



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

CF 7400
R-6857
6857-A

June 6, 1997

Texaco Exploration & Production, Inc.
P.O. Box 730
Hobbs, New Mexico 88241-0730

Attn: Mr. Robert McNaughton

**RE: Injection Pressure Increase,
 North Vacuum Abo West Waterflood Unit,
 Lea County, New Mexico**

Dear Mr. McNaughton:

Reference is made to your request dated March 31, 1997 to increase the surface injection pressure on 13 wells in the above referenced project. This request is based on step rate tests conducted on these wells between March 4 and 26, 1997. The results of the tests have been reviewed by my staff and we feel an increase in injection pressure all of the wells is justified at this time.

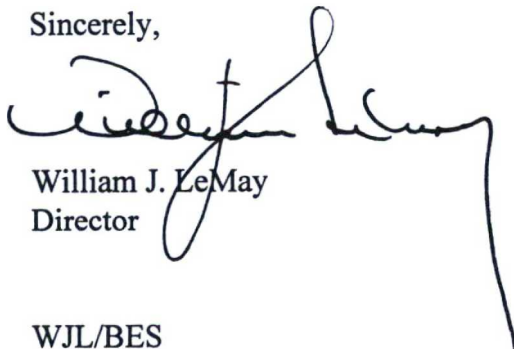
You are therefore authorized to increase the surface injection pressure on the following wells:

<i>Well and Location</i>	<i>Maximum Surface Injection Pressure</i>
North Vacuum Abo West Unit Well No.2 Unit Letter F, Section 15, Township 15 South, Range 34 East	4075 PSIG
North Vacuum Abo West Unit Well No.4 Unit Letter N, Section 15, Township 15 South, Range 34 East	4300 PSIG
North Vacuum Abo West Unit Well No.6 Unit Letter H, Section 21, Township 15 South, Range 34 East	4300 PSIG
North Vacuum Abo West Unit Well No.7 Unit Letter F, Section 22, Township 15 South, Range 34 East	4250 PSIG
North Vacuum Abo West Unit Well No.10 Unit Letter N, Section 21, Township 15 South, Range 34 East	4500 PSIG
North Vacuum Abo West Unit Well No.11 Unit Letter P, Section 21, Township 15 South, Range 34 East	4385 PSIG

<i>Well and Location</i>	<i>Maximum Surface Injection Pressure</i>
North Vacuum Abo West Unit Well No.12 Unit Letter N, Section 22, Township 15 South, Range 34 East	4275 PSIG
North Vacuum Abo West Unit Well No.16 Unit Letter F, Section 28, Township 15 South, Range 34 East	4165 PSIG
North Vacuum Abo West Unit Well No.17 Unit Letter H, Section 28, Township 15 South, Range 34 East	4135 PSIG
North Vacuum Abo West Unit Well No.18 Unit Letter F, Section 27, Township 15 South, Range 34 East	4285 PSIG
North Vacuum Abo West Unit Well No.21 Unit Letter P, Section 28, Township 15 South, Range 34 East	4100 PSIG
North Vacuum Abo West Unit Well No.22 Unit Letter N, Section 27, Township 15 South, Range 34 East	4110 PSIG
North Vacuum Abo West Unit Well No.25 Unit Letter L, Section 34, Township 18 South, Range 34 East	3870 PSIG

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,



William J. LeMay
Director

WJL/BES

cc: Oil Conservation Division - Hobbs
Files: 3rd Q97 PSI-X; Case File No.7400

WJL

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 7400
Order No. R-6857

APPLICATION OF TEXACO INC. FOR
A PRESSURE MAINTENANCE PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on November 4, 1981, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 18th day of December, 1981, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

- (1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.
- (2) That the applicant, Texaco, Inc., seeks authority to institute a pressure maintenance project in its North Vacuum Abo West Unit Area, North Vacuum-Abo Pool, Lea County, New Mexico, by the injection of water into the Abo formation through the following wells:

TOWNSHIP 15 SOUTH, RANGE 34 EAST, NMPM

<u>North Vacuum Abo West</u> <u>Unit Well Number</u>	<u>Unit</u> <u>Letter</u>	<u>Section</u>
2	F	15
4	N	15
6	H	21
7	F	22
10	N	21
11	P	21
12	N	22
16	F	28
17	H	28
18	F	27
21	P	28
22	N	27
25	L	34

(3) That there are 25 wells completed in the North Vacuum-Abo Pool in the unit area, and these wells are currently producing a total of approximately 296 barrels of oil per day, for an average daily rate of production of 11.8 barrels of oil per well.

(4) That considering the depth of the Abo reservoir in the unit area, from approximately 8700 feet to approximately 8900 feet, 11.8 barrels per day should be considered "stripper" production, and the subject project, under the provisions of Rule 701 F of the Division Rules and Regulations, should be classified as a waterflood project rather than a pressure maintenance project.

(5) That the proposed project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(6) That the operator should take all necessary steps 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 from injection, production, or plugged and abandoned wells.

(7) That based on the data submitted in Case No. 6248 relating to injection pressures in the North Vacuum Abo Pool, which was incorporated by reference into the record of the

instant case, the injection wells or injection pressurization system for the subject project should be so equipped as to limit injection pressure at the wellhead to no more than 3500 psi, but the Division Director should have authority to increase such pressure limitation, should conditions warrant.

(8) That the subject application should be approved and the project should be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texaco Inc., is hereby authorized to institute a waterflood project on its North Vacuum Abo West Unit Area, North Vacuum-Abo Pool, by the injection of water into the Abo formation through the following described wells in Township 15 South, Range 34 East, NMPM, Lea County, New Mexico:

<u>North Vacuum Abo West Unit Well Number</u>	<u>Unit Letter</u>	<u>Section</u>
2	F	15
4	N	15
6	H	21
7	F	22
10	N	21
11	P	21
12	N	22
16	F	28
17	H	28
18	F	27
21	P	28
22	N	27
25	L	34

(2) That injection into each of said wells shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation; that the casing-tubing annulus of each injection well shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(3) That the operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well,

or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(4) That the injection wells herein authorized and/or the injection pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 3500 psi, provided however, the Division Director may authorize a higher surface injection pressure upon satisfactory showing that such pressure will not result in fracturing of the confining strata.

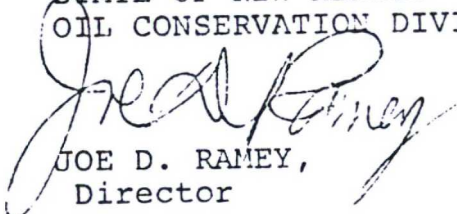
(5) That the subject waterflood project is hereby designated the North Vacuum Abo West Waterflood Project and shall be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

(6) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Division in accordance with Rules 706 and 1115 of the Division Rules and Regulations.

(7) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION


JOE D. RAMEY,
Director

S E A L



Texaco E & P

205 E. Bender Blvd.
Hobbs NM 88240
505 393 7194

PSI-X N/R

March 31, 1997

New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 88240



Attention: David R. Catanach

Re: Request for Increase in Surface Injection Pressure Limits
Texaco Exploration and Production Inc.
North Vacuum Abo West Unit, T-17-S, R-34, Lea County, New Mexico

Dear Mr. Catanach

Texaco Exploration and Production Inc. requests that the surface injection pressure limit be increased for the subject wells. Step rate tests were recently run and the results are attached. A summary is given below:

<u>Well No.</u>	<u>Observed Surface Parting Pressure</u>	<u>Requested Injection Pressure Limit</u>
2	4125 psi	4075 psi
4	4350 psi	4300 psi
6	4350 psi	4300 psi
7	4300 psi	4250 psi
10	4550 psi	4500 psi
11	4435 psi	4385 psi
12	4325 psi	4275 psi
16	4215 psi	4165 psi
17	4185 psi	4135 psi
18	4335 psi	4285 psi
21	4150 psi	4100 psi
22	4160 psi	4140 psi
25	3920 psi	3870 psi

If additional information is needed, please contact me at 505-397-0428.

Sincerely,

Robert McNaughton
Production Engineer

RTM/

attachments

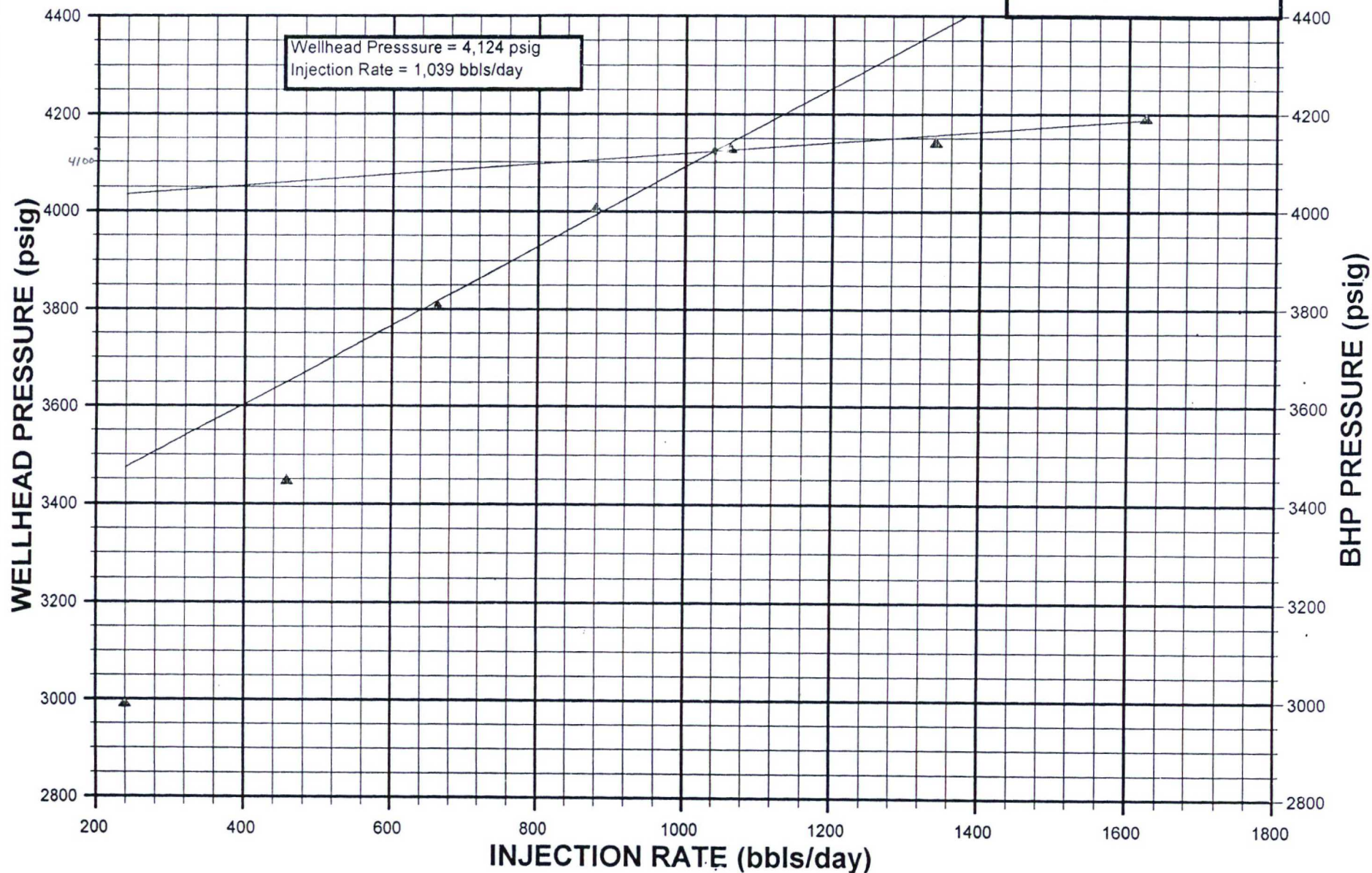
cc: Mr. Jerry Sexton
Hobbs NMOC

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
North Vacuum
ABO West Unit No. 2 WIW
Lea County, New Mexico

Wellhead Pressure = 4,124 psig
Injection Rate = 1,039 bbls/day



▲ RECORDED WELLHEAD PRESSURE ■ Measured BHP (not recorded)

WEST-TEST, INC.
A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 4, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 2 WIW
LEA COUNTY, NEW MEXICO

W.O. NO.: 97-14-0361

PERFS = 8761-8912

PACKER DEPTH = 8695-8705

BHP GAUGE DEPTH = SURFACE ONLY

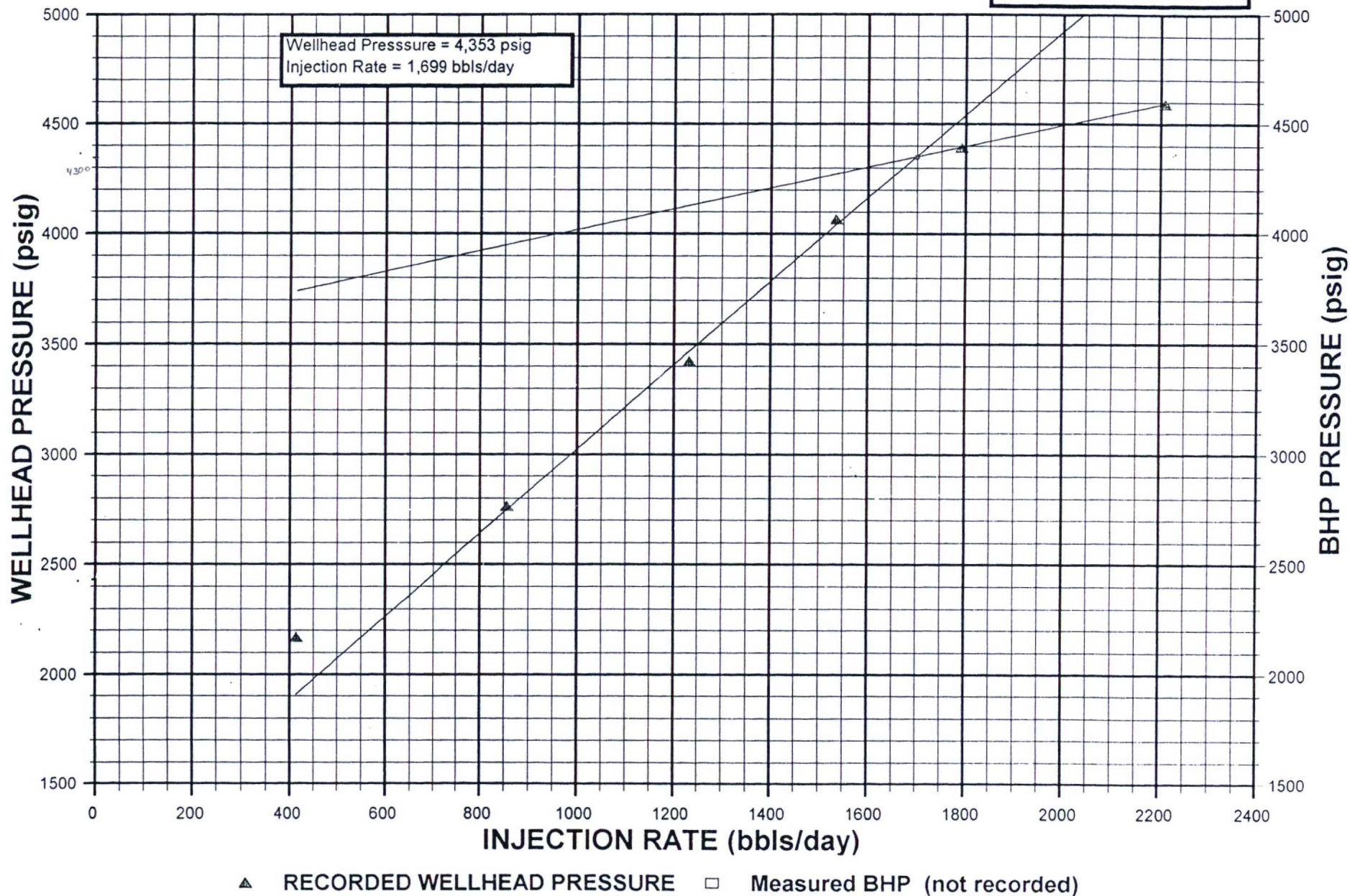
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	11:05	2629.0				2629.0		
	11:10	2707.0	0.8	230.4	5.044	2702.0	6.72	
	11:15	2822.6	1.6	230.4	5.044	2817.6	6.72	
	11:20	2875.2	2.5	259.2	6.272	2868.9	7.56	
	11:25	2916.2	3.3	230.4	5.044	2911.2	6.72	
	11:30	2976.5	4.2	259.2	6.272	2970.2	7.56	
	11:35	2994.4	5.0	230.4	5.044	2989.4	6.72	
				240.0				
	11:40	3115.6	6.6	460.8	18.182	3097.4	13.44	
	11:45	3217.4	8.1	432.0	16.136	3201.3	12.60	
2	11:50	3280.5	9.7	460.8	18.182	3262.3	13.44	
	11:55	3351.4	11.3	460.8	18.182	3333.2	13.44	
	12:00	3412.0	12.9	460.8	18.182	3393.8	13.44	
	12:05	3450.6	14.5	460.8	18.182	3432.4	13.44	
				456.0				
	12:10	3567.9	16.7	633.6	32.772	3535.1	18.48	
	12:15	3637.5	19.0	662.4	35.581	3601.9	19.32	
	12:20	3674.8	21.3	662.4	35.581	3639.2	19.32	
	12:25	3743.1	23.6	662.4	35.581	3707.5	19.32	
	12:30	3761.1	26.0	691.2	38.496	3722.6	20.16	
3	12:35	3810.1	28.3	662.4	35.581	3774.5	19.32	
				662.4				
	12:40	3882.3	31.3	864.0	58.170	3824.1	25.20	
	12:45	3922.2	34.4	892.8	61.808	3860.4	26.04	
	12:50	3950.5	37.4	864.0	58.170	3892.3	25.20	
	12:55	3969.8	40.5	892.8	61.808	3908.0	26.04	
	1:00	3992.9	43.6	892.8	61.808	3931.1	26.04	
	1:05	4009.6	46.6	864.0	58.170	3951.4	25.20	
				878.4				

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)
5	1:10	4078.1	50.1	1008.0	77.366	4000.7	29.40	
	1:15	4062.6	53.8	1065.6	85.743	3976.9	31.08	
	1:20	4102.7	57.5	1065.6	85.743	4017.0	31.08	
	1:25	4107.8	61.3	1094.4	90.079	4017.7	31.92	
	1:30	4100.1	65.0	1065.6	85.743	4014.4	31.08	
	1:35	4132.4	68.7	1065.6	85.743	4046.7	31.08	
				1060.8				
	1:40	4176.4	73.3	1324.8	128.271	4048.1	38.64	
	1:45	4206.1	77.8	1296.0	123.160	4082.9	37.80	
	1:50	4208.7	82.7	1411.2	144.175	4064.5	41.16	
6	1:55	4213.9	87.3	1324.8	128.271	4085.6	38.64	
	2:00	4241.1	91.9	1324.8	128.271	4112.8	38.64	
	2:05	4243.6	96.6	1353.6	133.477	4110.1	39.48	
				1339.2				
	2:10	4318.7	102.3	1641.6	190.719	4128.0	47.88	
7	2:15	4300.5	107.9	1612.8	184.575	4115.9	47.04	
	2:20	4294.1	113.5	1612.8	184.575	4109.5	47.04	
				1622.4				
FALLOFF	OUT OF WATER							
	2:21	4122.0				4122.0		
	2:22	4110.3				4110.3		
	2:23	4102.6				4102.6		
	2:24	4097.4				4097.4		
	2:25	4092.2				4092.2		
	2:30	4072.8				4072.8		
	2:35	4058.6				4058.6		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
North Vacuum ABO West
Unit No 4 WIW
Lea County, New Mexico



WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 24, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 4 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0362

PERFS = 8774-8812

PACKER DEPTH = 8710-8717

BHP GAUGE DEPTH = SURFACE ONLY

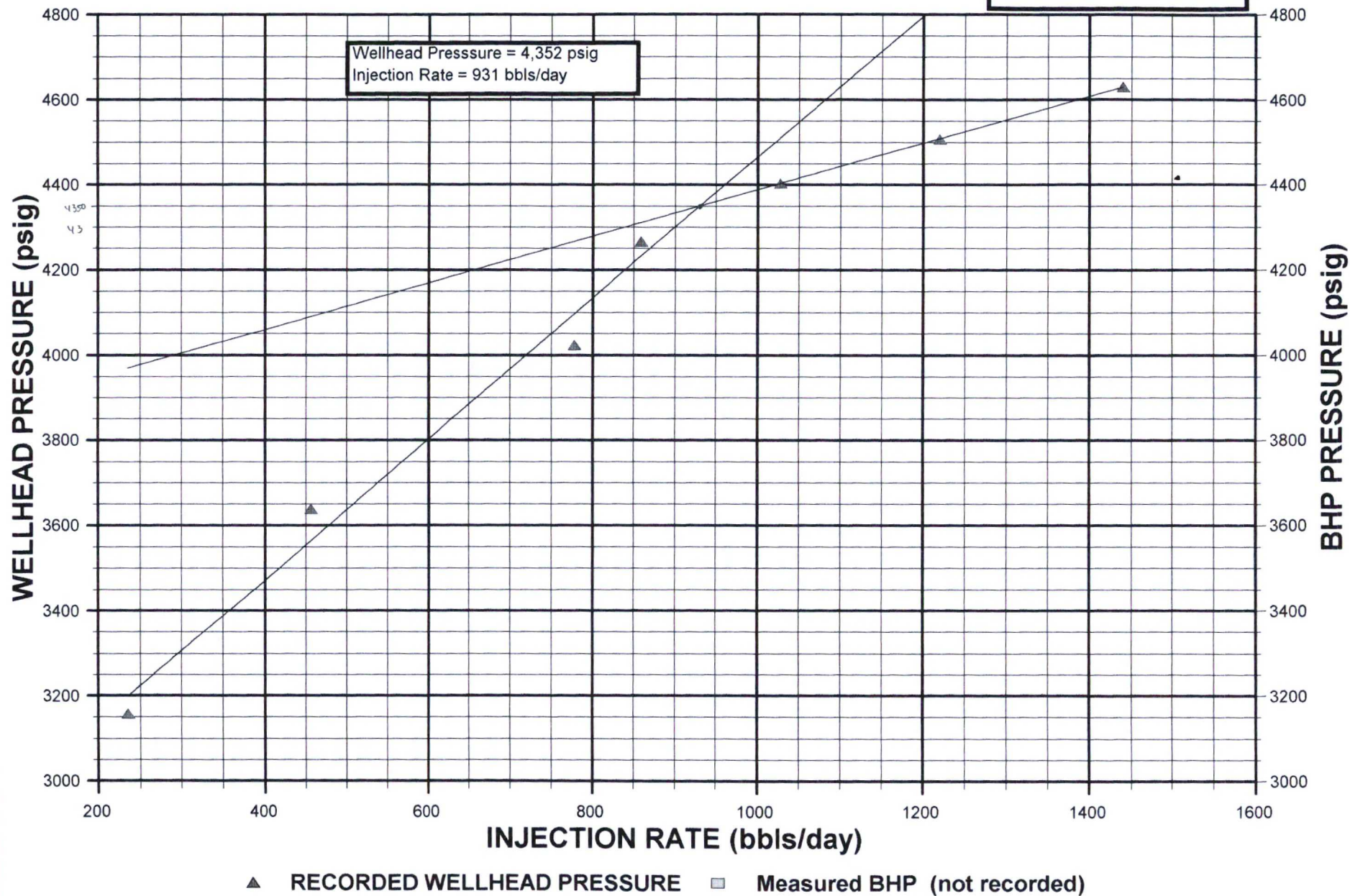
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:05	1852.8				1852.8		
	9:10	1948.6	1.5	432.0	16.056	1932.5	12.60	
	9:15	2022.7	2.9	403.2	14.132	2008.6	11.76	
	9:20	2105.7	4.4	432.0	16.056	2089.6	12.60	
	9:25	2146.5	5.8	403.2	14.132	2132.4	11.76	
	9:30	2161.6	7.2	403.2	14.132	2147.5	11.76	
	9:35	2172.8	8.6	403.2	14.132	2158.7	11.76	
				412.8				
	9:40	2391.7	11.6	864.0	57.881	2333.8	25.20	
	9:45	2483.7	14.6	864.0	57.881	2425.8	25.20	
2	9:50	2559.3	17.6	864.0	57.881	2501.4	25.20	
	9:55	2636.2	20.6	864.0	57.881	2578.3	25.20	
	10:00	2699.1	23.5	835.2	54.362	2644.7	24.36	
	10:05	2768.4	26.4	835.2	54.362	2714.0	24.36	
				854.4				
	10:10	2965.2	30.7	1238.4	112.661	2852.5	36.12	
	10:15	3110.7	35.0	1238.4	112.661	2998.0	36.12	
	10:20	3193.2	39.3	1238.4	112.661	3080.5	36.12	
	10:25	3287.2	43.6	1238.4	112.661	3174.5	36.12	
	10:30	3349.0	47.9	1238.4	112.661	3236.3	36.12	
3	10:35	3426.2	52.1	1209.6	107.862	3318.3	35.28	
				1233.6				
	10:40	3631.3	57.4	1526.4	165.870	3465.4	44.52	
	10:45	3749.9	62.9	1584.0	177.635	3572.3	46.20	
	10:50	3854.3	68.1	1497.6	160.127	3694.2	43.68	
	10:55	3907.2	73.4	1526.4	165.870	3741.3	44.52	
	11:00	4010.3	78.7	1526.4	165.870	3844.4	44.52	
	11:05	4068.5	84.1	1555.2	171.706	3896.8	45.36	
				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)
5	11:10	4205.6	89.7	1612.8	183.656	4021.9	47.04	
	11:15	4277.9	96.1	1843.2	235.121	4042.8	53.76	
	11:20	4318.0	102.4	1814.4	228.369	4089.6	52.92	
	11:25	4374.9	108.7	1814.4	228.369	4146.5	52.92	
	11:30	4392.9	115.1	1843.2	235.121	4157.8	53.76	
	11:35	4396.8	121.4	1814.4	228.369	4168.4	52.92	
				1790.4				
	11:40	4522.2	129.0	2188.8	323.120	4199.1	63.84	
	11:45	4548.0	136.6	2188.8	323.120	4224.9	63.84	
	11:50	4536.3	144.4	2246.4	339.026	4197.3	65.52	
6	11:55	4560.8	152.1	2217.6	331.029	4229.8	64.68	
	12:00	4553.0	159.7	2188.8	323.120	4229.9	63.84	
	12:05	4595.7	167.4	2217.6	331.029	4264.7	64.68	
				2208.0				
	FALLOFF 12:06	4260.6				4260.6		
	12:07	4233.4				4233.4		
	12:08	4216.6				4216.6		
	12:09	4203.6				4203.6		
	12:10	4192.0				4192.0		
	12:15	4138.9				4138.9		
	12:20	4088.4				4088.4		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 6 WIW
Lea County, New Mexico



WEST - TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 6, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 6 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0363

PERFS = 8774-8812

PACKER DEPTH = 8658-8665

BHP GAUGE DEPTH = SURFACE ONLY

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	10:55	2785.6				2785.6		
	11:00	2918.6	0.8	230.4	5.019	2913.6	6.72	
	11:05	2982.7	1.6	230.4	5.019	2977.7	6.72	
	11:10	3059.8	2.4	230.4	5.019	3054.8	6.72	
	11:15	3076.4	3.2	230.4	5.019	3071.4	6.72	
	11:20	3121.5	4.1	259.2	6.240	3115.3	7.56	
	11:25	3160.0	4.9	230.4	5.019	3155.0	6.72	
				235.2				
	11:30	3334.1	6.5	460.8	18.092	3316.0	13.44	
	11:35	3416.5	8.0	432.0	16.056	3400.4	12.60	
2	11:40	3486.1	9.6	460.8	18.092	3468.0	13.44	
	11:45	3535.0	11.2	460.8	18.092	3516.9	13.44	
	11:50	3591.6	12.8	460.8	18.092	3573.5	13.44	
	11:55	3640.6	14.4	460.8	18.092	3622.5	13.44	
				456.0				
	12:00	3786.2	16.7	662.4	35.404	3750.8	19.32	
	12:05	3868.7	19.0	662.4	35.404	3833.3	19.32	
	12:10	3903.4	21.1	604.8	29.920	3873.5	17.64	
	12:15	3970.4	23.4	662.4	35.404	3935.0	19.32	
	12:20	3989.7	25.7	662.4	35.404	3954.3	19.32	
3	12:25	4025.8	28.0	662.4	35.404	3990.4	19.32	
				652.8				
	12:30	4142.1	30.7	777.6	47.630	4094.5	22.68	
	12:35	4193.8	33.8	892.8	61.500	4132.3	26.04	
	12:40	4215.7	36.8	864.0	57.881	4157.8	25.20	
	12:45	4235.0	39.8	864.0	57.881	4177.1	25.20	
	12:50	4255.6	42.9	892.8	61.500	4194.1	26.04	
	12:55	4268.5	45.9	864.0	57.881	4210.6	25.20	
				859.2				

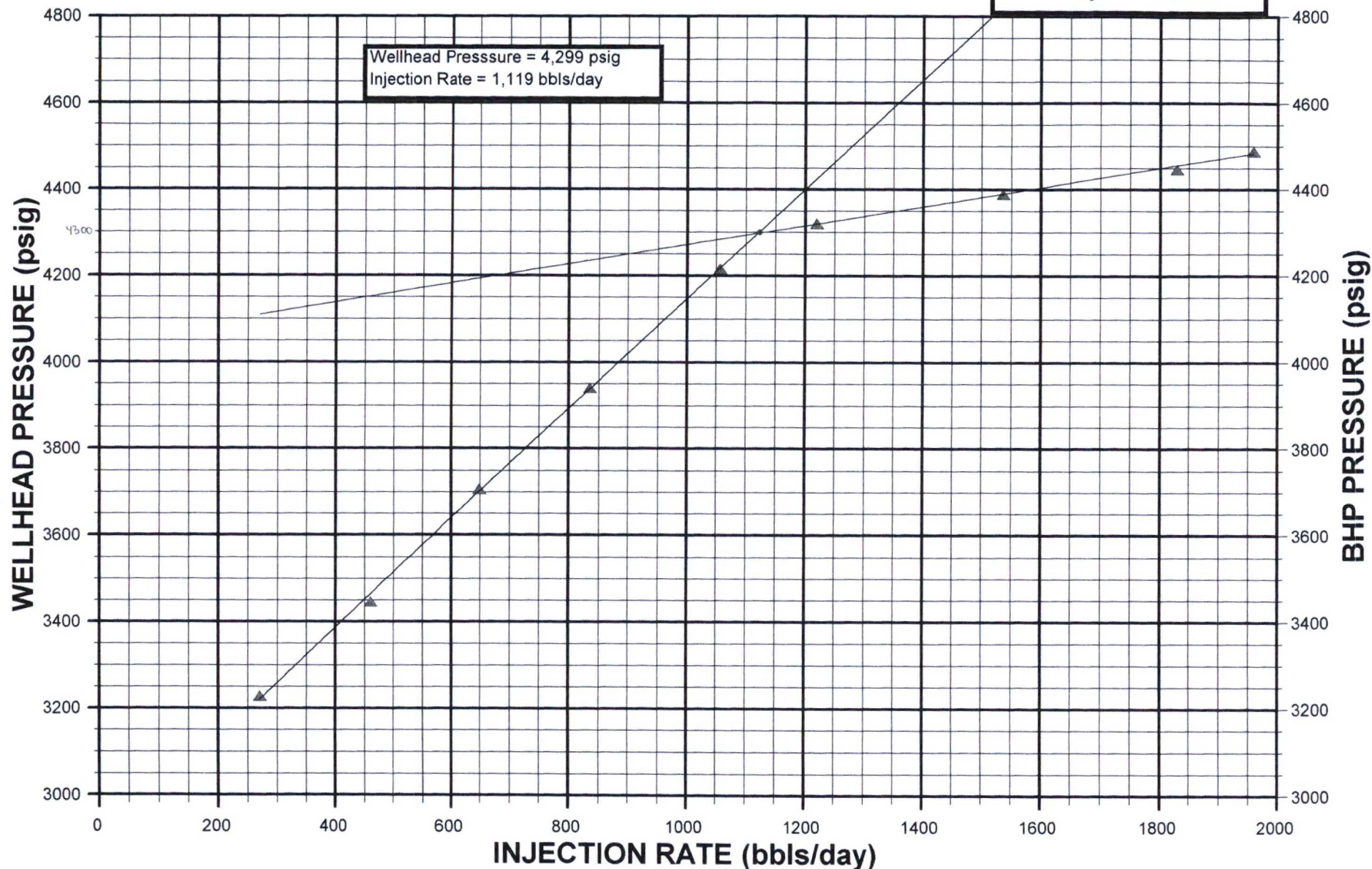
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1) - (4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
5	1:00	4333.1	49.4	1008.0	76.981	4256.1	29.40	
	1:05	4352.3	53.1	1065.6	85.316	4267.0	31.08	
	1:10	4369.1	56.6	1008.0	76.981	4292.1	29.40	
	1:15	4385.8	60.1	1008.0	76.981	4308.8	29.40	
	1:20	4403.8	63.6	1008.0	76.981	4326.8	29.40	
	1:25	4405.0	67.3	1065.6	85.316	4319.7	31.08	
				1027.2				
	1:30	4503.2	71.5	1209.6	107.862	4395.3	35.28	
	1:35	4517.4	76.0	1296.0	122.547	4394.9	37.80	
	1:40	4506.9	80.1	1180.8	103.159	4403.7	34.44	
6	1:45	4506.8	84.2	1180.8	103.159	4403.6	34.44	
	1:50	4523.6	88.5	1238.4	112.661	4410.9	36.12	
	1:55	4509.2	92.7	1209.6	107.862	4401.3	35.28	
				1219.2				
	2:00	4620.4	97.4	1353.6	132.813	4487.6	39.48	
7	2:05	4615.2	102.5	1468.8	154.477	4460.7	42.84	
	2:10	4600.8	107.5	1440.0	148.920	4451.9	42.00	
	2:15	4631.8	112.7	1497.6	160.127	4471.7	43.68	
				1440.0				
FALLOFF	2:16	4335.6				4335.6		
	2:17	4303.2				4303.2		
	2:18	4287.7				4287.7		
	2:19	4272.1				4272.1		
	2:20	4260.5				4260.5		
	2:25	4209.9				4209.9		
	2:30	4172.3				4172.3		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 7 WIW
Lea County, New Mexico

Wellhead Pressure = 4,299 psig
Injection Rate = 1,119 bbls/day



▲ RECORDED WELLHEAD PRESSURE ■ Measured BHP (not recorded)

WEST - TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 7, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 7 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0364

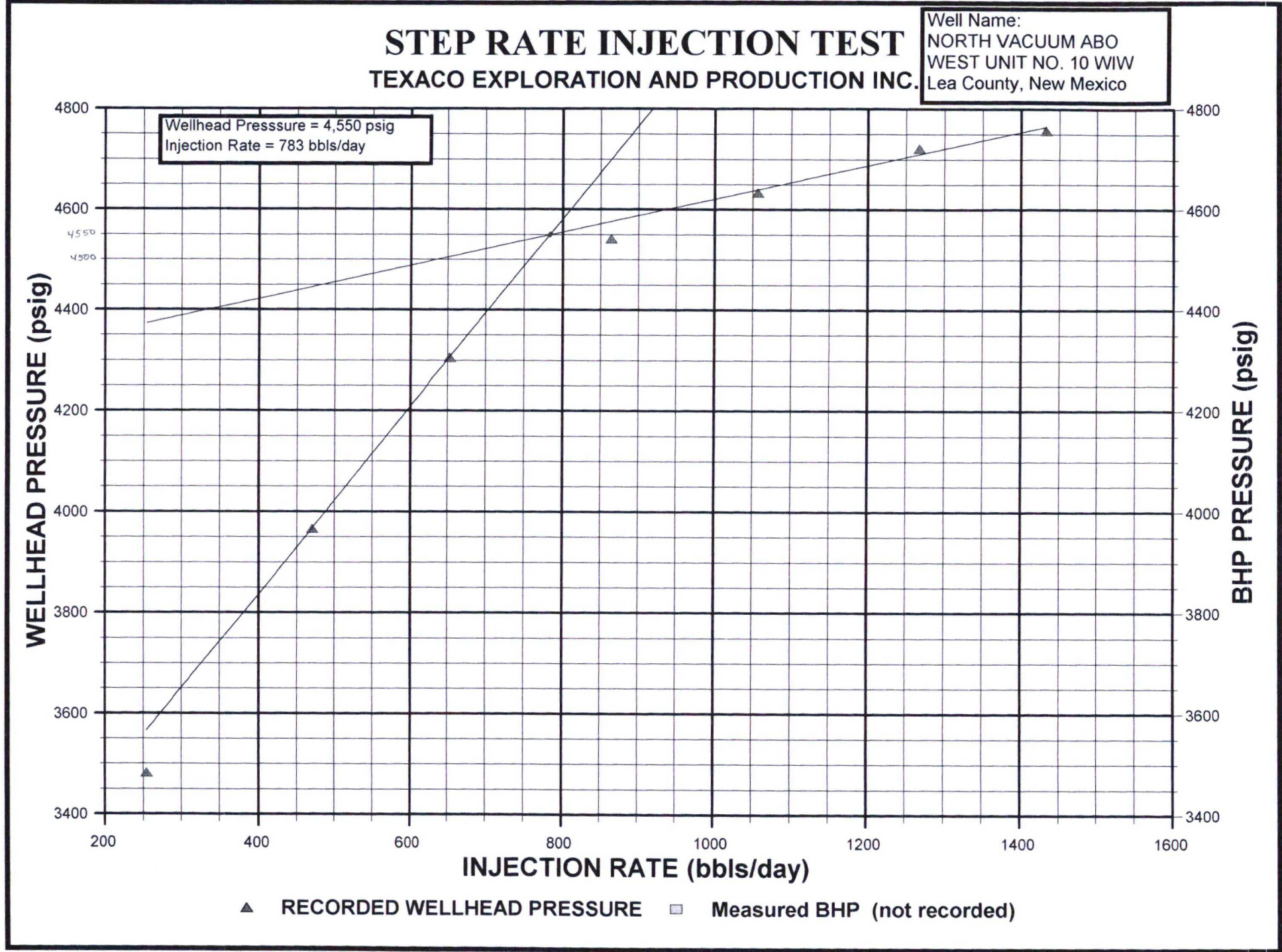
PERFS = 8711-8867

PACKER DEPTH = 8639-8647

BHP GAUGE DEPTH = SURFACE ONLY

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	9:00	3026.5				3026.5		
	9:05	3088.1	0.9	259.2	6.237	3081.9	7.56	
	9:10	3122.6	1.8	259.2	6.237	3116.4	7.56	
	9:15	3172.6	2.7	259.2	6.237	3166.4	7.56	
	9:20	3207.1	3.7	288.0	7.580	3199.5	8.40	
	9:25	3206.7	4.6	259.2	6.237	3200.5	7.56	
	9:30	3229.6	5.6	288.0	7.580	3222.0	8.40	
				268.8				
	9:35	3296.4	7.2	460.8	18.083	3278.3	13.44	
	9:40	3337.4	8.8	460.8	18.083	3319.3	13.44	
2	9:45	3370.6	10.4	460.8	18.083	3352.5	13.44	
	9:50	3396.2	12.0	460.8	18.083	3378.1	13.44	
	9:55	3424.3	13.6	460.8	18.083	3406.2	13.44	
	10:00	3448.5	15.2	460.8	18.083	3430.4	13.44	
				460.8				
	10:05	3527.0	17.4	633.6	32.594	3494.4	18.48	
	10:10	3593.8	19.6	633.6	32.594	3561.2	18.48	
	10:15	3601.2	22.0	691.2	38.287	3562.9	20.16	
	10:20	3643.5	24.2	633.6	32.594	3610.9	18.48	
	10:25	3670.4	26.5	662.4	35.388	3635.0	19.32	
3	10:30	3707.5	28.7	633.6	32.594	3674.9	18.48	
				648.0				
	10:35	3767.9	31.4	777.6	47.608	3720.3	22.68	
	10:40	3833.4	34.3	835.2	54.337	3779.1	24.36	
	10:45	3873.2	37.4	892.8	61.472	3811.7	26.04	
	10:50	3894.9	40.5	892.8	61.472	3833.4	26.04	
	10:55	3929.6	43.3	806.4	50.922	3878.7	23.52	
	11:00	3942.3	46.1	806.4	50.922	3891.4	23.52	
				835.2				

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)
5	11:05	4042.8	50.0	1123.2	94.000	3948.8	32.76	
	11:10	4086.7	53.4	979.2	72.928	4013.8	28.56	
	11:15	4121.5	57.1	1065.6	85.277	4036.2	31.08	
	11:20	4161.5	60.8	1065.6	85.277	4076.2	31.08	
	11:25	4195.0	64.4	1036.8	81.063	4113.9	30.24	
	11:30	4216.9	68.1	1065.6	85.277	4131.6	31.08	
				1056.0				
	11:35	4282.8	72.3	1209.6	107.813	4175.0	35.28	
	11:40	4290.4	76.5	1209.6	107.813	4182.6	35.28	
	11:45	4302.0	80.7	1209.6	107.813	4194.2	35.28	
6	11:50	4317.4	85.0	1238.4	112.610	4204.8	36.12	
	11:55	4312.1	89.3	1238.4	112.610	4199.5	36.12	
	12:00	4322.3	93.5	1209.6	107.813	4214.5	35.28	
				1219.2				
	12:05	4354.6	98.5	1440.0	148.852	4205.7	42.00	
	12:10	4373.9	103.8	1526.4	165.795	4208.1	44.52	
	12:15	4360.8	109.2	1555.2	171.628	4189.2	45.36	
	12:20	4387.9	114.7	1584.0	177.554	4210.3	46.20	
	12:25	4380.0	120.1	1555.2	171.628	4208.4	45.36	
	12:30	4390.2	125.5	1555.2	171.628	4218.6	45.36	
7				1536.0				
	12:35	4491.1	131.8	1814.4	228.266	4262.8	52.92	
	12:40	4505.2	138.2	1843.2	235.014	4270.2	53.76	
	12:45	4493.6	144.5	1814.4	228.266	4265.3	52.92	
	12:50	4481.9	150.9	1843.2	235.014	4246.9	53.76	
	12:55	4456.0	157.3	1843.2	235.014	4221.0	53.76	
	1:00	4448.2	163.6	1814.4	228.266	4219.9	52.92	
				1828.8				
	1:05	4497.3	169.8	1785.6	221.608	4275.7	52.08	
	1:10	4503.7	176.0	1785.6	221.608	4282.1	52.08	
8	1:15	4506.3	183.1	2044.8	284.766	4221.5	59.64	
	1:20	4503.6	190.2	2044.8	284.766	4218.8	59.64	
	1:25	4489.3	197.3	2044.8	284.766	4204.5	59.64	
	1:30	4490.5	204.4	2044.8	284.766	4205.7	59.64	
				1958.4				



WEST - TEST INC.,
A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 10, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 10 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0365

PERFS = 8816-8924

PACKER DEPTH = 8747-8754

BHP GAUGE DEPTH = SURFACE ONLY

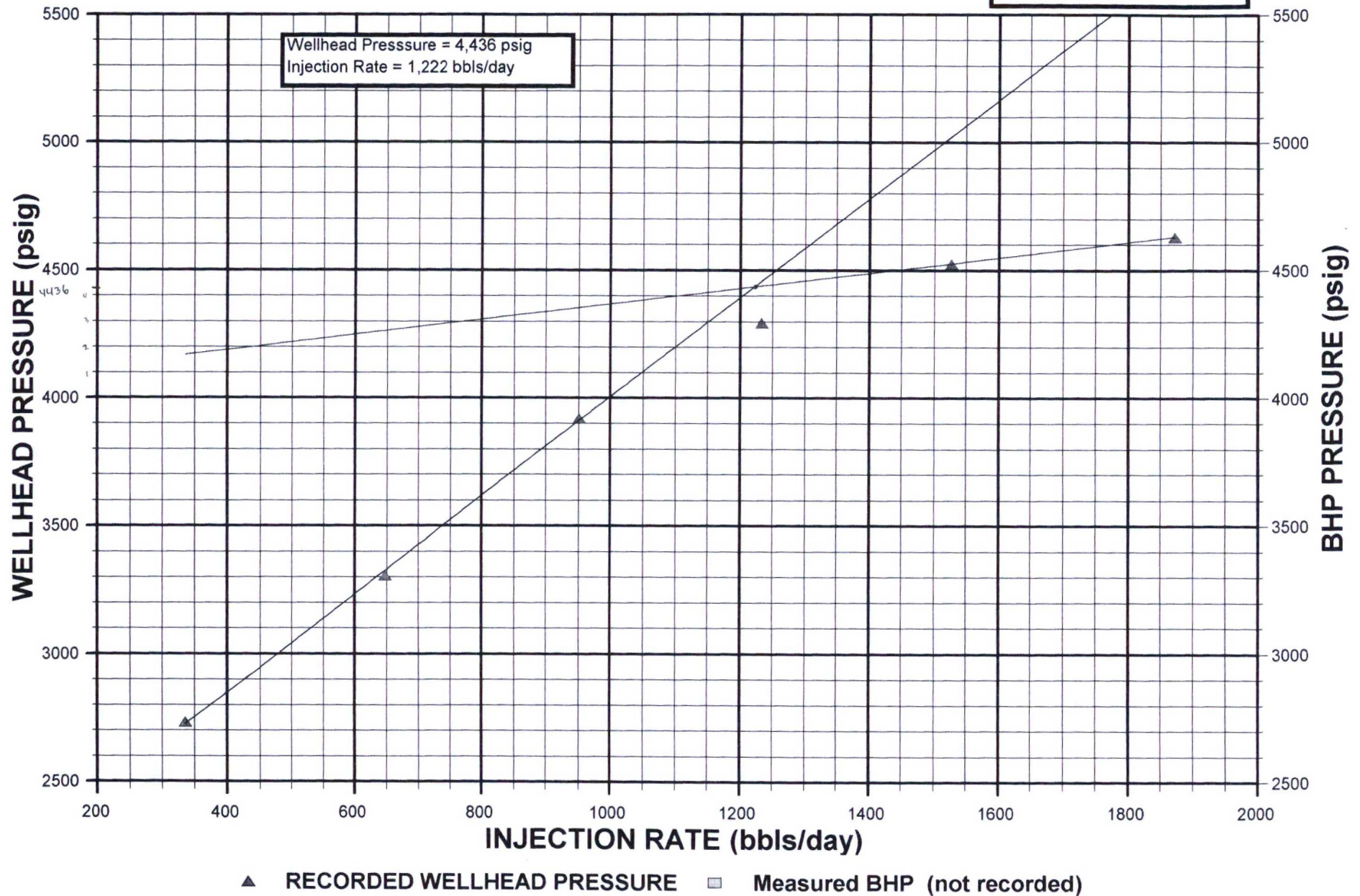
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:10	3033.8				3033.8		
	9:15	3184.4	0.9	259.2	6.295	3178.1	7.56	
	9:20	3260.3	1.8	259.2	6.295	3254.0	7.56	
	9:25	3334.9	2.7	259.2	6.295	3328.6	7.56	
	9:30	3395.3	3.5	230.4	5.062	3390.2	6.72	
	9:35	3446.7	4.4	259.4	6.304	3440.4	7.57	
	9:40	3483.9	5.3	259.4	6.304	3477.6	7.57	
				254.4				
	9:45	3637.7	6.9	460.8	18.250	3619.4	13.44	
	9:50	3717.0	8.5	460.8	18.250	3698.7	13.44	
2	9:55	3787.7	10.2	489.6	20.416	3767.3	14.28	
	10:00	3854.6	11.8	460.8	18.250	3836.3	13.44	
	10:05	3880.3	13.4	460.8	18.250	3862.0	13.44	
	10:10	3967.8	15.1	489.6	20.416	3947.4	14.28	
				470.4				
	10:15	4060.7	17.5	691.2	38.640	4022.1	20.16	
	10:20	4127.8	19.6	604.8	30.182	4097.6	17.64	
	10:25	4179.4	21.9	662.4	35.714	4143.7	19.32	
	10:30	4243.9	24.3	691.2	38.640	4205.3	20.16	
	10:35	4277.3	26.5	633.6	32.895	4244.4	18.48	
3	10:40	4306.9	28.7	633.6	32.895	4274.0	18.48	
				652.8				
	10:45	4388.3	31.6	835.2	54.838	4333.5	24.36	
	10:50	4436.0	34.7	892.8	62.039	4374.0	26.04	
	10:55	4488.9	37.7	864.0	58.387	4430.5	25.20	
	11:00	4526.3	40.7	864.0	58.387	4467.9	25.20	
	11:05	4524.9	43.7	864.0	58.387	4466.5	25.20	
	11:10	4542.8	46.7	864.0	58.387	4484.4	25.20	
				864.0				

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)
5	11:15	4586.7	50.4	1065.6	86.063	4500.6	31.08	
	11:20	4608.5	54.1	1065.6	86.063	4522.4	31.08	
	11:25	4626.5	57.9	1094.4	90.416	4536.1	31.92	
	11:30	4632.7	61.5	1036.8	81.810	4550.9	30.24	
	11:35	4629.9	65.1	1036.8	81.810	4548.1	30.24	
	11:40	4635.0	68.7	1036.8	81.810	4553.2	30.24	
				1056.0				
	11:45	4686.5	73.1	1267.2	118.586	4567.9	36.96	
	11:50	4699.4	77.5	1267.2	118.586	4580.8	36.96	
	11:55	4714.7	81.9	1267.2	118.586	4596.1	36.96	
6	12:00	4713.3	86.3	1267.2	118.586	4594.7	36.96	
	12:05	4718.3	90.7	1267.2	118.586	4599.7	36.96	
	12:10	4723.3	95.1	1267.2	118.586	4604.7	36.96	
				1267.2				
	12:15	4758.1	100.2	1468.8	155.829	4602.3	42.84	
7	12:20	4756.6	105.2	1440.0	150.224	4606.4	42.00	
	12:25	4772.0	110.0	1382.4	139.297	4632.7	40.32	
	12:30	4758.9	115.0	1440.0	150.224	4608.7	42.00	
				1432.8				
FALLOFF	OUT OF WATER							
	12:31	4639.9				4639.9		
	12:32	4604.9				4604.9		
	12:33	4595.8				4595.8		
	12:34	4590.6				4590.6		
	12:35	4581.6				4581.6		
	12:40	4549.1				4549.1		
	12:45	4521.7				4521.7		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
North Vacuum ABO West
Unit No. 11 WIW
Lea County, New Mexico



WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 25, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 11 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0366

PERFS = 8785-8889

PACKER DEPTH = 8724-8731

BHP GAUGE DEPTH = SURFACE ONLY

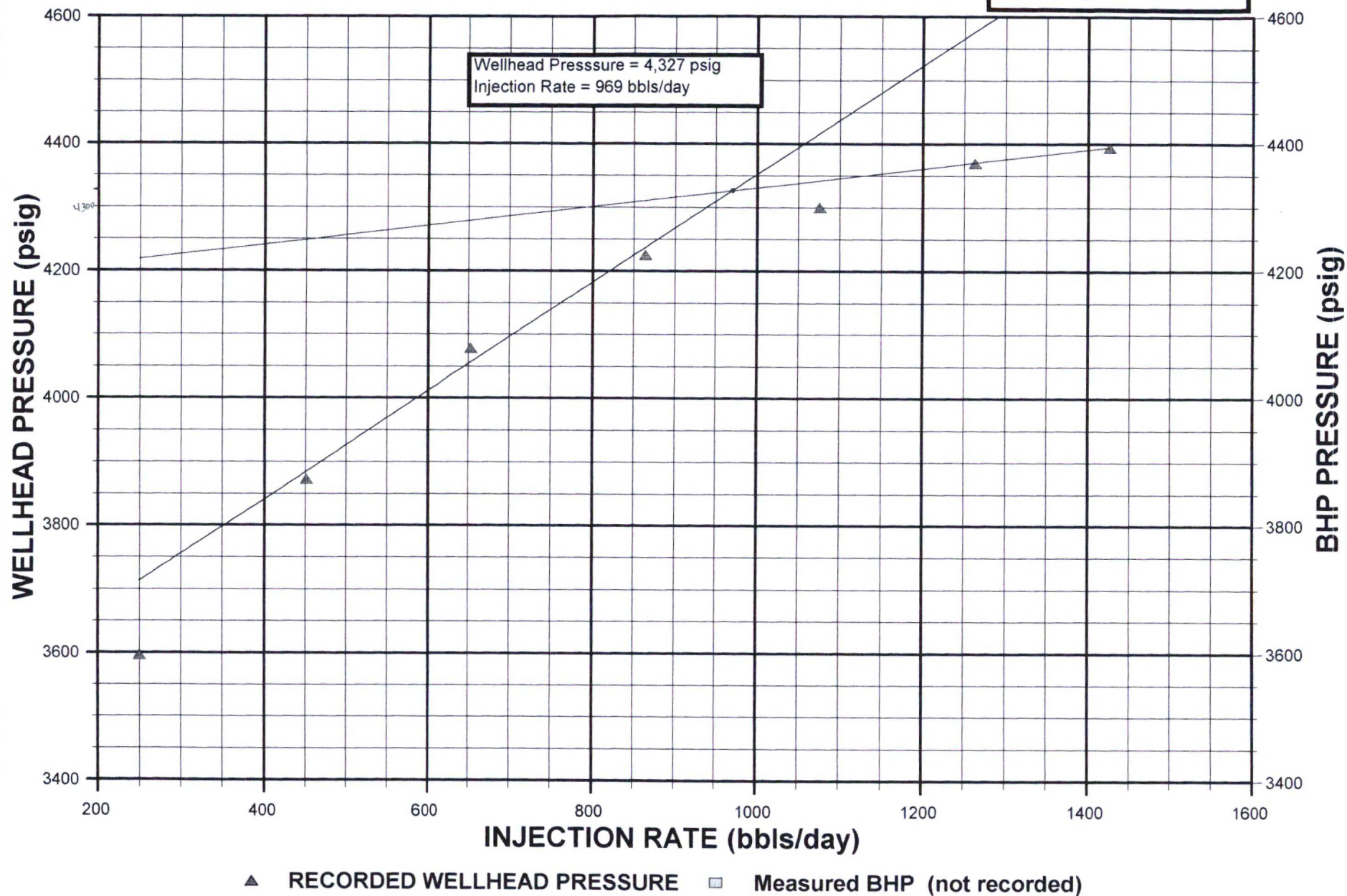
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:35	232.9				232.9		
	9:40	2466.2	1.1	316.8	9.091	2457.1	9.24	
	9:45	2537.9	2.3	345.6	10.679	2527.2	10.08	
	9:50	2609.7	3.5	345.6	10.679	2599.0	10.08	
	9:55	2625.0	4.6	316.8	9.091	2615.9	9.24	
	10:00	2703.2	5.8	345.6	10.679	2692.5	10.08	
	10:05	2735.1	7.0	345.6	10.679	2724.4	10.08	
				336.0				
	10:10	2944.5	9.3	662.4	35.581	2908.9	19.32	
	10:15	3043.3	11.7	691.2	38.496	3004.8	20.16	
2	10:20	3133.4	13.9	633.6	32.772	3100.6	18.48	
	10:25	3206.7	16.2	662.4	35.581	3171.1	19.32	
	10:30	3327.8	18.4	633.6	32.772	3295.0	18.48	
	10:35	3308.3	20.5	604.8	30.070	3278.2	17.64	
				648.0				
	10:40	3521.0	23.9	979.2	73.327	3447.7	28.56	
	10:45	3678.2	27.3	979.2	73.327	3604.9	28.56	
	10:50	3712.9	30.5	921.6	65.547	3647.4	26.88	
	10:55	3781.1	33.8	950.4	69.387	3711.7	27.72	
	11:00	3840.3	37.1	950.4	69.387	3770.9	27.72	
3	11:05	3921.5	40.3	921.6	65.547	3856.0	26.88	
				950.4				
	11:10	4081.5	44.8	1296.0	123.160	3958.3	37.80	
	11:15	4138.2	48.8	1152.0	99.046	4039.2	33.60	
	11:20	4183.4	53.1	1238.4	113.225	4070.2	36.12	
	11:25	4224.6	57.5	1267.2	118.144	4106.5	36.96	
	11:30	4280.1	61.8	1238.4	113.225	4166.9	36.12	
	11:35	4295.5	66.0	1209.6	108.402	4187.1	35.28	
				1233.6				

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)
5	11:40	4445.4	71.0	1440.0	149.665	4295.7	42.00	
	11:45	4462.0	76.4	1555.4	172.607	4289.4	45.37	
	11:50	4520.1	81.8	1555.2	172.566	4347.5	45.36	
	11:55	4532.8	87.2	1555.2	172.566	4360.2	45.36	
	12:00	4530.1	92.4	1497.6	160.928	4369.2	43.68	
	12:05	4527.3	97.8	1555.2	172.566	4354.7	45.36	
				1526.4				
	12:10	4619.0	104.2	1843.2	236.297	4382.7	53.76	
	12:15	4616.3	110.7	1872.0	243.173	4373.1	54.60	
	12:20	4644.6	117.2	1872.0	243.173	4401.4	54.60	
6	12:25	4647.0	123.8	1900.8	250.139	4396.9	55.44	
	12:30	4648.1	130.3	1872.0	243.173	4404.9	54.60	
	12:35	4631.2	136.8	1872.0	243.173	4388.0	54.60	
				1872.0				
	FALLOFF							
	12:36	4404.8				4404.8		
	12:37	4360.7				4360.7		
	12:38	4336.1				4336.1		
	12:39	4316.7				4316.7		
	12:40	4301.1				4301.1		
	12:45	4238.9				4238.9		
	12:50	4190.9				4190.9		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 12 WIW
Lea County, New Mexico



WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 11, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 12 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0367

PERFS = 8706-8812

PACKER DEPTH = 8642-8649

BHP GAUGE DEPTH = SURFACE ONLY

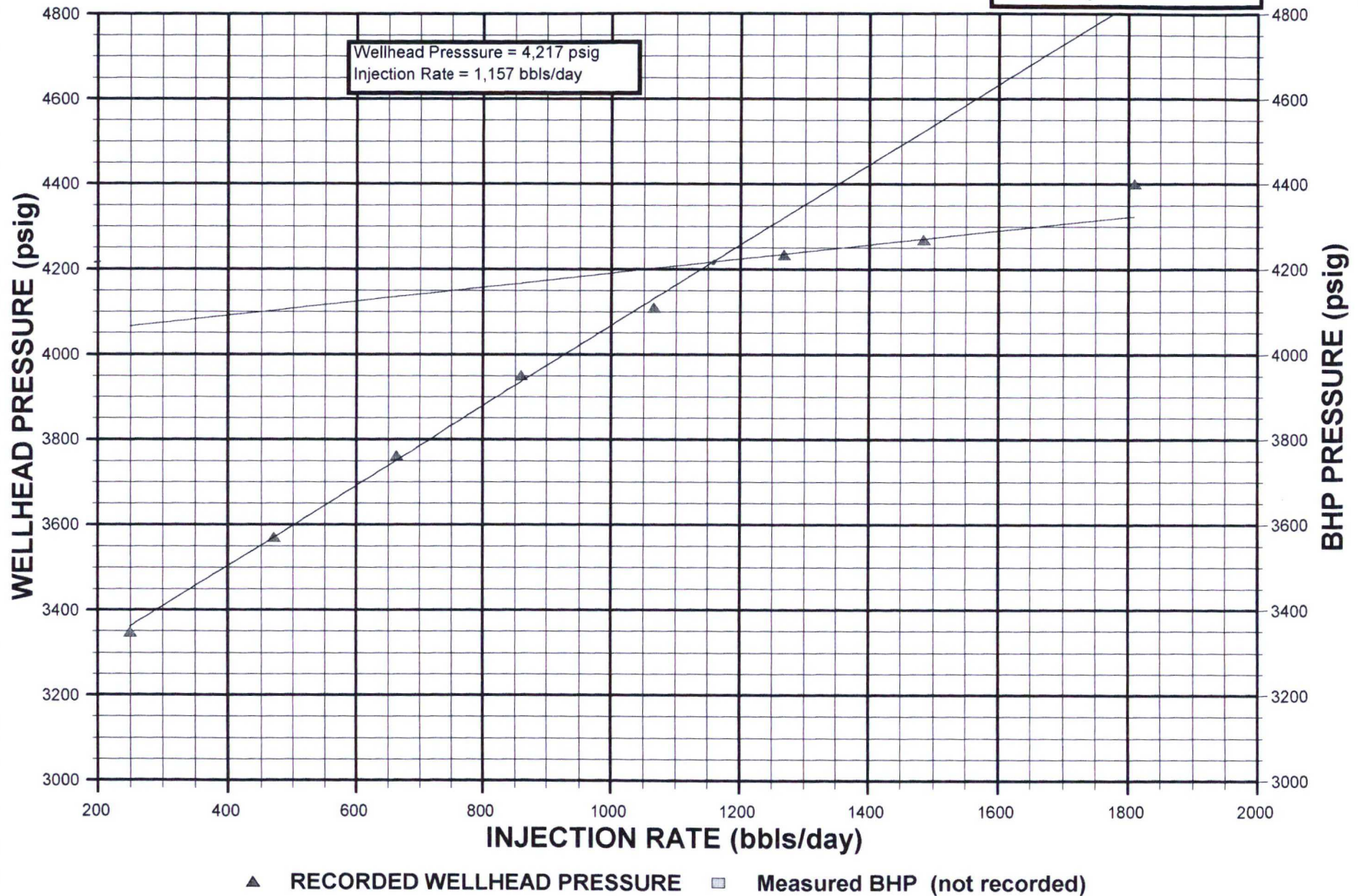
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:40	3257.4				3257.4		
	9:45	3373.0	0.8	230.4	4.999	3368.0	6.72	
	9:50	3437.1	1.6	230.4	4.999	3432.1	6.72	
	9:55	3488.2	2.5	259.2	6.216	3482.0	7.56	
	10:00	3544.6	3.4	259.2	6.216	3538.4	7.56	
	10:05	3568.7	4.3	259.2	6.216	3562.5	7.56	
	10:10	3596.7	5.2	259.2	6.216	3590.5	7.56	
				249.6				
	10:15	3704.7	6.8	460.8	18.022	3686.7	13.44	
	10:20	3735.3	8.4	460.8	18.022	3717.3	13.44	
2	10:25	3795.6	10.0	460.8	18.022	3777.6	13.44	
	10:30	3828.8	11.5	432.0	15.994	3812.8	12.60	
	10:35	3838.8	13.1	460.8	18.022	3820.8	13.44	
	10:40	3873.3	14.6	432.0	15.994	3857.3	12.60	
				451.2				
	10:45	3953.0	16.9	662.4	35.267	3917.7	19.32	
	10:50	3979.8	19.2	662.4	35.267	3944.5	19.32	
	10:55	4002.8	21.4	633.6	32.483	3970.3	18.48	
	11:00	4034.8	23.7	662.4	35.267	3999.5	19.32	
	11:05	4064.3	25.9	633.6	32.483	4031.8	18.48	
3	11:10	4079.6	28.2	662.4	35.267	4044.3	19.32	
				652.8				
	11:15	4141.5	31.1	835.2	54.152	4087.3	24.36	
	11:20	4168.5	34.1	864.0	57.657	4110.8	25.20	
	11:25	4186.4	37.0	835.2	54.152	4132.2	24.36	
	11:30	4201.7	40.1	892.8	61.262	4140.4	26.04	
	11:35	4219.6	43.1	864.0	57.657	4161.9	25.20	
	11:40	4225.9	46.2	892.8	61.262	4164.6	26.04	
				864.0				

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)
5	11:45	4265.8	49.9	1065.6	84.986	4180.8	31.08	
	11:50	4301.8	53.7	1094.4	89.284	4212.5	31.92	
	11:55	4308.1	57.4	1065.6	84.986	4223.1	31.08	
	12:00	4309.3	61.2	1094.4	89.284	4220.0	31.92	
	12:05	4310.4	64.9	1065.6	84.986	4225.4	31.08	
	12:10	4301.2	68.6	1065.6	84.986	4216.2	31.08	
				1075.2				
	12:15	4347.7	73.0	1267.2	117.102	4230.6	36.96	
	12:20	4363.1	77.4	1267.2	117.102	4246.0	36.96	
	12:25	4363.0	81.7	1238.4	112.226	4250.8	36.12	
6	12:30	4365.6	86.1	1267.2	117.102	4248.5	36.96	
	12:35	4357.7	90.5	1267.2	117.102	4240.6	36.96	
	12:40	4370.6	94.9	1267.2	117.102	4253.5	36.96	
				1262.4				
	12:45	4404.2	99.9	1440.0	148.344	4255.9	42.00	
7	12:50	4399.0	104.8	1411.2	142.902	4256.1	41.16	
	12:55	4404.2	109.7	1411.2	142.902	4261.3	41.16	
	1:00	4395.1	114.7	1440.0	148.344	4246.8	42.00	
				1425.6				
FALLOFF	OUT OF WATER							
	1:01	4230.8				4230.8		
	1:02	4211.4				4211.4		
	1:03	4202.3				4202.3		
	1:04	4194.6				4194.6		
	1:05	4186.8				4186.8		
	1:10	4159.6				4159.6		
	1:15	4139.0				4139.0		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACCUUM ABO
WEST UNIT NO. 16 WIW
Lea County, New Mexico



WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 12, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 16 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0368

PERFS = 8777-8859

PACKER DEPTH = 8461-8471

BHP GAUGE DEPTH = SURFACE ONLY

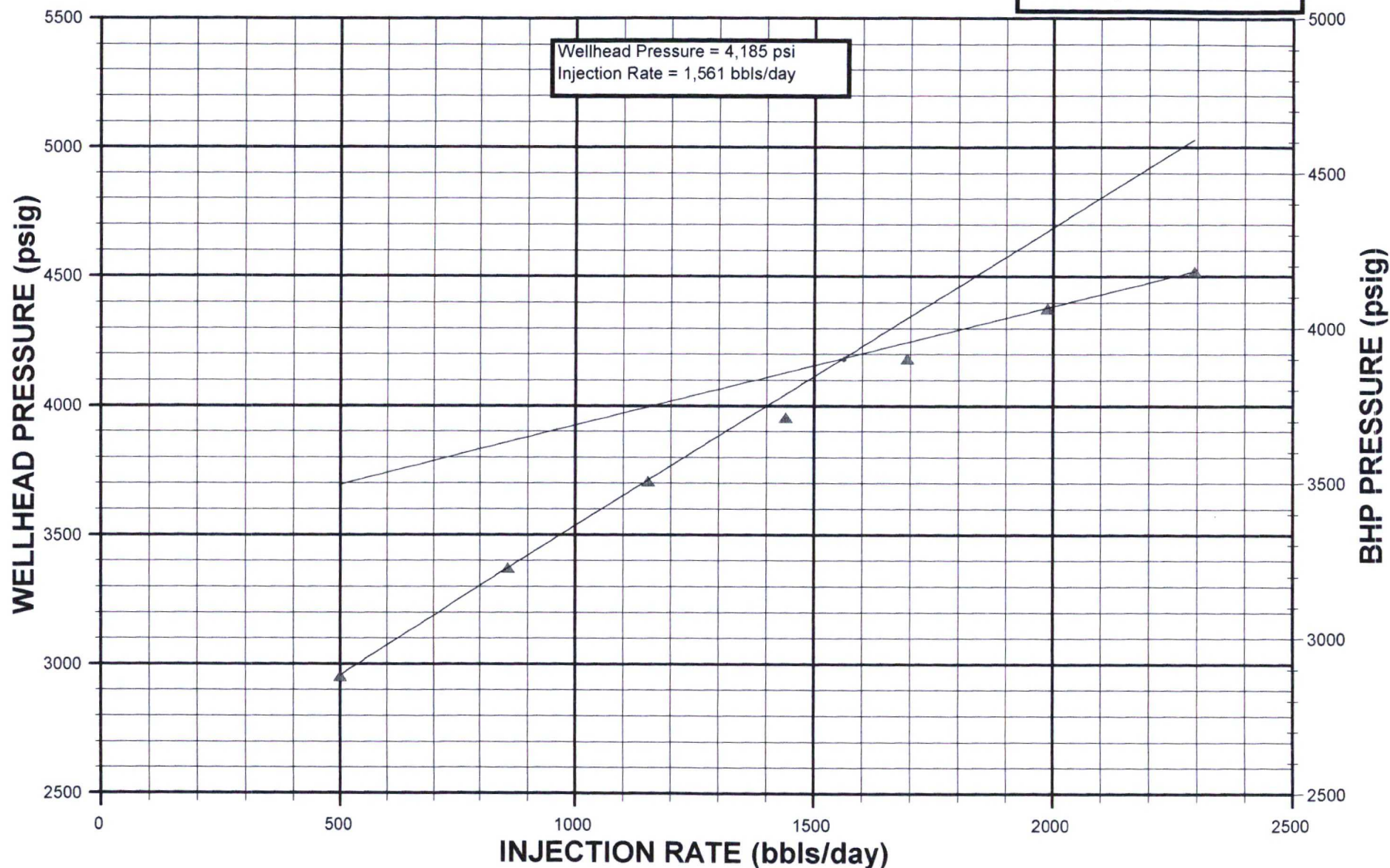
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	9:25	3151.3				3151.3		
	9:30	3227.2	0.8	230.4	5.033	3222.2	6.72	
	9:35	3268.3	1.7	259.2	6.258	3262.0	7.56	
	9:40	3286.1	2.6	259.2	6.258	3279.8	7.56	
	9:45	3292.4	3.5	259.2	6.258	3286.1	7.56	
	9:50	3330.8	4.4	259.2	6.258	3324.5	7.56	
	9:55	3350.0	5.2	230.4	5.033	3345.0	6.72	
				249.6				
	10:00	3432.4	6.8	460.8	18.143	3414.3	13.44	
	10:05	3474.8	8.5	489.6	20.297	3454.5	14.28	
2	10:10	3497.8	10.1	460.8	18.143	3479.7	13.44	
	10:15	3522.1	11.7	460.8	18.143	3504.0	13.44	
	10:20	3545.2	13.4	489.6	20.297	3524.9	14.28	
	10:25	3573.4	15.0	460.8	18.143	3555.3	13.44	
				470.4				
	10:30	3641.6	17.3	662.4	35.505	3606.1	19.32	
	10:35	3669.8	19.6	662.4	35.505	3634.3	19.32	
	10:40	3690.3	21.9	662.4	35.505	3654.8	19.32	
	10:45	3722.4	24.1	633.6	32.702	3689.7	18.48	
	10:50	3757.1	26.4	662.4	35.505	3721.6	19.32	
3	10:55	3764.7	28.8	691.2	38.413	3726.3	20.16	
				662.4				
	11:00	3843.3	32.0	921.6	65.406	3777.9	26.88	
	11:05	3870.3	34.7	777.6	47.765	3822.5	22.68	
	11:10	3912.7	37.6	835.2	54.516	3858.2	24.36	
	11:15	3937.1	40.6	864.0	58.045	3879.1	25.20	
	11:20	3952.5	43.6	864.0	58.045	3894.5	25.20	
	11:25	3952.3	46.7	892.8	61.675	3890.6	26.04	
				859.2				

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)
5	11:30	4023.2	50.4	1065.6	85.559	3937.6	31.08	
	11:35	4047.7	54.1	1065.6	85.559	3962.1	31.08	
	11:40	4079.9	57.8	1065.6	85.559	3994.3	31.08	
	11:45	4094.0	61.6	1094.4	89.886	4004.1	31.92	
	11:50	4105.6	65.3	1065.6	85.559	4020.0	31.08	
	11:55	4112.0	68.9	1036.8	81.330	4030.7	30.24	
				1065.6				
	12:00	4174.0	73.4	1296.0	122.895	4051.1	37.80	
	12:05	4195.9	77.7	1238.4	112.982	4082.9	36.12	
	12:10	4199.7	82.1	1267.2	117.890	4081.8	36.96	
6	12:15	4213.8	86.5	1267.2	117.890	4095.9	36.96	
	12:20	4218.9	90.9	1267.2	117.890	4101.0	36.96	
	12:25	4235.6	95.3	1267.2	117.890	4117.7	36.96	
				1267.2				
	12:30	4278.2	100.5	1497.6	160.582	4117.6	43.68	
	12:35	4262.7	105.6	1468.8	154.916	4107.8	42.84	
	12:40	4275.5	110.6	1440.0	149.343	4126.2	42.00	
	12:45	4287.1	115.8	1497.6	160.582	4126.5	43.68	
	12:50	4270.2	121.0	1497.6	160.582	4109.6	43.68	
	12:55	4271.4	126.2	1497.6	160.582	4110.8	43.68	
7				1483.2				
	1:00	4336.1	132.1	1699.2	202.846	4133.3	49.56	
	1:05	4369.6	138.5	1843.2	235.789	4133.8	53.76	
	1:10	4370.8	144.9	1843.2	235.789	4135.0	53.76	
	1:15	4383.7	151.2	1814.4	229.019	4154.7	52.92	
	1:20	4388.8	157.6	1843.2	235.789	4153.0	53.76	
	1:25	4403.0	163.9	1814.4	229.019	4174.0	52.92	
				1809.6				
	1:26	4161.1				4161.1		
	1:27	4136.5				4136.5		
8	1:28	4130.0				4130.0		
	1:29	4120.9				4120.9		
	1:30	4114.4				4114.4		
	1:35	4088.5				4088.5		
	1:40	4067.8				4067.8		
FALLOFF								

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 17 WIW
Lea County, New Mexico



▲ RECORDED WELLHEAD PRESSURE ■ Measured BHP (not recorded)

WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 17, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 17 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0369

PERFS = 8723-8874

PACKER DEPTH = 8671-8678

BHP GAUGE DEPTH = SURFACE ONLY

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	8:50	2776.9				2776.9		
	8:55	2869.2	1.2	345.6	10.633	2858.6	10.08	
	9:00	3018.0	3.0	518.4	22.512	2995.5	15.12	
	9:05	3062.9	4.8	518.4	22.512	3040.4	15.12	
	9:10	2921.2	6.6	518.4	22.512	2898.7	15.12	
	9:15	3044.5	8.5	547.2	24.880	3019.6	15.96	
	9:20	2955.5	10.4	547.2	24.880	2930.6	15.96	
				499.2				
	9:25	3175.6	13.4	864.0	57.920	3117.7	25.20	
	9:30	3211.5	16.4	864.0	57.920	3153.6	25.20	
2	9:35	3287.3	19.4	864.0	57.920	3229.4	25.20	
	9:40	3289.7	22.4	864.0	57.920	3231.8	25.20	
	9:45	3344.9	25.3	835.2	54.399	3290.5	24.36	
	9:50	3375.6	28.3	864.0	57.920	3317.7	25.20	
				859.2				
	9:55	3464.4	32.2	1123.2	94.107	3370.3	32.76	
	10:00	3504.2	36.2	1152.0	98.620	3405.6	33.60	
	10:05	3627.9	40.2	1152.0	98.620	3529.3	33.60	
	10:10	3654.9	44.3	1180.8	103.230	3551.7	34.44	
	10:15	3628.9	48.3	1152.0	98.620	3530.3	33.60	
3	10:20	3710.1	52.3	1152.0	98.620	3611.5	33.60	
				1152.0				
	10:25	3824.9	57.1	1382.4	138.182	3686.7	40.32	
	10:30	3867.4	62.1	1440.0	149.021	3718.4	42.00	
	10:35	3917.6	67.2	1468.8	154.582	3763.0	42.84	
	10:40	3905.9	72.3	1468.8	154.582	3751.3	42.84	
	10:45	3983.2	77.4	1468.8	154.582	3828.6	42.84	
	10:50	3956.1	82.3	1411.2	143.555	3812.5	41.16	
				1440.0				
4								

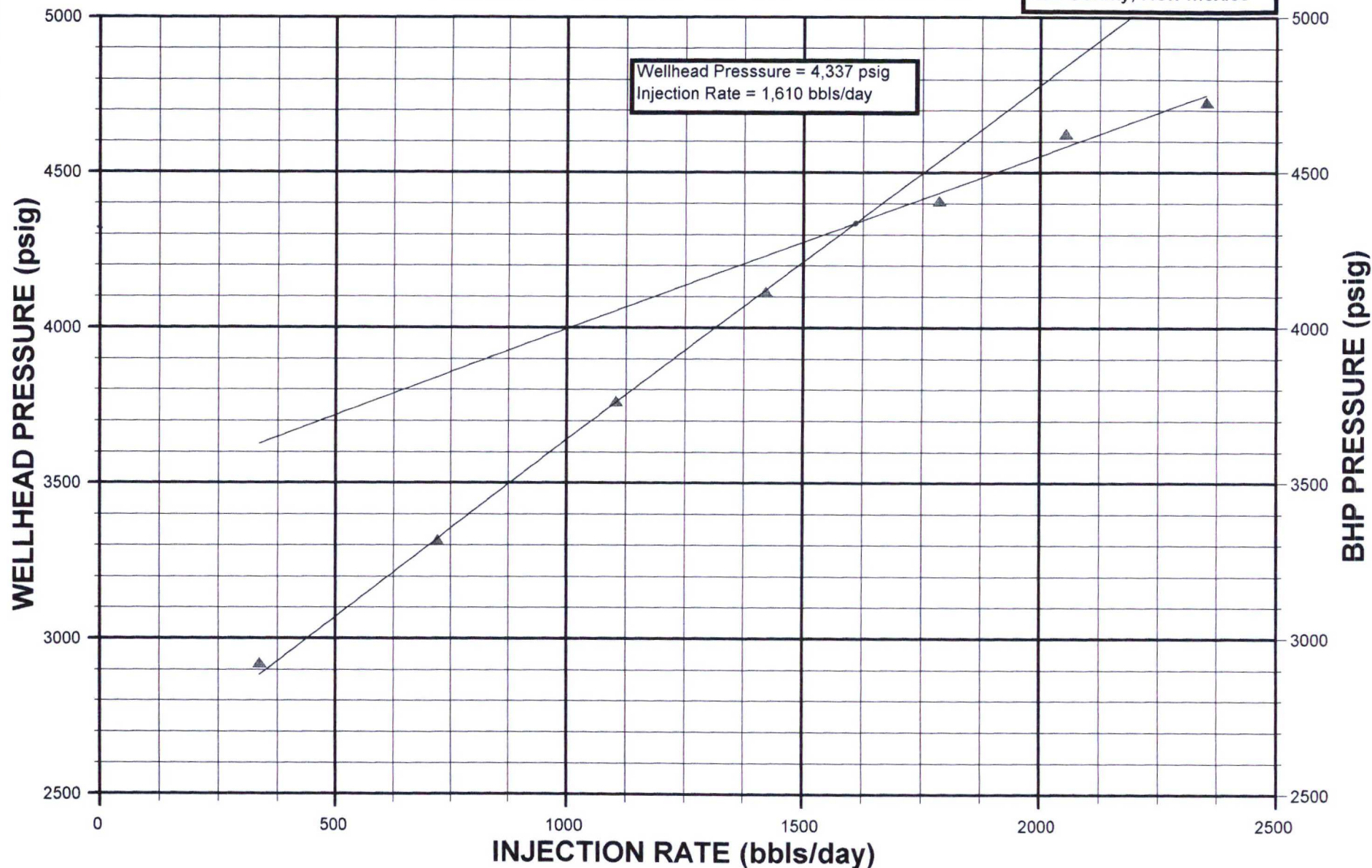
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1) - (4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
5	10:55	4077.5	87.6	1526.4	165.983	3911.5	44.52	
	11:00	4140.8	93.7	1756.8	215.285	3925.5	51.24	
	11:05	4166.6	99.8	1756.8	215.285	3951.3	51.24	
	11:10	4157.4	105.8	1728.0	208.802	3948.6	50.40	
	11:15	4184.4	111.8	1728.0	208.802	3975.6	50.40	
	11:20	4184.3	117.6	1670.4	196.108	3988.2	48.72	
				1694.4				
	11:25	4314.8	124.5	1987.2	270.411	4044.4	57.96	
	11:30	4319.8	131.5	2016.0	277.706	4042.1	58.80	
	11:35	4323.5	138.3	1958.4	263.206	4060.3	57.12	
	11:40	4351.9	145.2	1987.2	270.411	4081.5	57.96	
	11:45	4346.6	152.1	1987.2	270.411	4076.2	57.96	
	11:50	4381.4	159.0	1987.2	270.411	4111.0	57.96	
				1987.2				
6	11:55	4488.6	166.4	2131.2	307.775	4180.8	62.16	
	12:00	4533.8	174.3	2275.2	347.348	4186.5	66.36	
	12:05	4518.2	182.5	2361.6	372.143	4146.1	68.88	
	12:10	4503.9	190.6	2332.8	363.791	4140.1	68.04	
	12:15	4528.3	198.7	2332.8	363.791	4164.5	68.04	
	12:20	4523.1	206.8	2332.8	363.791	4159.3	68.04	
				2294.4				
FALLOFF	12:21	4091.0				4091.0		
	12:22	4069.0				4069.0		
	12:23	4045.7				4045.7		
	12:24	4027.6				4027.6		
	12:25	4012.1				4012.1		
	12:30	3946.2				3946.2		
	12:35	3898.4				3898.4		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 18 WIW
Lea County, New Mexico

Wellhead Pressure = 4,337 psig
Injection Rate = 1,610 bbls/day



▲ RECORDED WELLHEAD PRESSURE ■ BHP PRESSURE

WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY
Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 18, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 18 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0370

PERFS = 8651-8722

PACKER DEPTH = 8527-8537

BHP GAUGE DEPTH = SURFACE ONLY

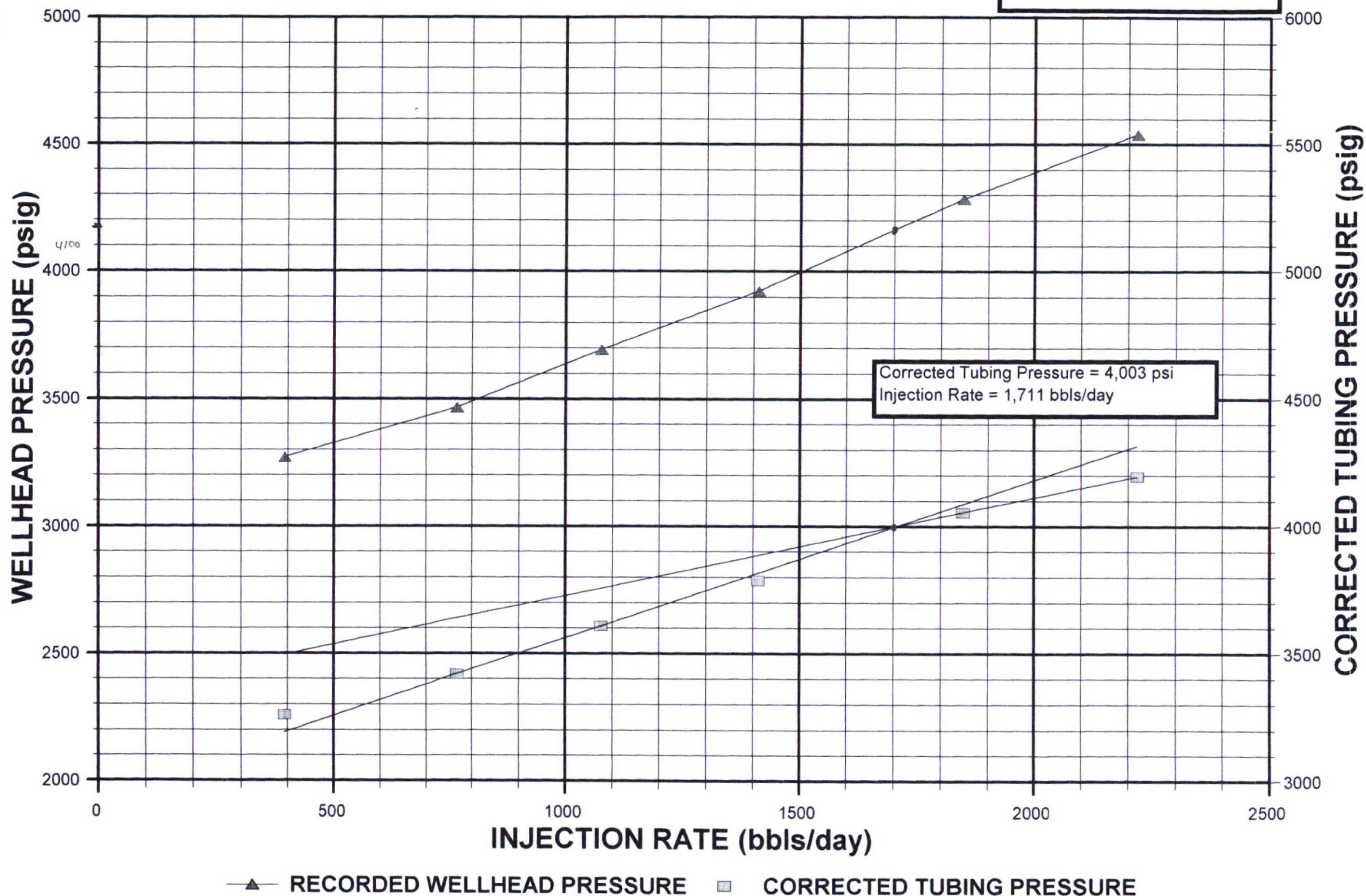
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	8:35	2725.2				2725.2		
	8:40	2795.7	0.9	259.2	6.165	2789.5	7.56	
	8:45	2814.8	2.0	316.8	8.936	2805.9	9.24	
	8:50	2848.1	3.2	345.6	10.497	2837.6	10.08	
	8:55	2849.2	4.4	345.6	10.497	2838.7	10.08	
	9:00	2874.8	5.6	345.6	10.497	2864.3	10.08	
	9:05	2923.5	7.0	403.2	13.961	2909.5	11.76	
				336.0				
	9:10	3067.5	9.5	720.0	40.811	3026.7	21.00	
	9:15	3152.5	11.9	691.2	37.843	3114.7	20.16	
2	9:20	3180.7	14.5	748.8	43.883	3136.8	21.84	
	9:25	3268.3	16.9	691.2	37.843	3230.5	20.16	
	9:30	3275.9	19.4	720.0	40.811	3235.1	21.00	
	9:35	3319.7	22.0	748.8	43.883	3275.8	21.84	
				720.0				
	9:40	3496.4	25.8	1094.4	88.550	3407.8	31.92	
	9:45	3582.7	29.9	1180.8	101.916	3480.8	34.44	
	9:50	3644.5	33.6	1065.6	84.288	3560.2	31.08	
	9:55	3714.1	37.4	1094.4	88.550	3625.5	31.92	
	10:00	3743.7	41.2	1094.4	88.550	3655.1	31.92	
3	10:05	3765.5	45.0	1094.4	88.550	3676.9	31.92	
				1104.0				
	10:10	3961.6	49.5	1296.0	121.069	3840.5	37.80	
	10:15	3993.7	53.9	1267.2	116.139	3877.6	36.96	
	10:20	4046.6	59.9	1728.0	206.144	3840.5	50.40	
	10:25	4081.5	64.8	1411.2	141.727	3939.8	41.16	
	10:30	4108.5	69.8	1440.0	147.125	3961.4	42.00	
	10:35	4118.8	74.6	1382.4	136.423	3982.4	40.32	
				1420.8				

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) MEASURED BHP (psi)
5	10:40	4306.3	80.9	1814.4	225.616	4080.7	52.92	
	10:45	4338.6	87.1	1785.6	219.036	4119.6	52.08	
	10:50	4361.7	93.3	1785.6	219.036	4142.7	52.08	
	10:55	4382.4	99.5	1785.6	219.036	4163.4	52.08	
	11:00	4387.5	105.7	1785.6	219.036	4168.5	52.08	
	11:05	4412.0	111.8	1756.8	212.545	4199.5	51.24	
				1785.6				
	11:10	4536.1	118.3	1872.0	239.045	4297.1	54.60	
	11:15	4541.2	125.7	2131.2	303.857	4237.3	62.16	
	11:20	4541.2	132.7	2016.0	274.171	4267.0	58.80	
6	11:25	4589.0	139.9	2073.6	288.839	4300.2	60.48	
	11:30	4590.2	147.2	2102.4	296.304	4293.9	61.32	
	11:35	4629.0	154.6	2131.2	303.857	4325.1	62.16	
				2054.4				
	11:40	4706.5	162.8	2361.6	367.406	4339.1	68.88	
	11:45	4706.5	171.0	2361.6	367.406	4339.1	68.88	
	11:50	4710.3	179.3	2390.4	375.738	4334.6	69.72	
	11:55	4728.4	187.4	2332.8	359.160	4369.2	68.04	
	12:00	4712.8	195.5	2332.8	359.160	4353.6	68.04	
	12:05	4729.6	203.6	2332.8	359.160	4370.4	68.04	
FALLOFF				2352.0				
	12:06	4317.0				4317.0		
	12:07	4278.1				4278.1		
	12:08	4269.1				4269.1		
	12:09	4261.3				4261.3		
	12:10	4249.7				4249.7		
	12:15	4205.6				4205.6		
	12:20	4169.4				4169.4		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 21 WIW
Lea County, New Mexico



WEST-TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 19, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 21 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0371

PERFS = 8651-8722

PACKER DEPTH = 8638-8648

BHP GAUGE DEPTH = SURFACE ONLY

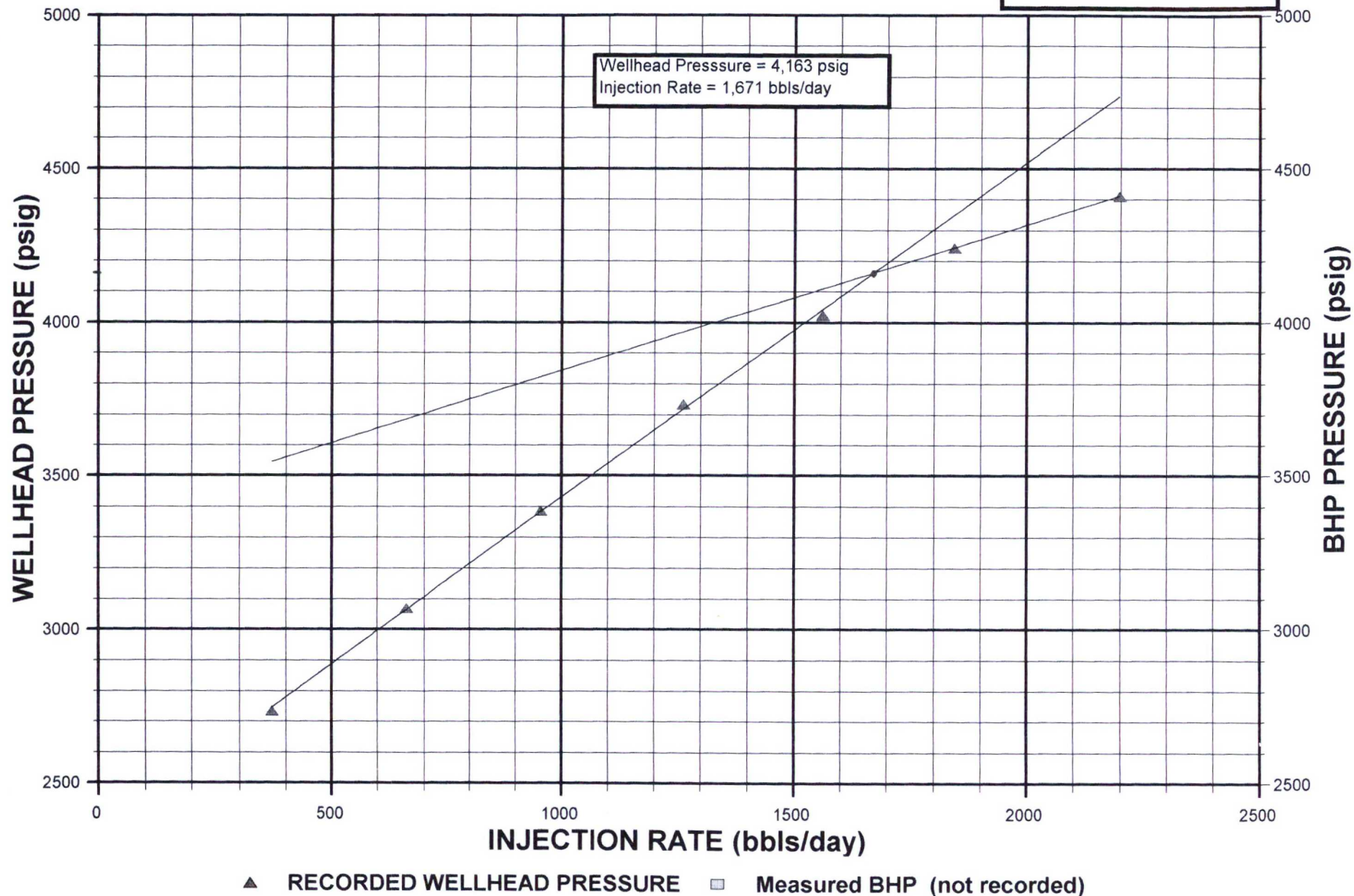
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	8:30	3096.2				3096.2		
	8:35	3165.5	1.3	374.4	12.173	3153.3	10.92	
	8:40	3185.7	2.7	403.2	13.961	3171.7	11.76	
	8:45	3193.1	4.1	403.2	13.961	3179.1	11.76	
	8:50	3159.2	5.5	403.2	13.961	3145.2	11.76	
	8:55	3225.9	6.9	403.2	13.961	3211.9	11.76	
	9:00	3272.0	8.2	374.4	12.173	3259.8	10.92	
				393.6				
	9:05	3377.5	11.0	806.4	50.331	3327.2	23.52	
	9:10	3372.0	13.6	748.8	43.883	3328.1	21.84	
2	9:15	3411.7	16.2	748.8	43.883	3367.8	21.84	
	9:20	3414.0	18.8	748.8	43.883	3370.1	21.84	
	9:25	3444.7	21.5	777.6	47.056	3397.6	22.68	
	9:30	3467.6	24.2	777.6	47.056	3420.5	22.68	
				768.0				
	9:35	3595.1	28.0	1094.4	88.550	3506.5	31.92	
	9:40	3616.8	31.7	1065.6	84.288	3532.5	31.08	
	9:45	3620.4	35.6	1123.2	92.910	3527.5	32.76	
	9:50	3655.1	39.2	1036.8	80.122	3575.0	30.24	
	9:55	3680.6	42.9	1065.6	84.288	3596.3	31.08	
3	10:00	3694.6	46.6	1065.6	84.288	3610.3	31.08	
				1075.2				
	10:05	3846.7	52.0	1555.2	169.636	3677.1	45.36	
	10:10	3853.0	56.4	1267.2	116.139	3736.9	36.96	
	10:15	3922.5	61.4	1440.0	147.125	3775.4	42.00	
	10:20	3888.8	66.3	1411.2	141.727	3747.1	41.16	
	10:25	3909.2	71.2	1411.2	141.727	3767.5	41.16	
	10:30	3925.8	76.0	1382.4	136.423	3789.4	40.32	
				1411.2				

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)
5	10:35	4133.7	82.4	1843.2	232.286	3901.4	53.76	
	10:40	4167.2	88.8	1843.2	232.286	3934.9	53.76	
	10:45	4183.9	95.2	1843.2	232.286	3951.6	53.76	
	10:50	4240.6	101.6	1843.2	232.286	4008.3	53.76	
	10:55	4270.2	108.1	1872.0	239.045	4031.2	54.60	
	11:00	4288.2	114.5	1843.2	232.286	4055.9	53.76	
				1848.0				
	11:05	4416.2	121.5	2016.0	274.171	4142.0	58.80	
	11:10	4449.7	129.2	2217.6	327.038	4122.7	64.68	
	11:15	4498.7	137.1	2275.2	342.926	4155.8	66.36	
	11:20	4521.9	144.9	2246.4	334.939	4187.0	65.52	
	11:25	4541.2	152.8	2275.2	342.926	4198.3	66.36	
	11:30	4541.2	160.7	2275.2	342.926	4198.3	66.36	
				2217.6				
6 FALLOFF	11:35	4079.2				4079.2		
	11:36	4054.7				4054.7		
	11:37	4033.9				4033.9		
	11:38	4017.1				4017.1		
	11:39	4002.9				4002.9		
	11:40	3988.7				3988.7		
	11:45	3931.8				3931.8		
	11:50	3889.2				3889.2		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
North Vacuum
ABO West Unit No. 22 WIW
Lea County, New Mexico



WEST - TEST, INC.

A SUBSIDIARY OF JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: TEXACO EXPLORATION AND PRODUCTION, INC.

DATE: MARCH 26, 1997

WELL NAME: NORTH VACUUM ABO WEST UNIT NO. 22 WIW
LEA COUNTY, NEW MEXICO

WO#: 97-14-0372

PERFS = 8654-8739

PACKER DEPTH = 8586-8596

BHP GAUGE DEPTH = SURFACE ONLY

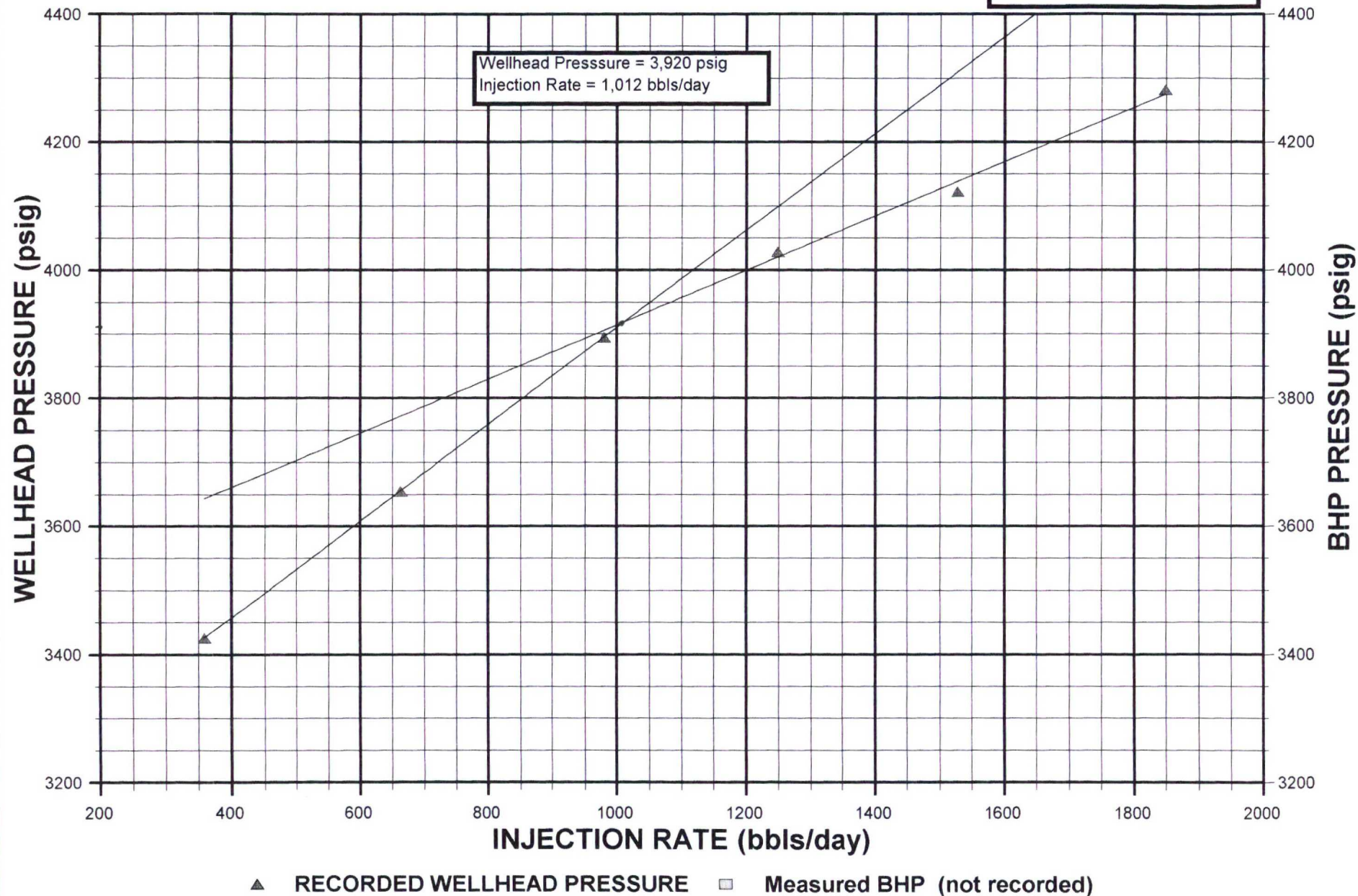
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (psi)
1	8:40	2575.7				2575.7		
	8:45	2596.0	1.3	374.4	12.306	2583.7	10.92	
	8:50	2639.5	2.6	374.4	12.306	2627.2	10.92	
	8:55	2649.6	3.8	345.6	10.612	2639.0	10.08	
	9:00	2666.1	5.1	374.4	12.306	2653.8	10.92	
	9:05	2696.8	6.4	374.4	12.306	2684.5	10.92	
	9:10	2736.4	7.7	374.4	12.306	2724.1	10.92	
				369.6				
	9:15	2801.8	10.0	662.4	35.360	2766.4	19.32	
	9:20	2946.8	12.4	691.2	38.256	2908.5	20.16	
2	9:25	2940.2	14.7	662.4	35.360	2904.8	19.32	
	9:30	3044.2	17.0	662.4	35.360	3008.8	19.32	
	9:35	3027.3	19.3	662.4	35.360	2991.9	19.32	
	9:40	3072.3	21.5	633.6	32.568	3039.7	18.48	
				662.4				
	9:45	3158.7	24.8	950.4	68.955	3089.7	27.72	
	9:50	3221.7	28.1	950.4	68.955	3152.7	27.72	
	9:55	3250.0	31.4	950.4	68.955	3181.0	27.72	
	10:00	3311.8	34.8	979.2	72.870	3238.9	28.56	
	10:05	3365.9	38.1	950.4	68.955	3296.9	27.72	
3	10:10	3388.9	41.4	950.4	68.955	3319.9	27.72	
				955.2				
	10:15	3492.0	45.8	1267.2	117.409	3374.6	36.96	
	10:20	3579.6	50.1	1238.4	112.520	3467.1	36.12	
	10:25	3597.5	54.4	1238.4	112.520	3485.0	36.12	
	10:30	3678.6	58.9	1296.0	122.393	3556.2	37.80	
	10:35	3709.4	63.3	1267.2	117.409	3592.0	36.96	
	10:40	3735.1	67.7	1267.2	117.409	3617.7	36.96	
				1262.4				

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)
5	10:45	3830.4	73.1	1555.2	171.492	3658.9	45.36	
	10:50	3906.4	78.5	1555.2	171.492	3734.9	45.36	
	10:55	3948.9	83.9	1555.2	171.492	3777.4	45.36	
	11:00	3982.3	89.3	1555.2	171.492	3810.8	45.36	
	11:05	4002.8	94.7	1555.2	171.492	3831.3	45.36	
	11:10	4026.0	100.2	1584.0	177.413	3848.6	46.20	
				1560.0				
	11:15	4125.5	106.2	1728.0	208.398	3917.1	50.40	
	11:20	4143.6	112.6	1843.2	234.827	3908.8	53.76	
	11:25	4165.5	119.2	1900.8	248.583	3916.9	55.44	
6	11:30	4195.2	125.6	1843.2	234.827	3960.4	53.76	
	11:35	4226.3	132.0	1843.2	234.827	3991.5	53.76	
	11:40	4244.4	138.6	1900.8	248.583	3995.8	55.44	
				1843.2				
	11:45	4398.4	146.6	2304.0	354.839	4043.6	67.20	
	11:50	4390.7	154.4	2246.4	338.602	4052.1	65.52	
	11:55	4386.8	162.1	2217.6	330.615	4056.2	64.68	
	12:00	4379.1	169.5	2131.2	307.180	4071.9	62.16	
	12:05	4406.3	177.0	2160.0	314.904	4091.4	63.00	
	12:10	4412.7	184.4	2131.2	307.180	4105.5	62.16	
FALLOFF				2198.4				
	12:11	4078.9				4078.9		
	12:12	4038.8				4038.8		
	12:13	4019.4				4019.4		
	12:14	4002.6				4002.6		
	12:15	3989.7				3989.7		
	12:20	3934.2				3934.2		
	12:25	3890.2				3890.2		

STEP RATE INJECTION TEST

TEXACO EXPLORATION AND PRODUCTION INC.

Well Name:
NORTH VACUUM ABO
WEST UNIT NO. 25 WIW
Lea County, New Mexico



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)
5	11:00	4120.7	73.0	1526.4	165.191	3955.5	44.52	
	11:05	4098.6	78.4	1555.2	171.003	3927.6	45.36	
	11:10	4106.2	83.6	1497.6	159.471	3946.7	43.68	
	11:15	4146.2	88.8	1497.6	159.471	3986.7	43.68	
	11:20	4118.9	94.2	1555.2	171.003	3947.9	45.36	
	11:25	4122.7	99.5	1526.4	165.191	3957.5	44.52	
				1526.4				
	11:30	4237.7	105.9	1843.2	234.158	4003.5	53.76	
	11:35	4254.4	112.3	1843.2	234.158	4020.2	53.76	
	11:40	4291.8	118.8	1872.0	240.972	4050.8	54.60	
6	11:45	4263.2	125.3	1872.0	240.972	4022.2	54.60	
	11:50	4285.1	131.6	1814.4	227.434	4057.7	52.92	
	11:55	4282.3	138.0	1843.2	234.158	4048.1	53.76	
				1848.0				
FALLOFF	11:56	3883.6				3883.6		
	11:57	3947.4				3947.4		
	11:58	3937.1				3937.1		
	11:59	3928.0				3928.0		
	12:00	3920.2				3920.2		
	12:05	3887.9				3887.9		
	12:10	3864.6				3864.6		