



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



BRUCE KING  
 GOVERNOR

ANITA LOCKWOOD  
 CABINET SECRETARY

March 16, 1993

POST OFFICE BOX 2088  
 STATE LAND OFFICE BUILDING  
 SANTA FE, NEW MEXICO 87504  
 (505) 827-5800

WFX-619  
 PDEV0020600619

S & J Operating Company  
 811 Sixth Street, Suite 300  
 Wichita Falls, TX 76307-2249

Attention: Bruce L. Robertson

**RE: Injection Pressure Increase on Three Wells in the North Denton Wolfcamp Unit Waterflood Project, Lea County, New Mexico**

Dear Mr. Robertson:

Reference is made to your request dated March 5, 1993 to increase the surface injection pressure on three wells in the North Denton Wolfcamp Waterflood Project. This request is based on step rate tests conducted on these wells between February 23 and 25, 1993. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

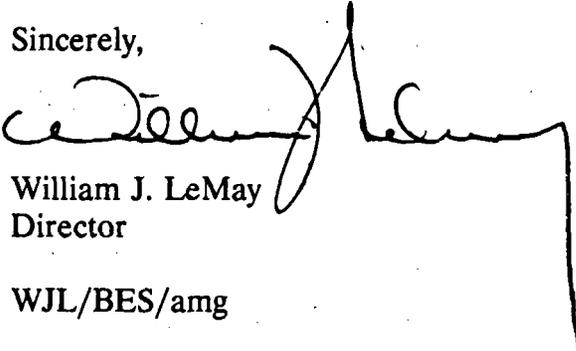
Well and Location	Maximum Injection Surface Pressure
NDWU No. 5-12 1980' FNL - 810' FWL Unit E, Section 35, Township 14 South, Range 37 East	3000 PSIG
NDWU No. 7-3 660' FSL - 660' FWL Unit M, Section 36, Township 14 South, Range 37 East	3000 PSIG
NDWU No. 8-1 660' FSL - 2310' FEL Unit O, Section 36, Township 14 South, Range 37 East	3000 PSIG
All wells located in Lea County, New Mexico.	

*Injection Pressure Increase  
S & J Operating Company  
March 16, 1993  
Page 2*

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The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

A handwritten signature in black ink, appearing to read "William J. LeMay". The signature is fluid and cursive, with a large loop at the end of the last name.

William J. LeMay  
Director

WJL/BES/amg

cc: Oil Conservation Division - Hobbs  
David Catanach  
File: WFX-619

NO WAITING PERIOD

COMPANY: S & J OPERATING COMPANY  
ADDRESS: 811 SIXTH STREET, SUITE 300  
CITY, STATE, ZIP: WICHITA FALLS, TEXAS 76307-2249  
ATTENTION: BRUCE C. ROBERTSON

Re: Injection Pressure Increase  
3 WELLS  
NORTH DENTON WOLFCAMP UNIT  
LEA County, New Mexico

Dear Sir:

Reference is made to your request dated MARCH 5, 1993, to increase the surface injection pressure on 3 WELLS IN THE NORTH DENTON WOLFCAMP UNIT. This request is based on step rate tests conducted on these wells BETWEEN FEB 23<sup>RD</sup> & 25<sup>TH</sup>, 1993. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

<u>Well &amp; Location</u>	<u>Maximum Injection Surface Pressure</u>
<u>NDWU No. 5-12</u> <u>1980' FNL &amp; 810' FNL</u> <u>"E" 35-145-37E</u>	<u>3000 PSIG</u>
<u>NDWU No. 7-3</u> <u>660' FSL &amp; 660' FNL</u> <u>"M" 36-145-37E</u>	<u>3000 PSIG</u>
<u>NDWU No. 8-1</u> <u>660' FSL &amp; 2310' FEL</u> <u>"O" 36-145-37E</u>	<u>3000 PSIG</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

cc: T. CALLEGOS    D. CATANACH    FILE- WFX-619    OCD- HOBBES

Telephone (817) 723-2166

**S&J OPERATING COMPANY**

FAX (817) 723-8113

811 Sixth Street, Suite 300

Post Office Box 2249  
OIL CONSERVATION DIVISION  
RECEIVED

WICHITA FALLS, TEXAS  
76307-2249

'93 MAR 9 AM 8 49

March 5, 1993

Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87504

Attn: Mr. David Catanach

Re: S & J Operating Company  
North Denton Wolfcamp Unit  
T14S-R37E  
Lea County, New Mexico

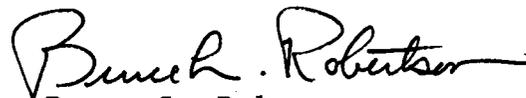
Dear Mr. Catanach:

Please find enclosed step rate tests on the North Denton Wolfcamp Unit wells No. 5-12, 7-3 and 8-1. S & J Operating Company requests that the maximum authorized injection pressure for each of these wells be raised to 3,000 psig. Currently, these three wells have maximum authorized pressures of 1,854, 1,837 and 1,854 psig, respectively. These pressures were based on .2 psig per foot under Administrative Order No. WFX-619 dated January 31, 1992. The other injection wells in the Unit are unrestricted based on Order No. R-3001 dated November 29, 1965 by application of Mobil Oil Company for the North Denton Wolfcamp Unit.

If you need any additional information, please do not hesitate to contact us.

Yours very truly,

S & J OPERATING COMPANY

  
Bruce L. Robertson

BLR/dk

cc: Oil Conservation Division  
P. O. Box 1980  
Hobbs, New Mexico 88241-1980  
Attn: Evelyn Downs

# JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: S & J OPERATING COMPANY

DATE: FEBRUARY 23, 1988

WELL NAME: NORTH DENTON WOLFCAMP FIELD TRACT 8 WELL 1

WO#: 88-14-0278

Lea County, New Mexico

MID-PERFS. = 8947

PACKER DEPTH =

BHP GAUGE DEPTH =

STEP NO. & REMAINS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psf)	(5) CORRECTED TUBING PRESS. (psf) (1)-(4)	(6) INJECTION RATE (gpm) (2)/(34.7037)	(7) MEASURED BHP (psf)
	9:55	323.3				323.3		
	10:00	481.4	1.0	288.0	8.061	473.3	8.40	
	10:05	548.6	1.9	259.2	6.633	542.0	7.56	
1	10:10	603.2	2.8	259.2	6.633	596.6	7.56	
				268.8				
	10:15	796.6	4.7	547.2	26.429	770.2	15.96	
	10:20	907.9	6.6	547.2	26.429	881.5	15.96	
2	10:25	987.6	8.5	547.2	26.429	961.2	15.96	
				547.2				
	10:30	1190.1	11.1	748.8	47.217	1142.9	21.84	
	10:35	1316.7	13.8	777.6	50.631	1266.1	22.68	
3	10:40	1428.1	16.4	748.8	47.217	1380.9	21.84	
				758.8				
	10:45	1651.0	19.7	950.4	73.391	1577.6	27.72	
	10:50	1808.8	23.1	979.2	77.558	1729.2	28.56	
4	10:55	1923.3	26.4	950.4	73.391	1849.9	27.72	
				959.9				
	11:00	2154.0	30.4	1152.0	104.762	2049.2	33.60	
	11:05	2292.2	34.4	1152.0	104.762	2187.4	33.60	
5	11:10	2403.9	38.4	1152.0	104.762	2299.1	33.60	
				1152.0				
	11:15	2633.6	43.1	1353.6	141.180	2492.4	39.48	
	11:20	2623.5	47.9	1382.4	146.788	2476.7	40.32	
6	11:25	2685.8	52.6	1353.6	141.180	2544.6	39.48	
				1363.2				
	11:30	2819.2	58.0	1555.2	182.525	2636.7	45.36	
	11:35	2956.5	63.3	1526.4	176.321	2780.2	44.52	
7	11:40	3039.2	68.6	1526.4	176.321	2862.9	44.52	
				1535.9				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (ps)	(5) CORRECTED TUBING PRESS. (ps) (1) - (4)	(6) INJECTION RATE (gpm) (8) / (34.2887)	(7) MEASURED DHP (ps)
8	11:45	3241.7	74.7	1756.8	228.693	3013.0	51.24	
	11:50	3316.8	80.7	1728.0	221.808	3095.0	50.40	
	11:55	3388.1	86.8	1756.8	228.693	3159.4	51.24	
9	12:00	3539.6	93.5	1929.6	272.039	3267.6	56.28	
	12:05	3599.5	100.2	1929.6	272.039	3327.5	56.28	
	12:10	3627.5	107.0	1958.4	279.598	3347.9	57.12	
10	12:15	3726.8	114.4	2131.2	326.943	3399.9	62.16	
	12:20	3747.1	122.0	2188.8	343.478	3403.6	63.84	
	12:25	3768.8	129.4	2131.2	326.943	3441.9	62.16	
11	12:30	3930.4	137.3	2275.2	368.980	3561.4	66.36	
	12:35	3875.7	145.5	2361.6	395.320	3480.4	68.88	
	12:40	3850.3	153.8	2390.4	404.285	3446.0	69.72	
FALLOFF	12:41	3385.7				3385.7		
	12:42	3367.9				3367.9		
	12:43	3339.8				3339.8		
	12:44	3318.2				3318.2		
	12:45	3300.4				3300.4		
	12:46	3282.6				3282.6		
	12:47	3264.7				3264.7		
	12:48	3250.7				3250.7		
	12:49	3235.5				3235.5		
	12:50	3220.2				3220.2		
	12:51	3206.2				3206.2		
	12:52	3192.2				3192.2		
	12:53	3179.4				3179.4		
12:54	3165.4				3165.4			
12:55	3152.7				3152.7			

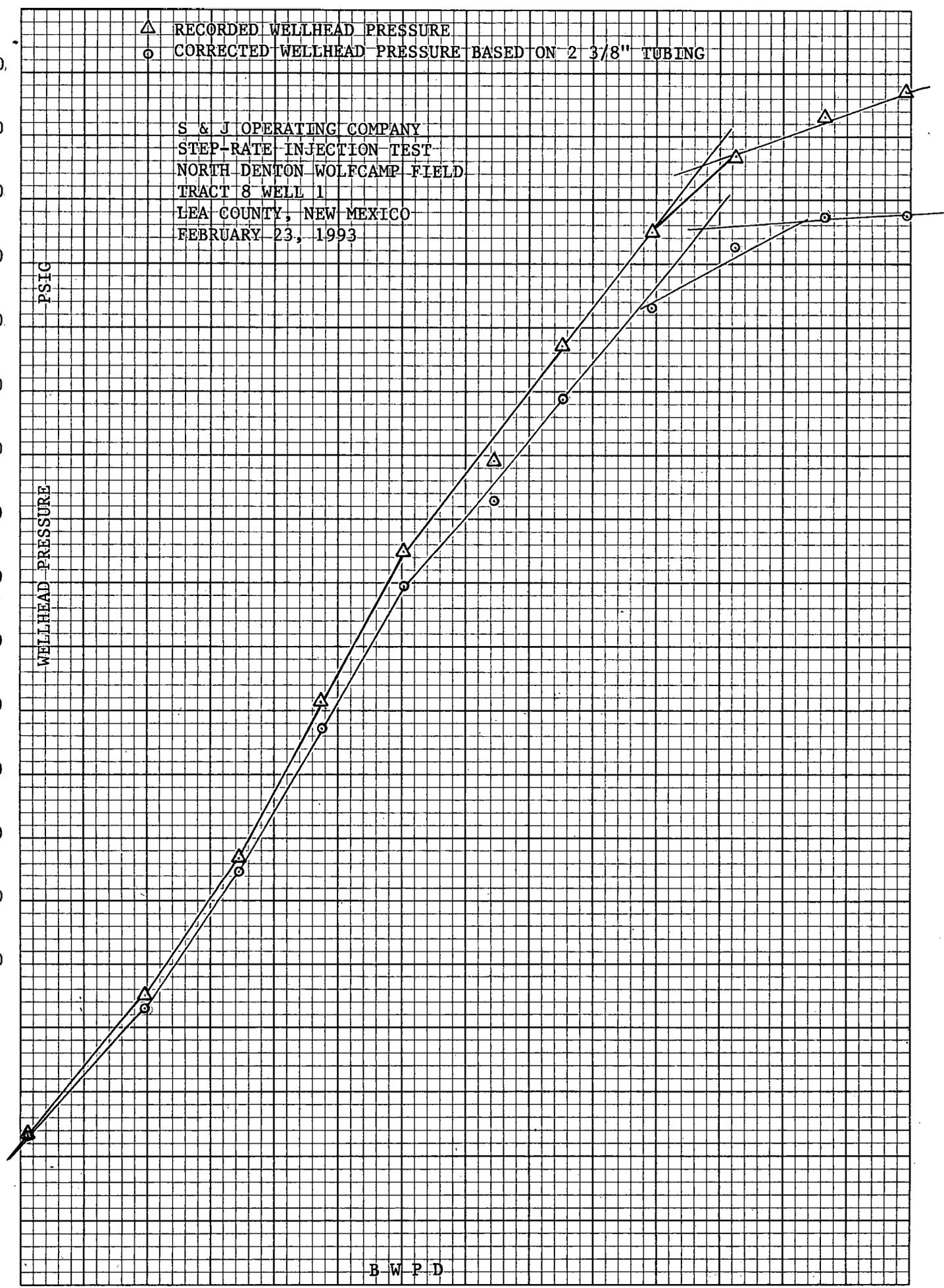
△ RECORDED WELLHEAD PRESSURE  
○ CORRECTED WELLHEAD PRESSURE BASED ON 2 3/8" TUBING

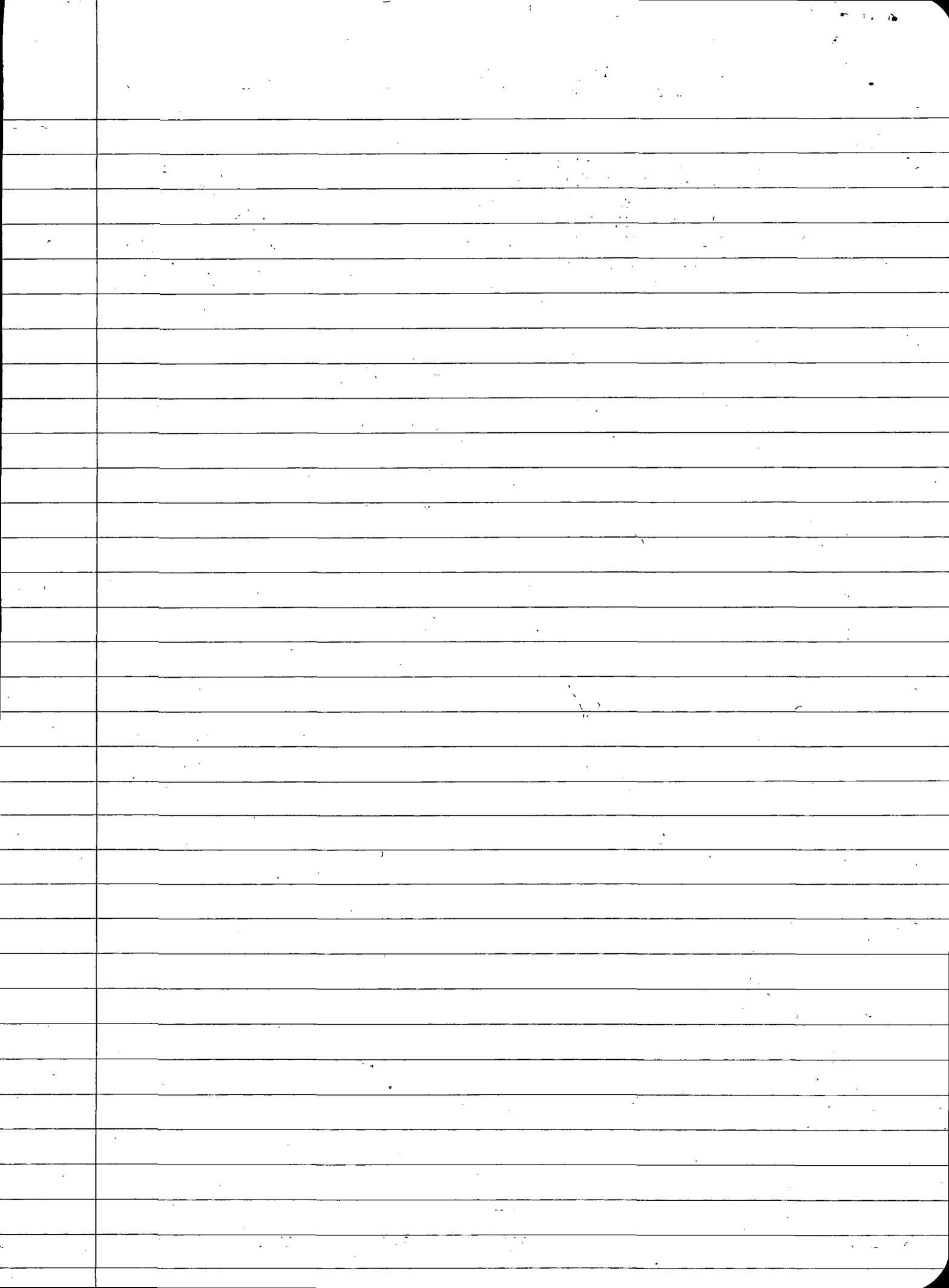
S & J OPERATING COMPANY  
STEP-RATE INJECTION TEST  
NORTH DENTON WOLFCAMP FIELD  
TRACT 8 WELL 1  
LEA COUNTY, NEW MEXICO  
FEBRUARY 23, 1993

PSIG  
WELLHEAD PRESSURE

B W P D

250 550 850 1150 1450 1750 2050 2350





# JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: S & J OPERATING COMPANY

DATE: FEBRUARY 25, 1988

WELL NAME: NORTH DENTON WOLFCAMP FIELD TRACT 5 WELL NO. 12

WO#: 88-14-0278

Lea County, New Mexico

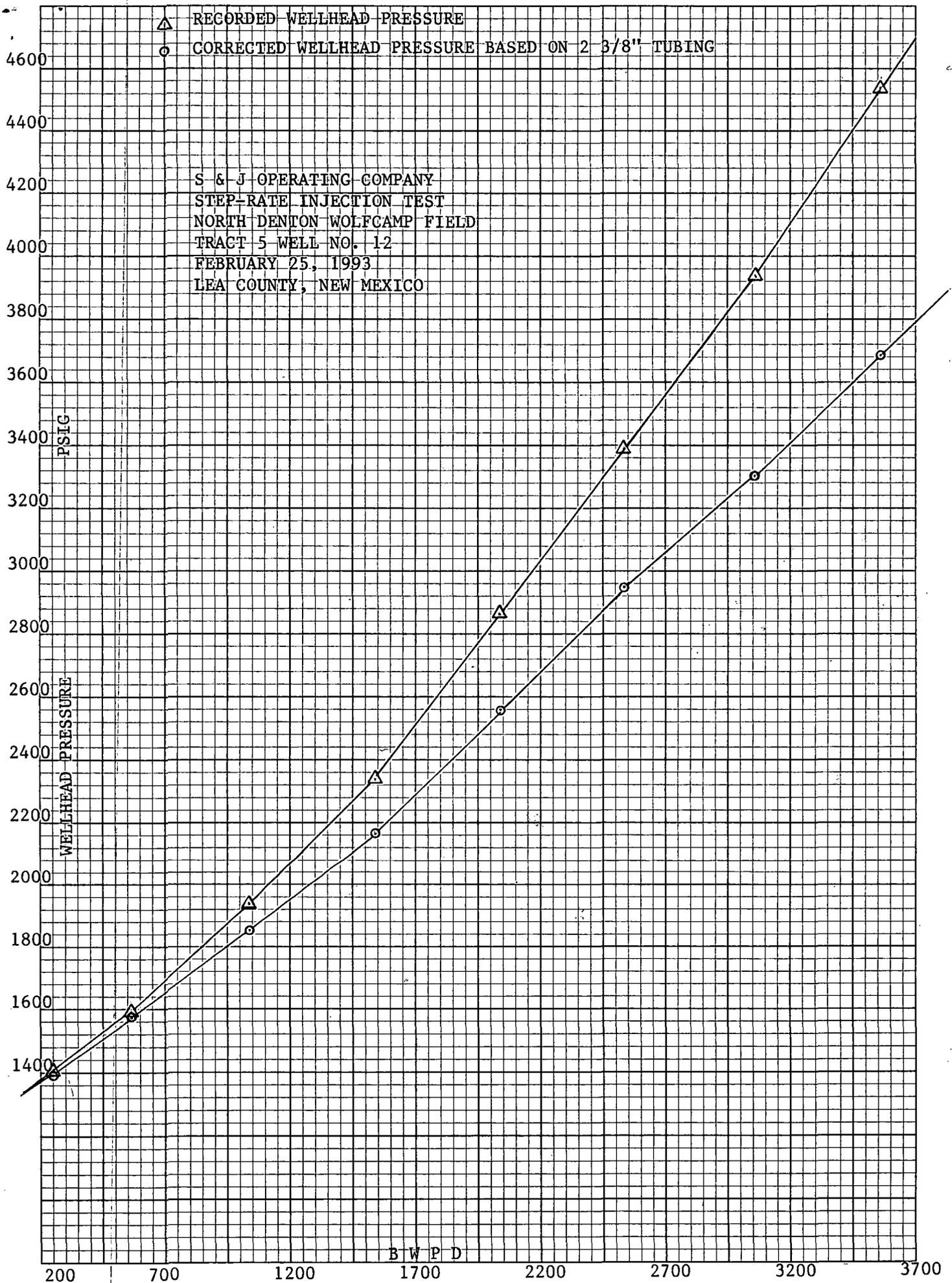
MID-PERFS. = 8830

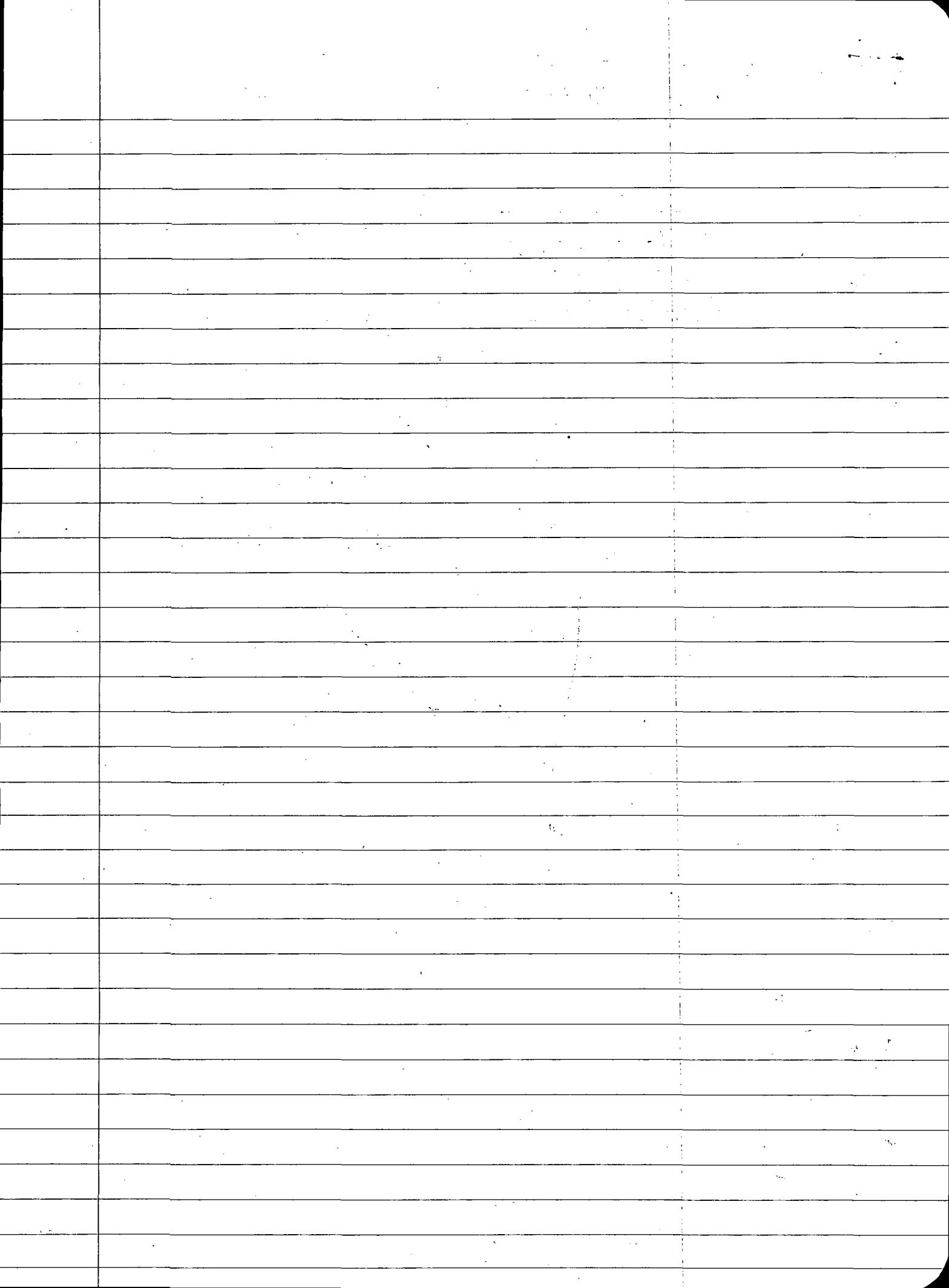
PACKER DEPTH =

BHP GAUGE DEPTH = 8830

STEP NO. & REMAINS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psf)	(5) CORRECTED TUBING PRESS. (psig) (1)-(4)	(6) INJECTION RATE (gpm) (3)(34.2327)	(7) MEASURED BHP (psf)
	11:15	1288.4				1288.4		
	11:20	1350.5	0.9	259.2	6.621	1343.9	7.56	
	11:25	1379.6	1.7	230.4	5.325	1374.3	6.72	
1	11:30	1404.9	2.6	259.2	6.621	1398.3	7.56	
				249.6				
	11:35	1503.6	4.6	576.0	29.007	1474.6	16.80	
	11:40	1551.7	6.5	547.2	26.381	1525.3	15.96	
2	11:45	1594.8	8.4	547.2	26.381	1568.4	15.96	
				556.8				
	11:50	1788.5	12.1	1065.6	90.527	1698.0	31.08	
	11:55	1865.7	15.7	1036.8	86.052	1779.6	30.24	
3	12:00	1936.5	19.3	1036.8	86.052	1850.4	30.24	
				1046.4				
	12:05	2186.1	24.7	1555.2	182.193	2003.9	45.36	
	12:10	2280.0	30.1	1555.2	182.193	2097.8	45.36	
4	12:15	2335.7	35.4	1526.4	176.000	2159.7	44.52	
				1545.6				
	12:20	2633.8	42.5	2044.8	302.295	2331.5	59.64	
	12:25	2755.8	49.6	2044.8	302.295	2453.5	59.64	
5	12:30	2862.6	56.7	2044.8	302.295	2560.3	59.64	
				2044.8				
	12:35	3188.2	65.5	2534.4	449.672	2738.5	73.92	
	12:40	3293.9	74.4	2563.2	459.171	2834.7	74.76	
6	12:45	3394.4	83.1	2505.6	440.264	2954.1	73.08	
				2534.4				
	12:50	3734.3	93.8	3081.6	645.599	3088.7	89.88	
	12:55	3848.9	104.3	3024.0	623.452	3225.4	88.20	
7	1:00	3943.1	114.9	3052.8	634.481	3308.6	89.04	
				3052.8				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (ps)	(5) CORRECTED TUBING PRESS. (ps) (1) - (4)	(6) INJECTION RATE (gpm) (3)/(24.25)	(7) MEASURED BHP (ps)
8 OUT OF WATER END TEST	1:05	4319.6	127.0	3484.8	810.505	3509.1	101.64	
	1:10	4460.1	139.5	3600.0	860.768	3599.3	105.00	
	1:15	4541.8	152.0	3600.0 3561.6	860.768	3681.0	105.00	
FALLOFF	1:16	3475.9				3475.9		
	1:17	3436.5				3436.5		
	1:18	3411.0				3411.0		
	1:19	3395.7				3395.7		
	1:20	3379.2				3379.2		
	1:21	3365.2				3365.2		
	1:22	3352.4				3352.4		
	1:23	3341.0				3341.0		
	1:24	3329.5				3329.5		
	1:25	3319.3				3319.3		
	1:26	3309.1				3309.1		
	1:27	3299.0				3299.0		
1:28	3290.1				3290.1			
1:29	3281.0				3281.0			
1:30	3273.5				3273.5			





# JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

## STEP RATE INJECTION TEST

CLIENT: S & J OPERATING COMPANY

DATE: FEBRUARY 24, 1983

WELL NAME: NORTH DENTON WOLFCAMP FIELD TRACT 7 WELL 3  
Lea County, New Mexico

WO#: 93-14-0276

MID-PERFS. = 9185 - 9274

PACKER DEPTH = 9116

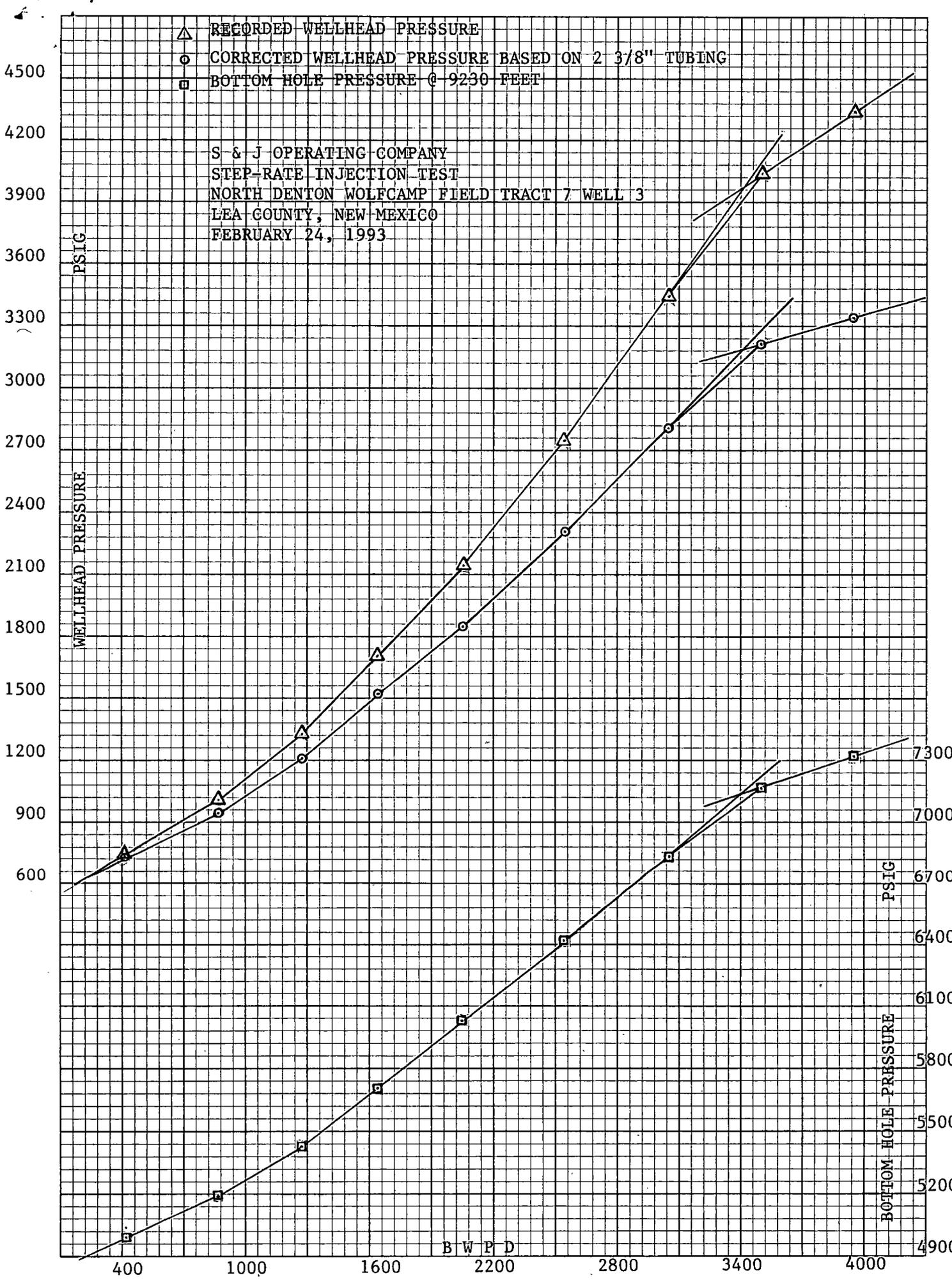
BHP GAUGE DEPTH = 9230

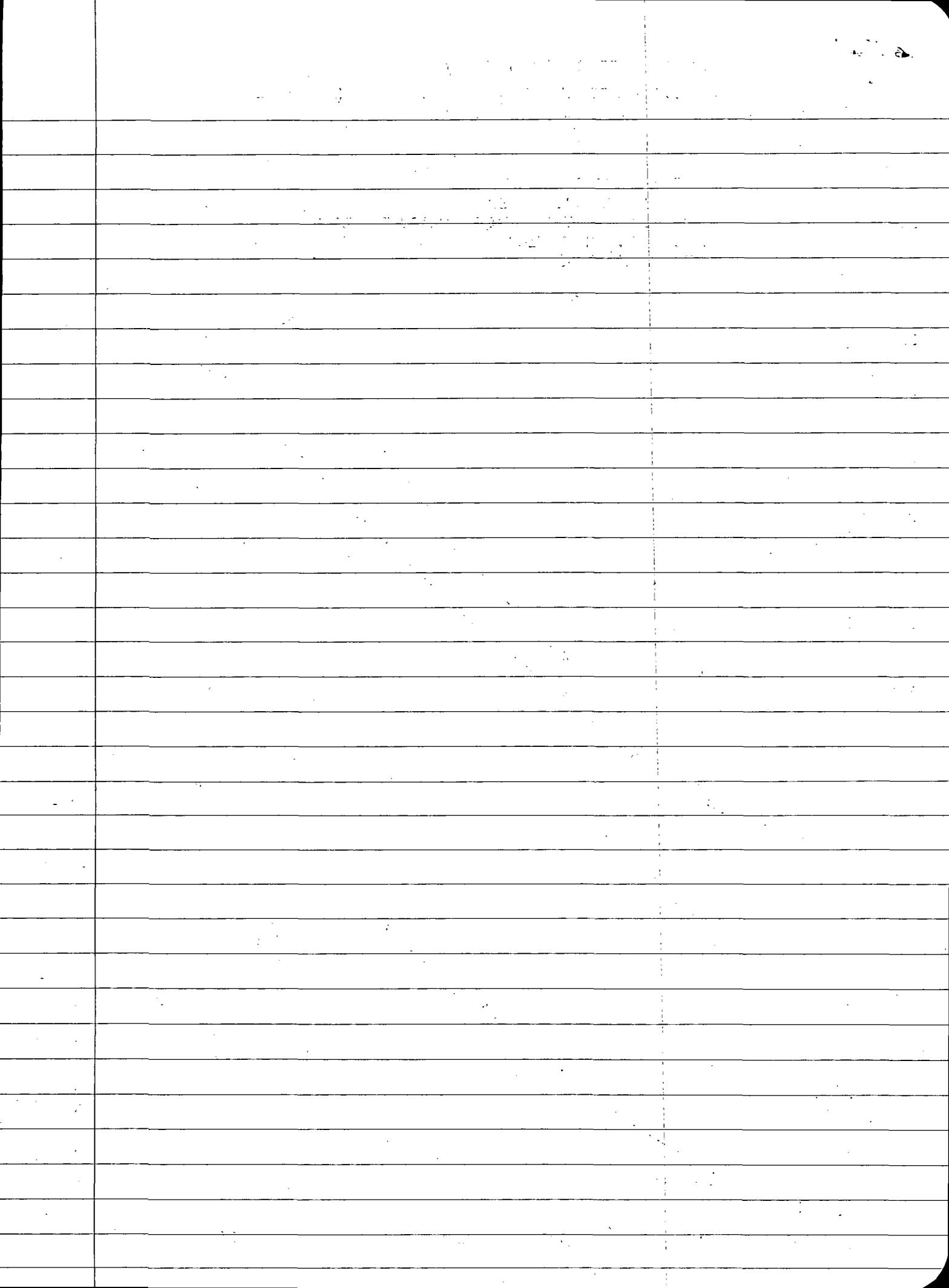
STEP NO. S	REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (ps)	(5) CORRECTED TUBING PRESS. (ps) (1)-(4)	(6) INJECTION RATE (GPM) (1)/(34.7)	(7) MEASURED BHP (ps)
		9:10	618.1				618.1		4865
		9:15	691.5	1.4	403.2	14.834	676.7	11.76	4923
		9:20	730.7	2.9	432.0	16.854	713.8	12.60	4961
1		9:25	744.6	4.4	432.0	16.854	727.7	12.60	4992
					422.4				
		9:30	892.5	7.5	892.8	64.557	827.9	26.04	5077
		9:35	967.1	10.6	892.8	64.557	902.5	26.04	5139
2		9:40	1016.4	13.7	892.8	64.557	951.8	26.04	5194
					892.8				
		9:45	1189.8	18.2	1296.0	128.637	1061.2	37.80	5289
		9:50	1260.7	22.6	1267.2	123.399	1137.3	36.96	5365
3		9:55	1326.5	27.0	1267.2	123.399	1203.1	36.96	5433
					1276.8				
		10:00	1543.0	32.7	1641.6	199.201	1343.8	47.88	5542
		10:05	1621.5	38.5	1670.4	205.714	1415.8	48.72	5630
4		10:10	1712.6	44.1	1612.8	192.784	1519.8	47.04	5711
					1641.6				
		10:15	1970.8	51.2	2044.8	299.055	1671.7	59.64	5836
		10:20	2064.5	58.3	2044.8	299.055	1765.4	59.64	5940
5		10:25	2157.0	65.4	2044.8	299.055	1857.9	59.64	6035
					2044.8				
		10:30	2530.7	74.3	2563.2	454.249	2076.5	74.76	6186
		10:35	2635.1	83.2	2563.2	454.249	2180.9	74.76	6306
6		10:40	2753.4	92.0	2534.4	444.852	2308.5	73.92	6418
					2553.6				
		10:45	3187.3	102.6	3052.8	627.680	2559.6	89.04	6581
		10:50	3322.4	113.2	3052.8	627.680	2694.7	89.04	6715
7		10:55	3446.0	123.8	3052.8	627.680	2818.3	89.04	6836
					3052.8				

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (ps)	(5) CORRECTED TUBING PRESS. (ps) (1)-(4)	(6) INJECTION RATE (gpm) (3)/24.2857	(7) MEASURED BHP (ps)
8	11:00	3572.1	136.1	3542.4	826.508	2745.6	103.32	6979
	11:05	3921.1	148.1	3456.0	789.602	3131.5	100.80	7082
	11:10	4038.4	160.4	3542.4	826.508	3211.9	103.32	7171
9	11:15	4282.3	174.1	3513.6				
	11:20	4282.3	174.1	3945.6	1008.918	3273.4	115.08	7255
	11:25	4323.2	187.8	3945.6	1008.918	3314.3	115.08	7301
10 SHUT DOWN ENGINE HOT	11:25	4350.0	201.5	3945.6	1008.918	3341.1	115.08	7314
	11:30	4459.8	215.4	3945.6				
	11:35	4459.8	215.4	4003.2	1036.335	3423.5	116.76	7319
FALLOFF	11:35	4448.3	229.3	4003.2	1036.335	3412.0	116.76	7316
	11:40							
	11:36	2935.5				2935.5		7218
	11:37	2850.1				2850.1		7158
	11:38	2808.2				2808.2		7103
	11:39	2767.5				2767.5		7060
	11:40	2731.9				2731.9		7020
	11:41	2697.6				2697.6		6983
	11:42	2667.1				2667.1		6951
	11:43	2635.3				2635.3		6917
	11:44	2607.4				2607.4		6886
	11:45	2580.7				2580.7		6857
	11:46	2556.5				2556.5		6832
	11:47	2534.9				2534.9		6808
	11:48	2513.3				2513.3		6784
	11:49	2493.0				2493.0		6766
	11:50	2475.3				2475.3		6747

- △ RECORDED WELLHEAD PRESSURE
- CORRECTED WELLHEAD PRESSURE BASED ON 2 3/8" TUBING
- BOTTOM HOLE PRESSURE @ 9230 FEET

S & J OPERATING COMPANY  
 STEP-RATE INJECTION TEST  
 NORTH DENTON WOLFCAMP FIELD TRACT 7 WELL 3  
 LEA COUNTY, NEW MEXICO  
 FEBRUARY 24, 1993







STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
 OIL CONSERVATION DIVISION  
 HOBBS DISTRICT OFFICE

OIL CONSERVATION DIVISION  
 RECEIVED  
 93 MAR 12 AM 9 18

March 9, 1993

BRUCE KING  
 GOVERNOR

POST OFFICE BOX 1980  
 HOBBS, NEW MEXICO 88240  
 (505) 393-6161

OIL CONSERVATION DIVISION  
 P.O. BOX 2088  
 SANTA FE, NEW MEXICO 87504-2088

RE: APPLICATION FOR PRESSURE LIMIT INCREASE FOR DISPOSAL & INJECTION WELLS

Gentlemen:

I have examined the step rate test for the:

S & J Operating Company	North Denton Wolfcamp Unit	Tr 7 #3-M	36-17-37
Operator	Lease & Well No.	Unit	S-T-R

and my recommendations are as follows:

*OK*

Very truly yours

Jerry Sexton  
 Supervisor, District I

/bp



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
 OIL CONSERVATION DIVISION  
 HOBBS DISTRICT OFFICE

March 9, 1993

BRUCE KING  
 GOVERNOR

OIL CONSERVATION DIVISION  
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OIL CONSERVATION DIVISION  
 P.O. BOX 2088  
 SANTA FE, NEW MEXICO 87504-2088

RE: APPLICATION FOR PRESSURE LIMIT INCREASE FOR DISPOSAL & INJECTION WELLS

Gentlemen:

I have examined the step rate test for the:

S & J Operating Company	North Denton Wolfcamp Unit	Tr 8 #1-0	36-17-37
Operator	Lease & Well No.	Unit	S-T-R

and my recommendations are as follows:

Probably OK - (not sure what break at 2300 was)

Very truly yours

Jerry Sexton  
 Supervisor, District I

/bp



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
 OIL CONSERVATION DIVISION  
 OIL CONSERVATION DIVISION  
 HOBBS DISTRICT OFFICE

'93 MAR 12 AM 9 18

March 9, 1993

POST OFFICE BOX 1980  
 HOBBS, NEW MEXICO 88240  
 (505) 393-6161

BRUCE KING  
 GOVERNOR

OIL CONSERVATION DIVISION  
 P.O. BOX 2088  
 SANTA FE, NEW MEXICO 87504-2088

RE: APPLICATION FOR PRESSURE LIMIT INCREASE FOR DISPOSAL & INJECTION WELLS

Gentlemen:

I have examined the step rate test for the:

S & J Operating Company	North Denton Wolfcamp Unit	Tr 5 #12-E	35-14-37
Operator	Lease & Well No.	Unit	S-T-R

and my recommendations are as follows:

*OK*

Very truly yours

Jerry Sexton  
 Supervisor, District I

/bp

