



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



BRUCE KING
GOVERNOR

September 14, 1993

ANITA LOCKWOOD
CABINET SECRETARY

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

Marbob Energy Corporation
P.O. Box 217
Artesia, NM 88210

Attention: Raye Miller

CF 8418

WFX-555

PDEV00200600555

**RE: *Injection Pressure Increase Burch-Keely Cooperative Waterflood Project,
Eddy County, New Mexico***

Dear Mr. Miller:

Reference is made to your request to increase the surface injection pressure on all wells in the above-referenced Burch-Keely Cooperative Waterflood Project. This request is based on step rate tests conducted previously in this project. The results of the tests have been reviewed by my staff and we feel a field-wide increase in injection pressure is justified at this time.

You are therefore authorized to increase the surface injection pressure to a maximum of 900 psi each, on thirty-two authorized injection wells in the subject waterflood project in Eddy County, New Mexico.

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/amg

cc: Oil Conservation Division - Artesia
File: WFX-555
Case File 8418
D. Catanach

NO WAITING PERIOD

COMPANY: MARBOB ENERGY CORPORATION
ADDRESS: P.O. Drawer 217
CITY, STATE, ZIP: Artesia, New Mexico 88210
ATTENTION: Mr. Raye Miller

*RE: Injection Pressure Increase
Burch-Keely Cooperative
Waterflood Project
Eddy County, New Mexico*

Dear Sir:

Reference is made to your request to increase the surface injection pressure on **all wells in the above referenced Burch-Keely Cooperative Waterflood Project**. This request is based on several step rate tests conducted previously in this project. The results of the tests have been reviewed by my staff and we feel a field-wide increase in injection pressure is justified at this time.

You are therefore authorized to increase the surface injection pressure to a maximum of 900 psi each, on 32 authorized injection wells in the subject waterflood project in Eddy County, New Mexico.

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/

xc: D. Catanach FILE - WFX-555; case file #8418 OCD - Artesia

Memo

From
DAVID CATANACH
Petroleum Engineer

To

Ben,

Give Chesjys

900 psi field-wide.

DAC.

JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

AUG 09 1993

STEP RATE INJECTION TEST

CLIENT: MARBOB ENERGY CORPORATION

DATE: AUGUST 3, 1993

WELL NAME: BURCH "C" FEDERAL NO. 7
EDDY COUNTY, NEW MEXICO

WO#: 93-14-1469

Cleaned scale out of well.

MID-PERFS. =

PACKER DEPTH =

BHP GAUGE DEPTH = 3320

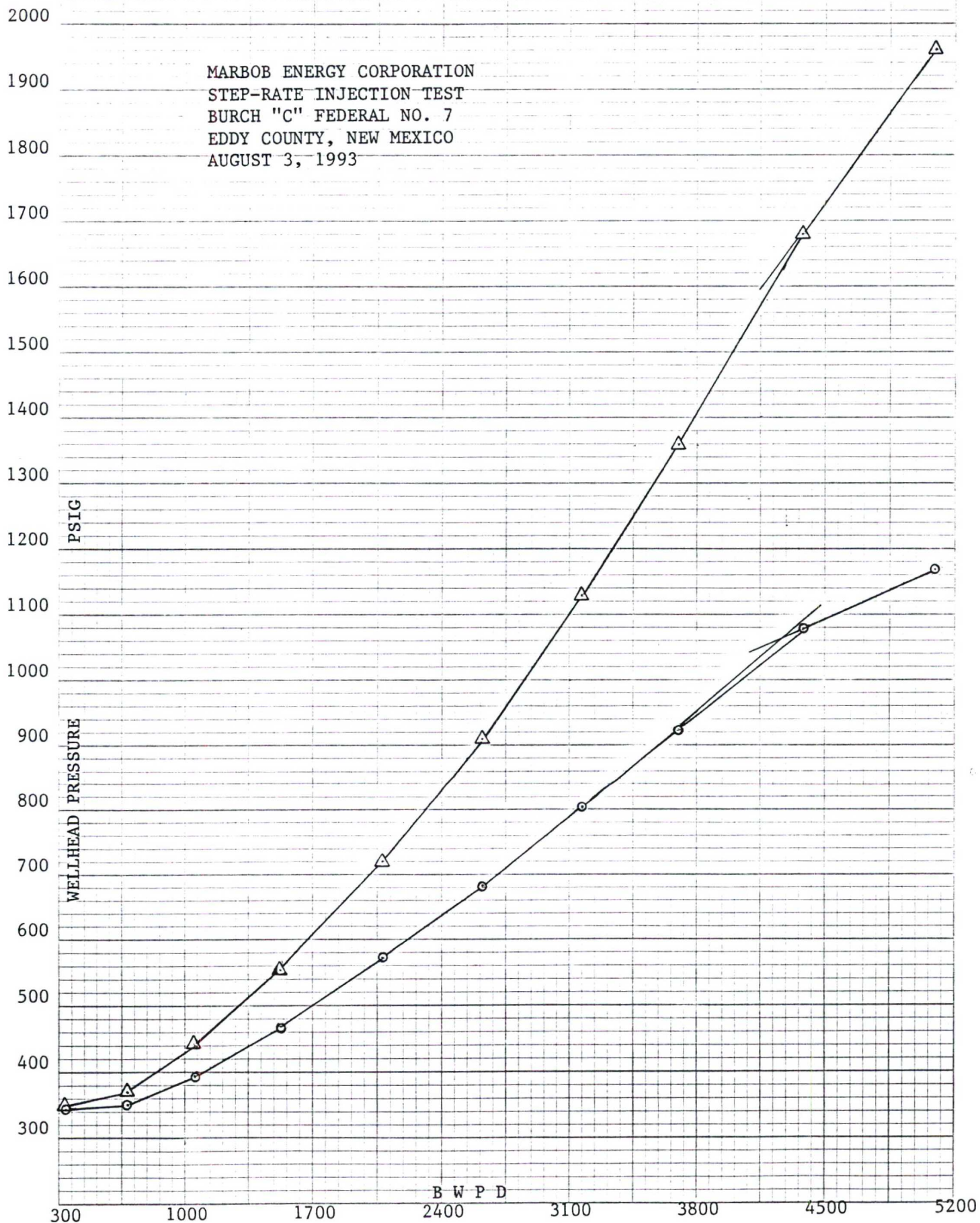
STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (psi)	(5) CORRECTED TUBING PRESS. (psi) (1)-(4)	(6) INJECTION RATE (gpm) (8)/34.2857	(7) MEASURED BHP (psi)
1	12:45	340.0				340.0		
	12:50	350.0	1.2	340.0	5.264	344.7	9.92	
	12:55	350.0	2.4	330.0	4.981	345.0	9.63	
	1:00	350.0	3.6	330.0	4.981	345.0	9.63	
2				333.3				
	1:05	370.0	5.9	670.0	18.463	351.5	19.54	
	1:10	370.0	8.3	680.0	18.976	351.0	19.83	
	1:15	370.0	10.6	680.0	18.976	351.0	19.83	
3				676.6				
	1:20	415.0	14.2	1060.0	43.140	371.9	30.92	
	1:25	425.0	17.8	1070.0	43.896	381.1	31.21	
	1:30	440.0	21.4	1070.0	43.896	396.1	31.21	
4				1066.7				
	1:35	515.0	26.6	1530.0	85.064	429.9	44.63	
	1:40	545.0	32.2	1530.0	85.064	459.9	44.63	
	1:45	555.0	37.1	1520.0	84.038	471.0	44.33	
5				1526.7				
	1:50	675.0	44.1	2080.0	150.136	524.9	60.67	
	1:55	695.0	51.0	2070.0	148.803	546.2	60.38	
	2:00	720.0	58.0	2075.0	149.469	570.5	60.52	
6				2075.0				
	2:05	865.0	67.0	2615.0	229.293	635.7	76.27	
	2:10	895.0	75.9	2620.0	230.104	664.9	76.42	
	2:15	910.0	84.7	2615.0	229.293	680.7	76.27	
7				2616.7				
	2:20	1080.0	95.2	3170.0	327.361	752.6	92.46	
	2:25	1110.0	106.0	3170.0	327.361	782.6	92.46	
	2:30	1130.0	116.8	3170.0	327.361	802.6	92.46	
				3170.0				

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
STEP NO. & REMARKS	TIME	SURFACE TUBING PRESS. (psig)	CUMMULATIVE VOL. INJECTED (bbls)	INJECTION RATE (bbls/day)	FRICTION HEAD LOSS (psi)	CORRECTED TUBING PRESS. (psig) (1)-(4)	INJECTION RATE (gpm) (5)/34.2857	MEASURED BHP (psi)
8	2:35	1300.0	129.4	3700.0	435.753	864.2	107.92	
	2:40	1350.0	141.9	3730.0	442.312	907.7	108.79	
	2:45	1360.0	154.5	3690.0	433.577	926.4	107.63	
9				3706.7				
	2:50	1590.0	169.0	4370.0	592.868	997.1	127.46	
	2:55	1645.0	184.0	4360.0	590.361	1054.6	127.17	
10	3:00	1680.0	200.0	4390.0	597.898	1082.1	128.04	
				4373.3				
	3:05	1950.0	214.9	5100.0	788.991	1161.0	148.75	
FALLOFF	3:10	1955.0	232.5	5090.0	786.132	1168.9	148.46	
	3:15	1960.0	250.2	5100.0	788.991	1171.0	148.75	
				5096.7				
FALLOFF	3:17	1030.0				1030.0		
	3:18	1025.0				1025.0		
	3:19	1020.0				1020.0		
	3:20	1015.0				1015.0		
	3:21	1010.0				1010.0		
	3:22	1010.0				1010.0		
	3:23	1010.0				1010.0		
	3:24	1010.0				1010.0		
	3:25	1010.0				1010.0		

△ RECORDED WELLHEAD PRESSURE

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

MARBOB ENERGY CORPORATION
STEP-RATE INJECTION TEST
BURCH "C" FEDERAL NO. 7
EDDY COUNTY, NEW MEXICO
AUGUST 3, 1993



JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

AUG 09 1993

STEP RATE INJECTION TEST

CLIENT: MARBOB ENERGY CORPORATION

DATE: AUGUST 5, 1993

WELL NAME: KEELY "C" FEDERAL NO. 9
EDDY COUNTY, NEW MEXICO

WO#: 93-14-1468

MID-PERF8. -

PACKER DEPTH = 3256

BHP GAUGE DEPTH = 3382

STEP NO. 1 REMARKS	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) (3)/34.2857	(7) MEASURED BHP (psf)
	1:15	250.0				250.0		
	1:20	285.0	0.7	250.0	3.036	282.0	7.29	
	1:25	290.0	1.7	240.0	2.815	287.2	7.00	
1	1:30	300.0	2.5	220.0	2.397	297.6	6.42	
				236.6				
	1:35	365.0	4.4	560.0	13.497	351.5	16.33	
	1:40	380.0	6.3	530.0	12.190	367.8	15.46	
2	1:45	395.0	8.2	520.0	11.768	383.2	15.17	
				536.6				
	1:50	520.0	11.8	1030.0	41.673	478.3	30.04	
	1:55	530.0	15.3	1030.0	41.673	488.3	30.04	
3	2:00	535.0	18.9	1030.0	41.673	493.3	30.04	
				1030				
	2:05	640.0	23.9	1500.0	83.536	556.5	43.75	
	2:10	645.0	29.2	1500.0	83.536	561.5	43.75	
4	2:15	645.0	34.2	1500.0	83.536	561.5	43.75	
				1500.0				
	2:20	800.0	41.2	2020.0	144.878	655.1	58.92	
	2:25	800.0	47.9	2015.0	144.215	655.8	58.77	
5	2:30	810.0	54.7	2010.0	143.554	666.4	58.63	
				2015.0				
	2:35	970.0	63.6	2545.0	222.139	747.9	74.23	
	2:40	975.0	72.1	2530.0	219.723	755.3	73.79	
6	2:45	975.0	80.6	2530.0	219.723	755.3	73.79	
				2535.0				
	2:50	1170.0	91.1	3120.0	323.809	846.2	91.00	
	2:55	1180.0	101.8	3120.0	323.809	856.2	91.00	
7	3:00	1180.0	112.3	3125.0	324.770	855.2	91.15	
				3121.6				

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
STEP NO. & REMARKS	TIME	SURFACE TUBING PRESS. (psig)	CUMULATIVE VOL. INJECTED (bbls)	INJECTION RATE (bbls/day)	FRICTION HEAD LOSS (psf)	CORRECTED TUBING PRESS. (psig) (1)-(4)	INJECTION RATE (gpm) (3)/(24.257)	MEASURED BHP (psf)
8	3:05	1400.0	124.8	3700.0	443.891	956.1	107.92	
	3:10	1400.0	137.3	3700.0	443.891	956.1	107.92	
	3:15	1410.0	149.8	3695.0 3698.3	442.782	967.2	107.77	
9	3:20	1570.0	165.3	4150.0	548.898	1021.1	121.04	
	3:25	1585.0	178.0	4165.0	552.574	1032.4	121.48	
	3:30	1580.0	192.0	4170.0 4161.6	553.802	1026.2	121.63	
10	3:35	1800.0	208.3	4700.0	691.009	1109.0	137.08	
	3:40	1780.0	223.8	4690.0	688.292	1091.7	136.79	
	3:45	LOST	PUMP					
FALLOFF	3:46	730.0				730.0		
	3:47	720.0				720.0		
	3:48	715.0				715.0		
	3:49	705.0				705.0		
	3:50	700.0				700.0		
	3:55	690.0				690.0		

△ RECORDED WELLHEAD PRESSURE

○ CORRECTED WELLHEAD PRESSURE BASED ON 2 /38" TUBING

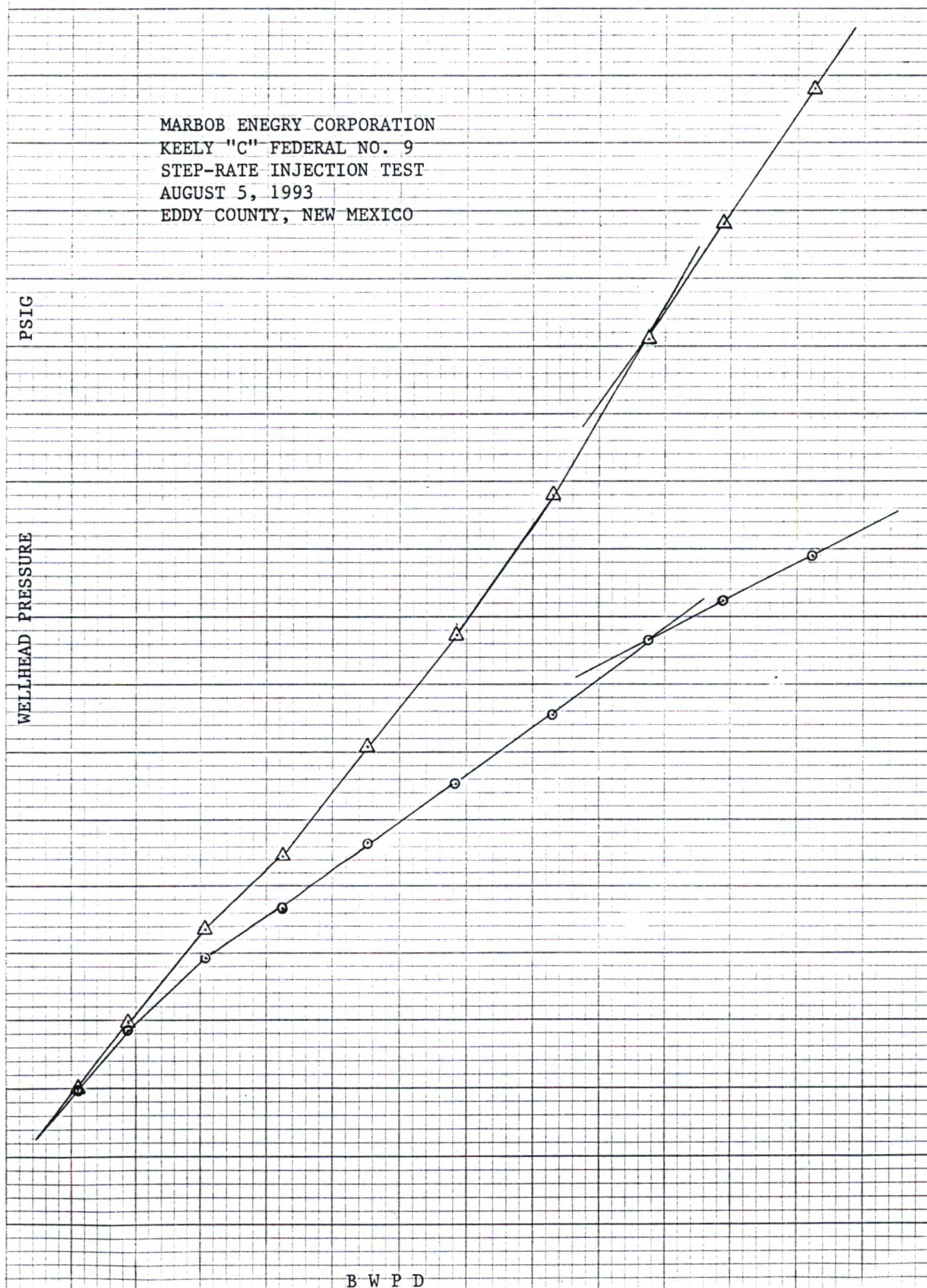
MARBOB ENERGY CORPORATION
KEELY "C" FEDERAL NO. 9
STEP-RATE INJECTION TEST
AUGUST 5, 1993
EDDY COUNTY, NEW MEXICO

1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
300
200

PSIG
WELLHEAD PRESSURE

B W P D

200 1000 1800 2600 3400 4200 5000



JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

AUG 09 1993

STEP RATE INJECTION TEST

CLIENT: MARBOB ENERGY CORPORATION

DATE: AUGUST 5, 1993

WELL NAME: KEELY "B" FEDERAL NO. 4
EDDY COUNTY, NEW MEXICO

WO#: 93-14-1468

MID-PERF. = 2224-3066

PACKER DEPTH =

BHP GAUGE DEPTH = 3385

STEP NO. & REMARKS	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) (8)/34.2857	(7) MEASURED BHP (psf)
1	9:45	440.0				440.0		
	9:50	450.0	0.8	215.0	0.637	449.4	6.27	
	9:55	460.0	1.8	305.0	1.216	458.8	8.90	
	10:00	465.0	2.5	215.0	0.637	464.4	6.27	
2				245.0				
	10:05	480.0	4.5	560.0	3.743	476.3	16.33	
	10:10	500.0	6.5	600.0	4.253	495.7	17.50	
	10:15	510.0	8.7	640.0	4.792	505.2	18.67	
3				600.0				
	10:20	530.0	12.2	1010.0	11.144	518.9	29.46	
	10:25	540.0	15.7	1030.0	11.556	528.4	30.04	
	10:30	550.0	19.5	1060.0	12.187	537.8	30.92	
4				1033.3				
	10:35	580.0	24.2	1500.0	23.165	556.8	43.75	
	10:40	600.0	29.4	1520.0	23.740	576.3	44.33	
	10:45	610.0	34.1	1520.0	23.740	586.3	44.33	
5				1513.3				
	10:50	640.0	41.1	1850.0	34.145	605.9	53.96	
	10:55	670.0	47.6	1960.0	37.996	632.0	57.17	
	11:00	675.0	54.3	1960.0	37.996	637.0	57.17	
6				1923.3				
	11:05	750.0	63.1	2550.0	61.825	688.2	74.38	
	11:10	775.0	71.6	2555.0	62.049	713.0	74.52	
	11:15	780.0	80.2	2550.0	61.825	718.2	74.38	
7				2551.6				
	11:20	860.0	90.5	3040.0	85.582	774.4	88.67	
	11:25	870.0	101.0	3020.0	84.543	785.5	88.08	
	11:30	880.0	111.1	3030.0	85.062	794.9	88.38	
				3030.0				

STEP NO. & REMARKS	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) (8)/34.2857	(7) MEASURED BHP (psf)
8	11:35	975.0	123.3	3595.0	116.710	858.3	104.85	
	11:40	980.0	135.5	3590.0	116.410	863.6	104.71	
	11:45	990.0	147.7	3595.0	116.710	873.3	104.85	
9				3593.6				
	11:50	1055.0	161.6	4100.0	148.838	906.2	119.58	
	11:55	1060.0	176.0	4095.0	148.503	911.5	119.44	
10	12:00	1065.0	189.4	4095.0	148.503	916.5	119.44	
				4096.6				
	12:05	1150.0	205.3	4570.0	181.932	968.1	133.29	
11	12:10	1160.0	220.0	4595.0	183.778	976.2	134.02	
	12:15	1150.0	236.4	4610.0	184.889	965.1	134.46	
				4591.6				
FALLOFF	12:20	1260.0	254.1	5150.0	226.938	1033.1	150.21	
	12:25	1260.0	271.4	5150.0	226.938	1033.1	150.21	
	12:30	1250.0	289.0	5160.0	227.754	1022.2	150.50	
FALLOFF				5120.0				
	12:31	900.0				900.0		
	12:32	890.0				890.0		
	12:33	890.0				890.0		
	12:34	890.0				890.0		
	12:35	885.0				885.0		
	12:40	880.0				880.0		
FALLOFF	12:45	880.0				880.0		

△ RECORDED WELLHEAD PRESSURE

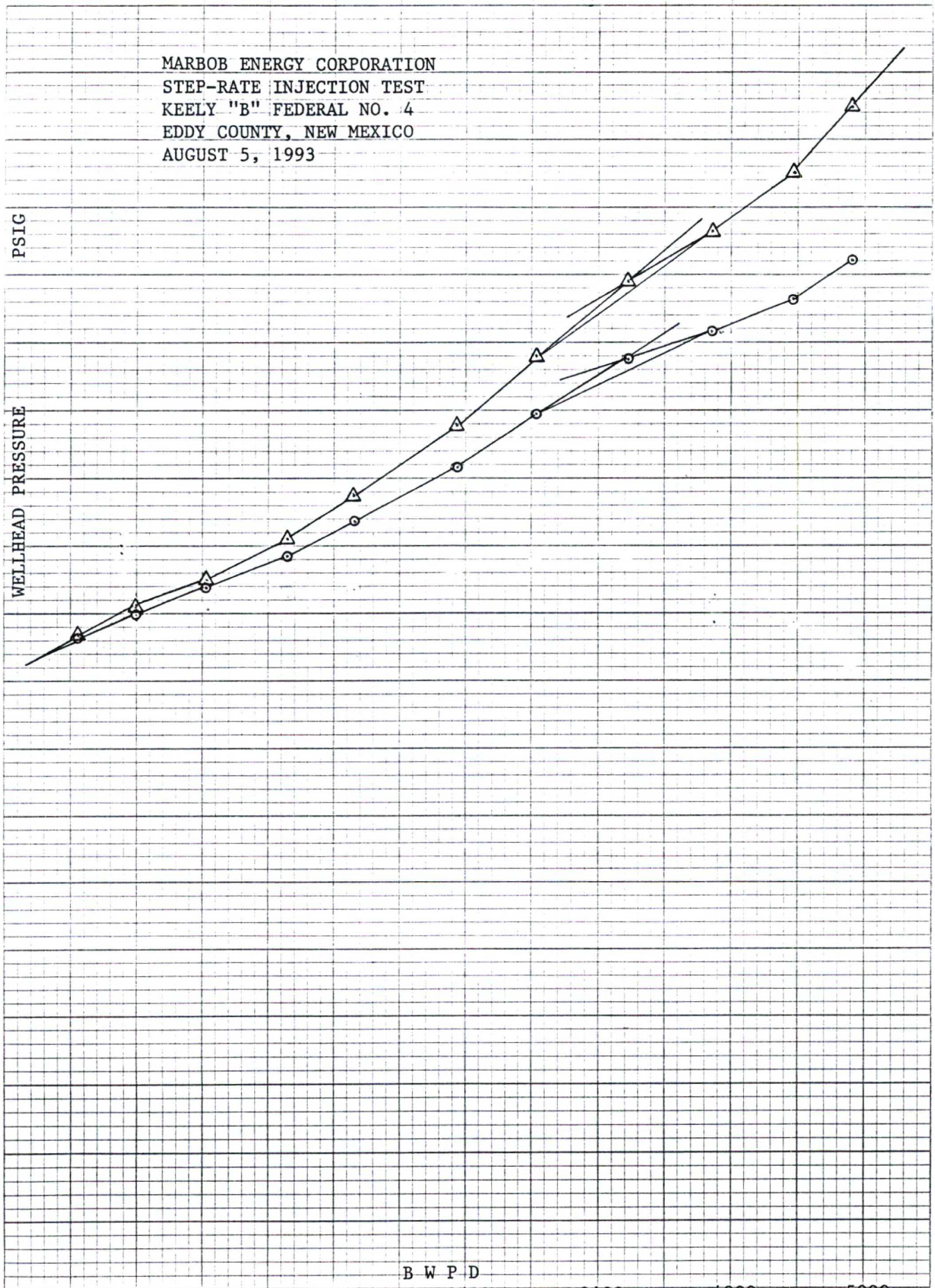
○ CORRECTED WELLHEAD PRESSURE BASED ON 2 3/8" TUBING

MARBOB ENERGY CORPORATION
STEP-RATE INJECTION TEST
KEELY "B" FEDERAL NO. 4
EDDY COUNTY, NEW MEXICO
AUGUST 5, 1993

PSIG
WELLHEAD PRESSURE

B W P D

200 1000 1800 2600 3400 4200 5000



AUG 12 1993

JOHN WEST ENGINEERING COMPANY

Hobbs, New Mexico

STEP RATE INJECTION TEST

CLIENT: MARBOB ENERGY CORPORATION

DATE: AUGUST 9, 1993

WELL NAME: BURCH "C" FEDERAL NO. 1

WO#: 93-14-1468

Lea County, New Mexico

MID-PERFS. = 3238 TO 3319

PACKER DEPTH =

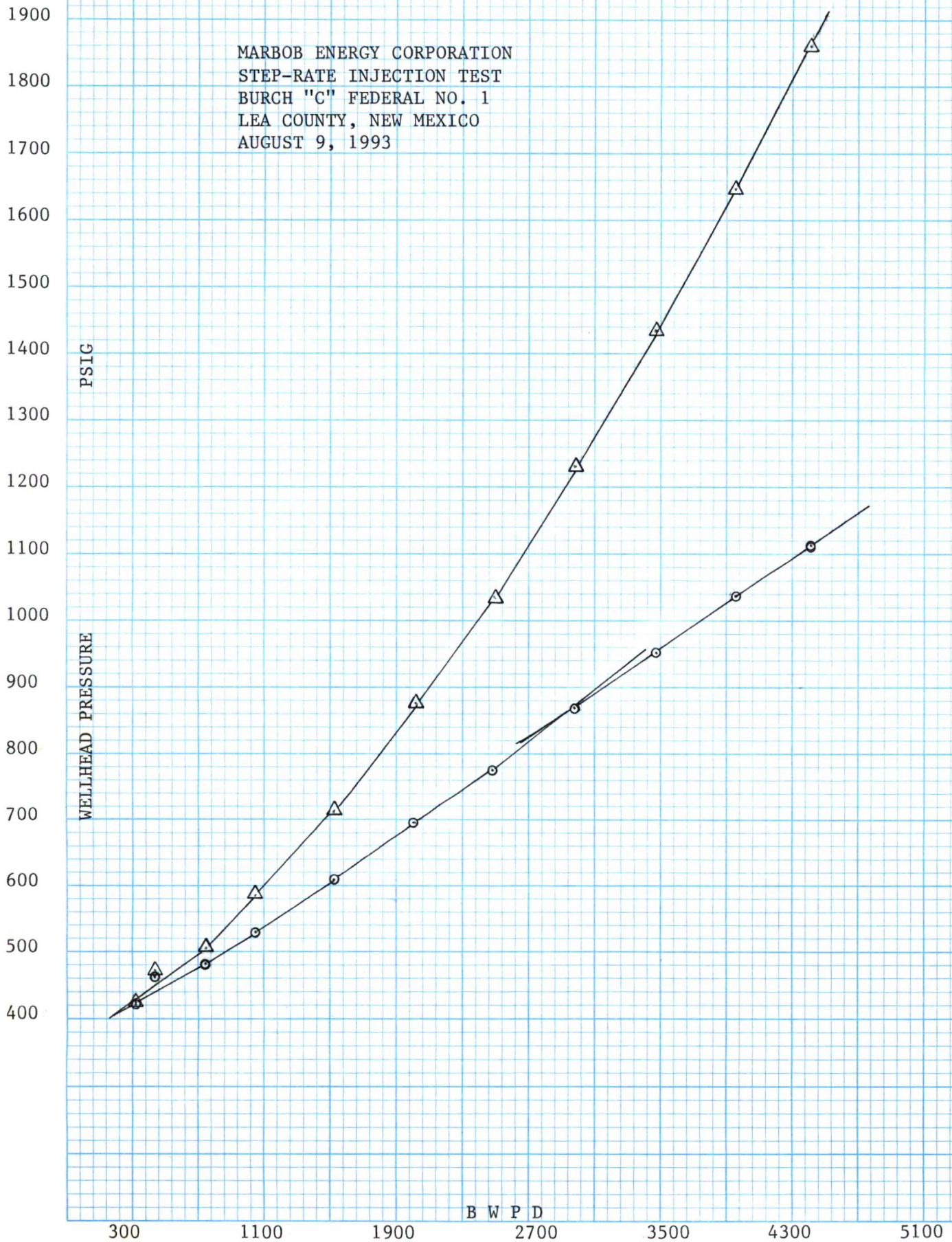
BHP GAUGE DEPTH = 3278

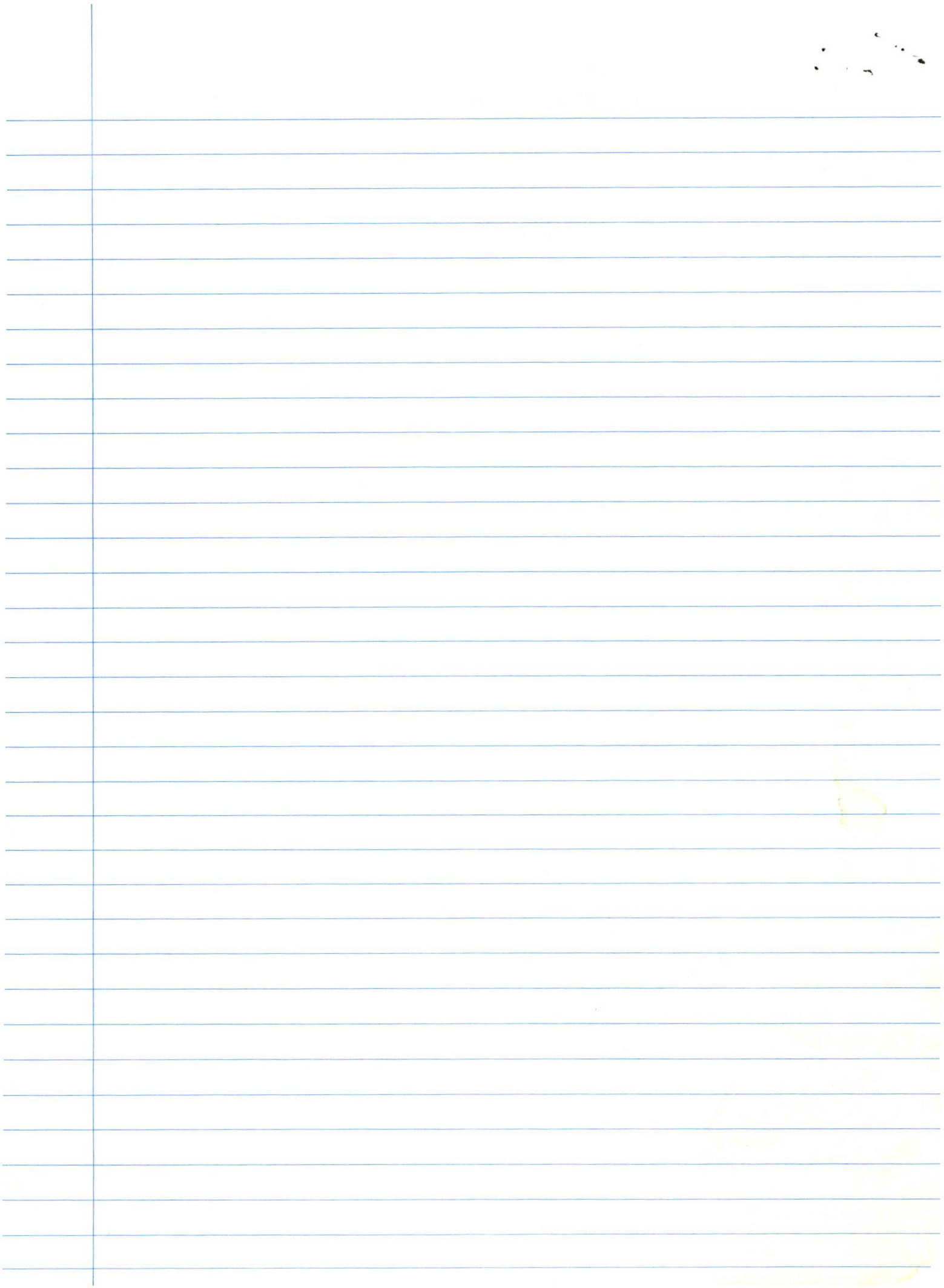
STEP NO. A		(1) SURFACE TUBING PRESS. (psig)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (ps)	(5) CORRECTED TUBING PRESS. (ps) (1)-(4)	(6) INJECTION RATE (gpm) (8)/34.2067	(7) MEASURED BHP (ps)
	9:50				0.000	0.0	0.00	
	9:55	414.4	1.5	432.0	10.283	404.1	12.60	
	10:00	421.7	2.3	230.4	3.214	418.5	6.72	
1	10:05	430.4	3.2	259.2	3.997	426.4	7.56	
				307.2	0.000	0.0	0.00	
	10:10	444.1	4.7	432.0	10.283	433.8	12.60	
	10:15	448.9	6.3	460.8	11.587	437.3	13.44	
2	10:20	471.7	7.8	432.0	10.283	461.4	12.60	
				441.6	0.000	0.0	0.00	
	10:25	491.9	10.4	748.0	28.392	463.5	21.82	
	10:30	500.6	13.0	748.0	28.392	472.2	21.82	
3	10:35	509.3	15.6	748.0	28.392	480.9	21.82	
				748.0	0.000	0.0	0.00	
	10:40	558.9	19.2	1036.8	51.942	507.0	30.24	
	10:45	572.8	22.8	1036.8	51.942	520.9	30.24	
4	10:50	582.9	26.4	1036.8	51.942	531.0	30.24	
				1036.8	0.000	0.0	0.00	
	10:55	681.1	31.6	1497.6	102.556	578.5	43.68	
	11:00	695.0	36.9	1526.4	106.235	588.8	44.52	
5	11:05	714.0	42.2	1526.4	106.235	607.8	44.52	
				1516.8	0.000	0.0	0.00	
	11:10	828.7	49.2	2016.0	177.741	651.0	58.80	
	11:15	856.6	56.2	2016.0	177.741	678.9	58.80	
6	11:20	874.5	63.2	2016.0	177.741	696.8	58.80	
				2016.0	0.000	0.0	0.00	
	11:25	997.0	71.8	2476.8	260.123	736.9	72.24	
	11:30	1016.0	80.5	2505.6	265.746	750.3	73.08	
7	11:35	1037.7	89.1	2476.8	260.123	777.6	72.24	
				2486.4	0.000	0.0	0.00	

STEP NO. & REMARKS	TIME	(1) SURFACE TUBING PRESS. (p-sg)	(2) CUMMULATIVE VOL. INJECTED (bbls)	(3) INJECTION RATE (bbls/day)	(4) FRICTION HEAD LOSS (p-s)	(5) CORRECTED TUBING PRESS. (p-s) (1) - (4)	(6) INJECTION RATE (gpm) (3)/34.2857	(7) MEASURED BHP (p-s)
8	11:40	1198.9	99.5	2995.2	369.716	829.2	87.36	
	11:45	1217.9	109.9	2995.2	369.716	848.2	87.36	
	11:50	1231.8	120.2	2966.4	363.166	868.6	86.52	
				2985.6	0.000	0.0	0.00	
9	11:55	1400.8	132.4	3513.6	496.732	904.1	102.48	
	12:00	1418.6	144.4	3456.0	481.772	936.8	100.80	
	12:05	1436.4	156.4	3456.0	481.772	954.6	100.80	
				3475.2	0.000	0.0	0.00	
10	12:10	1611.7	170.2	3974.4	623.925	987.8	115.92	
	12:15	1630.8	184.1	4003.2	632.315	998.5	116.76	
	12:20	1646.0	197.7	3916.8	607.300	1038.7	114.24	
				3960.8	0.000	0.0	0.00	
11	12:25	1845.6	213.0	4406.4	755.154	1090.4	128.52	
	12:30	1848.2	228.5	4464.0	773.517	1074.7	130.20	
	12:35	1859.8	243.7	4377.6	746.048	1113.8	127.68	
				4416.0	0.000	0.0	0.00	
FALLOFF	12:37	1001.9			0.000	1001.9	0.00	
	12:38	994.2			0.000	994.2	0.00	
	12:39	989.1			0.000	989.1	0.00	
	12:40	985.2			0.000	985.2	0.00	
	12:41	982.6			0.000	982.6	0.00	
	12:42	980.1			0.000	980.1	0.00	
	12:43	977.5			0.000	977.5	0.00	
	12:44	974.9			0.000	974.9	0.00	
	12:45	973.5			0.000	973.5	0.00	
	12:50	963.2			0.000	963.2	0.00	
	12:55	954.1			0.000	954.1	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	
					0.000	0.0	0.00	

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

MARBOB ENERGY CORPORATION
STEP-RATE INJECTION TEST
BURCH "C" FEDERAL NO. 1
LEA COUNTY, NEW MEXICO
AUGUST 9, 1993





08/23/93

07:39

505 748 9720

OCD DIST II

001

OIL CONSERVATION DIVISION
ARTESIA, NEW MEX. 88210

TO: David Catanach
FROM: Mike Williams
DATE: 8-23-93

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET) 2

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL 505-748-1283.

FAX NUMBER (505) 748-9720



