD before test. Chart attached.
**02-01-95 Commenced injection** at 169 BW w/TP 600 psi in 24 hrs.

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

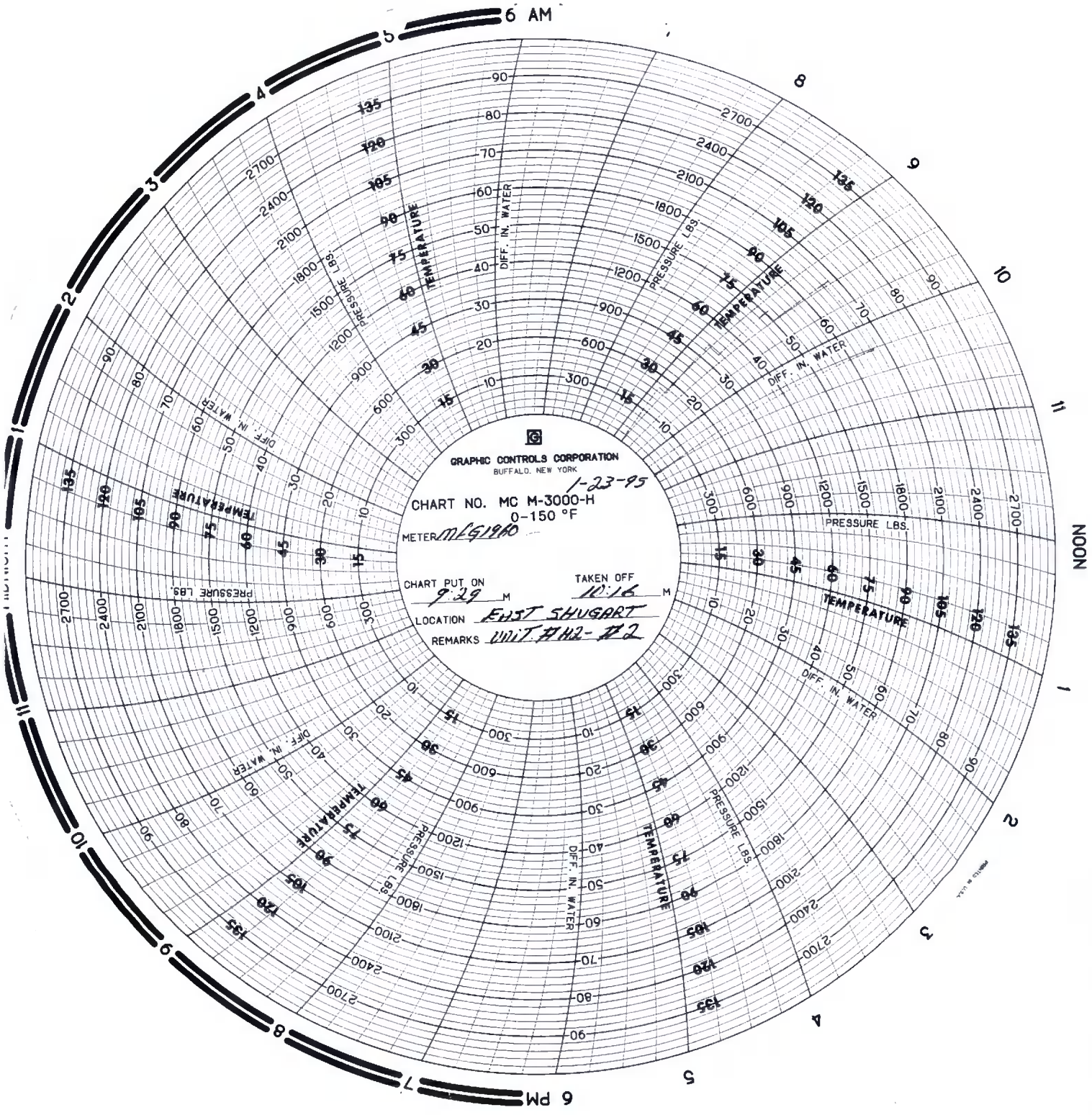
Signed Candace R. Graham Title CANDACE R. GRAHAM ENGINEERING TECH. Date 2/14/95

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

***See Instruction on Reverse Side**


6 AM
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
1-23-95
CHART NO. MC M-3000-H
0-150 °F
METER MC19160
CHART PUT ON 9:29 M
TAKEN OFF 10:16 M
LOCATION EAST SHUGART
REMARKS UNIT #42-#2
PRESSURE LBS.
TEMPERATURE
DIFF. IN. WATER

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**FORM APPROVED**
Budget Bureau No. 1004-0135
Expires March 31, 1993

**SUNDRY NOTICES AND REPORTS ON WELLS**

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

***SUBMIT IN TRIPLICATE***

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other WIW

2. Name of Operator
**DEVON ENERGY CORPORATION (NEVADA)**

3. Address and Telephone No.
**20 NORTH BROADWAY, SUITE 1500, OKLAHOMA CITY, OKLAHOMA 73102 (405) 235-3611**

4. Location of Well (Footage. Sec., T., R., M., or Survey Description)
**660' FNL & 990' FEL Sec. K-34-18S-31E**

A

5. Lease Designation and Serial No.
NM10190

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA, Agreement Designation
14-08-001-11572

8. Well Name and No.
East Shugart Unit #33

9. API Well No.
30-015-26484

10. Field and Pool, or Exploratory Area
Shugart (Y-SR-Q-G)

11. County or Parish, State
Eddy, NM

CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | |
|---|---|---|
| ☐ Notice of Intent | ☐ Abandonment | ☐ Change of Plans |
| ☒ Subsequent Report | ☐ Recompletion | ☐ New Construction |
| ☐ Final Abandonment Notice | ☐ Plugging Back | ☐ Non-Routine Fracturing |
| | ☐ Casing Repair | ☐ Water Shut-Off |
| | ☐ Altering Casing | ☒ Conversion to Injection |
| | ☐ Other _____ | ☐ Dispose Water |

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

As authorized by Order No. WFX-664, the following work was completed to convert the ESU #33 to injection:
01-04-95 thru 01-12-95 PBTD 3370'. TIH w/bit and cleaned out fill to TD. Ran Baker retainer, set at 2490'. Loaded hole w/fresh water. Pumped into Yates perfs at 3 BPM w/1300 psi.
**Dowell sqzd Yates perfs at 2606-2777'** w/200 sx Class C (w/3% salt, 4/10% D-59, 2/10% D-65) + 200 sx Class C (w/1% D-127, 1% $CaCl_2$, 2/10% D-46). Final sqz press 1150 psi.
Pulled out of retainer. Reversed hole clean. Drld retainer at 2500' and hard cement 2650-2785'. Had cement stringers from 2728-2785'. Press tested Yates sqzd perfs 2606-2777' to 500 psi. Bled off to 300 psi in 4 mins. Ran tbg to 2800'.
Spotted 50 sx Class "H" cement (w/4% salt, .25% D-65 dispersant, .75 gal/sx D-60 Latex, 2/10% D-46 defoamer; mixed at 16.5 ppg= 1.07 cf/sx yield. Pulled tbg to 2000'. Reversed out. Dowell press'd to 1000 psi for 15 mins; lost 10 psi. Press'd to 1500 psi for 30 mins; lost zero psi. Press'd to 2000 psi; lost zero psi.
(Continued on reverse.)

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

Signed Candace R. Graham Title CANDACE R. GRAHAM ENGINEERING TECH. Date 2/16/95

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

***See Instruction on Reverse Side**

01-13-95 thru 01-17-95 Drld hard cement 2420-2845' and fell free. Tested csg to 580 psi. In 30 mins CP 535 psi. Drld cement, CIBP at 3390' and on CIBP at 3680'. CIBP fell to 3775'. **Pushed CIBP to 3960'** and circ'd hole clean. Drld on 2nd CIBP.
Ran Baker Lokset nickel-plated packer w/stainless steel on-off connector (L316) and "F" profile nipple (1.81") on 2 7/8" tbg. Set packer at 3298'. Press'd annulus to 550 psi for 30 mins, held OK. Released on-off connector. POH w/connector. Ran on-off connector on 2 3/8" FG tbg.

01-18-95 Circ'd hole w/packer fluid. Latched onto packer (at 3298') w/on-off tool. Pressure tested casing to 520 psi. NMOCD rep, Ken Livingston, witnessed test and OK'd same. Chart attached.
Built wellhead. Well converted to injector. WO injection line tie-in.

6 PM
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MIDNIGHT
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6 AM
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11
NOON
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3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
6 AM
7
8
9
10
11
NOON
TEMPERATURE
PRESSURE LBS.
DIFF. IN. WATER
CHART NO. MC M-3000-H
0-150 °F
TAKEN OFF
CHART PUT ON
LOCATION
REMARKS

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires March 31, 1993

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Use "APPLICATION FOR PERMIT—" for such proposals

***SUBMIT IN TRIPLICATE***

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other WIW

2. Name of Operator
**DEVON ENERGY CORPORATION (NEVADA)**

3. Address and Telephone No.
**20 NORTH BROADWAY, SUITE 1500, OKLAHOMA CITY, OKLAHOMA 73102 (405) 235-3611**

4. Location of Well (Footage. Sec., T., R., M., or Survey Description)
**1650' FNL & 2210' FEL Sec. G-34-18S-31E**

5. Lease Designation and Serial No.
NM10190

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA, Agreement Designation
14-08-001-11572

8. Well Name and No.
East Shugart Unit #41

9. API Well No.
30-015-27676

10. Field and Pool, or Exploratory Area
Shugart (Y-SR-Q-G)

11. County or Parish, State
Eddy, NM

CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | |
|---|---|---|
| ☐ Notice of Intent | ☐ Abandonment | ☐ Change of Plans |
| ☒ Subsequent Report | ☐ Recompletion | ☐ New Construction |
| ☐ Final Abandonment Notice | ☐ Plugging Back | ☐ Non-Routine Fracturing |
| | ☐ Casing Repair | ☐ Water Shut-Off |
| | ☐ Altering Casing | ☒ Conversion to Injection |
| | ☐ Other _____ | ☐ Dispose Water |

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

As authorized by Order No. WFX-664, the following work was completed to convert the ESU #41 to injection:

01-18-95 thru 01-20-95 Unseated pump. Pumped 250 gals 15% NeFe acid down tbg. LD rods in singles. Pulled 2 7/8" tbg. Circ'd 40' sand off RBP. POH w/RBP and tbg. Drld CIBP's at 3720' and 3730'. Pushed CIBP's to 3936' PBTD. Ran nickel plated Baker Lokset packer 2 3/8" x 5 1/2" Model A-3 w/stainless steel on-off tool and "F" profile nipple (1.81") on 2 7/8" tbg. **Set packer at 3544'.** Press'd annulus to 500 psi, held OK. Pulled 2 7/8" tbg. Ran on-off tool on 120 jts 2 3/8" (Star 2000 psi WP) FG tbg.

02-21-95 Circ'd hole w/packer fluid. Latched onto packer w/on-off tool. Packed wellhead. Press tested annulus to 500 psi for 30 mins, held OK. Test witnessed by NMOCD rep Gary Williams. Chart attached.

**01-28-95 Commenced injection at 142 BW w/TP 550 psi in 24 hrs.**

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

Signed Candace R. Graham Title CANDACE R. GRAHAM ENGINEERING TECH. Date 2/16/95

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____

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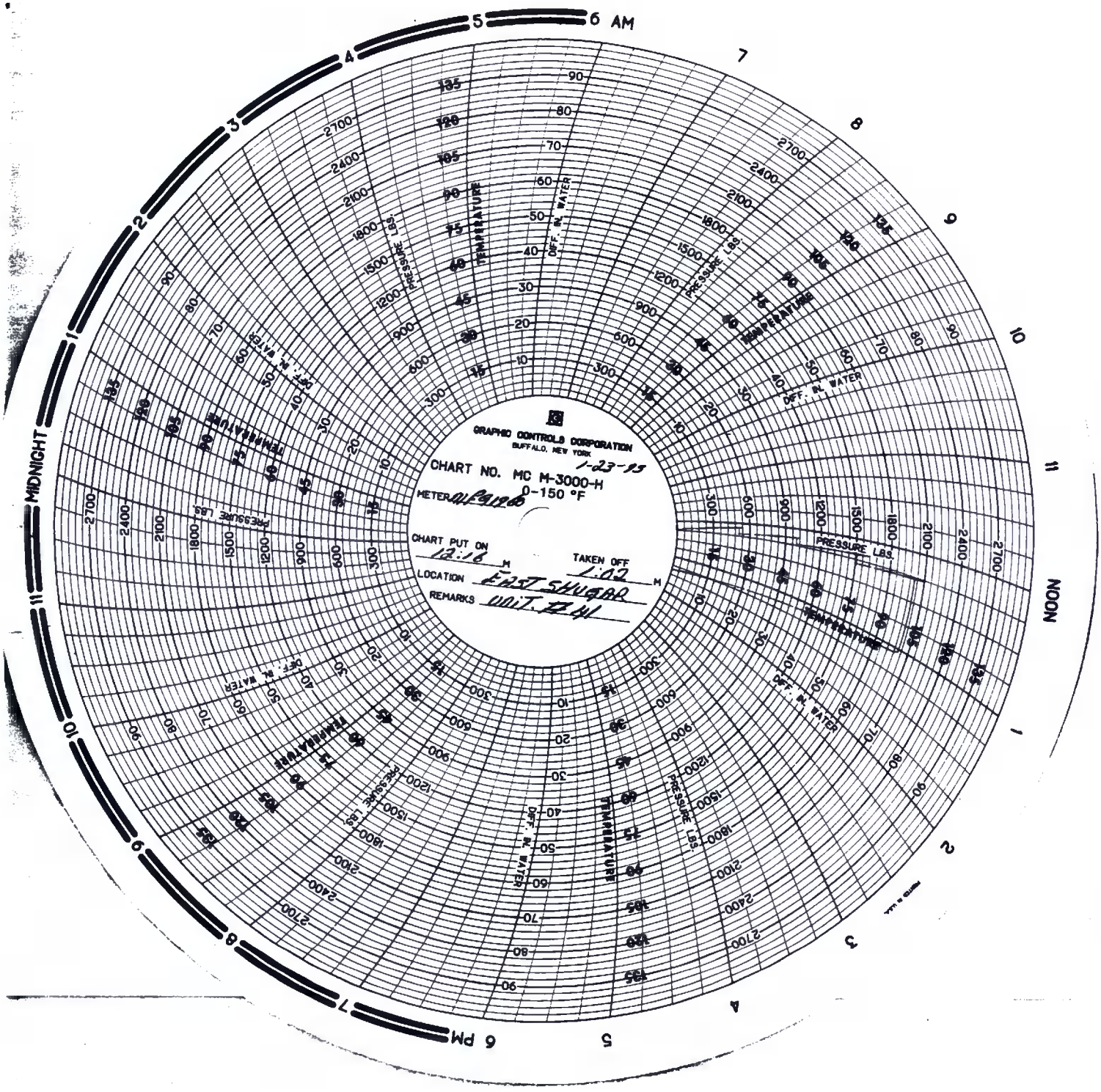
***See Instruction on Reverse Side**


GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
1-23-93
CHART NO. MC M-3000-H
0-150 °F
METER
CHART PUT ON
12:16 M
TAKEN OFF
1:02 M
LOCATION
EAST SHUGAR
REMARKS
UNIT #4
MIDNIGHT
6 AM
NOON
6 PM
PRESSURE LBS.
TEMPERATURE
DIFF. IN. WATER

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
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FORM APPROVED
Budget Bureau No. 1004-0135
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***SUBMIT IN TRIPLICATE***

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other WTW

2. Name of Operator
**DEVON ENERGY CORPORATION (NEVADA)**

3. Address and Telephone No.
**20 NORTH BROADWAY, SUITE 1500, OKLAHOMA CITY, OKLAHOMA 73102 (405) 235-3611**

4. Location of Well (Footage. Sec., T., R., M., or Survey Description)
**330' FNL & 1140' FEL Sec. A-34-18S-31E**

5. Lease Designation and Serial No.
NM10190

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA, Agreement Designation
14-08-001-11572

8. Well Name and No.
East Shugart Unit #42

9. API Well No.
30-015-27670

10. Field and Pool, or Exploratory Area
Shugart (Y-SR-Q-G)

11. County or Parish, State
Eddy, NM

CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | | |
|---|---|---|---|
| ☐ Notice of Intent | ☐ Abandonment | ☐ Change of Plans | |
| ☒ Subsequent Report | ☐ Recompletion | ☐ New Construction | |
| ☐ Final Abandonment Notice | ☐ Plugging Back | ☐ Non-Routine Fracturing | |
| | ☐ Casing Repair | ☐ Water Shut-Off | |
| | ☐ Altering Casing | ☒ Conversion to Injection | |
| | ☐ Other ____ | ☐ Dispose Water | |

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

**NMOCD order #WFX 664; Permit #123-2920-94-A**

12-27-94: RIH w/ 4 3/4" bit, csg scrapper & 2 7/8" tbg to 3950'. Circ hole clean w/fresh wtr. Pulled tbg, scraper & bit. Ran Baker Loc Set pkr (nickle plated) w/stainless steel Model L-316 ON-OFF CONNECTOR + 1.81" "F" profile nipple on 2 7/8" tbg. Set pkr @ 3549'. RU Charger & acidized Queen perfs @ 3641'-3812' w/5000 gals 15% NeFe acid using 64 ball sealers. Did not ball out. Over flushed w/70 barrels fresh wtr. Max press 2020 psi, avg press 1750 psi @ 5.1 BPM, ISIP 1450 psi, 5 min 1360 psi, 10 min 1320 psi, 15 min 1290 psi. Flowed well back to pit. Left flowing to pit overnight.

12-28-94: Released on-off tool. Pulled & LD 120 jts 2 7/8" work string. Ran 2 3/8" fiberglass tbg w/on-off tool on btm. Circ hole clean w/pkr fluid (fresh wtr + corrosion inhibitor). Latched onto pkr w/on-off tool. Press annulus to 500 psi for 30 mins. RD unit. NMOCD notified, but did not witness test. Well converted to injection. WO tie-in to injection system.

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

Signed E. L. Buttross Jr. Title E. L. Buttross, Jr. District Engineer Date 1/11/95

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____

Conditions of approval, if any:

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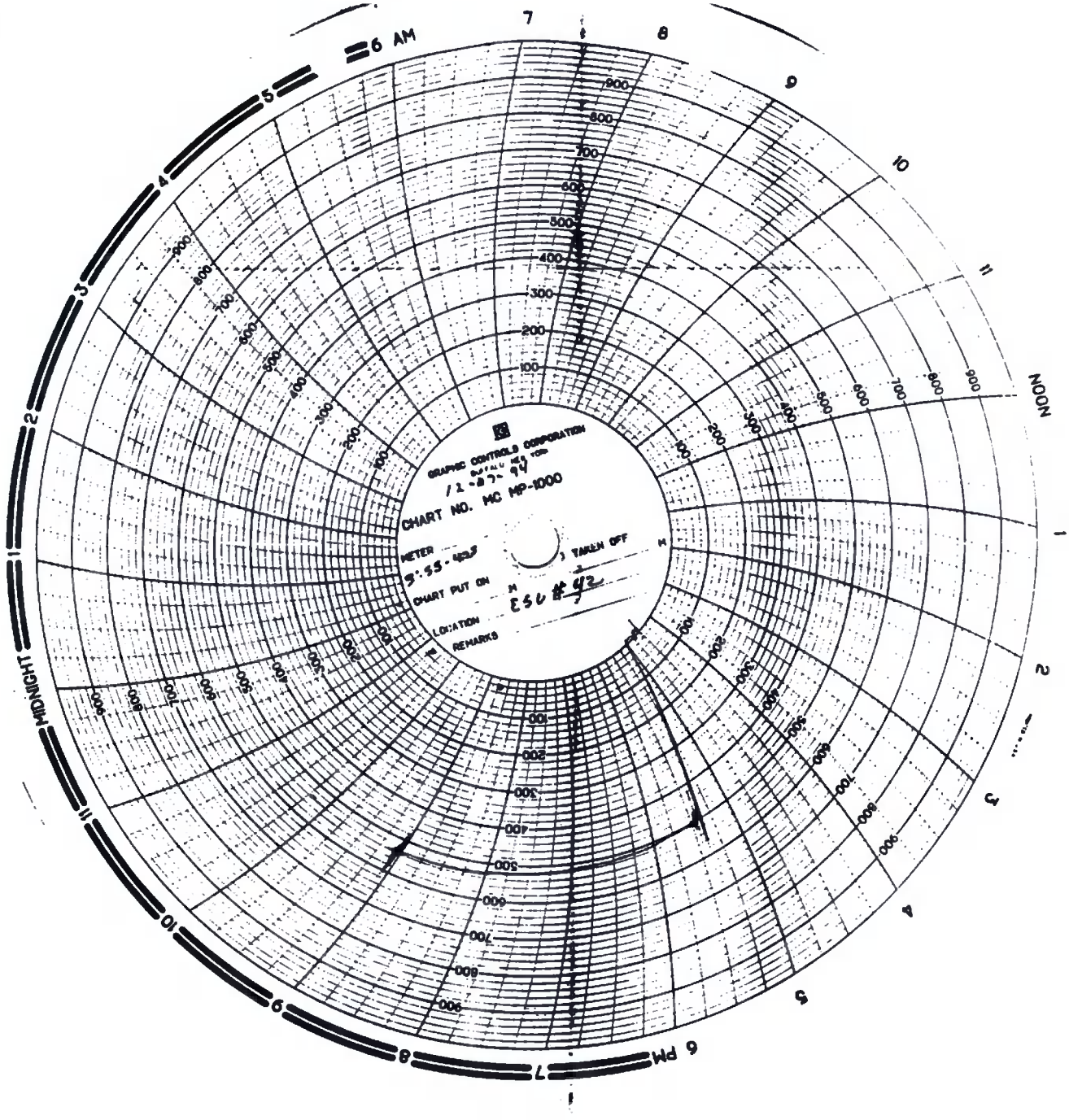
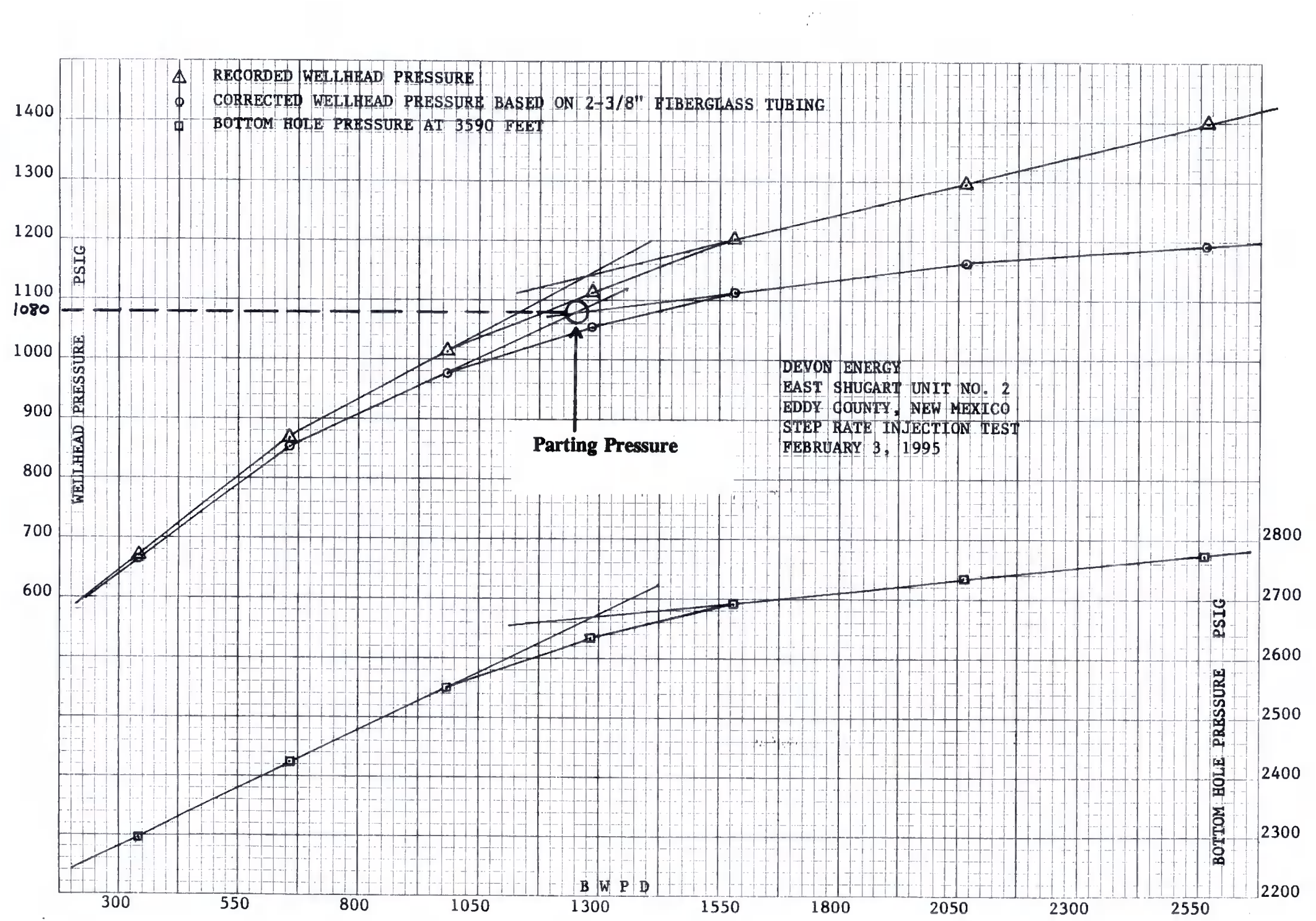
*See Instruction on Reverse Side




OK


RECORDED WELLHEAD PRESSURE
CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" FIBERGLASS TUBING
BOTTOM HOLE PRESSURE AT 3590 FEET
1400
1300
1200
1100
1080
1000
900
800
700
600
WELLHEAD PRESSURE PSIG
Parting Pressure
DEVON ENERGY
EAST SHUGART UNIT NO. 2
EDDY COUNTY, NEW MEXICO
STEP RATE INJECTION TEST
FEBRUARY 3, 1995
2800
2700
2600
2500
2400
2300
2200
BOTTOM HOLE PRESSURE PSIG
B W P D
300
550
800
1050
1300
1550
1800
2050
2300
2550

# WEST – TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY

DATE: FEBRUARY 3, 1995

WELL NAME: EAST SHUGART UNIT NO.2
EDDY COUNTY, NEW MEXICO

WO#: 95-14-0142

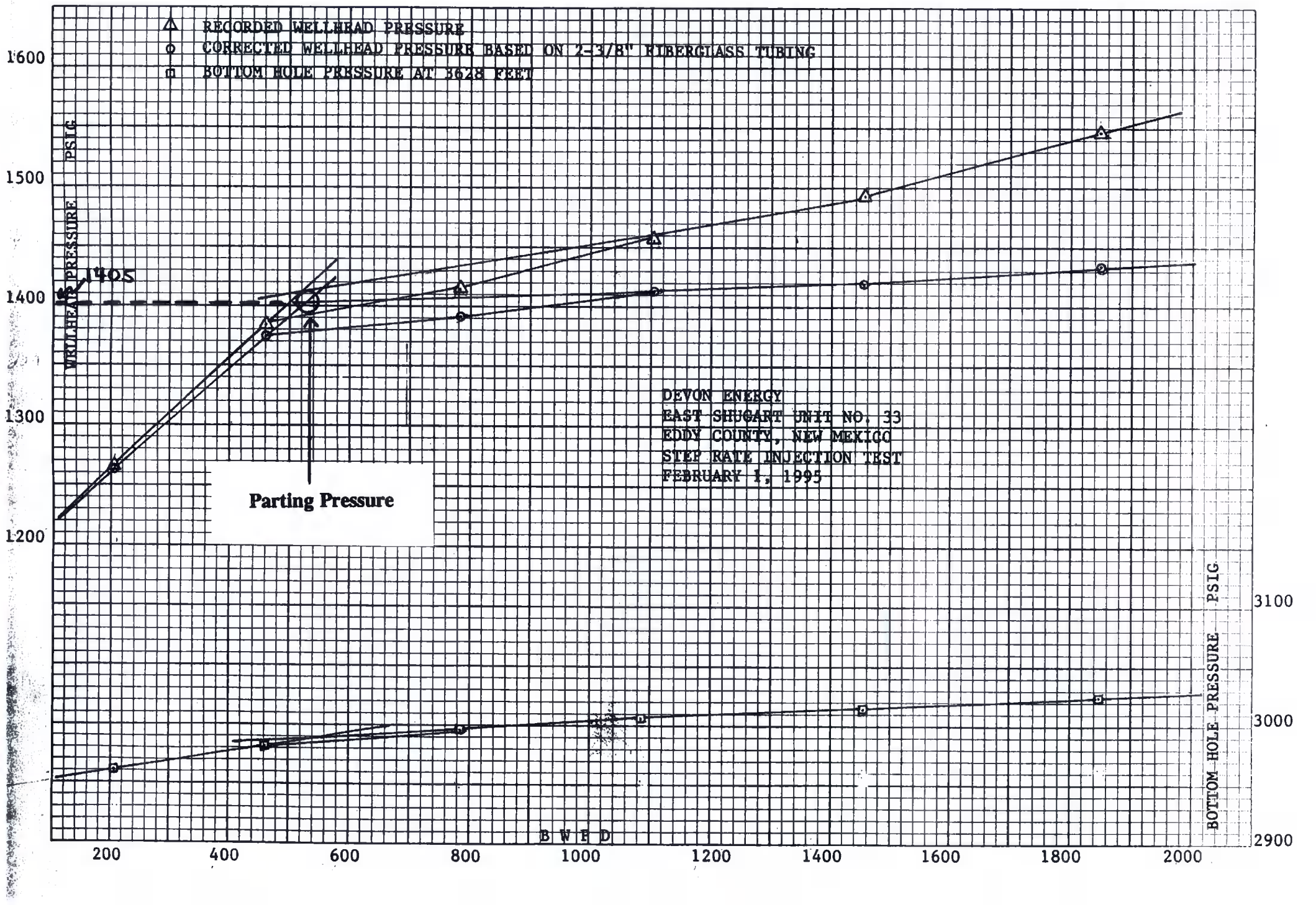
**PERFS = 3298-3882**

**PACKER DEPTH = 3200**

**BHP GAUGE DEPTH = 3590**

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS. (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 9:10 | 497.1 | | | | 497.1 | | 2186.0 |
| | 9:15 | 549.4 | 1.3 | 374.4 | 5.911 | 543.5 | 10.92 | 2220.0 |
| | 9:20 | 573.6 | 2.5 | 345.6 | 5.097 | 568.5 | 10.08 | 2240.0 |
| | 9:25 | 602.8 | 3.6 | 316.8 | 4.339 | 598.5 | 9.24 | 2257.0 |
| | 9:30 | 624.3 | 4.8 | 345.6 | 5.097 | 619.2 | 10.08 | 2272.0 |
| | 9:35 | 646.9 | 6.0 | 345.6 | 5.097 | 641.8 | 10.08 | 2285.0 |
| 1 | 9:40 | 669.5 | 7.1 | 316.8 | 4.339 | 665.2 | 9.24 | 2295.0 |
| | | | | 340.8 | | | | |
| | 9:45 | 739.4 | 9.4 | 662.4 | 16.984 | 722.4 | 19.32 | 2328.0 |
| | 9:50 | 781.3 | 11.7 | 662.4 | 16.984 | 764.3 | 19.32 | 2351.0 |
| | 9:55 | 801.5 | 13.9 | 633.6 | 15.643 | 785.9 | 18.48 | 2372.0 |
| | 10:00 | 824.3 | 16.2 | 662.4 | 16.984 | 807.3 | 19.32 | 2391.0 |
| | 10:05 | 852.3 | 18.5 | 662.4 | 16.984 | 835.3 | 19.32 | 2408.0 |
| 2 | 10:10 | 871.3 | 20.8 | 662.4 | 16.984 | 854.3 | 19.32 | 2422.0 |
| | | | | 657.6 | | | | |
| | 10:15 | 926.0 | 24.2 | 979.2 | 35.001 | 891.0 | 28.56 | 2453.0 |
| | 10:20 | 943.7 | 27.6 | 979.2 | 35.001 | 908.7 | 28.56 | 2481.0 |
| | 10:25 | 966.5 | 31.0 | 979.2 | 35.001 | 931.5 | 28.56 | 2502.0 |
| | 10:30 | 984.2 | 34.4 | 972.2 | 34.539 | 949.7 | 28.36 | 2520.0 |
| | 10:35 | 999.4 | 37.9 | 1008.0 | 36.929 | 962.5 | 29.40 | 2536.0 |
| 3 | 10:40 | 1013.4 | 41.3 | 979.2 | 35.001 | 978.4 | 28.56 | 2549.0 |
| | | | | 984.0 | | | | |
| | 10:45 | 1053.0 | 45.8 | 1296.0 | 58.787 | 994.2 | 37.80 | 2571.0 |
| | 10:50 | 1069.6 | 50.2 | 1267.2 | 56.393 | 1013.2 | 36.96 | 2587.0 |
| | 10:55 | 1084.9 | 54.7 | 1296.0 | 58.787 | 1026.1 | 37.80 | 2601.0 |
| | 11:00 | 1100.2 | 59.2 | 1296.0 | 58.787 | 1041.4 | 37.80 | 2613.0 |
| | 11:05 | 1105.2 | 63.7 | 1296.0 | 58.787 | 1046.4 | 37.80 | 2624.0 |
| 4 | 11:10 | 1111.5 | 68.1 | 1267.2 | 56.393 | 1055.1 | 36.96 | 2633.0 |
| | | | | 1286.4 | | | | |

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS. (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 11:15 | 1160.0 | 73.6 | 1584.0 | 85.214 | 1074.8 | 46.20 | 2649.0 |
| | 11:20 | 1166.3 | 79.1 | 1584.0 | 85.214 | 1081.1 | 46.20 | 2660.0 |
| | 11:25 | 1175.1 | 84.6 | 1584.0 | 85.214 | 1089.9 | 46.20 | 2670.0 |
| | 11:30 | 1187.7 | 90.1 | 1584.0 | 85.214 | 1102.5 | 46.20 | 2678.0 |
| | 11:35 | 1194.0 | 95.5 | 1555.2 | 82.370 | 1111.6 | 45.36 | 2686.0 |
| 5 | 11:40 | 1201.6 | 101.0 | 1584.0 | 85.214 | 1116.4 | 46.20 | 2693.0 |
| | | | | 1579.2 | | | | |
| | 11:45 | 1265.5 | 108.2 | 2073.6 | 140.251 | 1125.2 | 60.48 | 2706.0 |
| | 11:50 | 1273.2 | 115.3 | 2044.8 | 136.669 | 1136.5 | 59.64 | 2716.0 |
| | 11:55 | 1284.6 | 122.5 | 2073.6 | 140.251 | 1144.3 | 60.48 | 2722.0 |
| | 12:00 | 1289.7 | 129.7 | 2073.6 | 140.251 | 1149.4 | 60.48 | 2730.0 |
| | 12:05 | 1292.2 | 136.9 | 2073.6 | 140.251 | 1151.9 | 60.48 | 2734.0 |
| 6 | 12:10 | 1297.3 | 144.0 | 2044.8 | 136.669 | 1160.6 | 59.64 | 2738.0 |
| | | | | 2064.0 | | | | |
| | 12:15 | 1374.0 | 152.8 | 2534.4 | 203.298 | 1170.7 | 73.92 | 2749.0 |
| | 12:20 | 1377.8 | 161.7 | 2563.2 | 207.593 | 1170.2 | 74.76 | 2756.0 |
| | 12:25 | 1385.5 | 170.7 | 2592.0 | 211.928 | 1173.6 | 75.60 | 2761.0 |
| | 12:30 | 1390.6 | 179.5 | 2534.4 | 203.298 | 1187.3 | 73.92 | 2766.0 |
| | 12:35 | 1395.6 | 188.5 | 2596.0 | 212.534 | 1183.1 | 75.72 | 2769.0 |
| 7 | 12:40 | 1399.4 | 197.4 | 2563.2 | 207.593 | 1191.8 | 74.76 | 2772.0 |
| | | | | 2563.2 | | | | |
| FALLOFF | 12:41 | 1186.2 | | | | 1186.2 | | 2762.0 |
| | 12:42 | 1185.5 | | | | 1185.5 | | 2757.0 |
| | 12:43 | 1181.6 | | | | 1181.6 | | 2753.0 |
| | 12:44 | 1179.1 | | | | 1179.1 | | 2749.0 |
| | 12:45 | 1176.5 | | | | 1176.5 | | 2746.0 |
| | 12:50 | 1167.4 | | | | 1167.4 | | 2736.0 |
| | 12:55 | 1159.7 | | | | 1159.7 | | 2729.0 |


RECORDED WELLHEAD PRESSURE
CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" FIBERGLASS TUBING
BOTTOM HOLE PRESSURE AT 3628 FEET
WELLHEAD PRESSURE PSIG
BOTTOM HOLE PRESSURE PSIG
1405
Parting Pressure
DEVON ENERGY
EAST SHUGART UNIT NO. 33
EDDY COUNTY, NEW MEXICO
STEP RATE INJECTION TEST
FEBRUARY 1, 1995
B W P D
1600
1500
1400
1300
1200
3100
3000
2900
200
400
600
800
1000
1200
1400
1600
1800
2000

# WEST–TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY

DATE: FEBRUARY 1, 1995

WELL NAME: EAST SHUGART UNIT NO. 33
EDDY COUNTY, NEW MEXICO

WO#: 95–14–0143

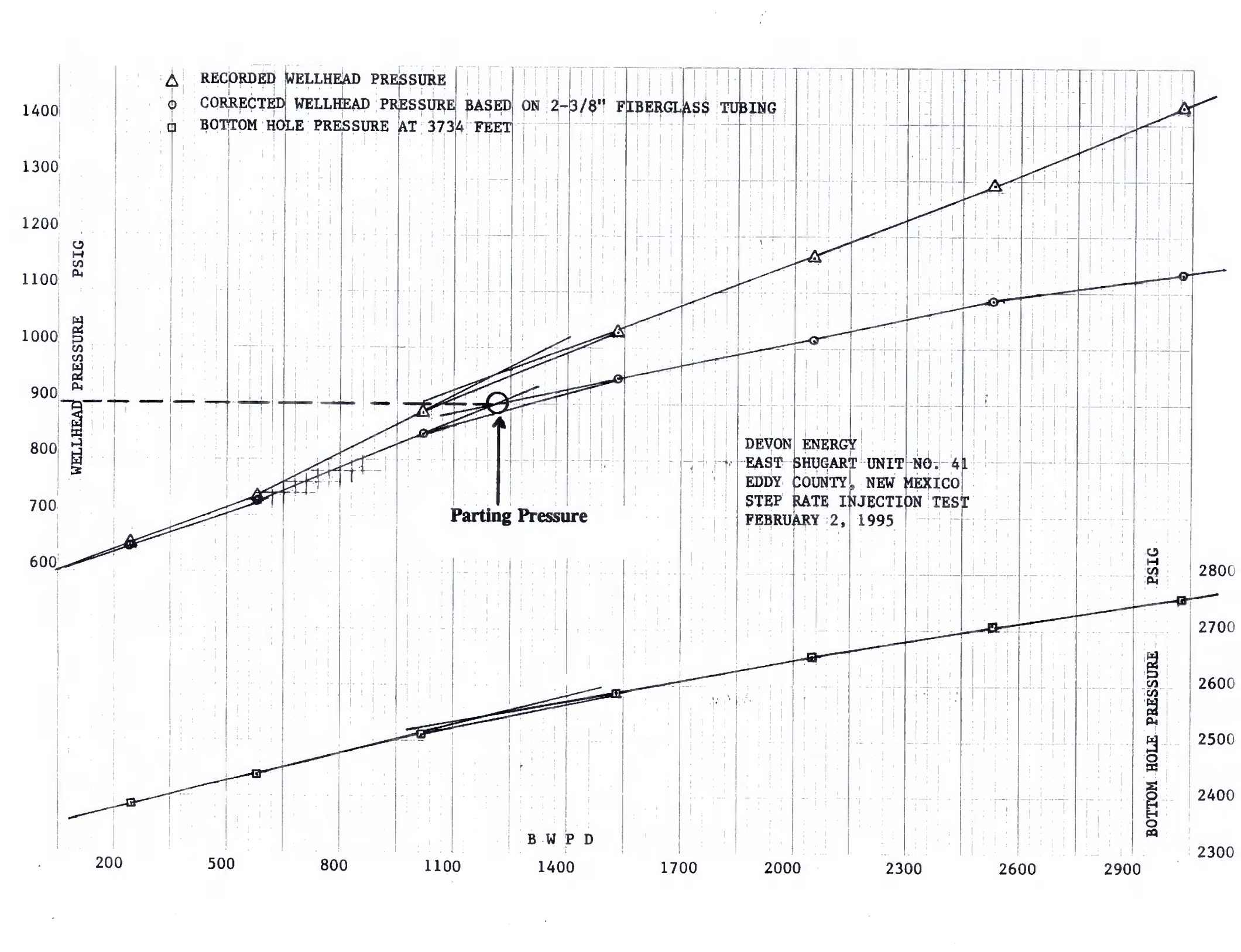
**PERFS = 3400–3857**

**PACKER DEPTH = 3298**

**BHP GAUGE DEPTH = 3628**

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS (psi) (1)–(4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 9:35 | 1217.4 | | | | 1217.4 | | 2940.0 |
| | 9:40 | 1242.7 | 0.9 | 259.2 | 3.025 | 1239.7 | 7.56 | 2957.0 |
| | 9:45 | 1254.1 | 1.8 | 259.2 | 3.025 | 1251.1 | 7.56 | 2960.0 |
| | 9:50 | 1253.9 | 2.5 | 201.6 | 1.900 | 1252.0 | 5.88 | 2957.0 |
| | 9:55 | 1262.8 | 3.1 | 172.8 | 1.429 | 1261.4 | 5.04 | 2958.0 |
| | 10:00 | 1268.9 | 3.7 | 172.8 | 1.429 | 1267.5 | 5.04 | 2960.0 |
| 1 | 10:05 | 1266.1 | 4.3 | 172.8 | 1.429 | 1264.7 | 5.04 | 2960.0 |
| | | | | 206.4 | | | | |
| | 10:10 | 1293.9 | 5.8 | 432.0 | 7.784 | 1286.1 | 12.60 | 2973.0 |
| | 10:15 | 1333.3 | 7.4 | 460.8 | 8.771 | 1324.5 | 13.44 | 2977.0 |
| | 10:20 | 1331.6 | 9.0 | 460.8 | 8.771 | 1322.8 | 13.44 | 2978.0 |
| | 10:25 | 1362.0 | 10.7 | 489.6 | 9.812 | 1352.2 | 14.28 | 2979.0 |
| | 10:30 | 1362.9 | 12.3 | 460.8 | 8.771 | 1354.1 | 13.44 | 2980.0 |
| 2 | 10:35 | 1383.0 | 13.9 | 460.8 | 8.771 | 1374.2 | 13.44 | 2980.0 |
| | | | | 460.8 | | | | |
| | 10:40 | 1400.6 | 16.6 | 777.6 | 23.091 | 1377.5 | 22.68 | 2989.0 |
| | 10:45 | 1400.6 | 19.3 | 777.6 | 23.091 | 1377.5 | 22.68 | 2991.0 |
| | 10:50 | 1407.6 | 22.0 | 777.6 | 23.091 | 1384.5 | 22.68 | 2992.0 |
| | 10:55 | 1411.2 | 24.7 | 777.6 | 23.091 | 1388.1 | 22.68 | 2993.0 |
| | 11:00 | 1417.4 | 27.5 | 806.4 | 24.698 | 1392.7 | 23.52 | 2994.0 |
| 3 | 11:05 | 1414.7 | 30.2 | 777.6 | 23.091 | 1391.6 | 22.68 | 2996.0 |
| | | | | 782.4 | | | | |
| | 11:10 | 1450.5 | 33.9 | 1065.6 | 41.361 | 1409.1 | 31.08 | 3002.0 |
| | 11:15 | 1454.2 | 37.7 | 1094.4 | 43.452 | 1410.7 | 31.92 | 3005.0 |
| | 11:20 | 1459.3 | 41.5 | 1094.4 | 43.452 | 1415.8 | 31.92 | 3004.0 |
| | 11:25 | 1452.9 | 45.2 | 1065.6 | 41.361 | 1411.5 | 31.08 | 3005.0 |
| | 11:30 | 1457.9 | 49.0 | 1094.4 | 43.452 | 1414.4 | 31.92 | 3006.0 |
| 4 | 11:35 | 1456.6 | 52.8 | 1094.4 | 43.452 | 1413.1 | 31.92 | 3007.0 |
| | | | | 1084.8 | | | | |

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS. (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEAGURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 11:40 | 1493.7 | 57.8 | 1440.0 | 72.195 | 1421.5 | 42.00 | 3014.0 |
| | 11:45 | 1493.8 | 62.8 | 1440.0 | 72.195 | 1421.6 | 42.00 | 3016.0 |
| | 11:50 | 1500.2 | 67.9 | 1468.8 | 74.889 | 1425.3 | 42.84 | 3016.0 |
| | 11:55 | 1495.0 | 72.9 | 1440.0 | 72.195 | 1422.8 | 42.00 | 3017.0 |
| | 12:00 | 1497.4 | 78.0 | 1468.8 | 74.889 | 1422.5 | 42.84 | 3016.0 |
| 5 | 12:05 | 1493.4 | 83.1 | 1468.8 | 74.889 | 1418.5 | 42.84 | 3014.0 |
| | | | | 1454.4 | | | | |
| | 12:10 | 1547.0 | 89.6 | 1872.0 | 117.301 | 1429.7 | 54.60 | 3023.0 |
| | 12:15 | 1545.6 | 96.0 | 1843.2 | 113.985 | 1431.6 | 53.76 | 3024.0 |
| | 12:20 | 1550.6 | 102.4 | 1843.2 | 113.985 | 1436.6 | 53.76 | 3024.0 |
| | 12:25 | 1537.7 | 108.9 | 1872.0 | 117.301 | 1420.4 | 54.60 | 3024.0 |
| | 12:30 | 1540.2 | 115.2 | 1814.4 | 110.712 | 1429.5 | 52.92 | 3023.0 |
| 6 | 12:35 | 1546.6 | 121.6 | 1843.2 | 113.985 | 1432.6 | 53.76 | 3024.0 |
| | | | | 1848.0 | | | | |
| FALLOFF | 12:36 | 1409.6 | | | | 1409.6 | | 3005.0 |
| | 12:37 | 1410.9 | | | | 1410.9 | | 3002.0 |
| | 12:38 | 1408.3 | | | | 1408.3 | | 2999.0 |
| | 12:39 | 1407.0 | | | | 1407.0 | | 2997.0 |
| | 12:40 | 1405.8 | | | | 1405.8 | | 2994.0 |
| | 12:45 | 1401.9 | | | | 1401.9 | | 2990.0 |
| | 12:50 | 1399.3 | | | | 1399.3 | | 2987.0 |


RECORDED WELLHEAD PRESSURE
CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" FIBERGLASS TUBING
BOTTOM HOLE PRESSURE AT 3734 FEET
WELLHEAD PRESSURE PSIG
BOTTOM HOLE PRESSURE PSIG
B W P D
Parting Pressure
DEVON ENERGY
EAST SHUGART UNIT NO. 41
EDDY COUNTY, NEW MEXICO
STEP RATE INJECTION TEST
FEBRUARY 2, 1995
1400
1300
1200
1100
1000
900
800
700
600
2800
2700
2600
2500
2400
2300
200
500
800
1100
1400
1700
2000
2300
2600
2900

# WEST – TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY

DATE: FEBRUARY 2, 1995

WELL NAME: EAST SHUGART UNIT NO. 41
EDDY COUNTY, NEW MEXICO

WO#: 95-14-0144

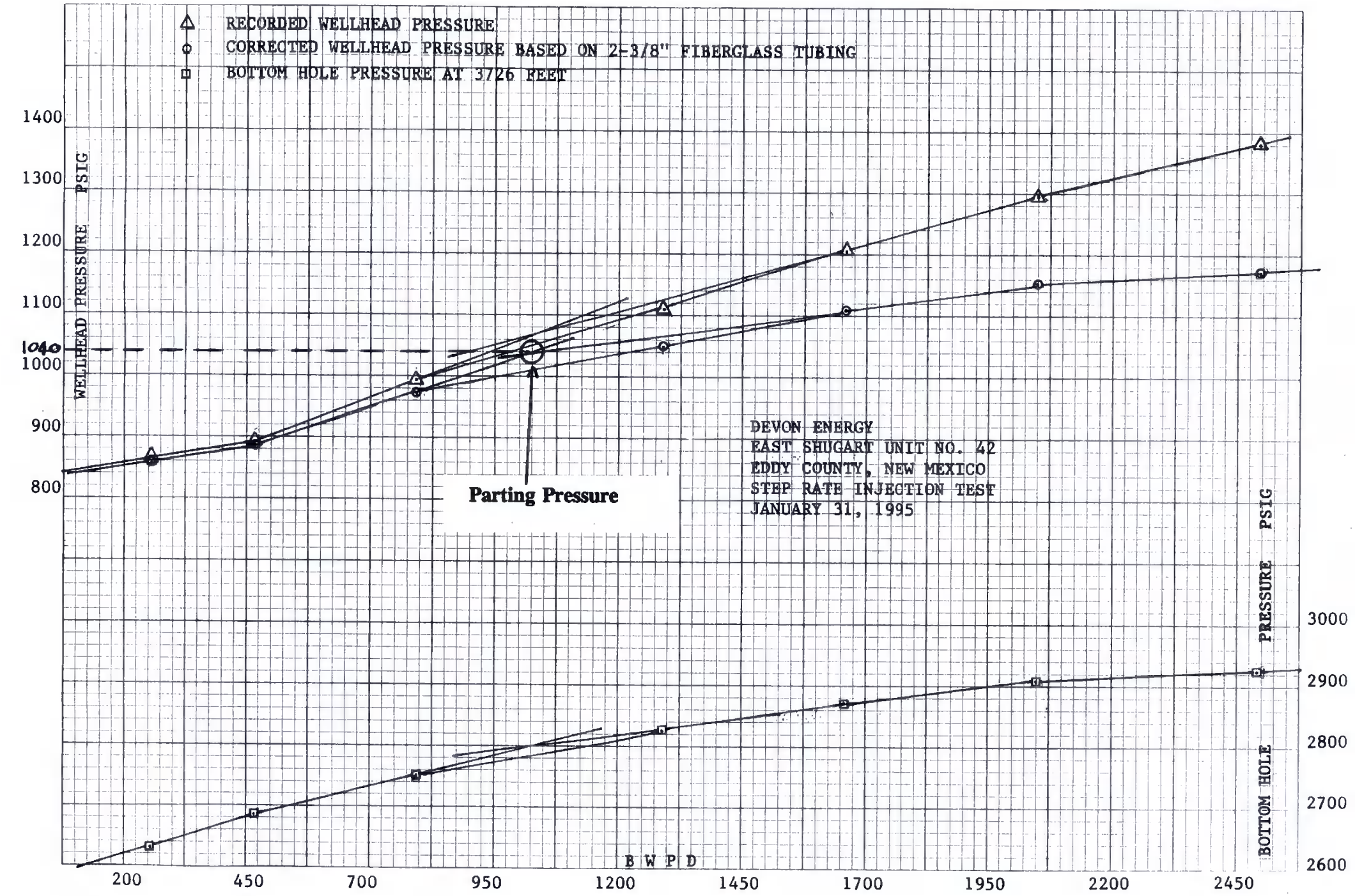
**PERFS = 3634-3835**

**PACKER DEPTH = 3544**

**BHP GAUGE DEPTH = 3734**

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS. (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 9:25 | 591.4 | | | | 591.4 | | 2342.0 |
| | 9:30 | 606.3 | 0.9 | 259.2 | 3.114 | 603.2 | 7.56 | 2356.0 |
| | 9:35 | 614.9 | 1.8 | 259.2 | 3.114 | 611.8 | 7.56 | 2362.0 |
| | 9:40 | 626.1 | 2.6 | 230.4 | 2.504 | 623.6 | 6.72 | 2370.0 |
| | 9:45 | 633.4 | 3.4 | 230.4 | 2.504 | 630.9 | 6.72 | 2373.0 |
| | 9:50 | 640.7 | 4.3 | 259.2 | 3.114 | 637.6 | 7.56 | 2379.0 |
| 1 | 9:55 | 644.2 | 5.1 | 230.4 | 2.504 | 641.7 | 6.72 | 2382.0 |
| | | | | 244.8 | | | | |
| | 10:00 | 677.1 | 7.2 | 604.8 | 14.929 | 662.2 | 17.64 | 2398.0 |
| | 10:05 | 699.8 | 9.2 | 576.0 | 13.640 | 686.2 | 16.80 | 2409.0 |
| | 10:10 | 714.8 | 11.2 | 576.0 | 13.640 | 701.2 | 16.80 | 2416.0 |
| | 10:15 | 728.6 | 13.2 | 576.0 | 13.640 | 715.0 | 16.80 | 2425.0 |
| | 10:20 | 725.8 | 15.2 | 576.0 | 13.640 | 712.2 | 16.80 | 2432.0 |
| 2 | 10:25 | 737.0 | 17.3 | 576.0 | 13.640 | 723.4 | 16.80 | 2438.0 |
| | | | | 585.6 | | | | |
| | 10:30 | 780.3 | 20.8 | 1008.0 | 38.410 | 741.9 | 29.40 | 2459.0 |
| | 10:35 | 810.7 | 24.3 | 1008.0 | 38.410 | 772.3 | 29.40 | 2473.0 |
| | 10:40 | 833.6 | 27.8 | 1008.0 | 38.410 | 795.2 | 29.40 | 2485.0 |
| | 10:45 | 856.4 | 31.4 | 1036.8 | 40.465 | 815.9 | 30.24 | 2495.0 |
| | 10:50 | 869.1 | 34.9 | 1008.0 | 38.410 | 830.7 | 29.40 | 2503.0 |
| 3 | 10:55 | 883.1 | 38.5 | 1036.8 | 40.465 | 842.6 | 30.24 | 2512.0 |
| | | | | 1017.6 | | | | |
| | 11:00 | 953.3 | 43.9 | 1555.2 | 85.674 | 867.6 | 45.36 | 2533.0 |
| | 11:05 | 972.4 | 49.2 | 1526.4 | 82.762 | 889.6 | 44.52 | 2547.0 |
| | 11:10 | 992.8 | 54.5 | 1526.4 | 82.762 | 910.0 | 44.52 | 2561.0 |
| | 11:15 | 1004.2 | 59.8 | 1526.4 | 82.762 | 921.4 | 44.52 | 2571.0 |
| | 11:20 | 1015.6 | 65.2 | 1555.2 | 85.674 | 929.9 | 45.36 | 2580.0 |
| 4 | 11:25 | 1029.7 | 70.5 | 1526.4 | 82.762 | 946.9 | 44.52 | 2587.0 |
| | | | | 1536.0 | | | | |

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 11:30 | 1105.4 | 77.6 | 2044.8 | 142.151 | 963.2 | 59.64 | 2606.0 |
| | 11:35 | 1123.5 | 84.7 | 2044.8 | 142.151 | 981.3 | 59.64 | 2618.0 |
| | 11:40 | 1136.6 | 91.8 | 2044.8 | 142.151 | 994.4 | 59.64 | 2629.0 |
| | 11:45 | 1144.5 | 98.9 | 2044.8 | 142.151 | 1002.3 | 59.64 | 2637.0 |
| | 11:50 | 1155.0 | 106.0 | 2044.8 | 142.151 | 1012.8 | 59.64 | 2646.0 |
| 5 | 11:55 | 1161.7 | 113.2 | 2073.6 | 145.877 | 1015.8 | 60.48 | 2653.0 |
| | | | | 2049.6 | | | | |
| | 12:00 | 1251.6 | 122.0 | 2534.4 | 211.453 | 1040.1 | 73.92 | 2669.0 |
| | 12:05 | 1260.8 | 130.8 | 2534.4 | 211.453 | 1049.3 | 73.92 | 2680.0 |
| | 12:10 | 1271.2 | 139.7 | 2563.2 | 215.920 | 1055.3 | 74.76 | 2688.0 |
| | 12:15 | 1276.6 | 148.4 | 2505.6 | 207.029 | 1069.6 | 73.08 | 2695.0 |
| | 12:20 | 1284.5 | 157.2 | 2534.4 | 211.453 | 1073.0 | 73.92 | 2703.0 |
| 6 | 12:25 | 1293.6 | 166.0 | 2534.4 | 211.453 | 1082.1 | 73.92 | 2710.0 |
| | | | | 2534.4 | | | | |
| | 12:30 | 1385.9 | 176.5 | 3024.0 | 293.171 | 1092.7 | 88.20 | 2723.0 |
| | 12:35 | 1395.0 | 187.1 | 3052.8 | 298.357 | 1096.6 | 89.04 | 2733.0 |
| | 12:40 | 1402.8 | 197.6 | 3024.0 | 293.171 | 1109.6 | 88.20 | 2740.0 |
| | 12:45 | 1410.5 | 208.1 | 3024.0 | 293.171 | 1117.3 | 88.20 | 2746.0 |
| | 12:50 | 1411.9 | 218.5 | 2995.2 | 288.026 | 1123.9 | 87.36 | 2752.0 |
| 7 | 12:55 | 1429.9 | 229.1 | 3052.8 | 298.357 | 1131.5 | 89.04 | 2758.0 |
| | | | | 3028.8 | | | | |
| FALLOFF | 12:56 | 1125.1 | | | | 1125.1 | | 2737.0 |
| | 12:57 | 1102.1 | | | | 1102.1 | | 2731.0 |
| | 12:58 | 1097.0 | | | | 1097.0 | | 2726.0 |
| | 12:59 | 1094.4 | | | | 1094.4 | | 2723.0 |
| | 1:00 | 1090.6 | | | | 1090.6 | | 2718.0 |
| | 1:05 | 1077.8 | | | | 1077.8 | | 2705.0 |
| | 1:10 | 1066.3 | | | | 1066.3 | | 2693.0 |


RECORDED WELLHEAD PRESSURE
CORRECTED WELLHEAD PRESSURE BASED ON 2-3/8" FIBERGLASS TUBING
BOTTOM HOLE PRESSURE AT 3726 FEET
WELLHEAD PRESSURE PSIG
1400
1300
1200
1100
1040
1000
900
800
Parting Pressure
DEVON ENERGY
EAST SHUGART UNIT NO. 42
EDDY COUNTY, NEW MEXICO
STEP RATE INJECTION TEST
JANUARY 31, 1995
BOTTOM HOLE PRESSURE PSIG
3000
2900
2800
2700
2600
B W P D
200
450
700
950
1200
1450
1700
1950
2200
2450

# WEST – TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: DEVON ENERGY

DATE: JANUARY 31, 1995

WELL NAME: EAST SHUGART UNIT NO. 42
EDDY COUNTY, NEW MEXICO

WO#: 95-14-0145

**PERFS = 3641 – 3812**

**PACKER DEPTH = 3549**

**BHP GAUGE DEPTH = 3726**

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 11:45 | 847.9 | | | | 847.9 | | 2584.0 |
| | 11:50 | 853.9 | 1.1 | 316.8 | 4.504 | 849.4 | 9.24 | 2595.0 |
| | 11:55 | 855.9 | 1.9 | 230.4 | 2.499 | 853.4 | 6.72 | 2604.0 |
| | 12:00 | 861.9 | 2.7 | 230.4 | 2.499 | 859.4 | 6.72 | 2610.0 |
| | 12:05 | 858.9 | 3.6 | 259.2 | 3.107 | 855.8 | 7.56 | 2616.0 |
| | 12:10 | 861.1 | 4.4 | 230.4 | 2.499 | 858.6 | 6.72 | 2622.0 |
| 1 | 12:15 | 862.1 | 5.3 | 259.2 | 3.107 | 859.0 | 7.56 | 2628.0 |
| | | | | 254.4 | | | | |
| | 12:20 | 879.7 | 6.9 | 460.8 | 9.008 | 870.7 | 13.44 | 2640.0 |
| | 12:25 | 874.4 | 8.6 | 489.6 | 10.077 | 864.3 | 14.28 | 2651.0 |
| | 12:30 | 885.8 | 10.2 | 460.8 | 9.008 | 876.8 | 13.44 | 2660.0 |
| | 12:35 | 875.5 | 11.8 | 460.8 | 9.008 | 866.5 | 13.44 | 2668.0 |
| | 12:40 | 878.0 | 13.5 | 489.6 | 10.077 | 867.9 | 14.28 | 2677.0 |
| 2 | 12:45 | 892.0 | 15.1 | 460.8 | 9.008 | 883.0 | 13.44 | 2684.0 |
| | | | | 470.4 | | | | |
| | 12:50 | 936.7 | 17.8 | 777.6 | 23.714 | 913.0 | 22.68 | 2701.0 |
| | 12:55 | 953.4 | 20.6 | 806.4 | 25.365 | 928.0 | 23.52 | 2713.0 |
| | 1:00 | 963.6 | 23.4 | 806.4 | 25.365 | 938.2 | 23.52 | 2724.0 |
| | 1:05 | 976.4 | 26.2 | 806.4 | 25.365 | 951.0 | 23.52 | 2733.0 |
| | 1:10 | 989.1 | 28.9 | 777.6 | 23.714 | 965.4 | 22.68 | 2743.0 |
| 3 | 1:15 | 998.2 | 31.7 | 806.4 | 25.365 | 972.8 | 23.52 | 2751.0 |
| | | | | 796.8 | | | | |
| | 1:20 | 1062.1 | 36.1 | 1267.2 | 58.530 | 1003.6 | 36.96 | 2771.0 |
| | 1:25 | 1073.6 | 40.7 | 1324.8 | 63.546 | 1010.1 | 38.64 | 2785.0 |
| | 1:30 | 1082.4 | 45.1 | 1267.2 | 58.530 | 1023.9 | 36.96 | 2795.0 |
| | 1:35 | 1092.6 | 49.6 | 1296.0 | 61.014 | 1031.6 | 37.80 | 2806.0 |
| | 1:40 | 1102.8 | 54.1 | 1296.0 | 61.014 | 1041.8 | 37.80 | 2814.0 |
| 4 | 1:45 | 1110.4 | 58.6 | 1296.0 | 61.014 | 1049.4 | 37.80 | 2823.0 |
| | | | | 1291.2 | | | | |

| STEP NO. & REMARKS | TIME | (1) SURFACE TUBING PRESS. (psig) | (2) CUMMULATIVE VOL. INJECTED (bbls) | (3) INJECTION RATE (bbls/day) | (4) FRICTION HEAD LOSS (psi) | (5) CORRECTED TUBING PRESS (psi) (1) – (4) | (6) INJECTION RATE (gpm) (3)/34.2857 | (7) MEASURED BHP (psi) |
|---|---|---|---|---|---|---|---|---|
| | 1:50 | 1167.9 | 64.3 | 1641.6 | 94.484 | 1073.4 | 47.88 | 2836.0 |
| | 1:55 | 1180.6 | 70.1 | 1670.4 | 97.573 | 1083.0 | 48.72 | 2847.0 |
| | 2:00 | 1185.6 | 75.9 | 1670.4 | 97.573 | 1088.0 | 48.72 | 2855.0 |
| | 2:05 | 1193.1 | 81.7 | 1670.4 | 97.573 | 1095.5 | 48.72 | 2862.0 |
| | 2:10 | 1199.4 | 87.4 | 1641.6 | 94.484 | 1104.9 | 47.88 | 2868.0 |
| 5 | 2:15 | 1204.4 | 93.2 | 1670.4 | 97.573 | 1106.8 | 48.72 | 2873.0 |
| | | | | 1660.8 | | | | |
| | 2:20 | 1270.9 | 100.3 | 2044.8 | 141.846 | 1129.1 | 59.64 | 2884.0 |
| | 2:25 | 1271.0 | 107.4 | 2044.8 | 141.846 | 1129.2 | 59.64 | 2891.0 |
| | 2:30 | 1277.5 | 114.5 | 2044.8 | 141.846 | 1135.7 | 59.64 | 2896.0 |
| | 2:35 | 1284.1 | 121.7 | 2073.6 | 145.564 | 1138.5 | 60.48 | 2900.0 |
| | 2:40 | 1288.3 | 128.8 | 2044.8 | 141.846 | 1146.5 | 59.64 | 2904.0 |
| 6 | 2:45 | 1298.9 | 135.9 | 2044.8 | 141.846 | 1157.1 | 59.64 | 2907.0 |
| | | | | 2049.6 | | | | |
| | 2:50 | 1372.2 | 144.4 | 2448.0 | 197.886 | 1174.3 | 71.40 | 2917.0 |
| | 2:55 | 1376.3 | 153.0 | 2476.8 | 202.214 | 1174.1 | 72.24 | 2922.0 |
| 7 | 2:58 | 1380.3 | 158.2 | 2496.0 | 205.123 | 1175.2 | 72.80 | 2924.0 |
| | OUT | OF WATER | SHUT | DOWN | | | | |
| FALLOFF | 2:59 | 1123.0 | | | | 1123.0 | | 2909.0 |
| | 3:00 | 1128.2 | | | | 1128.2 | | 2904.0 |
| | 3:01 | 1127.0 | | | | 1127.0 | | 2901.0 |
| | 3:02 | 1124.4 | | | | 1124.4 | | 2900.0 |
| | 3:03 | 1123.2 | | | | 1123.2 | | 2898.0 |
| | 3:04 | 1122.0 | | | | 1122.0 | | 2897.0 |
| | 3:05 | 1120.7 | | | | 1120.7 | | 2895.0 |
| | 3:10 | 1117.0 | | | | 1117.0 | | 2890.0 |
| | 3:15 | 1114.6 | | | | 1114.6 | | 2886.0 |

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

*ADMINISTRATIVE ORDER NO. WFX-664*

***APPLICATION OF DEVON ENERGY CORPORATION (NEVADA) TO EXPAND ITS WATERFLOOD PROJECT IN THE SHUGART-YATES-SEVEN RIVERS-QUEEN-GRAYBURG POOL IN EDDY COUNTY, NEW MEXICO***

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION

Under the provisions of Division Order Nos. R-3059 and R-3769, Devon Energy Corporation (Nevada) has made application to the Division on September 22, 1994 for permission to expand its East Shugart Unit Waterflood Project in the Shugart-Yates-Seven Rivers-Queen-Grayburg Pool in Eddy County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

(1) The application has been filed in due form.

(2) Satisfactory information has been provided that all offset operators have been duly notified of the application.

(3) No objection has been received within the waiting period as prescribed by Rule 701(B).

(4) The proposed injection well is eligible for conversion to injection under the terms of Rule 701.

(5) The proposed expansion of the above referenced East Shugart Unit Waterflood Project will not cause waste nor impair correlative rights.

(6) The application should be approved.

IT IS THEREFORE ORDERED THAT:

The applicant, Devon Energy Corporation (Nevada), be and the same is hereby authorized to inject water into the Queen formation at approximately 3298 feet to approximately 3871 feet through 2 3/8-inch plastic lined tubing set in a packer located within 100 feet of the uppermost

injection perforations in the following described wells shown on Exhibit "A" attached hereto, for purposes of secondary recovery .

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary, including cement squeezing perforations completed in the Yates formation in the East Shugart Well No.2 and the East Shugart Well No.33, to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

Prior to commencing injection operations into the wells, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing or packer.

The injection wells or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection wells to no more than .2 psi per foot of depth to the uppermost injection perforation.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Queen formation. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity tests so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

The subject well shall be governed by all provisions of Division Order Nos. R-3059 and R-3769, as amended and Rules 702-706 of the Division Rules and Regulations not inconsistent herewith.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for the entry of such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator

to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

DONE at Santa Fe, New Mexico, on this 4th day of November, 1994.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

cc: Oil Conservation Division - Artesia

EXHIBIT "A"
DIVISION ORDER NO. WFX-664
**EAST SHUGART UNIT**
APPROVED INJECTION WELLS

| *Well Name* | *Well No.* | *Location* | *Unit* | *S-T-R* | *Injection Perforations* | *Packer Depth* | *Tubing Size* | *Injection Pressure* |
|---|---|---|---|---|---|---|---|---|
| East Shugart Unit | 2 | 990' FNL & 1650' FEL | B | 34-T18S-R31E | 3298'-3871' | 3200' | 2 3/8" | 660 PSIG |
| East Shugart Unit | 33 | 660' FNL & 990' FEL | A | 34-T18S-R31E | 3400'-3857' | 3320' | 2 3/8" | 680 PSIG |
| East Shugart Unit | 41 | 1650' FNL & 2210' FEL | G | 34-T18S-R31E | 3634'-3835' | 3550' | 2 3/8" | 727 PSIG |
| East Shugart Unit | 42 | 330' FNL & 1140' FEL | A | 34-T18S-R31E | 3641'-3812' | 3550' | 2 3/8" | 728 PSIG |

All in Eddy County, New Mexico