DOW CHEMICAL U.S.A.

EASTERN DIVISION
P. O. BOX 36000
STRONGSVILLE, OHIO 44136
January 9, 1986

Mr. Thomas C. Hinrichs
Magma Electric Company
993 Oak Lane
Escondido, California
92025

cc: Andrew Hoch, Magma Power Company
Don Beebe, Strongsville
Fred Teeters, Strongsville

Dear Mr. Hinrichs,

Attached is the follow-up of my report dated October 1, 1985. It completes East Mesa operations in 1985 and from 1981 to 1985.

The production, injection and related data were graphically plotted and enclosed in this report.

Best Regards,

Hai D. Truong

Hai D. Truong
Reservoir Engineering
(216)826-6422

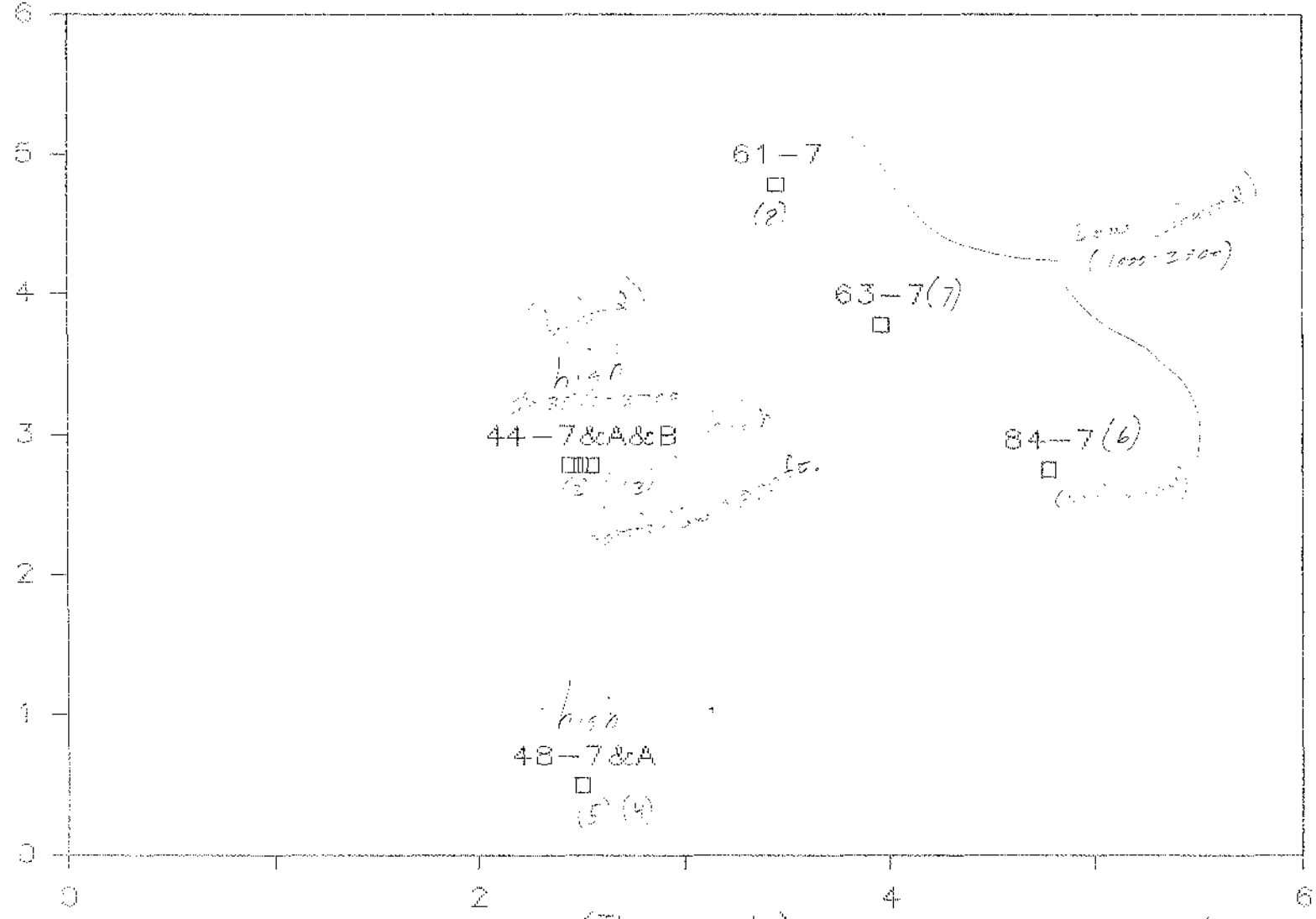
Attach.

eds

Look @ Published & Reports

EAST MESA MAGMA FIELD

WELL LOCATIONS



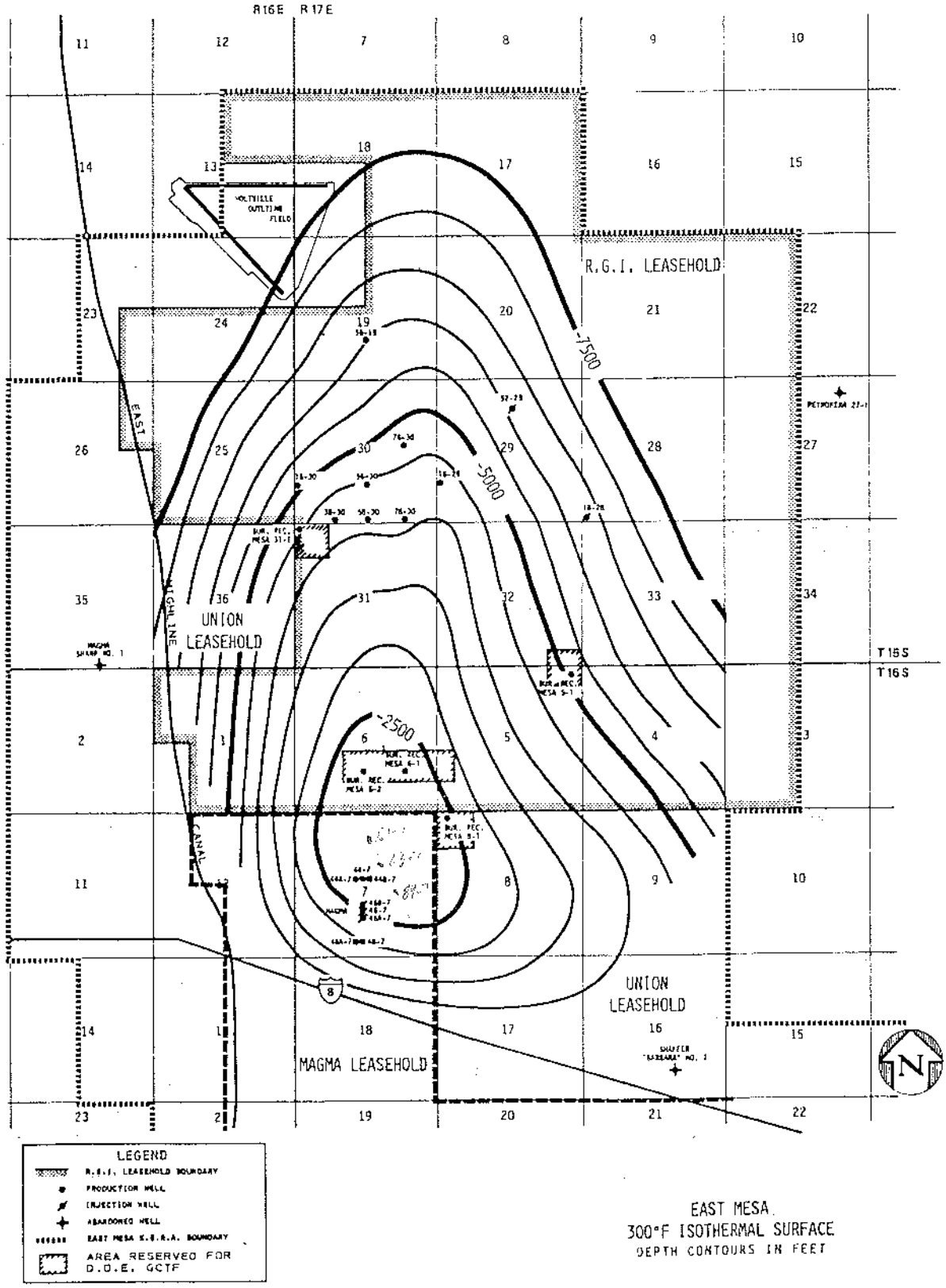


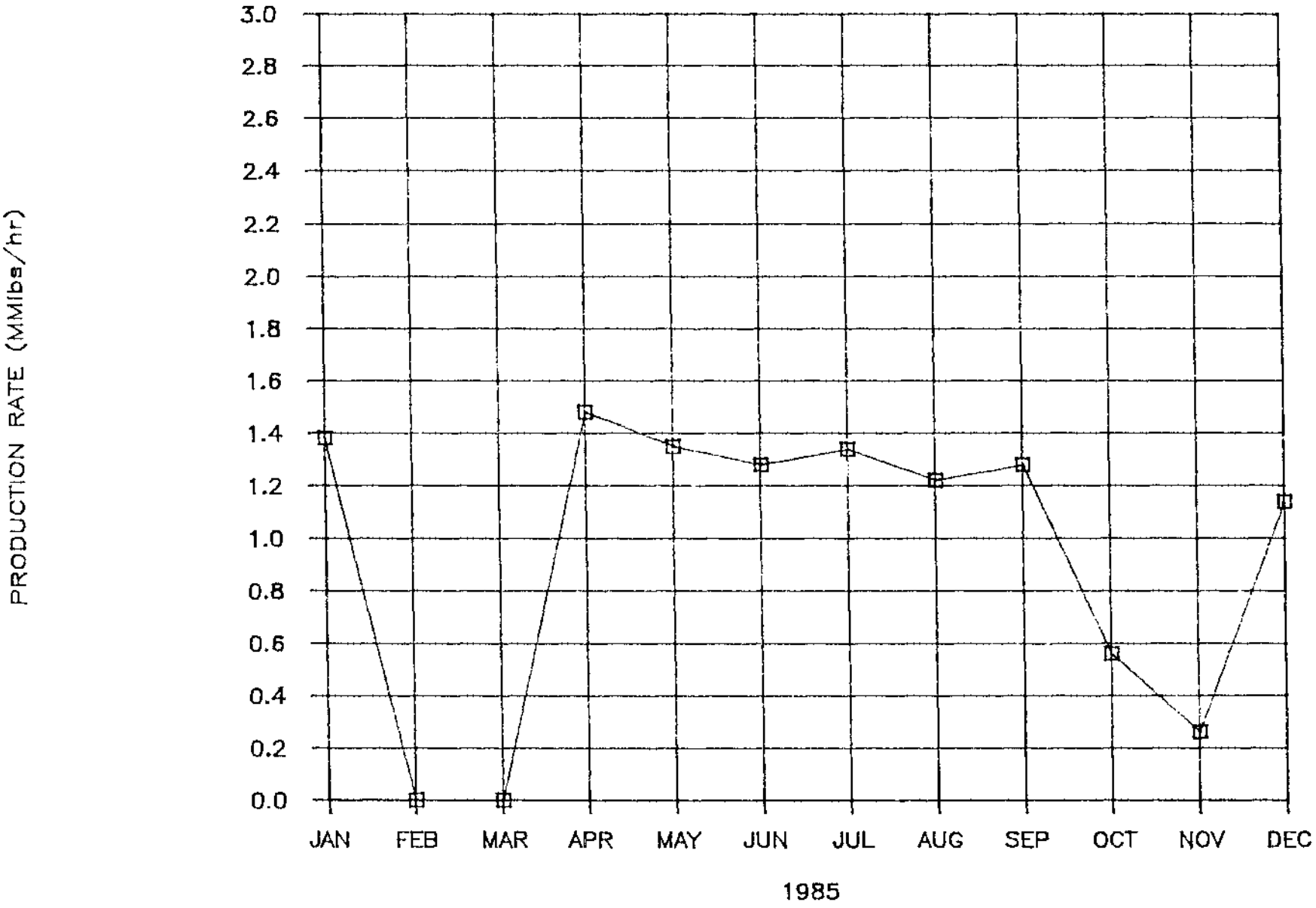
Figure 2.
Map of the East Mesa Geothermal Field, showing well locations, lease boundaries and depth (in feet) to the 150°C (300°F) isothermal surface (from Smith, 1979).

MAGMA EAST MESA OPERATION IN 1985

Month	Prod. Rate (MMlbs /hr)	Inj. Rate (MMlbs /hr)	Total Prod. (MM -lbs)	Total Inj. (MM -lbs)	Total Inj/Prod Ratio	Average Well Head Prod. Temp. (°F)	Prod. Press. (psi)	Inj. Temp. (°F)	Inj. Press. (psi)
JAN	1.38	1.1	847.51	822.06	0.96	349	283	153	468
FEB	0	0	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0	0	0
APR	1.48	1.45	694.14	676.8	0.97	346	287	150	438
MAY	1.35	1.5	919.07	1029.9	1.12	351	387	152	458
JUN	1.28	1.39	791.72	825.56	1.04	352	291	149	391
JUL	1.34	1.35	827.03	838.62	1.01	352	308	151	415
AUG	1.22	1.24	836.98	863.66	1.03	352	303	155	419
SEP	1.28	1.31	875.7	917.52	1.04	352	308	156	455
OCT	0.56	0.58	379.29	393.86	1.04	352	309	157	462
NOV	0.26	0.27	138.77	140.15	1.01	345	318	153	400
DEC	1.14	1.18	836.06	865.14	1.03	348	307	148	427
Avg/mo.	0.94	0.96	595.52	614.43	1.03	349	310	152	433
Total/yr			7146.28	7373.27					

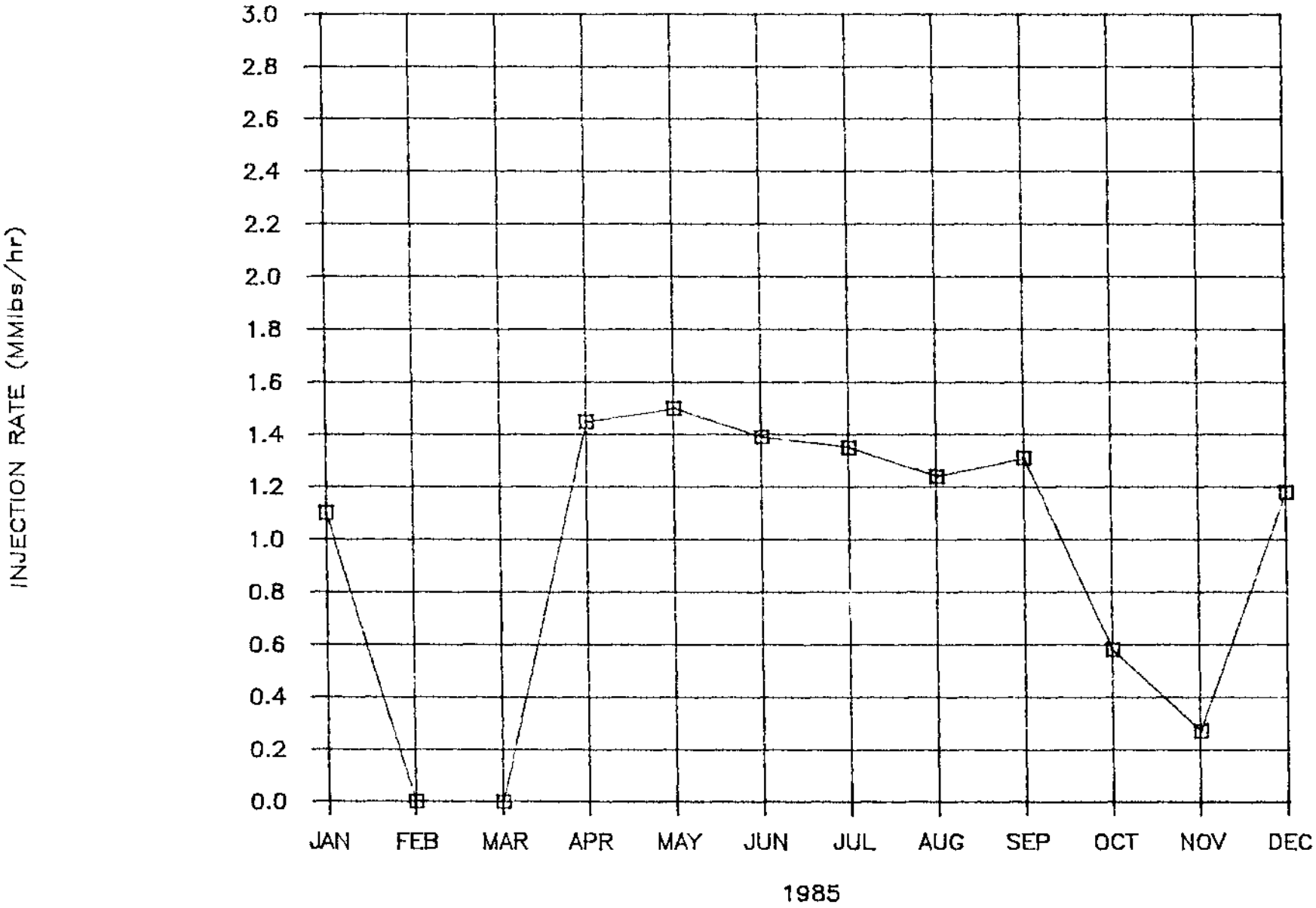
MAGMA OPERATION STATUS

East Mesa Field



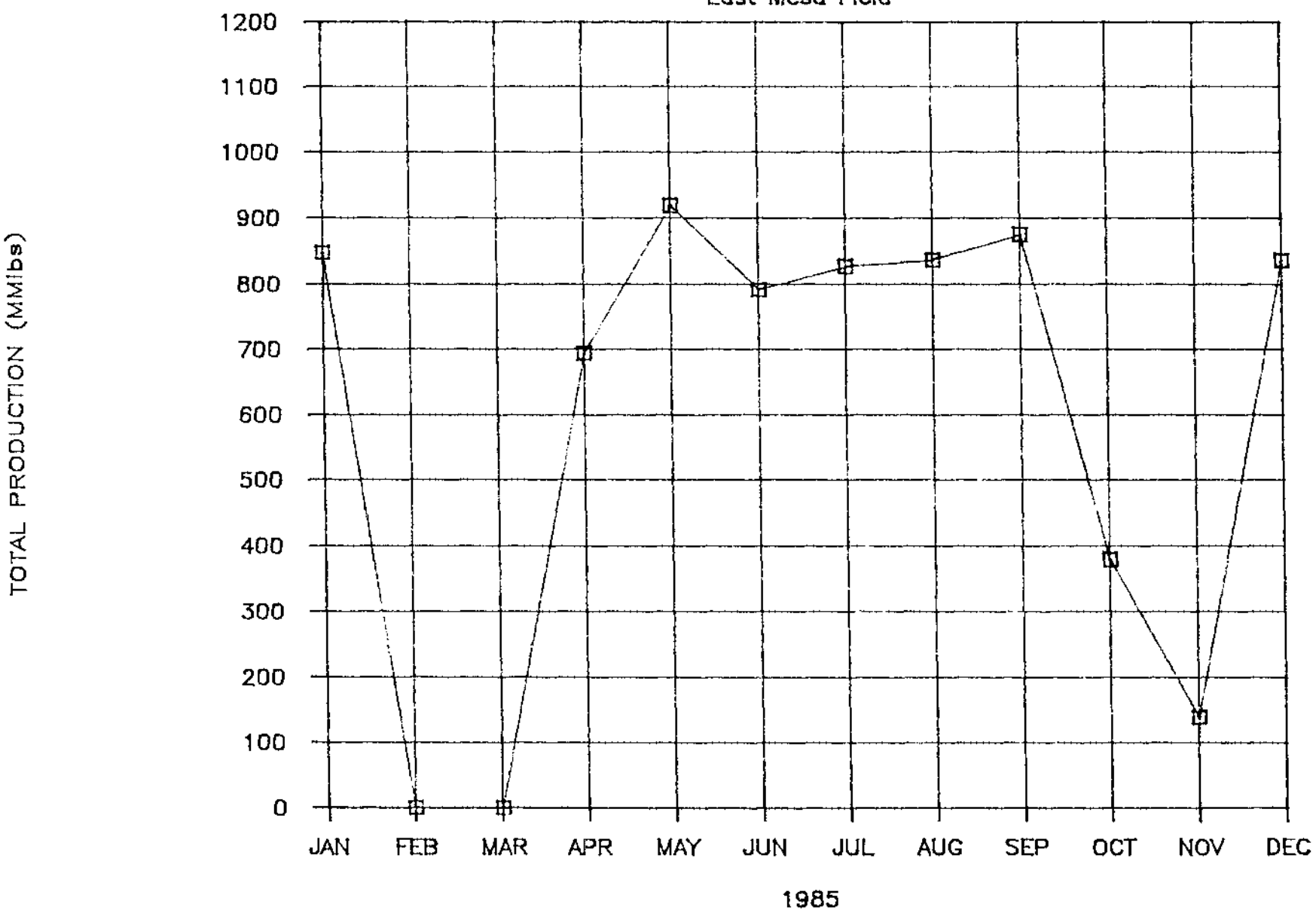
MAGMA OPERATION STATUS

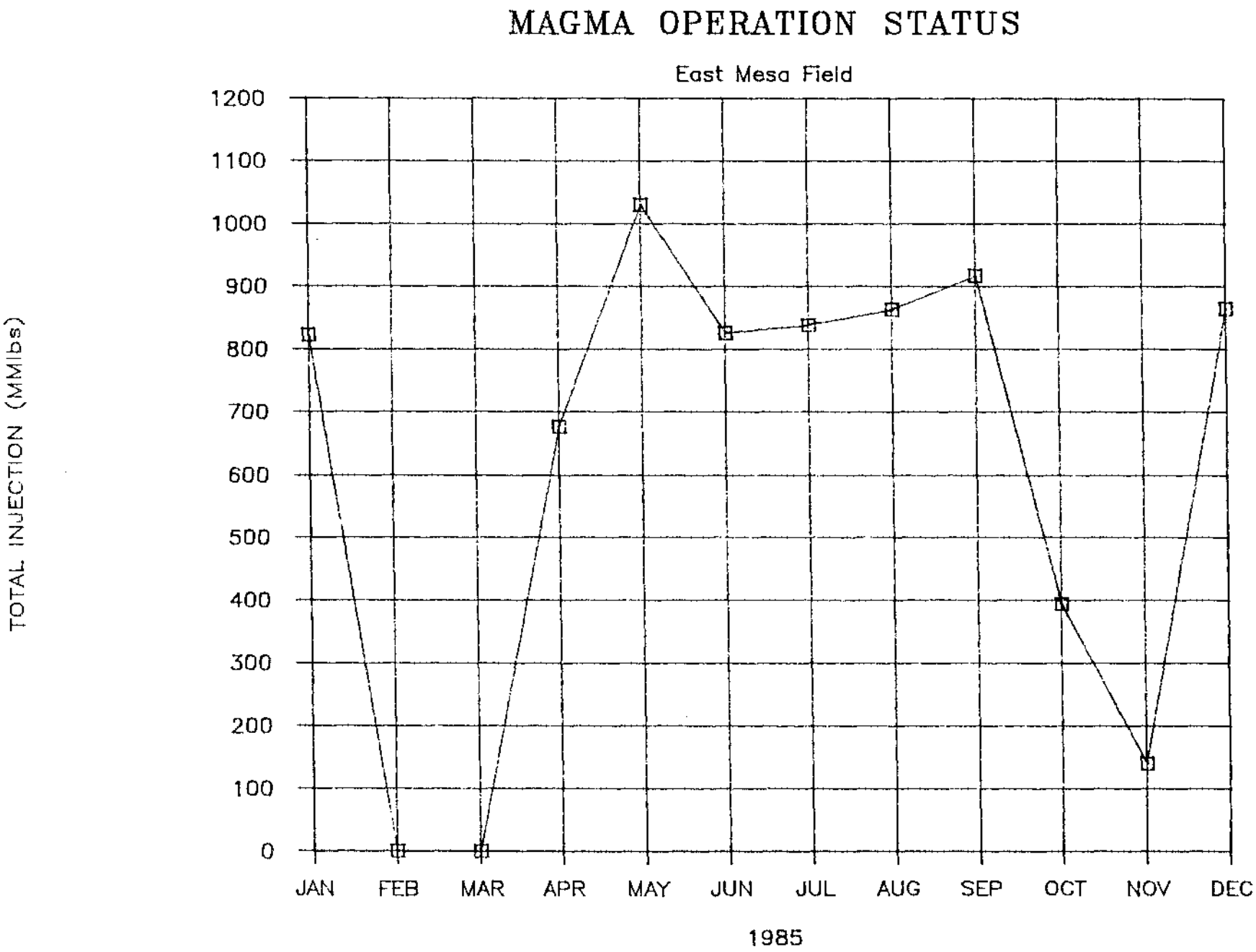
East Mesa Field



MAGMA OPERATION STATUS

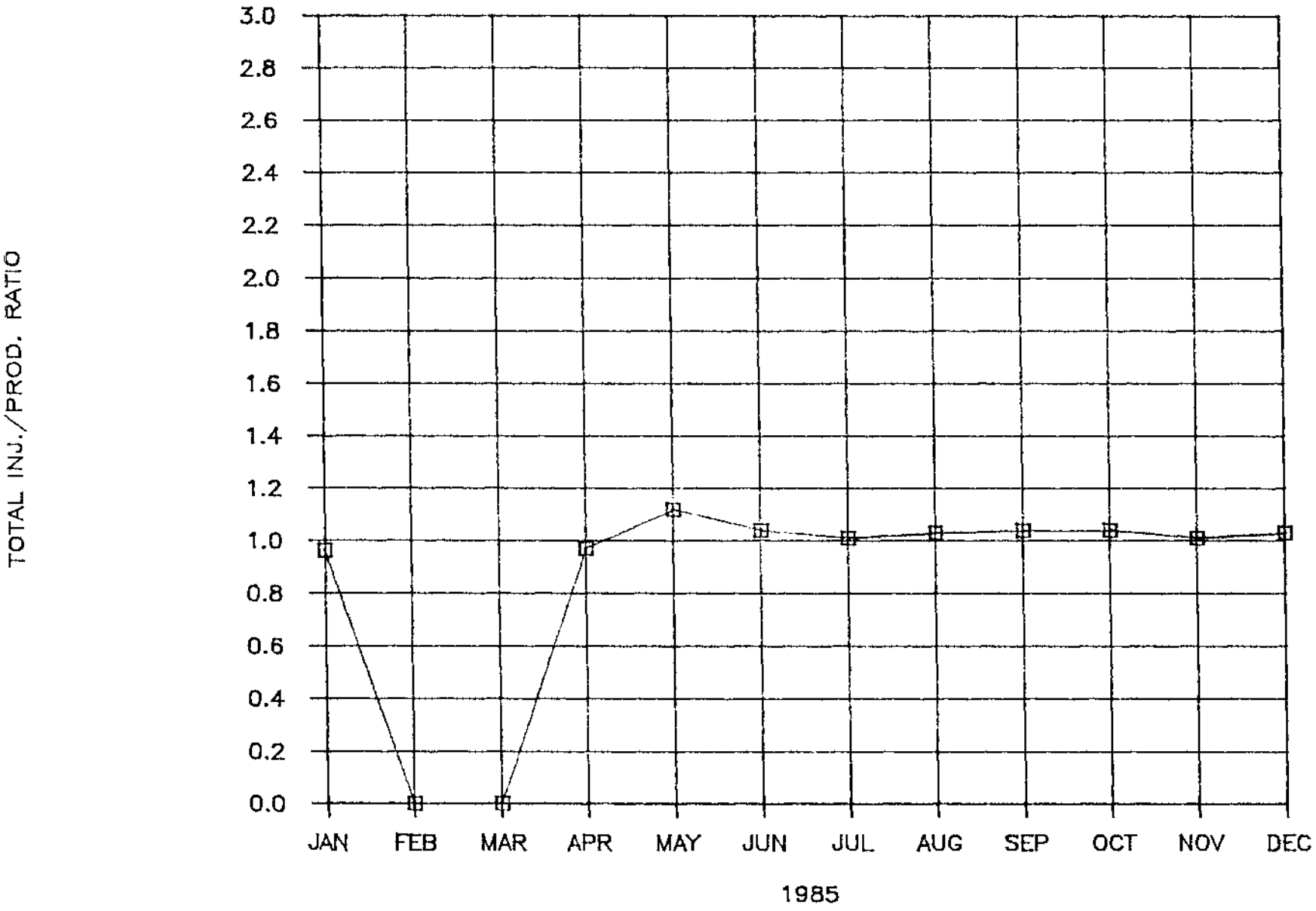
East Mesa Field




MAGMA OPERATION STATUS
East Mesa Field
TOTAL INJECTION (MMlbs)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
1985

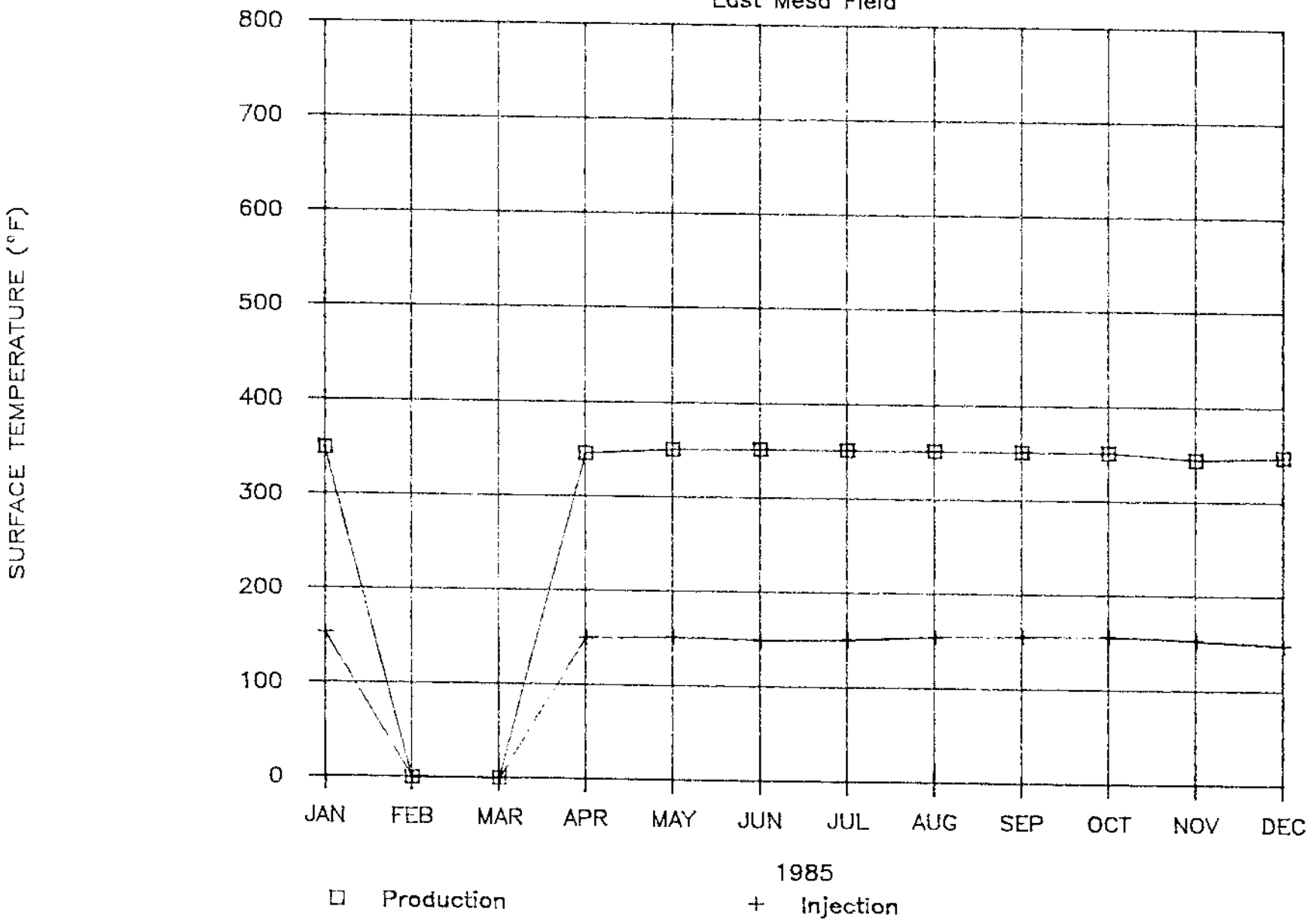
MAGMA OPERATION STATUS

East Mesa Field



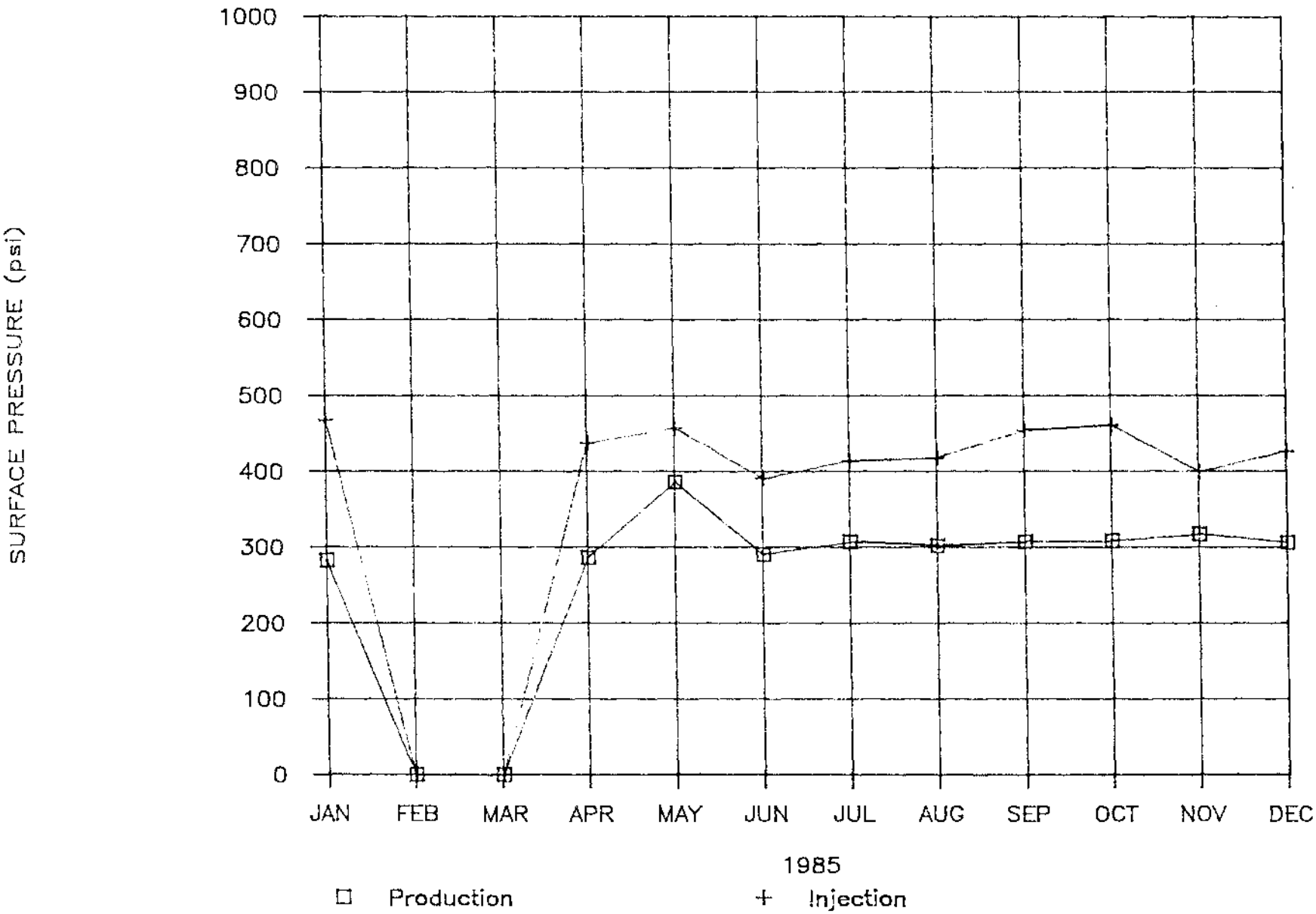
MAGMA OPERATION STATUS

East Mesa Field



MAGMA OPERATION STATUS

East Mesa Field

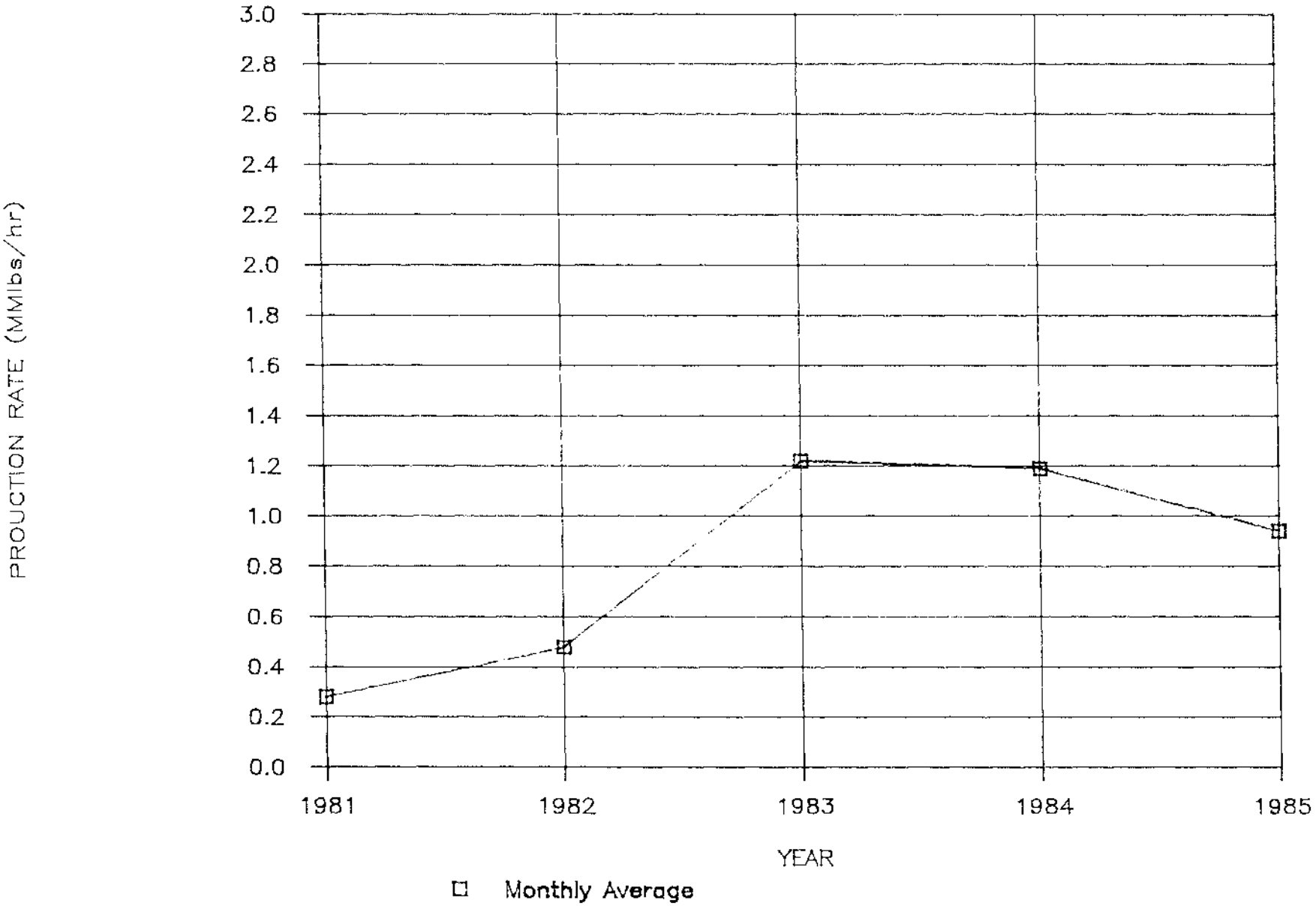


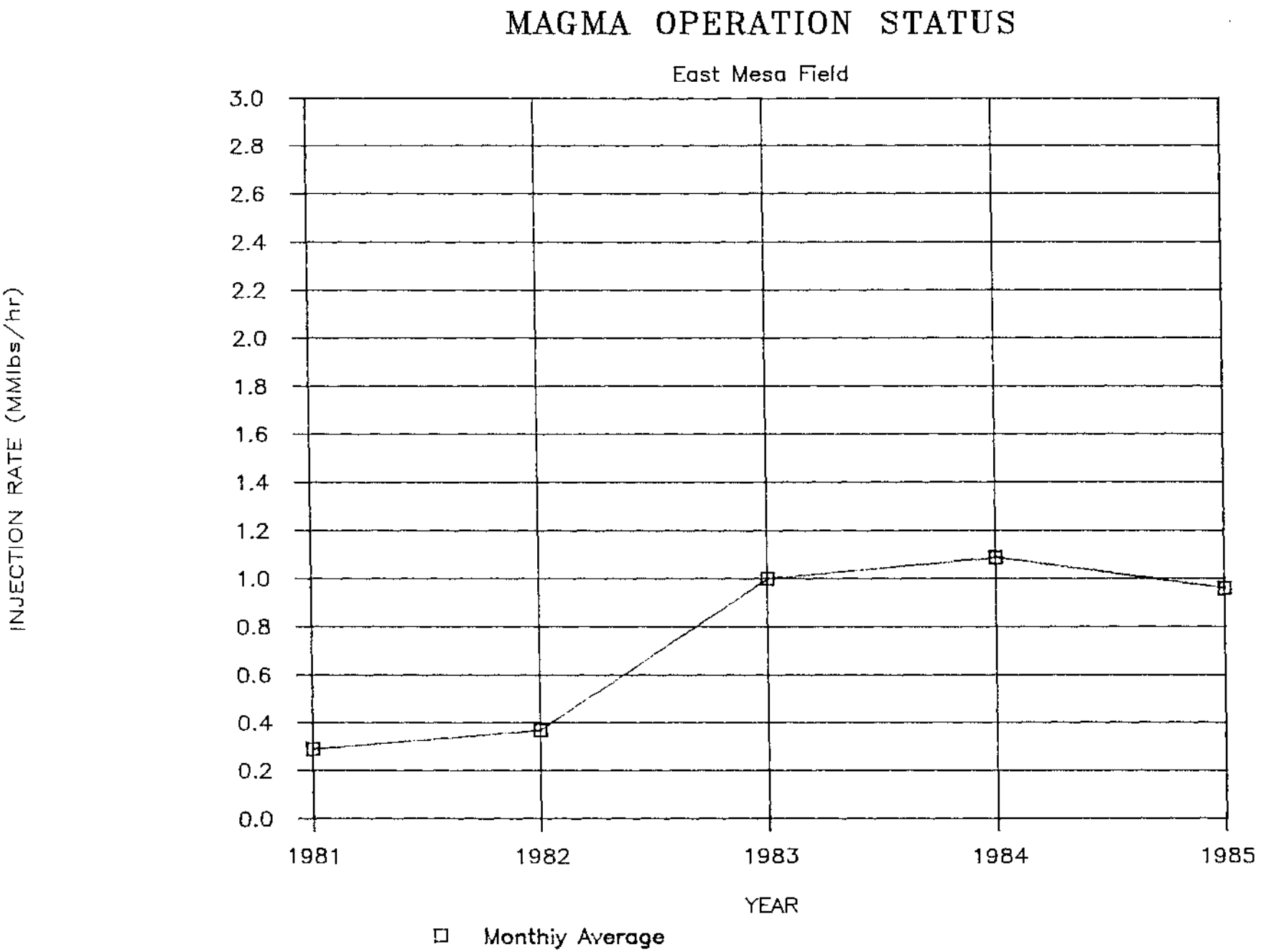
MAGMA OPERATIONS FROM 1981 TO 1985
EAST MESA FIELD

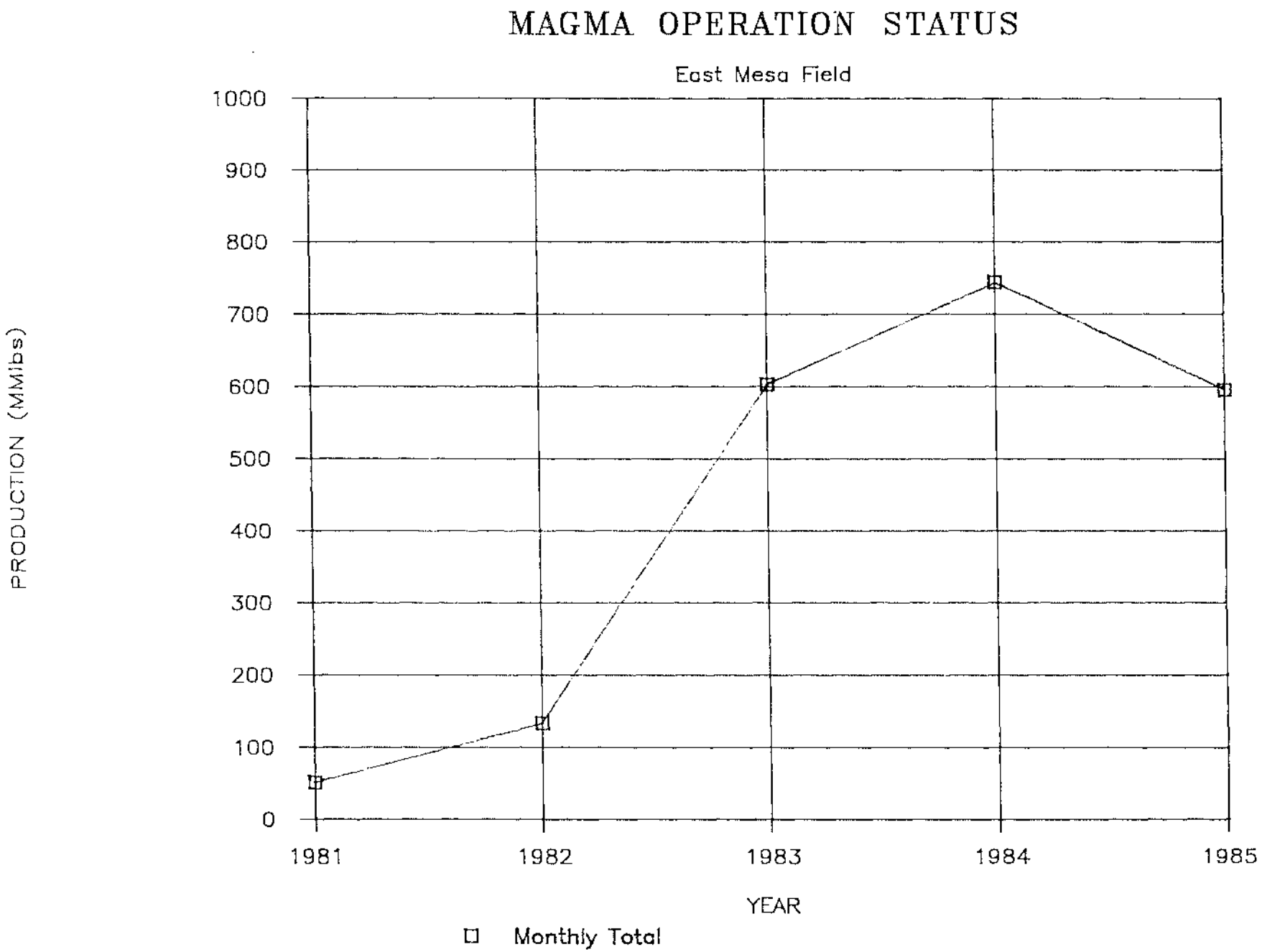
Year	Monthly Avg. Rate (MMlbs/hr)		Monthly Total (MMlbs)		Yearly Total (Billion lbs)		Total Inj / Prod.	Cumulative/Year (Billion lbs)		Average Surface Temperature (°F)		Average Surface Pressure (psi)	
	Prod.	Inj.	Prod.	Inj.	Prod.	Inj.	Ratio	Prod.	Inj.	Prod.	Inj.	Prod.	Inj.
1981	0.28	0.29	51.12	54.67	0.613	0.656	1.07	0.613	0.656	354	164	276	337
1982	0.48	0.37	134.27	135.67	1.611	1.628	1.01	2.224	2.284	353	212	279	410
1983	1.22	1	603.4	586.08	7.24	7.033	0.97	9.464	9.317	353	172	294	445
1984	1.19	1.09	744.07	734.27	8.928	8.811	0.98	18.382	18.128	352	158	287	452
1985	0.94	0.96	595.52	614.43	7.146	7.373	1.03	25.538	25.501	349	152	310	433

MAGMA OPERATION STATUS

East Mesa Field

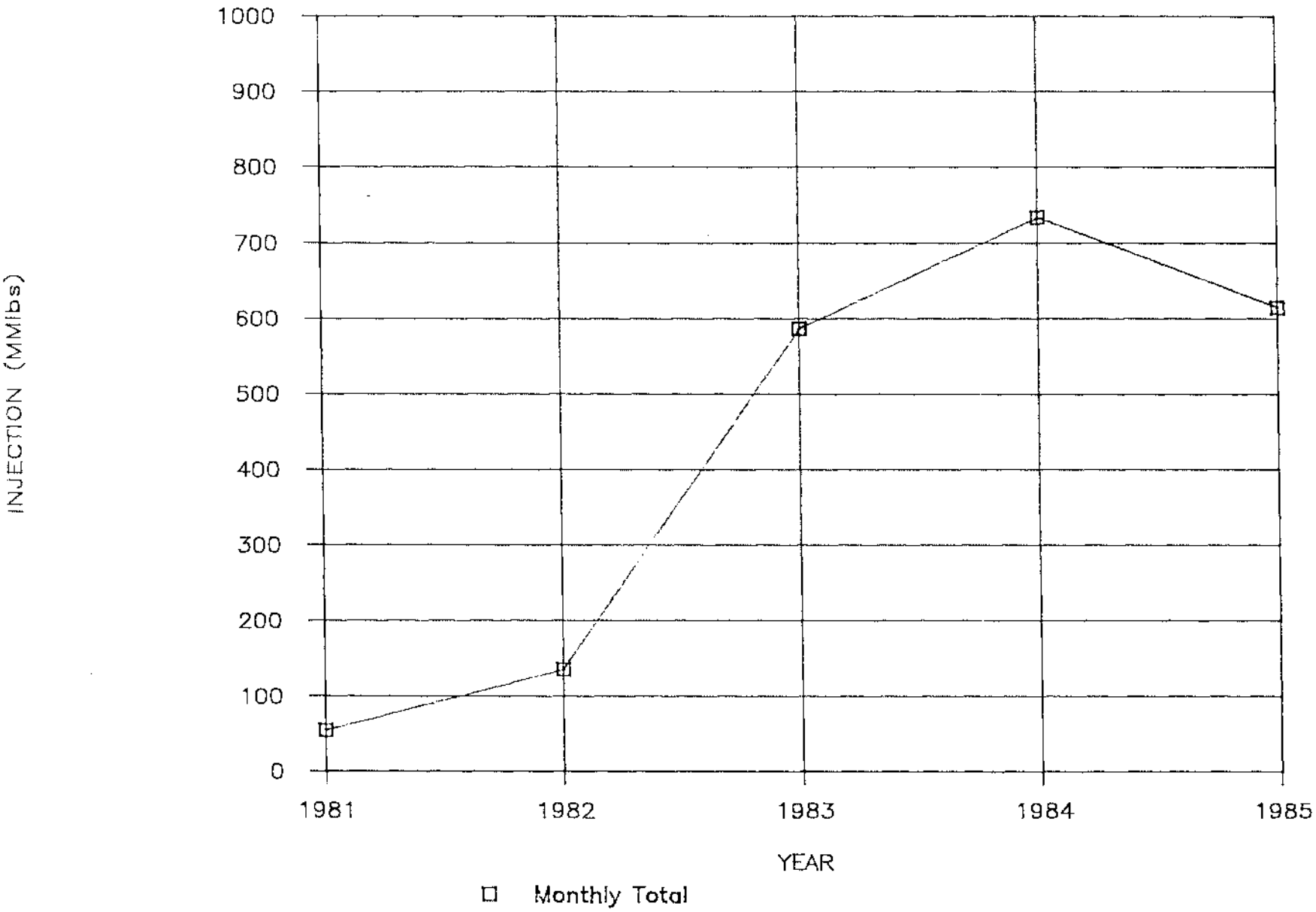


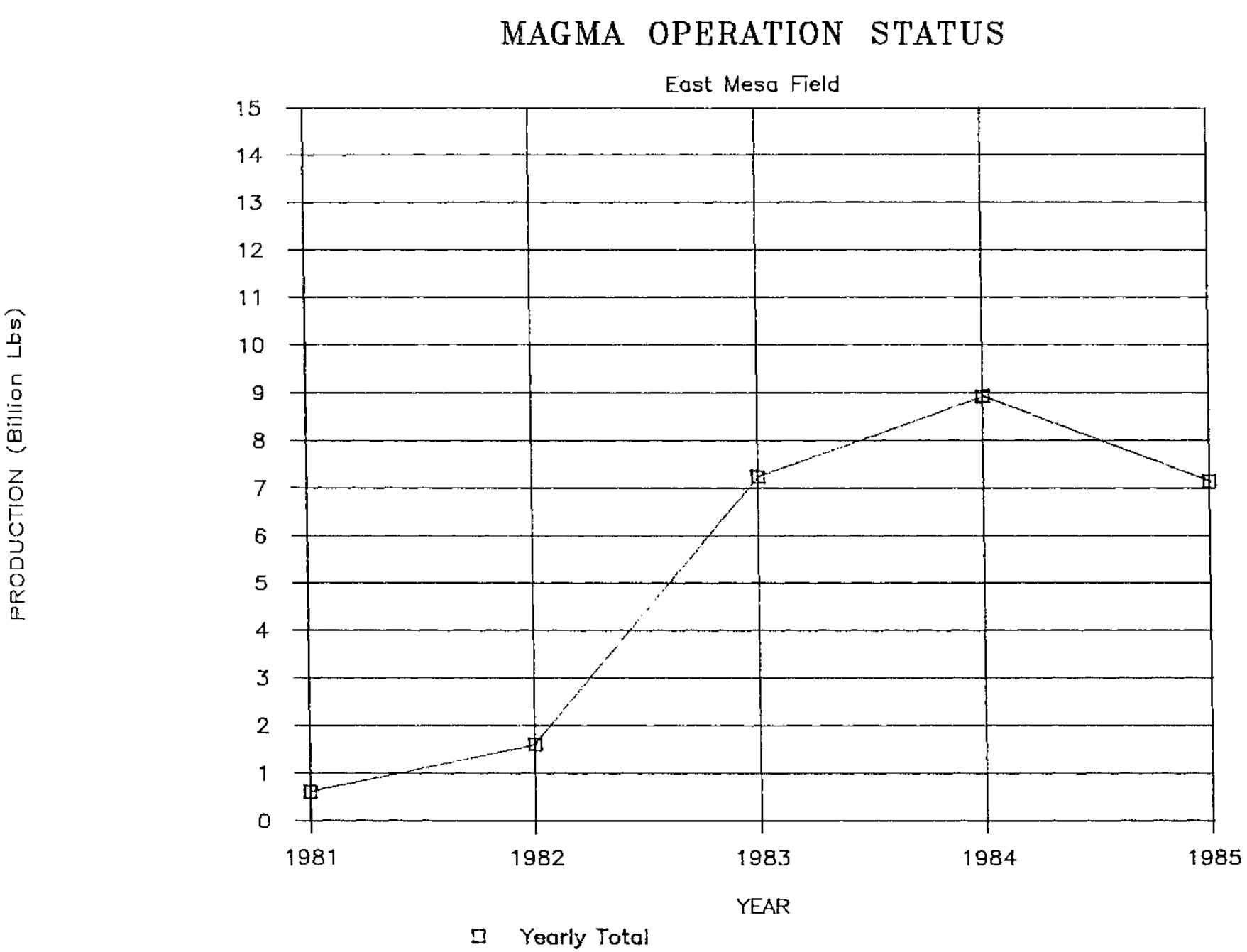

MAGMA OPERATION STATUS
East Mesa Field
INJECTION RATE (MMlbs/hr)
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1981
1982
1983
1984
1985
YEAR
Monthly Average


MAGMA OPERATION STATUS
East Mesa Field
PRODUCTION (MMlbs)
1000
900
800
700
600
500
400
300
200
100
0
1981
1982
1983
1984
1985
YEAR
Monthly Total

MAGMA OPERATION STATUS

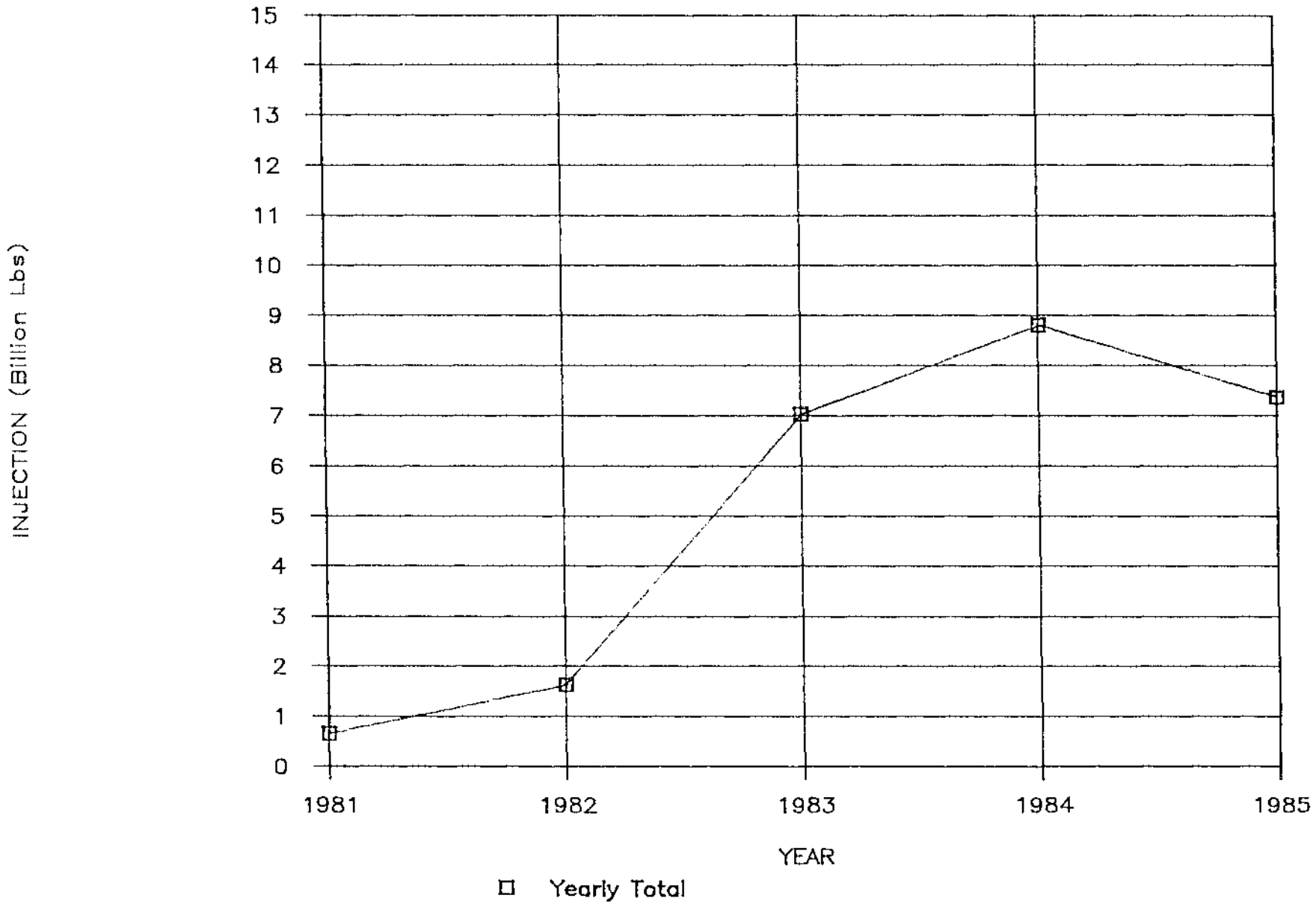
East Mesa Field




MAGMA OPERATION STATUS
East Mesa Field
PRODUCTION (Billion Lbs)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1981
1982
1983
1984
1985
YEAR
Yearly Total

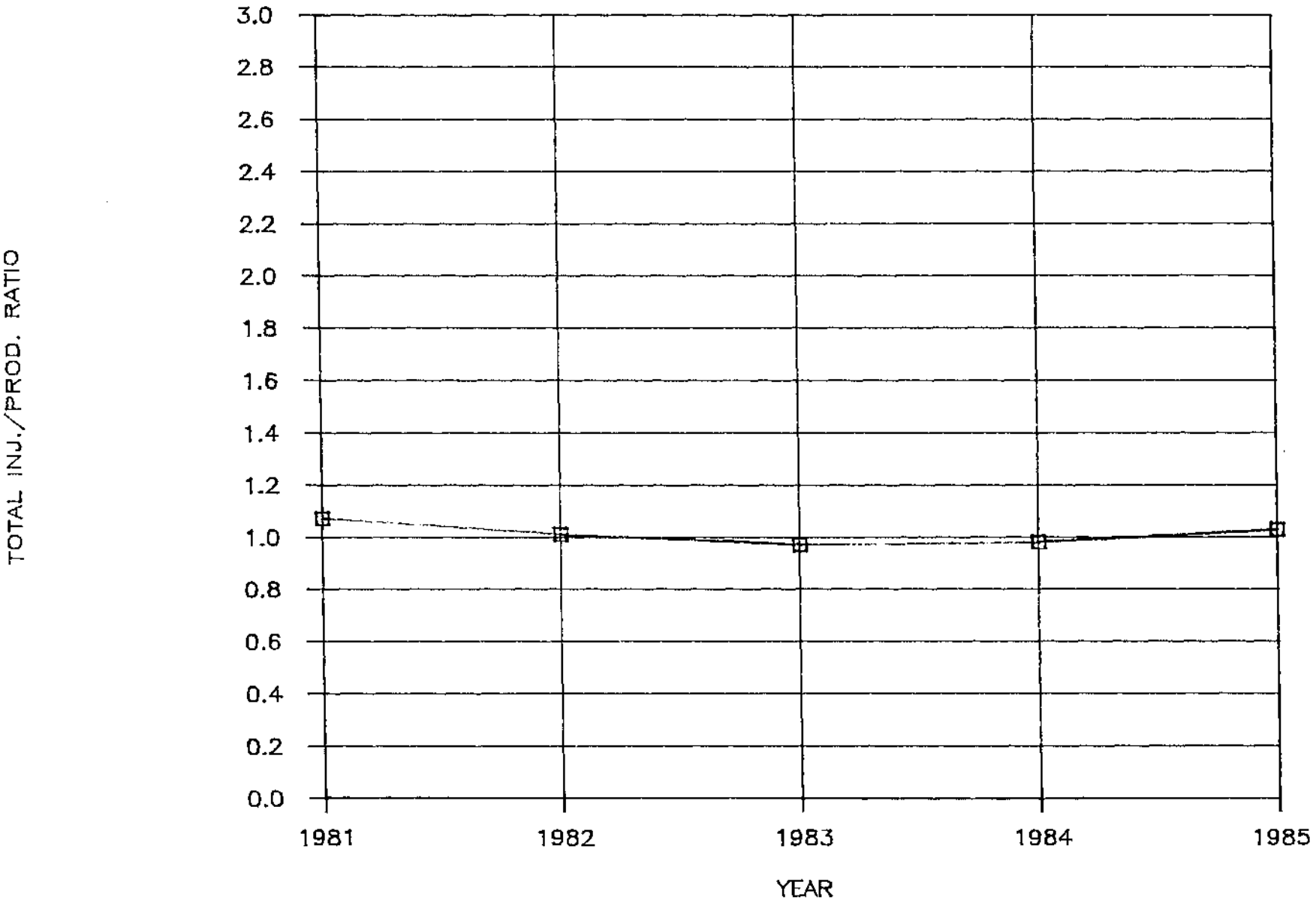
MAGMA OPERATION STATUS

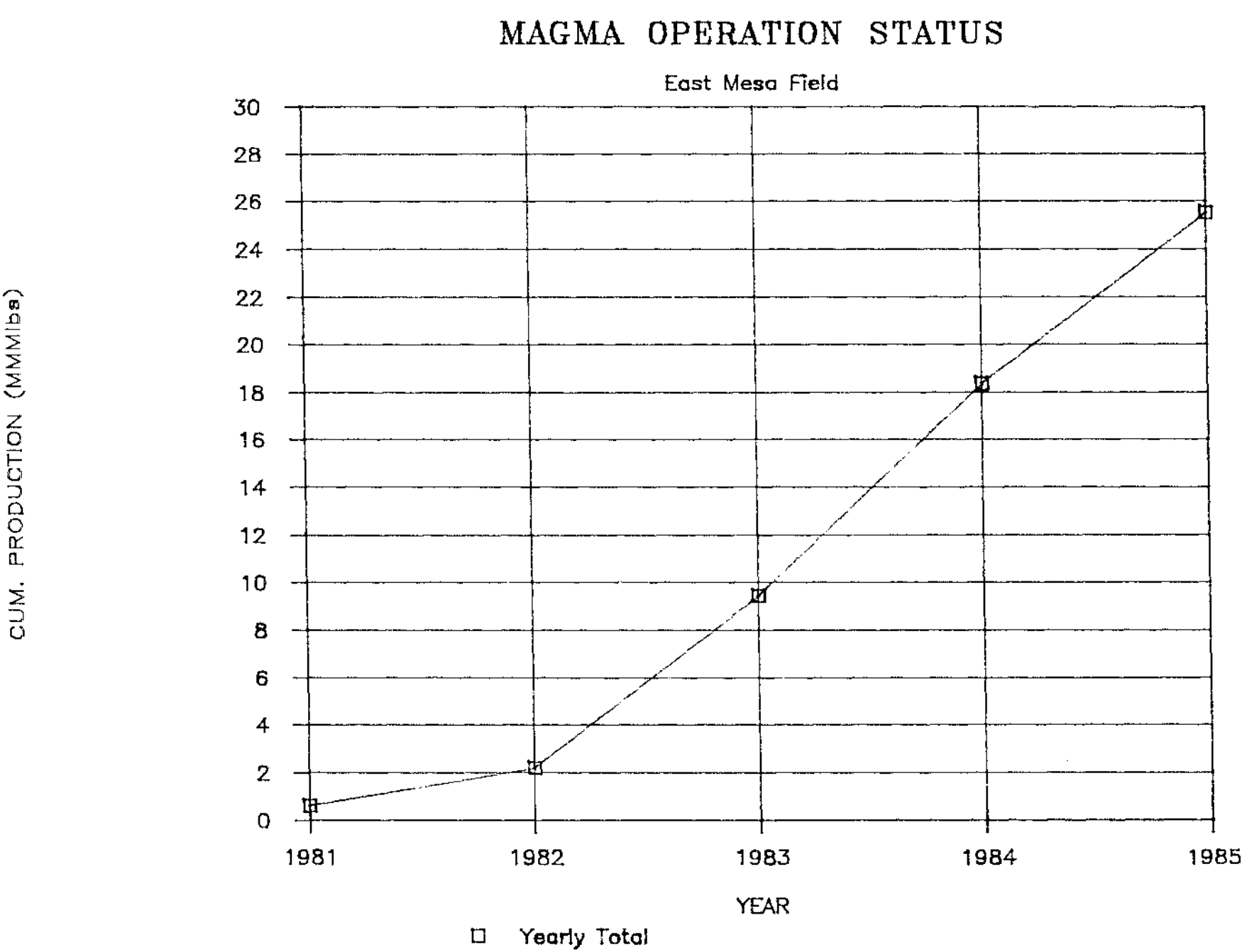
East Mesa Field



MAGMA OPERATION STATUS

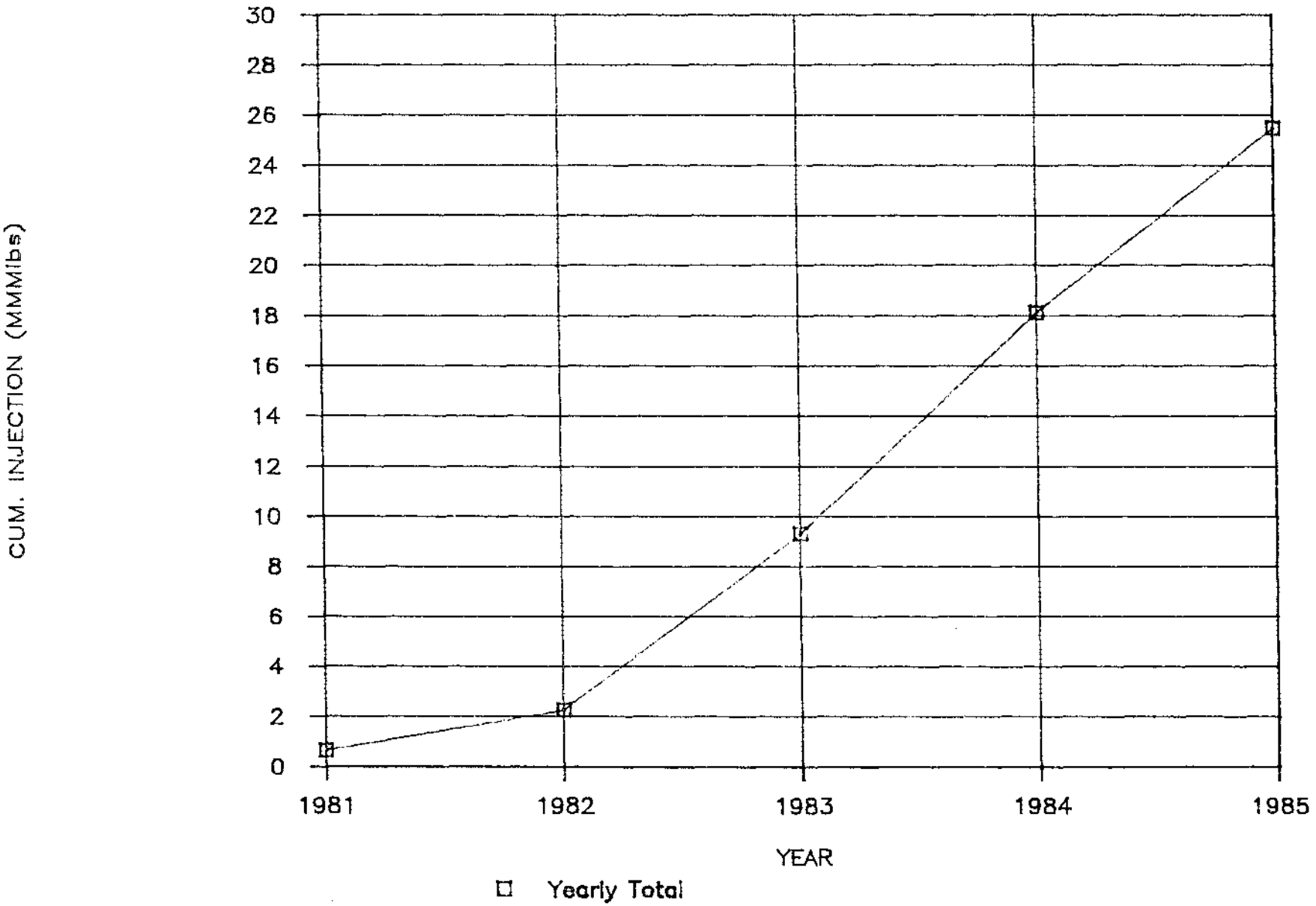
East Mesa Field

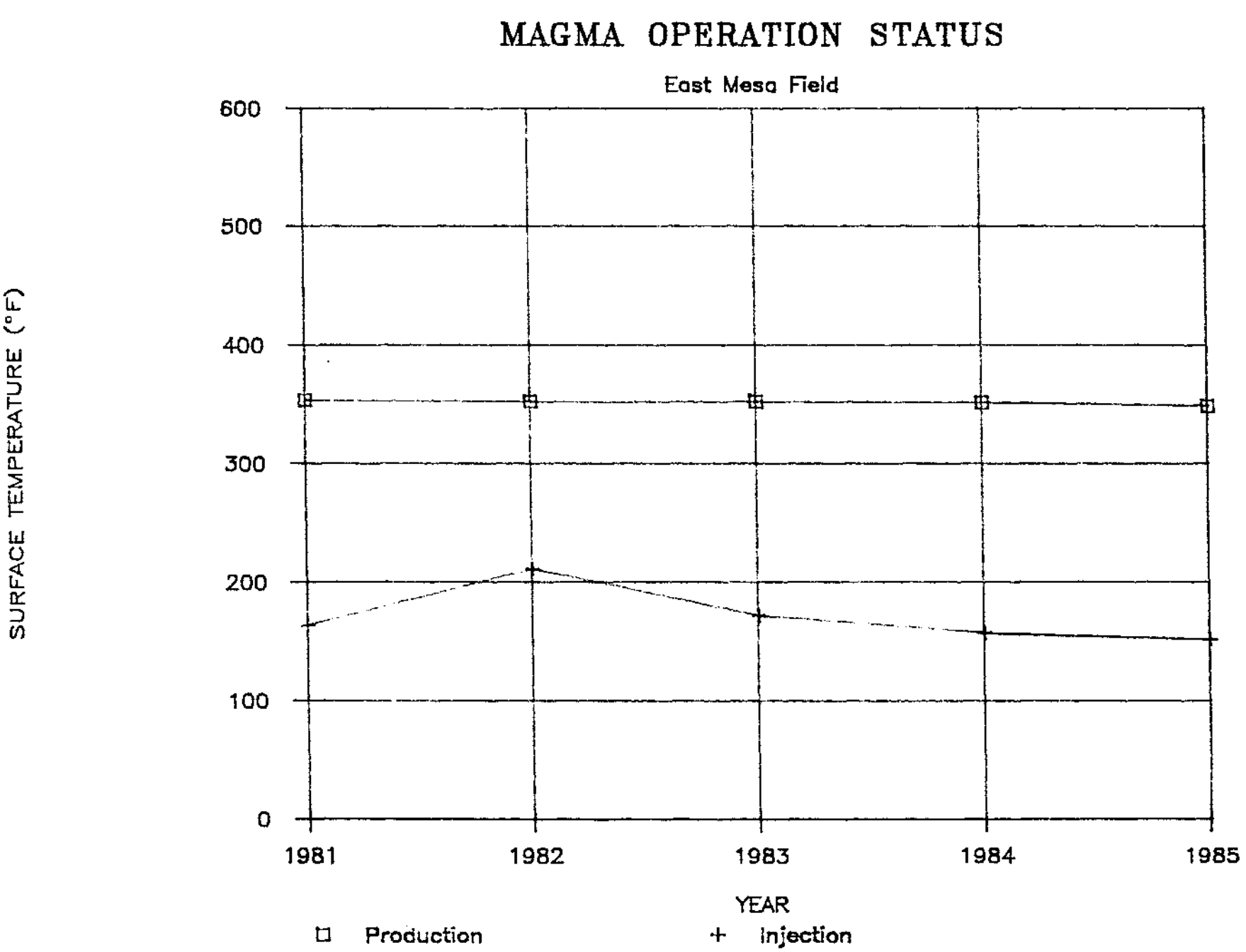



MAGMA OPERATION STATUS
East Mesa Field
CUM. PRODUCTION (MMMlbs)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1981
1982
1983
1984
1985
YEAR
Yearly Total

MAGMA OPERATION STATUS

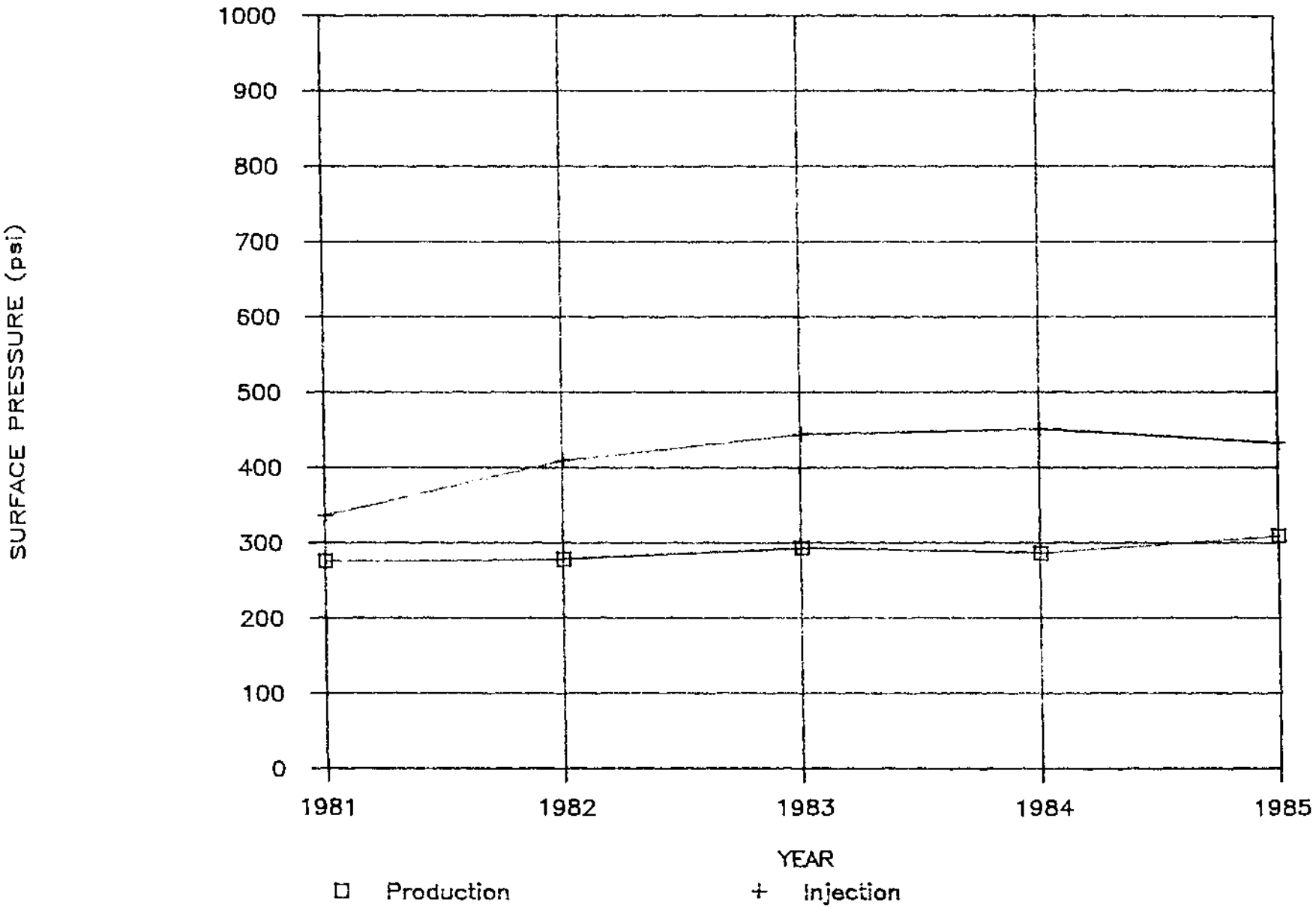
East Mesa Field




MAGMA OPERATION STATUS
East Mesa Field
SURFACE TEMPERATURE (°F)
600
500
400
300
200
100
0
1981
1982
1983
1984
1985
YEAR
Production
Injection

MAGMA OPERATION STATUS

East Mesa Field



BRINE SYSTEM REPORT SHEET

Magma Electric Co.

Date 1-31-86

Anaylsis: (In ppm)	Well # 44-7A (#1)	Well # 44-7A (#1)
Time	8-7-85	1-30-86
pH	5.80	5.52
TDS	6788	6616
Amonia (NH3)	13.0	12.0
Bicarbonate Alklinity	384	416
Calcium Hardness (as CaCO3)	86.0	74.0
Chlorides (Cl)	3551	3579
Dissolved Oxygen (D.O.)	ND	ND
Hydrogen Sulfide (H2S)	0.20	0.50
Silica (SiO2)	225	220
Sulfate (SO4)	68.0	68.0
Suspended Solids	6.30	1.83
Temperature (Deg. F)	335°	336
Pressure (psig)	295	300
Flow (gpm)	810	833
Metals: (In ppm)		
Calcium (Ca)	34.0	30.0
Iron (Fe)	0.20	0.20
Lithium (Li)	14.0	13.77
Potassium (K)	189	192
Sodium (Na)	2367	2370
Strontium (Sr)	5.95	4.87
Gases: (Mole % by volume)		
H20 Vapor	2.97	3.00
Argon (Ar)	-	-
Nitrogen (N2)	8.47	7.96
Methane (CH4)	20.54	21.34
Carbon Dioxide (CO2)	67.86	67.49
Ethane (C2H6)	0.16	0.21
Propane (C4H8)	ND	ND
Iso-Butane (C4H10)	ND	ND
Norm. Butane (NC4H10)	ND	ND

BRINE FROM PRO TION WELLS

MAGMA ELECTRIC CO.

DATE 2/16/84

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D.O.	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specifi Gravity
Hr.	No.	GPM	PSIG	°F	-	umhos	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	———
2/10/83	1	585	310	357	5.46	6805	6760	3698	0	1.00	56	70	436	264	89	18	0.80	—
2/9/84	1	461	300	355	5.35	6466	5840	3176	0	1.33	60	72	458	235	95	15	1.50	—

GASES

Well No.	H_2 %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
2/8/83	-	-	ND	10.96	24.79	61.99	0.08	-
2/9/84	-	-	ND	7.45	21.96	67.39	0.16	—

METALS

~~Ar~~ ppm	~~Boron~~ ppm	Ba ppm	Ca ppm	Tot.Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
2/17/84		1.30	22	0.42	196	14.8	0.40	112	2394	6.3
2/13/84		1.00	24	0.41	196	8.80	0.40	110	2240	5.0

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			

LAWRENCE LIVERMORE LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CA
MATERIALS DEPT., DOE GEOTHERMAL PROGRAMS

DATE: 1/2/80 Brine Supply Wells

PROJECT: [illegible]

CONCENTRATION (mg/ℓ) OR OTHER

SAMPLE ID / PARAMETER	Well #2 44-7 11-14-79	Well #3 44B / 12-6-79	Well #4 48-7A 11-8-79	Well #5 48-7 11-8-79
pH	5.26	5.44	5.15	5.35
CONDUCTIVITY μmho	15109	15629	11038	12566
TDS	10,255	10,092	7,630	8,840
SUSPENDED SOLIDS	1.4 to 15		19	0.8
TURBIDITY	15	10	5	7
HCO_3^- (TITRATION)	390.1	339	354	316
$CO_3^=$ (TITRATION)	-0-	-0-	-0-	-0-
$SO_4^=$ (TURBIDIMETRIC)	-			
$SO_4^=$ (ION CHROM.)	84	73	84	84
F^- (ION CHROM.)	2.5	3.3	2.5	2.4
Cl^- (TITRATION)	6271	5660	4075	4847
NH_3 (ELECTRODE)	20.4	23	17	19
SiO_2 (COLORIMETRIC)	260	280	235	225
NO_3^- (COLORIMETRIC)				
OTHER: H_2S	0.7	1.3	1.5	0.7
Total CO_2	1648	1787	1617	1576
Gas/Liquid ratio	0.07 ℓ gas/ kg brine	N.D.	0.16 ℓ gas/ kg brine	0.15 ℓ gas/ kg brine
Gas: [at.] Atl pressure % CO_2	60.2	74	63.3	68.5
Ar	0.12%	0.1%	0.17%	0.17%
N_2	6.5%	5.4%	10.4%	8.6%
H_2	0.2%	0.2%	0.09%	0.11%
CH_4	23.7%	20.4%	25.8%	22.6%
C_2H_6	0.14%	0.13%	0.15%	0.12%
Field O_2	0 ppb	0 ppb	0 ppb	0 ppb

Note: Well Startup - TDS, Na, Cl may be high due to kill fluids.

PLASMA RESULTS

CONCENTRATION (mg/ℓ)

SAMPLE ID / PARAMETER	SW2-02	SW3-01	SW4-05	SW5-02
Al	<0.5	<0.5	<0.5	<0.5
As	1.0	0.3	0.3	0.4
B	9.0	9.3	7.3	6.9
Be	1.4	2.3	0.9	1.3
Ca	49	72	31	81
Fe	0.6	0.9	0.4	1.1
K	300	261	220	272
Li	12	12	9	11
Mg	1.3	2.4	1.0	2.2
Na	4430	[illegible]	2715	3035
P	0.6	<0.5	0.5	<0.5
Si	[illegible]	[illegible]	92	94
Sr	16	[illegible]	7	20

PACIFIC NORTHWEST LABORATORIES, RICHLAND, WA
MATERIALS DEPT., CORROSION RES. AND ENGINEERING

DATE: 1-7-80

Plant Inlet and Outlet Brine

PROJECT: Magma HX Flow on

CONCENTRATION (mg/ℓ) OR OTHER

PARAMETER \ SAMPLE ID	Inlet 11/10/79 350 psi, 347F	Outlet 11/10/79 260 psi, 78F	Inlet 11/15/79 (Well 2)	Outlet 11/14/79 (Wells 2&4) Bypass
pH	5.62	5.66	5.48	5.59
CONDUCTIVITY	11933	11933	11827	12889
TDS	8225	8213	8716	9534
SUSPENDED SOLIDS	-	2.3	1.0	2.0
TURBIDITY	<5	12	-	10
HCO_3^- (TITRATION)	375	372	396	416
$CO_3^=$ (TITRATION)	-0-	-0-	-0-	-0-
$SO_4^=$ (TURBIDIMETRIC)	-	-	-	-
$SO_4^=$ (ION CHROM.)	84	84	84	86
F^- (ION CHROM.)	2.2	2.2	2.2	2.2
Cl^- (TITRATION)	4471	4451	4748	5242
NH_3 (ELECTRODE)	19.0	19.0	20.3	20.3
SiO_2 (COLORIMETRIC)	210	215	240	-
NO_3^- (COLORIMETRIC)				
OTHER: Field H_2S	-	0.6		
Total CO_2	1620	1671	1840	1927
Gas: CO_2	66%		72%	
Ar	0.17%		0.12%	
N_2	9.3%		5.9%	
H_2	0.11%		0.14%	
CH_4	24.2%		20.8%	
C_2H_6	0.14%		0.13%	
Field O_2	0 ppb	200 ppb	0 ppb	Not Det.

PLASMA RESULTS

CONCENTRATION (mg/ℓ)

PARAMETER \ SAMPLE ID	PC1-04	PC2-05	PC1-06	PC2-07
Al	<0.5	<1	<0.5	<0.5
As	0.2	0.3	0.5	0.6
B	7.2	7.1	9.0	8.8
Ba	1.2	1.2	1.2	1.4
Ca	57	61	44	46.5
Fe	0.7	1.4	0.8	1.3
K	-	250	-	245
Li	11.4	10	9.7	10.8
Mg	1.7	2.1	1.2	2.0
Na	3090	2963	3010	3790
P	<1	<1	<1	<1
Si	96	95	102	106
Sr	14.7	14.8	9.2	9.6

Well # 4-7

BRINE FROM PRODUCTION WELLS

AGMA ELECTRIC CO.

DATE 2/16/84

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D_2O	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specific Gravity
Hr.	No.	GPM	PSIG	°F	-	umhos	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	———
1/20/83	2	653	305	360	5.35	7203	6940	3620	0	1.80	84	-	372	240	100	15	0.90	-
1/9/84	2	529	317	350	5.30	6805	6760	3516	5	3.50	68	-	324	244	90	16	1.50	-

GASES

Well No.	H_2O %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
1/21/83	-	-	ND	6.03	23.53	68.51	0.10	-
1/9/84	-	-	ND	8.48	24.73	65.89	0.20	-

METALS

Ar ppm	Boron ppm	Ba ppm	Ca ppm	Tot. Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
-	-	1.33	30	0.31	182	15.4	0.69	112	2383	6.9
-	-	1.25	27	0.21	140	7.4	0.70	114	2135	3.1

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			

Aug. 8, 1985

SUBJECT: WELL #1 (US 44-7A)

TO: FRED TEETERS

Well #1 was changed to a different zone of 3100 - 3800 ft. The well was sampled for comparison purposes. The following anaylsis are samples taken at different periods of time. Well #2 is also included for your information.

ITEM (mg/l)	8-7-85 44-7A (1)	6-18-84 44-7A	2-9-84 44-7 (2)
ph	5.80	5.35	5.30
TDS	6788	6840	6760
Ammonia	13.0	16.0	16.0
Bicarbonate alklinity	384	447	324
Calcium hardness (CaCo 3)	86.0	52.0	68.0
Chlorides	3551	3643	3516
Hydrogen sulfide	0.20	1.00	1.50
Silica	225	237	244
Sulfate	68.0	95	90
Suspended solids	6.30	5.0	3.50
Specific gravity	1.013	1.014	1.013
METALS	PPM	PPM	PPM
Calcium	34.0	21.0	27.0
Iron	0.20	.25	.21
Magnesium	0.92	0.42	0.70
Potassium	189	194	140
Sodium	2367	2428	2344
GASES (By Volume)	MOLE %	MOLE %	MOLE %
Water vapor	2.97	3.34	2.85
Argon	0.10	0.13	0.10
Nitrogen	8.37	10.25	8.10
Methane	20.54	21.50	24.22
Ethane	0.16	0.16	0.20
Carbon dioxide	67.86	64.62	64.53
Temperature (degree F)	335 degrees	357 degrees	350 degrees
Pressure (psig)	295	305	317
Flow (gpm)	810	540	529
Depth (ft)	3800	7328	7080
Liquid to gas ratio	5.16	3.40	4.67

cc: Tom Hinrichs
Dennis Downs
Russ Tenney
Andy Hoch

February 25, 1983

Mr. Edward Zajac
Magma Power Co.
P.O. Box 17760
Los Angeles, Ca. 90017

Enclosed are anaylsis of Wells U.S. 44-7A, U.S. 44-7, and U.S. 48-7A. One set of anaylsis was done by Battelle Laboratories in 5-30-79, and the other set was done on 1-7-80. After 3 years, there are no great changes in the chemical composition, as you can see from my recent anaylsis done in 2-17-83.

PARAMETER	(5/30/79)#1 U.S. 44-7A	2/17/83)#1 U.S. 44-7A	(1/7/80)#2 U.S. 44-7	(2/17/83)#2 U.S. 44-7
pH	5.83	5.50	5.65	5.30
Conductivity	10900	9300	10255	9730
Suspended Solids	2.00	1.00	1.40	1.00
TDS	7322	6372	8618	7784
Total Alklinity	509	436	390	350
Sulfate	85	89	84	90
Chlorides	3861	3698	4120	3645
Ammonia	17	18	20	18
Silica	270	264	260	268
Hydrogen Sulfide	1.60	0.80	0.70	0.90
METALS				
Barium	0.80	1.20	1.40	1.60
Calcium	20	22	49	30
Iron	0.26	0.41	0.60	0.60
Potassium	220	196	300	200
Lithium	9.20	14.8	12	16
Magnesium	0.30	0.40	1.30	0.83
Sodium	2859	2394	3395	2113
Silicon	103	112	106	123
Strontium	4.4	6.3	10	8.0
Lead	0.20	0.10	0.10	0.10
Zinc	0.10	0.10	0.10	0.10
GASES				
Carbon Dioxide	69.50%	66.61%	69.20%	72.21%
Nitrogen	11.20%	11.00%	6.50%	8.96%
Methane	15.30%	14.89%	23.70%	14.22%
Ethane	0.12%	0.16%	0.14%	0.12%

PACIFIC NORTHWEST [illegible]

MATERIALS DEPT., CORROSION RES. AND ENGINEERING

: 5/30/79

IEC Magma

CONCENTRATION (mg/ℓ) OR OTHER

SAMPLE ID / METER	Magma Well 44-7 5/24/79 #2	Magma Well 44-7A 5/24/79 #1	Magma Exit Spool 5/25/79	
	5.65	5.83	5.75	
)UCTIVITY	13,500	10,900	12,350	
TDS	8618	7322	8094	
ENDED SOLIDS	5	2	3	
IDITY	10 FTU	10 FTU	10 FTU	
(TITRATION) HCO_3	385	509	453	
(TITRATION) CO_3	ND[1]	ND[1]	ND[1]	
(TURBIDIMETRIC) SO_4	---	---	---	
(ION CHROM.) SO_4	68	79	73	
ION CHROM.) F^-	2.7	3.2	2.8	
(TITRATION) Cl^-	4596	3861	4447	
(ELECTRODE) NH_3	17	14	15	
(COLORIMETRIC) SiO_2	225	270	260	
(ION CHROM.) NO_3	<0.25	<0.25	<0.25	
ER:				
(Na[illegible] Sample) Total CO_2	1807	1695	3633	
($Zn(OAC)_2$ Sample) H_2S	1.6	1.6	1.6	
(ION CHROM.)	3161	2640	2897	
(ION CHROM.)	0.41	0.41	0.41	
ION CHROM.)	4856	3701	4519	
ON CHROM.)	286	218	259	

ARGON PLASMA EMISSION SPECTROMETER RESULTS

CONCENTRATION (mg/ℓ)

SAMPLE ID / METER	Magma Well 44-7 5/24/79	Magma Well 44-7A 5/24/79	Magma Exit Spool 5/25/79	
al	0.10	0.10	0.16	
As	0.40	0.40	0.50	
Boron	9.8	9.3	10	
Ba	1.5	0.8	1.2	
Ca	47	20	35	
Fe	0.40	0.26	0.50	
	---	---	---	
	12	9.2	11	
	1.2	0.30	0.70	
Mg	3395	2859	3249	
K Na	<0.10	<0.10	<0.10	
P	110(235 as SiO_2)	108(231 as SiO_2)	111(238 as SiO_2)	
Si	10	4.4	7.6	
Sr				

PACIFIC NORTHWEST LABORATORY, RICHLAND, WA
MATERIALS DEPT., CORROSION RES. AND ENGINEERING

DATE: 5/30/79
PROJECT: Magma

ARGON PLASMA EMISSION SPECTROMETER RESULTS

CONCENTRATION (mg/ℓ)

PARAMETER \ SAMPLE ID	Magma Well 44-7 5/24/79	Magma Well 44-7A 5/24/79	Magma Exit Spool 5/25/79	
Ag	<0.01	<0.01	<0.01	
Cd	<0.01	<0.01	<0.01	
Co	<0.01	<0.01	<0.01	
Cr	<0.05	<0.05	<0.05	
Cu	<0.01	<0.01	<0.01	
Mn	0.05	0.03	0.04	
Mo	<0.50	<0.50	<0.50	
Ni	<0.01	0.01	<0.01	
Pb	<0.10	<0.10	<0.10	
Sb	<0.05	<0.05	<0.05	
Se	<0.10	<0.10	<0.10	
Sn	<0.10	<0.10	<0.10	
Sn	<0.10	<0.10	<0.10	
Ti	<0.05	<0.05	<0.05	
Tl	<0.10	<0.10	<0.10	
V	<0.05	<0.05	<0.05	
Zn	<0.05	<0.05	<0.05	
Zr	<0.05	<0.05	<0.05	

REMARKS: 1) Gas/Liquid Ratio

Sample Location	Gas/Liq. Ratio (Ml Gas/Liter Brine)	Comments
Well 44-7	235	500ml gas sampling bulb leaking water (1 valve loose)
Well 44-7A	187	---
Exit Spool	190	---

2) Gas Analysis (Mass Spec.)

Component	Well 44-7	Well 44-7A (Mole %)	Exit Spool
CO_2	72.9	~~64.9~~ 69.5	73.1
Ar	0.09	~~0.10~~ 0.11	0.09
O_2	0.06	~~0.35~~ 0.35	0.03
N_2	10.6	~~10.5~~ 11.2	10.6
CO	<0.1	~~<0.1~~ <0.1	<0.1
He	<0.01	~~<0.01~~ <0.01	<0.01
H_2	0.25	0.25 0.27	0.80
CH_4	15.9(15.8-GC)	~~14.3~~ 15.3(15.3-GC)	15.1(15.6-GC)
EST. H_2O	0.16	~~0.7~~ 3%	0.32

3) Footnotes

ND[1] - None Detected

Assumes H2O Vapor pressure from Temp

FIELD MEASUREMENTS

	Magma Well 44-7 5/24/79	Magma Well 44-7A 5/24/79	Magma Exit Spool 5/25/79
Pressure (psi)	290	270	---
Temp. (°F)	353	361	---
Flow (GPM)	600	600	---
pH	5.5 (20°C)	5.8 (36°C)	5.7 (24°C)
O_2 (ppb)	0	0	0
H_2S[2] (mg/ℓ)	1	0.3	0.8
NH_3[2] (mg/ℓ)	>10	10	9

Footnotes

[2]Chemetrics Test Kit

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4635

EAST MESA PLANT

July 5, 1983

Mr. Edward Zajac
Magma Power Co.
P.O. Box 17760
Los Angeles, Ca. 90017

Enclosed are the anaylsis on Wells 77-7 and 44-7B that I completed on 7-1-83. I am including the anaylsis completed on 2-17-83 for comparison.

PARAMETER	#2 U.S. 44-7 2-17-83	#2 U.S. 44-7 6-29-83	#3 U.S. 44-7B 3-8-83	#3 U.S. 44-7B 6-29-83
pH	5.30	5.29	5.50	5.36
Conductivity	9,730	10,350	10,000	9,450
Suspended solids	1.00	1.80	3.20	1.20
TDS	7,784	6,970	6,800	6,760
Total alklinity	350	368	454	466
Sulfate	90	100	85	95
Chlorides	3,645	3,649	3,650	3,567
Ammonia	18	14	13	15
Silica	268	274	285	291
Hydrogen sulfide	0.90	1.00	1.00	1.00
Temperature (deg.)	355	360	360	362
Pressure (PSIG)	287	322	290	295
Flow (GPM)	416	585	550	563
GASES				
Carbon dioxide	72.21%	71.17%	63.10%	73.84%
Nitrogen	8.96%	7.29%	9.75%	4.50%
Methane	14.22%	16.49%	25.72%	17.08%
Ethane	0.12%	0.08%	0.16%	0.09%
METALS				
Barium	1.60	1.25	1.56	1.83
Calcium	30.0	27.0	22.0	13.0
Iron	0.60	0.23	0.60	0.16
Potassium	200	190	210	180
Lithium	16.0	16.6	15.0	12.5

METALS CONT.	U.S.44-7	U.S 44-7	U.S. 44-7B	U.S. 44-7B
Magnesium	0.83	0.70	1.10	0.48
Sodium	2113	2281	2289	2105
Silicon	123	128	143	136
Strontium	8.0	5.64	7.0	5.12
Lead	0.10	0.10	0.10	0.10
Zinc	0.10	0.10	0.10	0.10

This is the anaylsis on Wells 48-7A and 48-7

PARAMETER	#4 U.S.48-7A 2-17-83	#4 U.S. 48-7A 6-28-83	#5 U.S. 48-7 1-7-83	#5 U.S. 48-7 6-28-83
pH	5.17	5.35	5.35	5.30
Conductivity	10,380	9,370	12,566	11,230
Suspended solids	1.20	0.90	0.80	2.40
TDS	7,160	6,930	8,840	8,070
Total Alklinity	400	376	316	280
Sulfate	90	80	84	75
Chlorides	3,822	3,926	4,847	4,756
Ammonia	16	14	19	16
Silica	240	285	225	285
Hydrogen sulfide	0.80	0.90	0.70	0.90
Temperature (deg.)	350	350	352	350
Pressure (PSIG)	275	283	300	295
Flow (GPM)	540	495	940	704
GASES				
Carbon dioxide	63.10%	74.95%	68.50%	74.59%
Nitrogen	9.75%	7.84%	8.60%	8.30%
Methane	25.72%	15.60%	22.60%	15.10%
Ethane	0.16%	0.06%	0.12%	0.05%
METALS				
Barium	1.40	1.60	1.30	1.50
Calcium	22.0	26.0	81	61
Iron	0.20	0.50	1.10	0.35
Potassium	180	173	272	208
Lithium	16.0	13.6	11.0	17.7
Magnesium	0.60	0.74	2.20	1.77

METALS CONT	U.S. 48-7A	U.S. 48-7A	U.S. 48-7	U.S. 48-7
Sodium	2,324	2,237	3,035	2,500
Strontium	10.0	5.12	20.0	10.3
Silicon	125	133	94	133
Lead	0.10	0.10	0.10	0.10
Zinc	0.10	0.10	0.10	0.10

Sincerely,

Hector Galarte

HECTOR GALARTE
Lab Technician

cc: A.W. Hoch
R.L. Tenney
Ray Collins

(6-A)

MAGMA POWER COMPANY

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017
(213) 483-2285

SUBSURFACE PRESSURE SURVEY

OWNER MAGMA POWER CO. FIELD

CASING 13 3/8" 1240'

LINER DESCRIPTION: 9 5/8" 1033' TO 5146'
7" 5031 TO 7301
7" SLOTTED 5699 TO 7301'

TUBING DETAIL:

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE

REMARKS: STATIC PRESSURE SURVEY

WELL NAME MAGMA/US 44-7

DATE: AUG. 12, 1976

ZERO POINT GRD + 12'

DEPTH 7328'

ZONE

INSTRUMENT KUSTER PSI

SERIAL NO.

MAX. TEMP. 385° °F @ 7300'

STABLIZATION PERIOD 16 DAYS

GROSS OIL RATE B/D

NET OIL RATE B/D

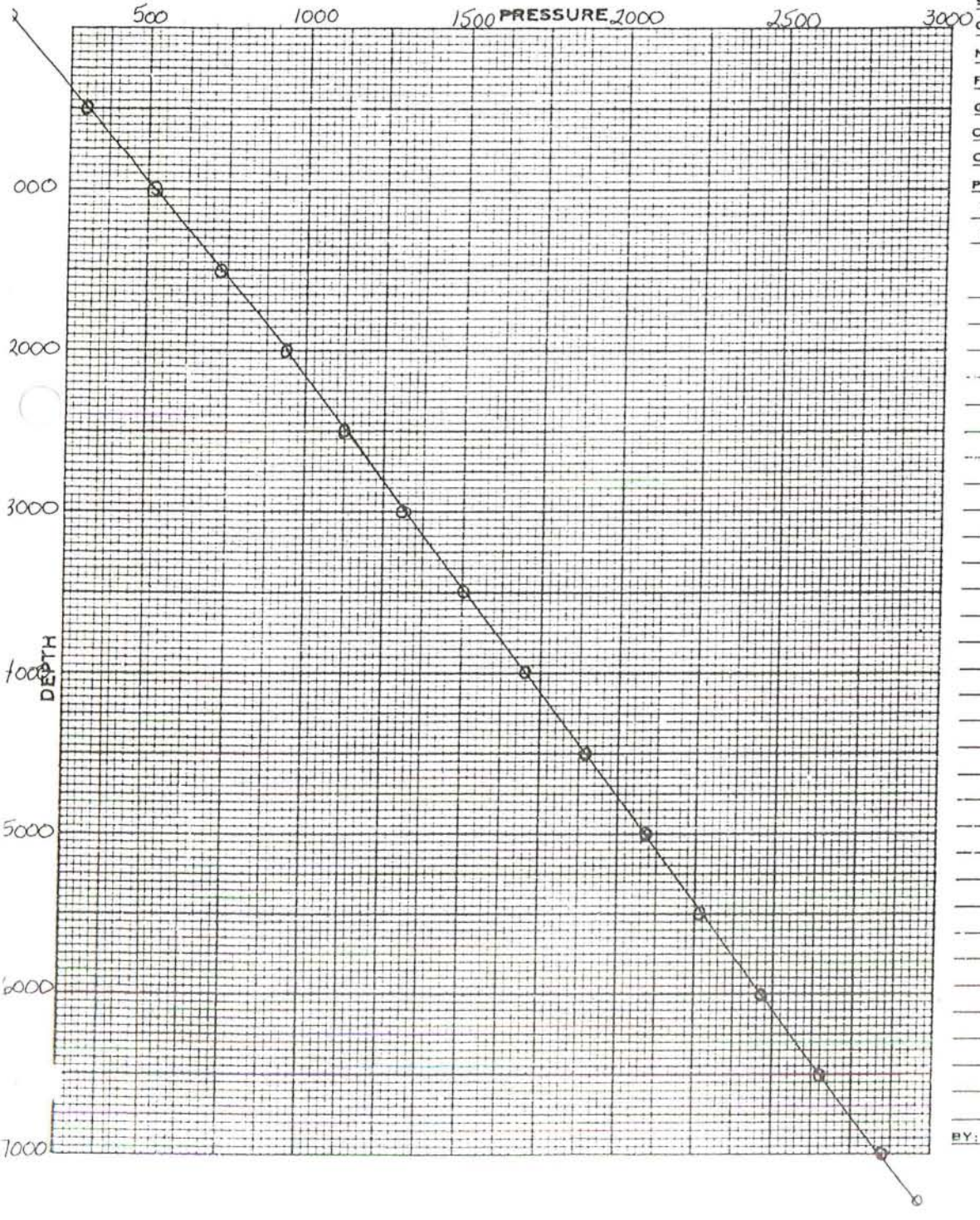
FORMATION GAS MCF D

GOR CFT/BBL.

CIRCULATED GAS MCF/D

OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSI	81	
TUBING, PSI		



DEPTH	PRESSURE	GRADIENT
500' -	304	
1000' -	522	
1500' -	734	
2000' -	931	
2500' -	1126	
3000' -	1313	
3500' -	1511	
4000' -	1696	
4500' -	1890	
5000' -	2080	
5500' -	2267	
6000' -	2462	
6500' -	2650	
7000' -	2842	
7300' -	2962	

BY: MIKE MAYS E.I.

MAGMA POWER COMPANY

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

TELEPHONE 483-2285 • 483-8542

(2)

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME MAGMA U.S. 44-7

CASING 13 3/8" 1240' ELEV. 30 DATE: 6-2-76

LINER DESCRIPTION: 9 5/8" 1032' to 5146', ZERO POINT GRD. + 12'

7" 5031' to 7301', DEPTH 7328'

SLOTTED 5699' to 7301' ZONE

TUBING DETAIL:

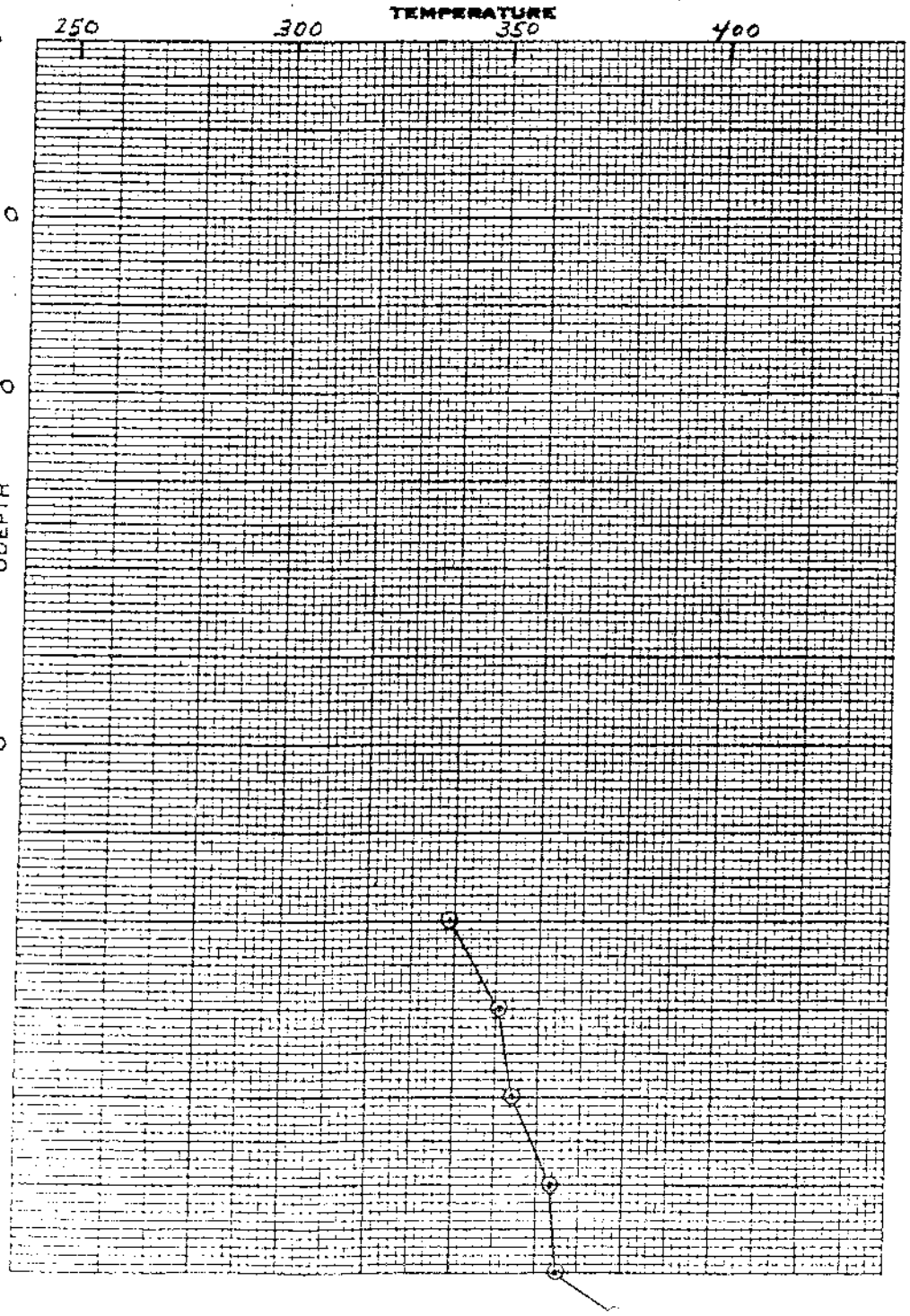
INSTRUMENT KUSTER °FAH

SERIAL NO.

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE STATIC TEMPERATURE SURVEY MAX. TEMP. 379 °F @ 7301'

REMARKS:



STABLIZATION PERIOD 10 DAYS

GROSS OIL RATE B/D

NET OIL RATE B/D

FORMATION GAS MCF/D

GOR CFT/BBL

CIRCULATED GAS MCF/D

OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSIG	80 PSI	
TUBING, PSIG		

DEPTH	TEMP.	DEPTH	TEMP

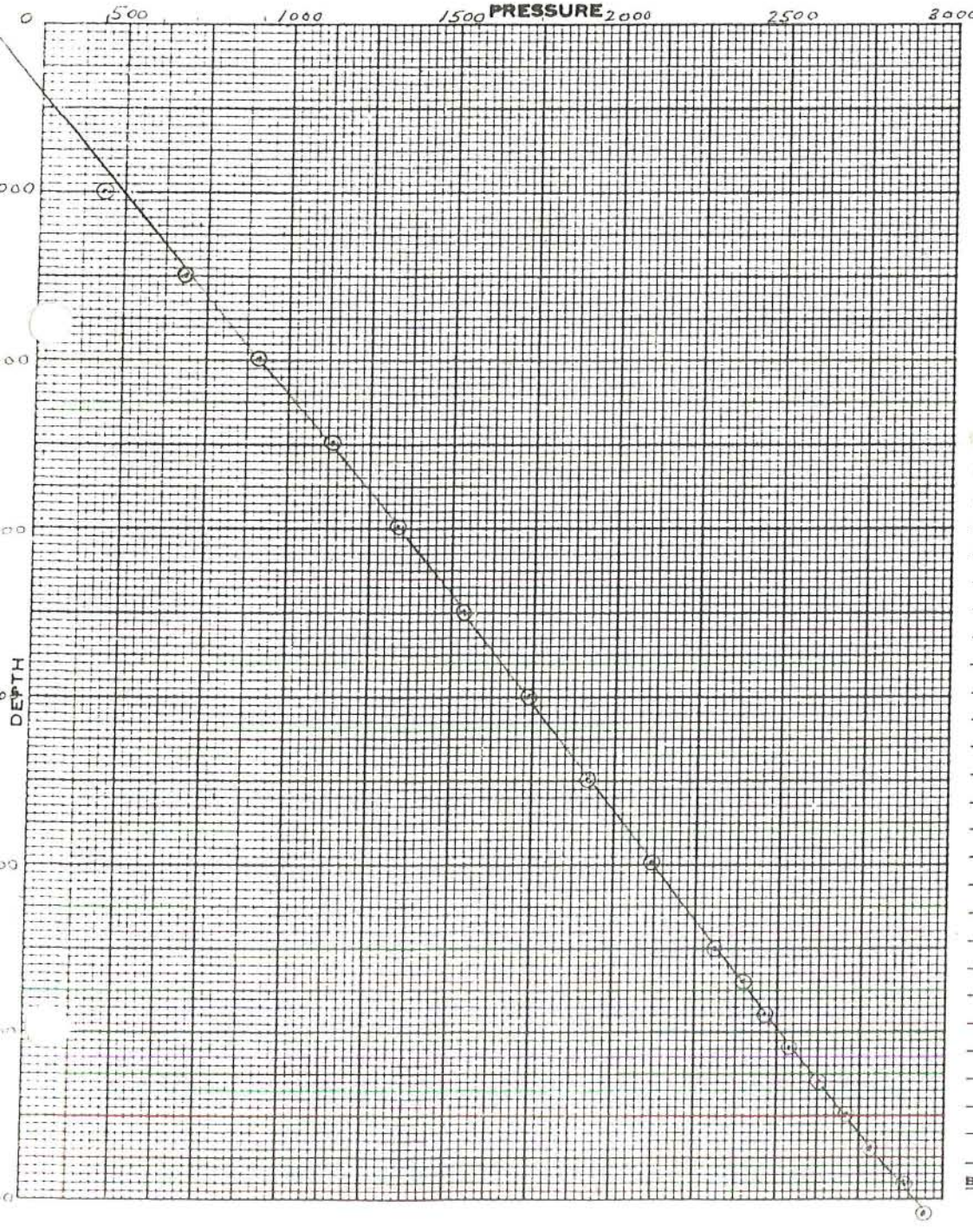
5000' - 349 °F
5500' - 361
6000' - 364
6500' - 374
7000' - 375
7301' - 379

BY: MIKE MAYS

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017
(213) 483-2285

SUBSURFACE PRESSURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME MAGMA 44-7
CASING 13 3/8" 1240' ELEV. 30' DATE: 1-4-78
LINER DESCRIPTION: 9 5/8" 1033' TO 5146' ZERO POINT GRD. + 12
7" 5031' TO 7301' DEPTH 7228
7" SLOTTED 5699' TO 7301' ZONE
TUBING DETAIL:
INSTRUMENT PSIG
SERIAL NO
PUMP SHOE GAS ANCHOR INTAKE:
PURPOSE STATIC PRESS. SURVEY MAX. TEMP. 381 °F @ 7318
REMARKS: (AFTER PUMP PRODUCING WELL)



STABLIZATION PERIOD
GROSS OIL RATE B/D
NET OIL RATE B/D
FORMATION GAS MCF D
GOR CFT/BBL.
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSI	0	
TUBING, PSI		

DEPTH	PRESSURE	GRADIENT
500'	154	
1000	406	
1500	677	
2000	906	
2500	1130	
3000	1332	
3500	1532	
4000	1747	
4500	1920	
5000	2116	
5500	2317	
5700	2390	
5900	2468	
6100	2544	
6300	2626	
6500	2704	
6700	2780	
6900	2861	
7100	2935	
7218	2985	

↑
MAY BE INFLUENCED BY KILL FLUID IN WELL

BY: [illegible] (EE)

(8)

MAGMA ENERGY, INC.

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

TELEPHONE 483-2285 • 483-5542

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER Co. FIELD EAST MESA Well Name MAGMA 44-7

CASING 13 3/8" 1240' ELEV. 30' DATE: 1-4-78

LINER DESCRIPTION: 9 5/8" 1033' TO 5146' ZERO POINT GRD. + 12'

7" 5031' TO 7301' DEPTH 7328'

7" SLOTTED 5699' TO 7301' ZONE

TUBING DETAIL:

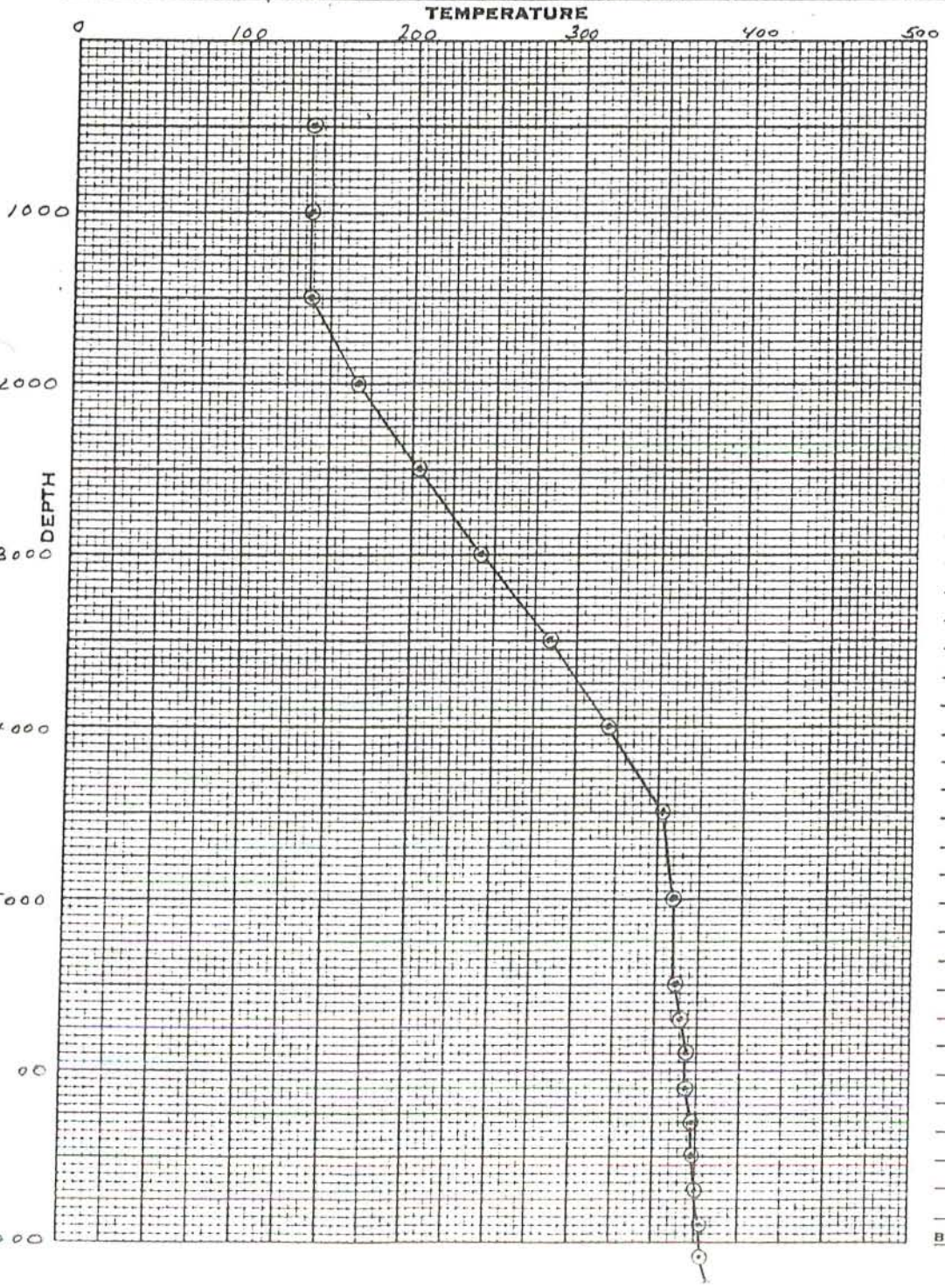
INSTRUMENT KUSTER ° FA

SERIAL NO.

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE STATIC TEMP. SURVEY MAX. TEMP. 381 °F @ 7318

REMARKS: (AFTER PUMP PRODUCING WELL)



STABLIZATION PERIOD

GROSS OIL RATE B D

NET OIL RATE B D

FORMATION GAS MCF D

GOR CFT BBL.

CIRCULATED GAS MCF/D

OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING. PSIG	0	
TUBING. PSIG		

DEPTH	TEMP.	DEPTH	TEMP
500'	138°F		
1000	138		
1500	138		
2000	167		
2500	204		
3000	241		
3500	283		
4000	320		
4500	353		
5000	360		
5500	362		
5700	365		
5900	368		
6100	369		
6300	372		
6500	373		
6700	375		
6900	377		
7100	379		
7318	381		

BY: COLLINS (EZ)

IMPERIAL MAGMA

DOWN HOLE SURVEY

WELL # 44-7

Date: 11-01-85

DEPTH	TEMPERATURE F°	PRESSURE PSI
500	256.8	203.56
1000	277.0	335.50
1200	289.0	503.94
1400	303.9	584.73
1600	317.6	663.55
1800	325.9	746.32
2000	331.1	825.14
2200	338.5	907.90
2400	344.6	986.72
2600	348.6	1063.52
2800	344.1	1144.90
3000	353.4	1230.26
3200	357.9	1303.70
3400	362.4	1387.07
3600	368.5	1468.45
3800	369.8	1539.70
4000	370.9	1577.41

Well has bridge @ 4000' and possible Hole in Casing

DOWN HOLE SURVEY

20 DAYS STATIC

WELL: Magma US 44-7A
DATE: 8-18-78
W.H.P:
W.H.T. °F:

START CLOCKS:
IN HOLE
M.R.T. °F
INSTRUMENT #

ME ON STOP	DEPTH	Temp DEFL.	Temp °F	Press DEFL	Press. PRESS	SOMETHING
	0			38	63.94	
	500	010	141.12	168	346 ~~282.50~~	
	1000	100	171.00	298	501.63	
	1500	182	197.32	430	717.32	
	2000	290	230.73	555	921.56	
	2500	422	270.97	680	1125.81	
	3000	537	304.84	800	1321.89	
	3500	601	323.69	918	1514.56	
	4000	642	335.60	1036	1705.50	
	4500	677	345.76	1155	1898.05	
	5000	694	350.70	1265	2076.05	
	5500	713	356.22	1385	2270.22	
	6000	733	362.03	1493	2444.98	
	6200	758	369.29	1539	2519.41	
	6400	766	371.62	1585	2593.85	
	6600	772	373.36	1631	2668.28	
	6800	779	375.39	1678	2744.33	
	7000	780	375.69	1711	2797.73	
	7062	783	376.56	1732	2831.71	

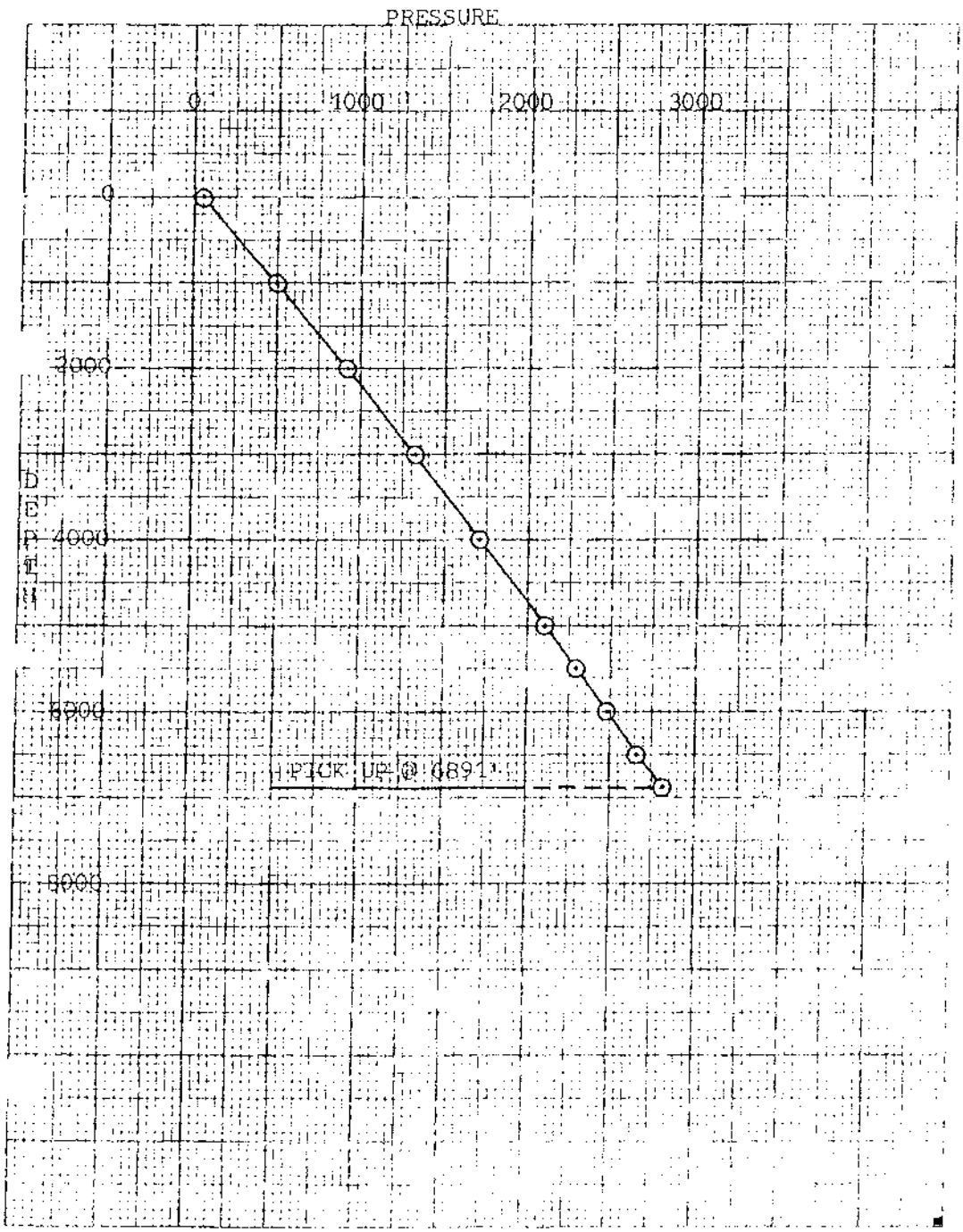
Prepaired by Leslie Bransfield

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER	MAGMA POWER COMPANY	FIELD	EAST MESA	WELL NAME	MAGMA 44-7A
CASING		ELEV.		DATE:	November 30, 1978
LINER DESCRIPTION:				ZERO POINT	Ground level
PERFORATIONS:				MPP	
TUBING DETAIL:	None			DEPTH	ZONE
		PUMP SHOE			
WELL STATUS	Static	SHUT IN		ON PRODUCTION	
SURVEYED	TUB. ☐ ANN. ☐ Casing	ENGAGE STYLUS	9:48 am	DISENGAGE STYLUS	12:45 pm
PICK UP @	6891'	TIME ON BOTTOM	12:15 pm	TIME OFF BOTTOM	12:21 pm
ELEMENT RANGE	3800#	SERIAL NO.	40826	CLOCK 12 hr.	TURN 7½
PURPOSE	STATIC PRESSURE GRADIENT SURVEY			MAX. °F 377.3	@ 6891'
REMARKS				STABILIZATION PERIOD	



PRESSURES:	START	FINISH
DATE	11/30	
CASING PSI OBS	75	
CASING PSI COR	58	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	PRESS.	GRAD.
0	58	
1000	495	.437
2000	920	.425
3000	1320	.400
4000	1713	.393
5000	2097	.384
5500	2290	.386
6000	2475	.370
6500	2664	.378
6891	2810	.373

BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

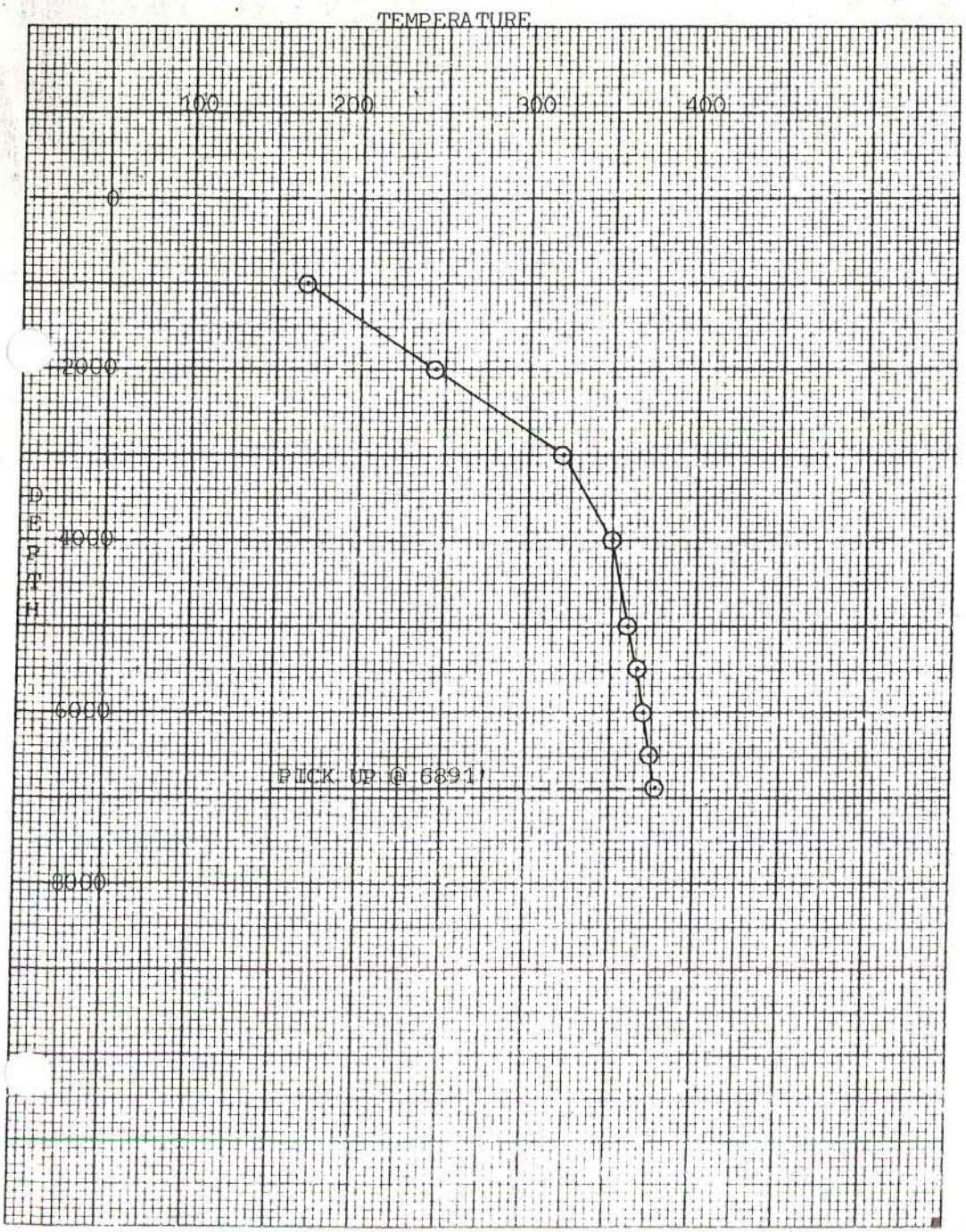
SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER	MAGMA POWER COMPANY	FIELD	EAST MESA	WELL NAME	MAGMA 44-7A
CASING		ELEV.		DATE:	November 30, 1978
LINER DESCRIPTION:				ZERO POINT	Ground level
PERFORATIONS:				MPP	
TUBING DETAIL:	None			DEPTH	ZONE
		PUMP SHOE			
WELL STATUS	Static	SHUT IN		ON PRODUCTION	
SURVEYED	TUB. ☐ ANN. ☐ Casing	ENGAGE STYLUS	9:48 am	DISENGAGE STYLUS	12:45 pm
PICK UP @	6891'	TIME ON BOTTOM	12:15 pm	TIME OFF BOTTOM	12:21 pm
ELEMENT RANGE	110-473	SERIAL NO.	10059	CLOCK 12 hr.	TURN 7½
PURPOSE	STATIC TEMPERATURE GRADIENT SURVEY			MAX. °F 377.3	@ 6891'
REMARKS:				STABILIZATION PERIOD	

PRESSURES:	START	FINISH
DATE	11/30	
CASING PSI OBS	75	
CASING PSI COR	58	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @



DEPTH	TEMP.
0	
1000	167.6
2000	244.6
3000	321.6
4000	350.4
5000	360.7
5500	366.3
6000	370.7
6500	374.8
6891	377.3

BY: SMITH & HARRIS

East Mesa - Well # 44-7A
6-29-85
Press Tool # 29832
72 hour Clock # 30228
Depth 4500'

	Time	Deflection	Press.
	Start Clock	.866	1688.6
start-up	7.5 hours	.866	1688.6
	10	.821	1599.3
	24	.808	1573.4
	40	.805	1565.5
Out →	91	.0	—0—

Two pressure dips occured shortly after start-up, probably caused by "spacing the pump."

1st -	.851	1658.8
2nd -	.840	1637.0

AGNEW and SWEET

24 HOUR PHONE 805-327-2267
4205 ATLAS COURT
BAKERSFIELD, CALIFORNIA

SUB-SURFACE PRESSURE SURVEY

CO. MAGMA POWER		RUN 02 FIELD IMPERIAL VALLEY WELL 44-7B			
EFF DEPTH		WELL STAT	STATIC	TOOL HUNG	5700'
CASING	-	CASING PRESS	5#	ON BOTTOM	09:07 5/04
LINER	4000'-4200'	TUBING PRESS		OFF BOTTOM	00:15 5/07
DATE	050784	ELEMENT RANGE	0 - 6386	ZERO POINT	GRD.
ELEVATION		ZONE		SHUT-IN	
MAX TEMP		PICK-UP	NONE MADE	ON-PROD	
PERF	-	CAL SER NO.	22884	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	PRESSURE DRAW DOWN		

SURVEY DATA

CO. MAGMA POWER — RUN 02 FIELD IMPERIAL VALLEY WELL 44-7B

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
9:07	2266.5	0.0	0.0	13:55	2234.6	-31.9	52.8
14:00	2269.2	2.7	5.0	14:16	2232.5	-34.0	53.2
19:00	2268.6	2.1	10.0	14:30	2217.3	-49.2	53.4
0:00	2271.3	4.8	15.0	14:41	2214.7	-51.8	53.6
5:00	2270.7	4.2	20.0	14:53	2208.9	-57.6	53.8
10:00	2266.9	.4	25.0	15:06	2209.6	-56.9	54.0
15:07	2263.2	-3.3	30.0	15:26	2226.5	-40.0	54.3
20:07	2259.4	-7.1	35.0	15:48	2224.5	-42.0	54.7
1:00	2255.8	-10.7	40.0	15:56	2224.9	-41.6	54.8
6:00	2255.2	-11.3	45.0	16:06	2219.0	-47.5	55.0
6:51	2254.2	-12.3	45.7	16:08	2219.1	-47.4	55.0
7:22	2253.8	-10.7	46.2	16:34	2217.3	-49.2	55.5
7:41	2253.6	-12.9	46.6	16:56	2218.4	-48.1	55.8
8:02	2251.5	-15.0	46.9	17:09	2215.9	-50.6	56.0
8:27	2249.6	-16.9	47.3	17:22	2226.1	-40.4	56.2
8:41	2240.8	-25.7	47.6	17:44	2227.2	-39.2	56.6
9:03	2238.7	-27.8	47.9	17:57	2227.9	-38.6	56.8
9:15	2236.2	-30.3	48.1	18:14	2222.4	-44.1	57.1
9:27	2236.8	-29.7	48.3	18:26	2223.0	-43.5	57.3
9:37	2246.8	-19.7	48.5	18:35	2223.5	-43.0	57.5
9:49	2247.4	-19.1	48.7	18:42	2214.3	-52.2	57.6
10:10	2251.7	-14.8	49.0	18:51	2214.8	-51.7	57.7
10:29	2252.6	-13.9	49.4	18:57	2199.2	-67.3	57.8
11:00	2248.3	-18.2	50.0	19:04	2170.9	-95.6	58.0
12:36	2252.8	-13.7	51.5	19:11	2168.1	-98.4	58.1
12:40	2240.3	-26.2	51.5	19:20	2162.2	-104.3	58.2
12:49	2240.7	-25.8	51.7	19:35	2156.6	-109.9	58.5
13:04	2241.5	-25.0	52.0	19:45	2157.1	-109.4	58.6
13:20	2236.0	-30.5	52.2	20:05	2151.8	-114.7	59.0
13:41	2233.8	-32.7	52.6	20:25	2152.8	-113.7	59.3

CO. MAGMA POWER

TIME	P-T
20:41	2150.4
20:54	2144.8
21:07	2142.2
21:24	2140.9
21:45	2137.8
22:06	2132.6
22:34	2127.6
23:03	2129.1
23:33	2127.4
0:04	2119.5
0:36	2121.2
1:09	2116.5
1:32	2117.6

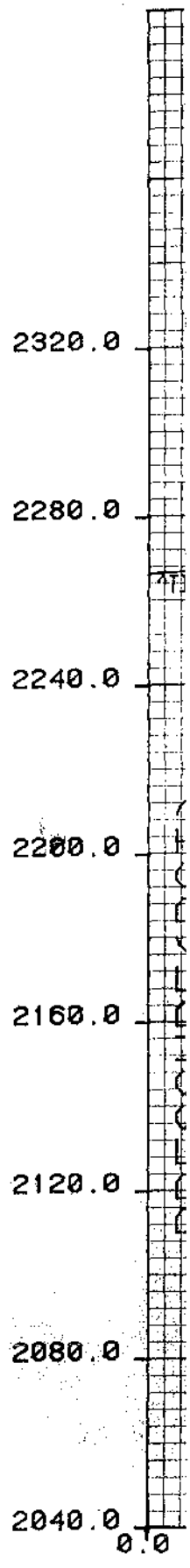
PRESSURE FILE #0
72 HR CLOCK, 630

SURVEY DATA

CO. MAGMA POWER RUN 02 FIELD IMPERIAL VALLEY WELL 44-7B

TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
20:41	2150.4	-116.1	59.6	2:05	2109.8	-156.7	65.0
20:54	2144.8	-121.7	59.8	2:07	2109.9	-156.6	65.0
21:07	2142.2	-124.2	60.0	2:26	2098.2	-168.3	65.3
21:24	2140.0	-126.5	60.3	2:49	2105.7	-160.8	65.7
21:45	2137.0	-128.7	60.6	3:15	2103.9	-162.6	66.1
22:06	2132.6	-133.9	61.0	3:41	2105.2	-161.3	66.6
22:34	2127.6	-138.9	61.5	3:58	2106.0	-160.5	66.8
23:03	2129.1	-137.4	61.9	4:25	2107.5	-159.0	67.3
23:33	2127.4	-139.1	62.4	4:48	2102.2	-164.3	67.7
0:04	2119.5	-147.0	63.0	5:06	2103.1	-163.4	68.0
0:36	2121.2	-145.3	63.5	7:07	2099.8	-166.7	70.0
1:09	2116.5	-150.0	64.0	8:15	2100.1	-166.4	71.1
1:32	2117.6	-148.9	64.4	0:00	0.0	0.0	0.0

PRESSURE FILE #021M44-7
72 HR CLOCK, 6300# ELEMENT



AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

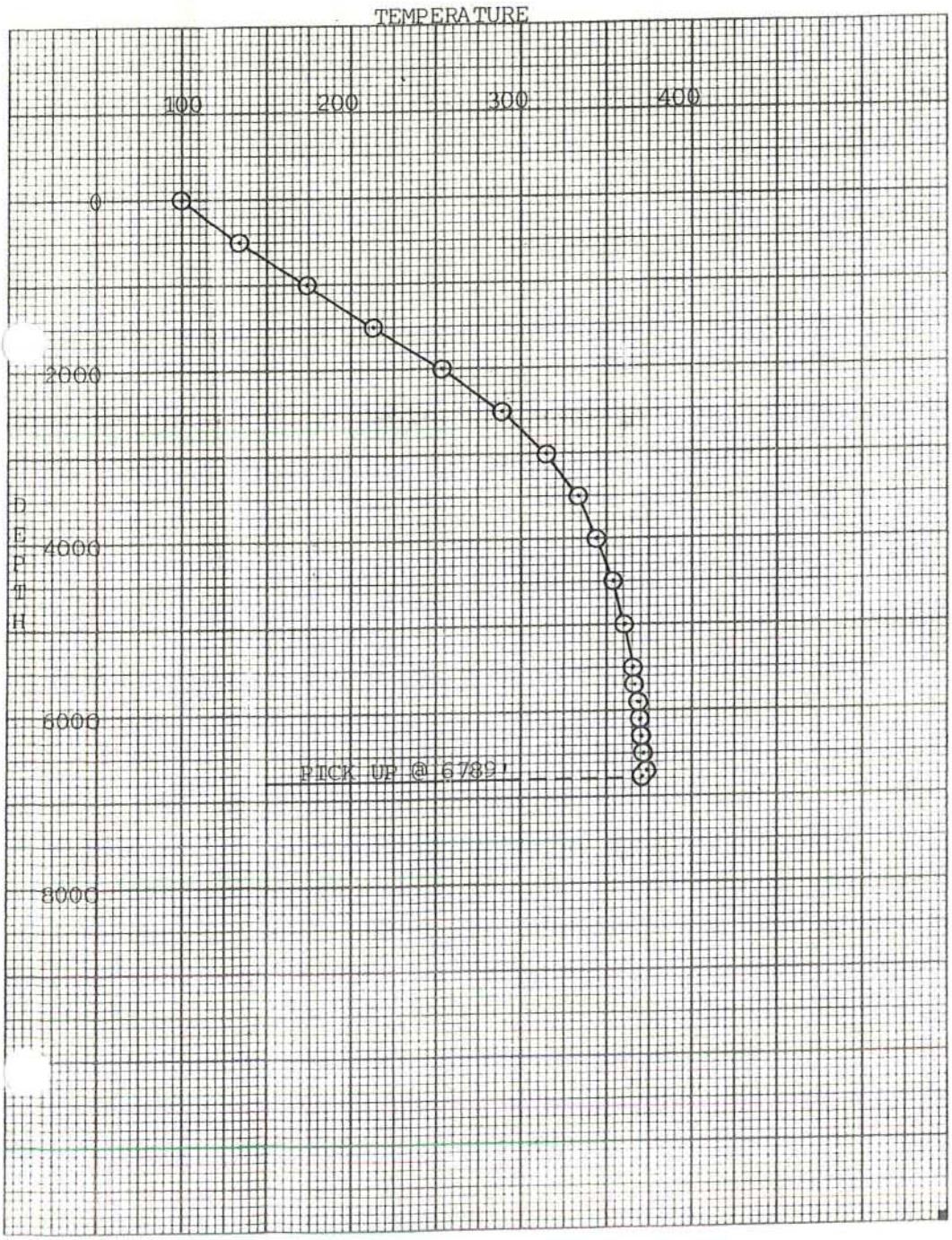
(1)

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME MAGMA 44-7B
CASING | ELEV. | DATE: November 30, 1978
LINER DESCRIPTION: | | ZERO POINT Ground level
PERFORATIONS: | | MPP
TUBING DETAIL: None | | DEPTH ZONE
| PUMP SHOE
WELL STATUS Static | SHUT IN | ON PRODUCTION
SURVEYED TUB. ☐ ANN. ☐ Casing | ENGAGE STYLUS 3:50 pm | DISENGAGE STYLUS 6:15 pm
PICK UP @ 6789' | TIME ON BOTTOM 5:49 pm | TIME OFF BOTTOM 5:54 pm
ELEMENT RANGE 110-473 | SERIAL NO. 10059 | CLOCK 3 hr. TURN 15
PURPOSE STATIC TEMPERATURE GRADIENT SURVEY | | MAX. °F 372.4 @ 6789'
REMARKS: | | STABILIZATION PERIOD

PRESSURES:	START	FINISH
DATE	11/30	
CASING PSI OBS	75	
CASING PSI COR	60	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @



DEPTH	TEMP.
0	110.7
500	134.6
1000	174.5
1500	213.1
2000	254.2
2500	289.3
3000	315.3
3500	333.5
4000	344.2
4500	354.4
5000	361.5
5500	366.7
5700	367.5
5900	369.2
6100	370.2
6300	371.7
6500	372.3
6700	374.4
6789	372.4

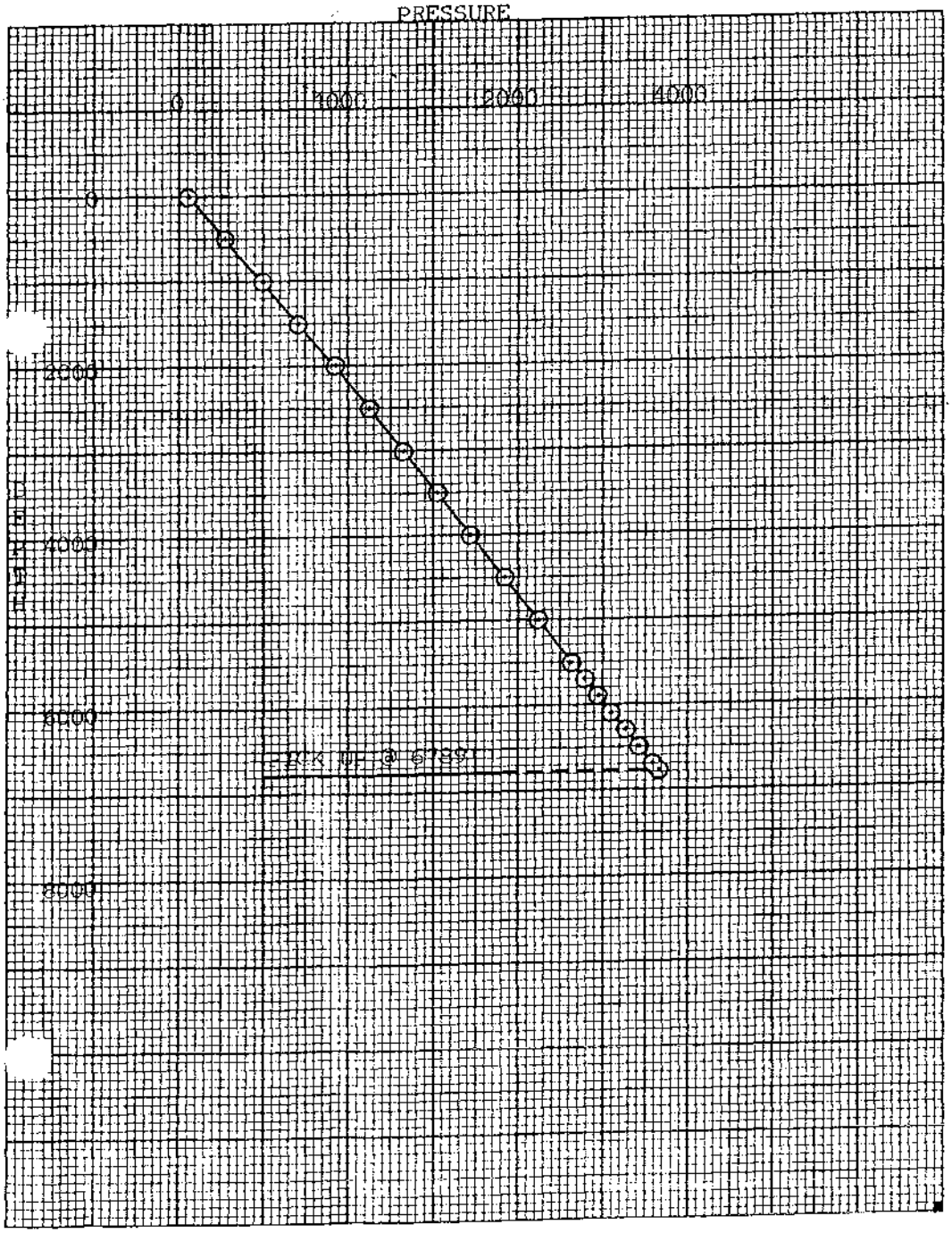
BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME MAGMA 44-7B
CASING | ELEV. | DATE: November 30, 1978
LINER DESCRIPTION: | | ZERO POINT Ground level
PERFORATIONS: | | MPP
TUBING DETAIL: None | | DEPTH ZONE
| PUMP SHOE | ON PRODUCTION
WELL STATUS Static | SHUT IN | DISENGAGE STYLUS 6:15 pm
SURVEYED TUB. ☐ ANN. ☐ Casing | ENGAGE STYLUS 3:50 pm | TIME OFF BOTTOM 5:54 pm
PICK UP @ 6789' | TIME ON BOTTOM 5:49 pm | CLOCK 12 hr. TURN 7½
ELEMENT RANGE 3800# | SERIAL NO. 40826 | MAX. °F 372.4 @ 6789'
PURPOSE STATIC PRESSURE GRADIENT SURVEY | | STABILIZATION PERIOD
REMARKS:



PRESSURES:	START	FINISH
DATE	11/30	
CASING PSI OBS	75	
CASING PSI COR	60	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	PRESS.	GRAD.
0	60	
500	277	.434
1000	495	.436
1500	708	.426
2000	920	.424
2500	1129	.418
3000	1324	.390
3500	1516	.384
4000	1721	.410
4500	1916	.390
5000	2116	.400
5500	2316	.400
5700	2396	.400
5900	2479	.415
6100	2559	.400
6300	2638	.395
6500	2716	.390
6700	2796	.400
6789	2844	.539

BY: SMITH & HARRIS

HOT HOLE INSTRUMENTS
For
IMPERIAL MAGMA
Well No. ~~40-7B~~ 44-7B
3/31/84

DEPTH	TEMPERTURE	PRESSURE
500	220.3	282.8
1000	263.0	506.5
1500	304.8	713.4
2000	322.4	943.0
2500	345.4	1166.1
3000	346.3	1368.1
3500	349.5	1573.3
4000	350.6	1755.4
4500	353.8	1946.3
5000	359.0	1964.2
5500	367.4	2131.2
5676	369.5	2177.1

DOW TEXAS OPERATIONS

JOB NO. 7-20-85 AUTH. NO.

CHARGE NO. FILE NO.

SUBJECT Prod. Well # 1 BY BLH

Static Survey – East Mesa DATE

SHEET OF CHECKED BY

Temp Tool # 27841 – 84–595 °F
Press Tool # 29832 – 0–3925 PSI
Temp Baseline = 95°F
3 Hour Clocks / 7min Stops to 5800' BH.

	Depth	Time	Temp Deflection		Pressure Deflection	TEMP
1	1000	7:55	.351	.380		196
2	2000	8:06	.415	.454		216
3	2200	8:14	.535	.514		241
4	2400	8:22	.592	.631		259
5	2600	8:30	.656	.695		281
6	2800	8:38	.705	.744		294
7	3000	8:47	.768	.807		311
8	3200	8:55	.802	.841		320
9	3400	9:03	.867	.906		337
10	3600	9:12	.890	.929		343
11	3800	9:20	.917	.956		350
12	4000	9:28	.930	.969		353
13	4200	9:36	.951	.990		356
14	4400	9:44	.962	1.001		361
15	4600	9:52	.968	1.007		363
16	4800	9:58	.972	1.011		364
17	5000	10:06	Ran Off Chart			
18	5100	Bottom				
		10:45 out of hole				

Temp Tool ran off app. 10°F

.971
.039
1.008

PARAMETER	(1/7/80) # 4 U.S. 48-7A	(2/17/83) # 4 U.S. 48-7A
pH	5.15	5.17
Conductivity	11088	10380
Suspended Solids	1.90	1.20
TDS	7630	7160
Total Alklinity	454	400
Sulfate	84	90
Chlorides	4075	3822
Ammonia	17	16
Silica	235	240
Hydrogen Sulfide	1.50	0.80
METALS		
Barium	0.90	1.40
Calcium	31	22
Iron	0.40	0.20
Potassium	220	180
Lithium	9	16
Magnesium	1.0	0.60
Sodium	2715	2324
Strontium	7	10
Silicon	110	105
Lead	0.10	0.10
Zinc	0.10	0.10
GASES		
Carbon Dioxide	63.30%	63.10%
Nitrogen	10.40%	9.75%
Methane	25.80%	25.72%
Ethane	0.15%	0.16%

All of the above parameters are reported in parts per million, except for the gases, which are reported in mole per cent.

Hector A. Galarte

BRINE FROM PRODUCTION WELLS

MAGMA ELECTRIC CO.

DATE 1-30-84

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D.O.	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specific Gravity
Hr.	No.	GPM	PSIG	°F	–	umhos	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	——
1/31/83	5	698	315	350	5.35	7280	8010	4375	10	1.60	190	216	290	227	100	16	0.90	–
1/25/84	5	563	317	350	5.40	8673	8170	4410	10	2.40	173	208	287	223	90	17	1.00	–

GASES

Well No.	H_2 %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
1/31/83	–	–	ND	8.34	18.40	71.89	0.10	–
1/25/84	–	–	ND	11.35	25.00	63.19	0.18	–

METALS

Ar ppm	Boron ppm	Ba ppm	Ca ppm	Tot.Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
–	–	1.30	76	0.20	243	14.0	1.68	106	2170	16.4
–	–	2.00	69	0.15	229	10.3	1.47	104	3111	14.6

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			

Well # 8-9A

BRINE FROM PRODUCTION WELLS

ACMA ELECTRIC CO.

DATE 7-13-84

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D.O.	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specific Gravity
Hr.	No.	GPM	PSIG	°F	-	umhos	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	——
1/25/84	4	491	300	350	5.42	7344	7344	3829	10	1.20	72	107	406	235	90	15	0.90	1.030
1/13/84	4	608	300	350	5.68	8800	7050	3686	0	1.60	71	85.0	392	223	80	14	0.90	1.030

GASES

Well No.	H_2 %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
1/25/84	0.23	0.14	ND	11.07	25.62	62.70	0.24	-
1/13/84	0.14	0.10	ND	6.65	17.49	75.42	0.20	-

METALS

Ar ppm	Boron ppm	Ba ppm	Ca ppm	Tot.Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
-	7.80	1.67	29.0	0.20	176	8.0	0.52	110	2778	7.31
-	8.57	1.10	29.0	0.25	175	6.80	0.42	104	2398	6.30

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
				⊗ 5.72							

⊗ = 2.86 liters of brine liquid to collect 500 ml of gas

Battelle Laboratories
Magma 48-7 Wellhead (5)
august 1978

in Computer

H_2S: 1) F.M. Bottle - 0.7 mg/l

2) Nalge Bottle - 3.4 mg/l
with sparger

Parameter	Concentration (mg/l) or Other
pH	5.87
Conductivity	13,050 µmhos/cm
TDS	9292
Suspended Solids	ND[1]
Turbidity	ND[1]
HCO_3^- (Titration)	305
$CO_3^=$ (Titration)	ND[1]
$SO_4^=$ (Turbidimetric)	78
$SO_4^=$ (Ion Chrom.)	82
F^- (Ion Chrom.)	2.2
Cl^- (Titration)	4852
NH_3 (Electrode)	16
SiO_2 (Colorimetric)	218
SiO_2 10:1 Dilution	193*
NO_3^- (Colorimetric)	9

---

*Sample container leaked

[1]ND - none detected

Magma 48-7 Wellhead (S)

August '87

Plasma Results

Parameter	Concentration (mg/l)
Al	<0.015
As	0.6
B	8.9
Ba	0.20
Ca	77.7 (78.4-AA)
Fe	0.4
K	405
Li	16.9
Mg	2.9
Na	2915 (2925-AA)
P	0.19 (0.58 as PO_4^{-3})
Si	130 (278 as SiO_2) (218 colorimetric) (193 SiO_2 Dil.)*
Sr	32.8

*Sample container leaked

Magma 48-7 Wellhead

august 78

Field

Press. - 280 psig

Temp. - 352°F

Flow - 647 gpm

pH (Field) - 5.3-5.4

O_2 (Field) - 0 ppb

Lab

Gas/Liquid - 170 ml/liter brine or 252 mg gas/kg brine

Gas Sample: Wellhead

Mole % (Mass Spec.)

CO_2	Ar	O_2	N_2	CO	He	H_2	CH_4
67.5	0.19	0.03	9.7	0.8	<0.01	0.11	21.7

No higher hydrocarbons detected

Gas Sample: Sand Separator

Mole % (Mass Spec.)

CO_2	Ar	O_2	N_2	CO	He	H_2	CH_4
65.1	0.19	0.06	9.9	1.6	<0.01	0.30	22.8

No higher hydrocarbons detected

CO_2:

1) 1 F.M. Bottle - 1330 mg/l

2) 1st F.M. Bottle - 1380 mg/l
   2nd F.M. Bottle - 605 mg/l
   } 1985 mg/l total

3) Blank - 111 mg/l

Magma 48-7 Wellhead (5)

August 78

Plasma Results

Parameter	Concentration (mg/l)
Ag	<0.03
Cd	0.042
Co	<0.015
Cr	<0.008
Cu	0.028
Mn	0.021
Mo	<0.8
Ni	0.057
Pb	<0.1
Sb	<0.03
Se	<0.2
Sn	<0.03
Th	<0.1
Ti	<0.008
Tl	<0.075
U	<0.075
Zn	<0.02
Zr	<0.01

BRINE SYS in computer

Magma Electric Co.

Date 2-3-86

Anaylsis: (In ppm)	Well # 48-7A (#4)	Well # 48-7A (#4)
Time	5-23-86	2-3-86
pH	5.76	5.66
TDS	7020	6976
Amonia (NH3)	15.0	14.0
Bicarbonate Alklinity	379	377
Calcium Hardness (as CaCO3)	73	76
Chlorides (Cl)	3646	3658
Dissolved Oxygen (D.O.)	ND	5ppb
Hydrogen Sulfide (H2S)	0.60	0.70
Silica (SiO2)	222	225
Sulfate (SO4)	80	76
Suspended Solids	1.60	2.40
Temperature (Deg. F)	353°	348°
Pressure (psig)	310	345
Flow (gpm)	547	572
Metals: (In ppm)		
Calcium (Ca)	29.2	30.4
Iron (Fe)	0.18	0.15
Lithium (Li)	7.32	7.30
Potassium (K)	186	187
Sodium (Na)	2353	2361
Strontium (Sr)	7.26	7.20
Gases: (Mole % by volume)		
H2O Vapor	3.42	3.38
Argon (Ar)	-	-
Nitrogen (N2)	9.88	9.34
Methane (CH4)	15.22	18.35
Carbon Dioxide (CO2)	71.35	68.79
Ethane (C2H6)	0.14	0.14
Propane (C4H8)	ND	ND
Iso-Butane (C4H10)	ND	ND
Norm. Butane (NC4H10)	ND	ND

W.O. # 42-7

BRINE FROM PRODUCTION WELLS

MAGMA ELECTRIC CO.

DATE 1/24/85

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D.O.	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specifi Gravity
Hr.	No.	GPM	PSIG	°F	-	umhos	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	at 25°C
1040	5	421	290	340	5.62	9828	9220	4882	ND	12.0	200	271	297	230	88	15	1.00	1.020

in computer

GASES

Well No.	H_2 %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
5	-	-	-	11.19	27.41	59.41	0.19	-

Ar ppm	Boron ppm	[illegible] ppm	[illegible]a ppm	Tot.Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
-	7.50	1.29	80.0	1.47	274	10.1	4.45	107	3125	21.[illegible]

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
					⊗ 8.00						

⊗ 8.00 = 125 mls of gas to 1000 mls of brine liquid.

IMPERIAL MAGMA
DOWN HOLE SURVEY

WELL: Magma Us 48-7 START CLOCKS:
DATE: IN HOLE:
W.H.P: M.R.T. °F:
W.H.T. °F: INSTRUMENT #

TIME ON STOP	DEPTH	TEMPERATURE DEFL.	TEMPERATURE °F	PRESSURE DEFL.	PRESSURE PRESS.	SOMETHING
						Well Head Pressure 35#
	500	0	138.00	165	261.07	
	1000	54	156.28	305	482.59	
	1500	149	186.72	446	694.02	
	2000	240	215.38	584	900.00	
	2500	348	248.53	721	1103.85	
	3000	454	280.90	851	1296.73	
	3500	528	302.19	985	1495.54	
	4000	596	322.22	1115	1687.86	
	4500	638	339.93	1298	1884.61	
	5000	676	345.97	1378	2076.92	
	5500	699	352.15	1513	2276.62	
	5700	704	353.61	1563	2350.59	
	5900	705	353.90	1619	2433.93	
	6100	717	357.18	1666	2502.91	
	6300	723	359.13	1718	2579.64	
	6500	723	359.13	1770	2656.34	
	6700	727	360.29	1822	2733.03	
	6900	729	360.87	1874	2750.73	
	7100	729	360.87	1928	2889.38	
	7300	734	362.32	1990	2980.32	

(1)

MAGMA POWER COMPANY

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

TELEPHONE 483-2285 • 483-6542

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME MAGMA/U.S. 48-7

CASING 13 3/8" 1245' ELEV. 30 DATE: 7-1-76

LINER DESCRIPTION: 9 5/8" 1072' TO 5266' ZERO POINT GRD. + 12'

7" 5142' TO 7517' DEPTH 7523

7" SLOTTED 5735' TO 7517' ZONE

TUBING DETAIL:

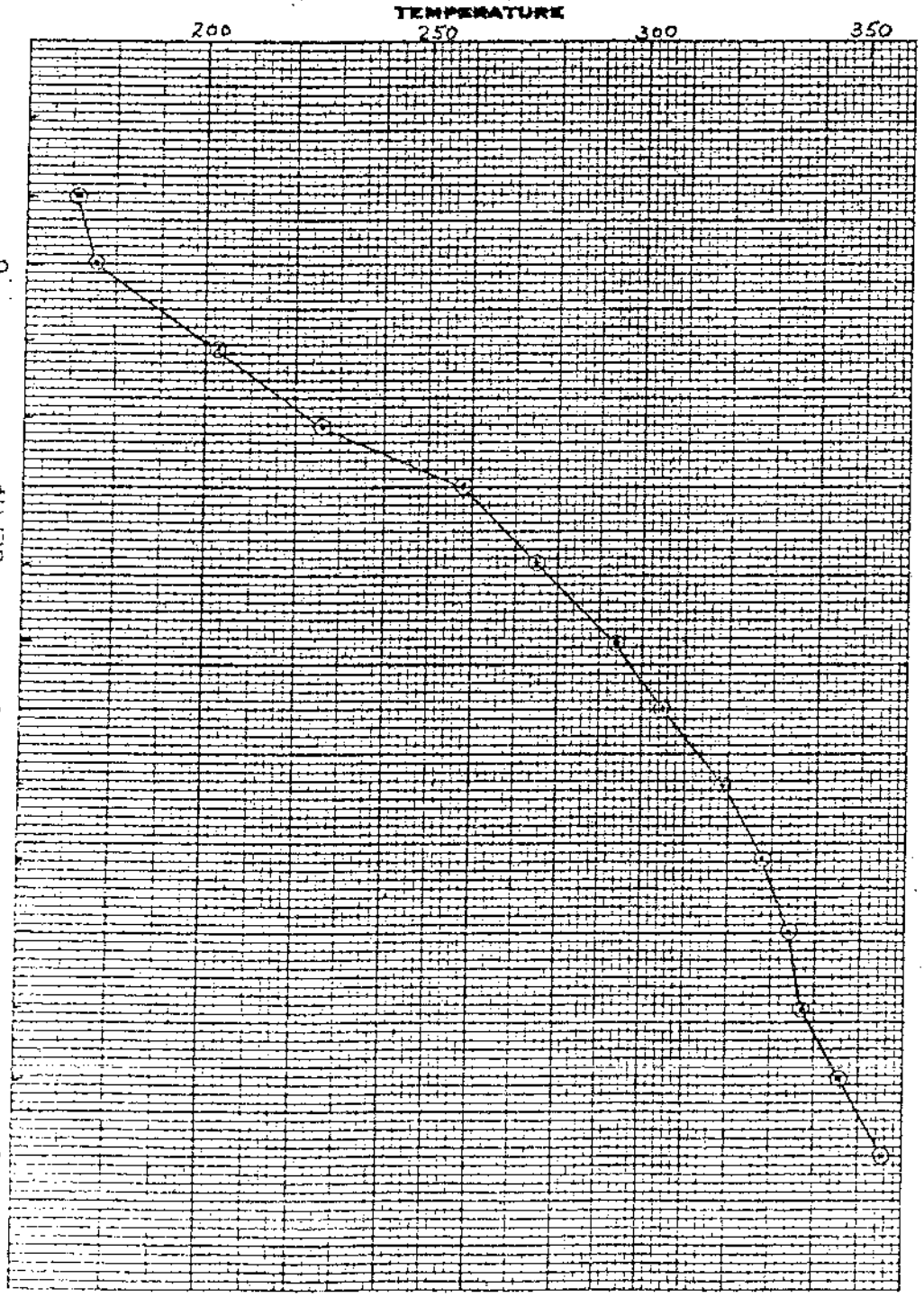
INSTRUMENT KUSTER °F

SERIAL NO.

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE STATIC TEMPERATURE SURVEY MAX. TEMP. 355 °F @ 7500'

REMARKS:



STABLIZATION PERIOD 4 DAYS

GROSS OIL RATE B/D

NET OIL RATE B/D

FORMATION GAS MCF/D

GOR CFT/BBL

CIRCULATED GAS MCF/D

OIL DRY GRAVITY °API

PRESSURES,	OBS	COR
CASING, PSIG	30 PSI	
TUBING, PSIG		

DEPTH	TEMP.	DEPTH	TEMP.
500'	143 °F		
1000	171		
1500	174		
2000	203		
2500	226		
3000	258		
3500	275		
4000	294		
4500	305		
5000	319		
5500	328		
6000	334		
6500	337		
7000	345		
7500	355		

BY: MIKE MAYS

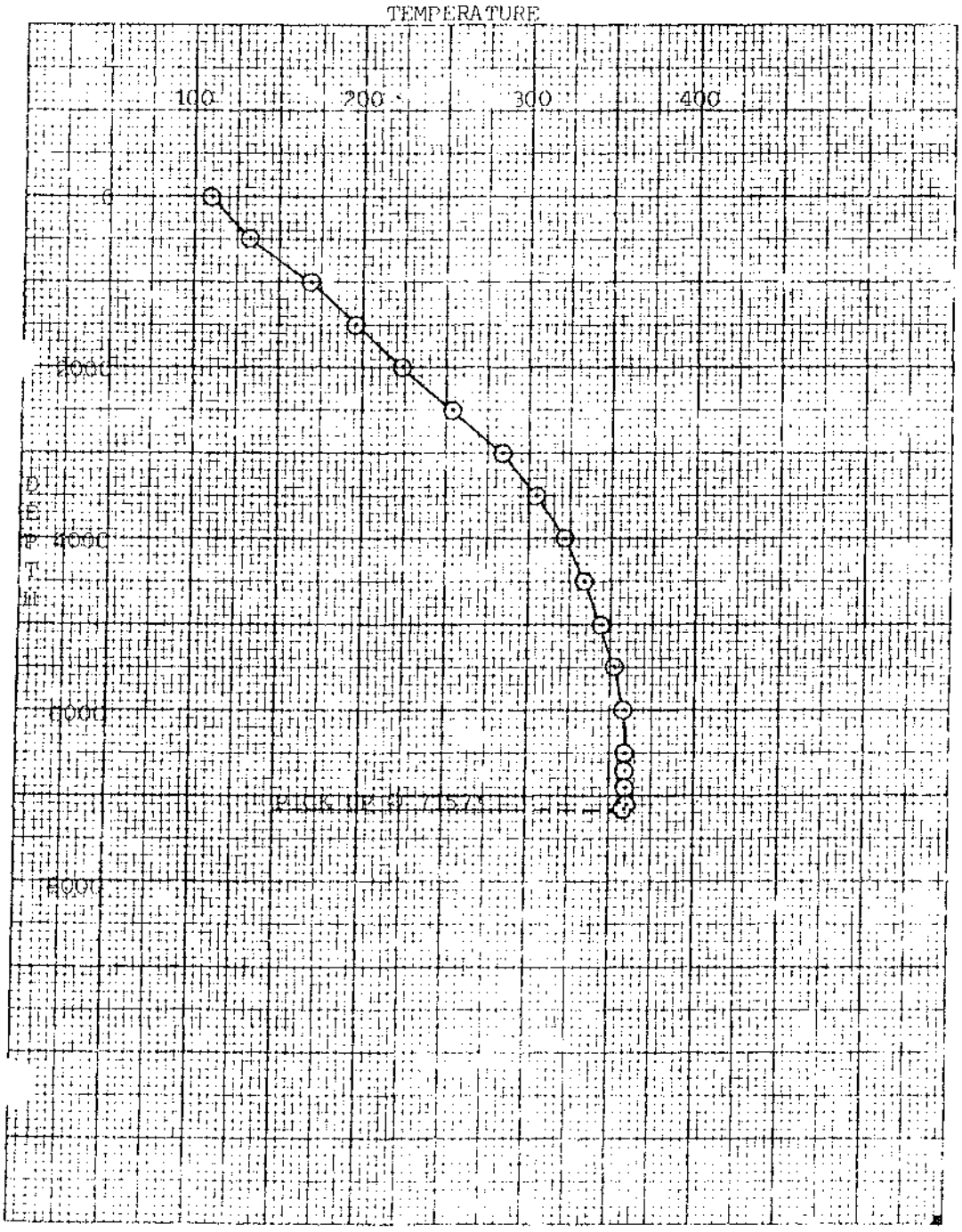
AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

(7)

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER	MAGMA POWER COMPANY	FIELD	EAST MESA	WELL NAME	MAGMA 48-7
CASING		ELEV.		DATE:	December 2,1978
LINER DESCRIPTION:				ZERO POINT	Ground level
PERFORATIONS:				MPP	
TUBING DETAIL:	None			DEPTH	ZONE
		PUMP SHOE			
WELL STATUS	Static	SHUT IN		ON PRODUCTION	
SURVEYED	TUB. ☐ ANN. ☐ Casing	ENGAGE STYLUS	8:20 am	DISENGAGE STYLUS	10:40 am
PICK UP @	7157'	TIME ON BOTTOM	10:18 am	TIME OFF BOTTOM	10:23 am
ELEMENT RANGE	110-473	SERIAL NO.	10059	CLOCK	3 hr. TURN 15
PURPOSE	STATIC TEMPERATURE GRADIENT SURVEY			MAX. °F	359.8 @ 7157'
REMARKS				STABILIZATION PERIOD	



PRESSURES:	START	FINISH
DATE	12/2	
CASING PSI OBS	0	
CASING PSI COR	0	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	TEMP.
0	110.2
500	132.5
1000	169.2
1500	196.6
2000	223.9
2500	254.5
3000	284.4
3500	305.4
4000	322.7
4500	334.9
5000	344.9
5500	252.3
6000	358.0
6500	359.0
6700	359.8
6900	360.9
7100	361.5
7157	359.8

BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME MAGMA 48-7

CASING | ELEV. | DATE: December 2, 1978

LINER DESCRIPTION: | ZERO POINT Ground level

PERFORATIONS: | MPP

TUBING DETAIL: None | DEPTH | ZONE

PUMP SHOE

WELL STATUS Static | SHUT IN | ON PRODUCTION

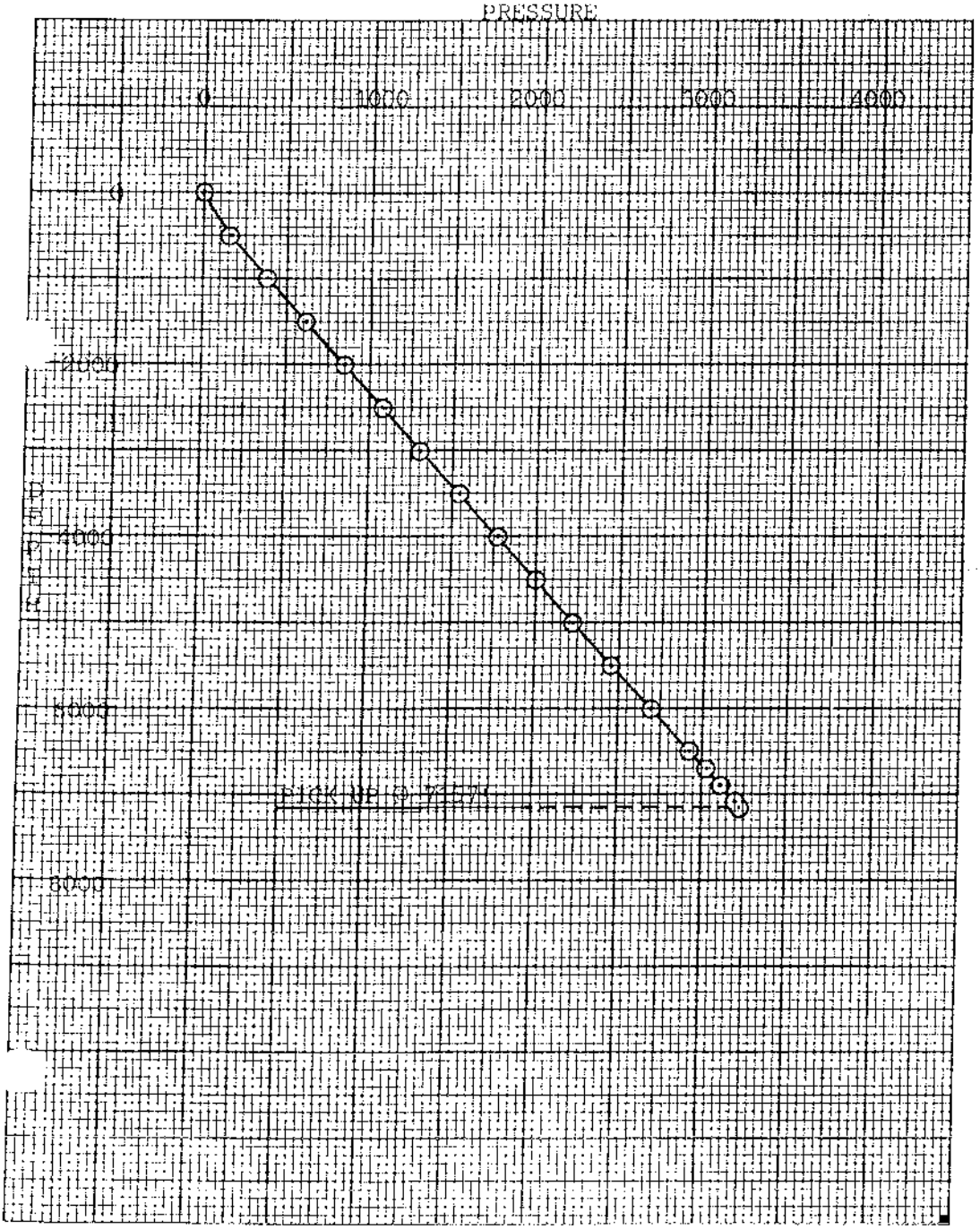
SURVEYED TUB. ☐ ANN. ☐ Casing | ENGAGE STYLUS 8:20 am | DISENGAGE STYLUS 10:40 am

PICK UP @ 7157' | TIME ON BOTTOM 10:18 am | TIME OFF BOTTOM 10:23

ELEMENT RANGE 3800# | SERIAL NO. 40826 | CLOCK 12 hr. | TURN 7½

PURPOSE STATIC PRESSURE GRADIENT SURVEY | MAX. °F 359.8 @ 7157'

REMARKS: | STABILIZATION PERIOD



PRESSURES:	START	FINISH
DATE	12/2	
CASING PSI OBS	0	
CASING PSI COR	0	
TUBING PSI OBS	–	
TUBING PSI COR	–	
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	PRESS.	GRAD.
0	0	
500	160	.320
1000	388	.456
1500	614	.452
2000	846	.464
2500	1080	.468
3000	1309	.458
3500	1540	.462
4000	1768	.456
4500	2003	.470
5000	2233	.460
5500	2461	.456
6000	2695	.468
6500	2932	.474
6700	3024	.460
7100	3207	.465
7157	3232	.438

BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

(7)

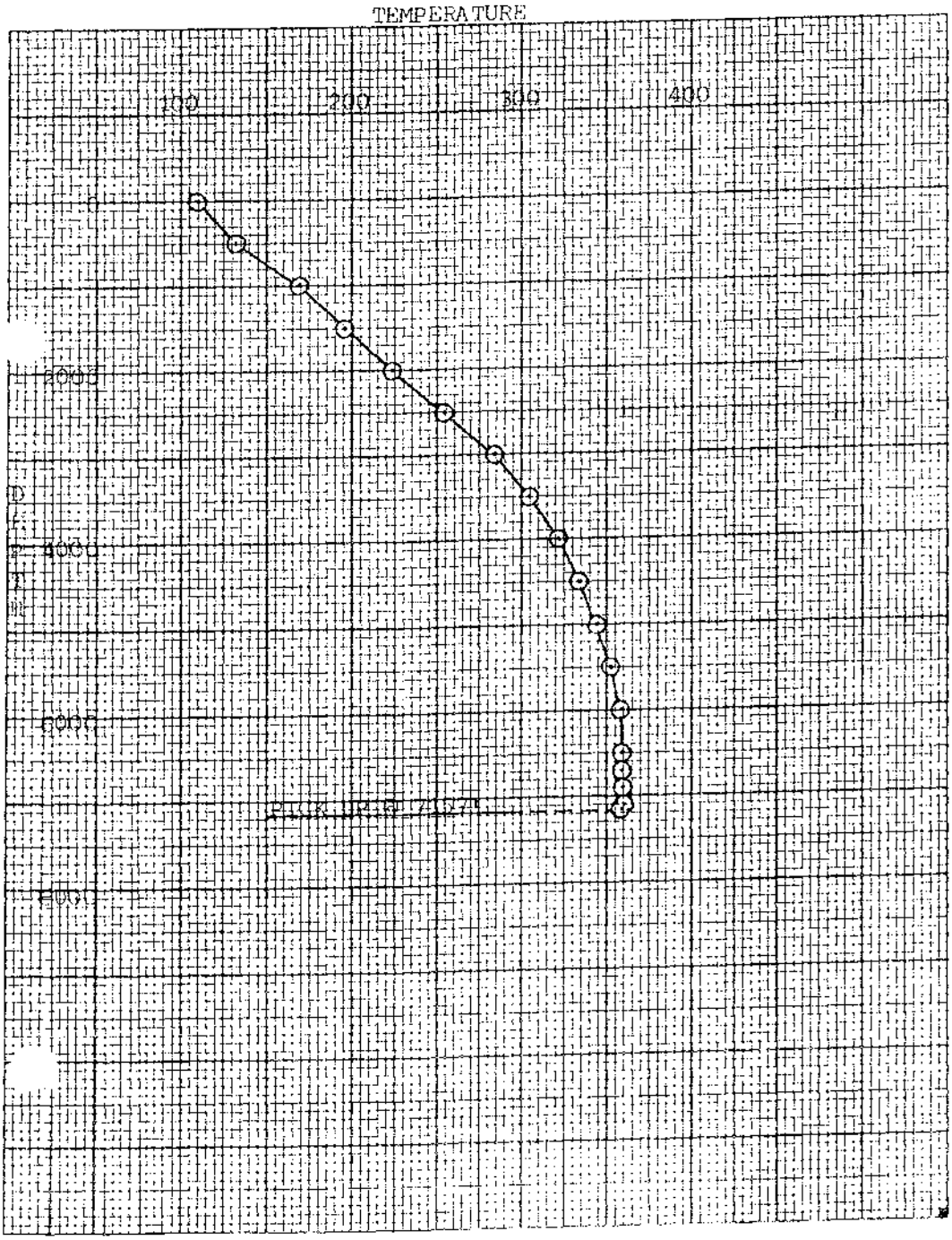
SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME MAGMA 48-7
CASING | ELEV. | DATE: December 2, 1978
ZERO POINT Ground level
LINER DESCRIPTION | MPP
PERFORATIONS | DEPTH | ZONE
TUBING DETAIL: None
PUMP SHOE
WELL STATUS Static | SHUT IN | ON PRODUCTION
SURVEYED | TUB. ☐ | ANN. ☐ Casing | ENGAGE STYLUS 8:20 am | DISENGAGE STYLUS 10:40 am
PICK UP @ 7157' | TIME ON BOTTOM 10:18 am | TIME OFF BOTTOM 10:23 am
ELEMENT RANGE 110-473 | SERIAL NO. 10059 | CLOCK 3 hr. | TURN 15
PURPOSE STATIC TEMPERATURE GRADIENT SURVEY | MAX. °F 359.8 @ 7157'
REMARKS: | STABILIZATION PERIOD

PRESSURES:	START	FINISH
DATE	12/2	
CASING PSI OBS	0	
CASING PSI COR	0	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @



DEPTH	TEMP.
0	110.2
500	132.5
1000	169.2
1500	196.6
2000	223.9
2500	254.5
3000	284.4
3500	305.4
4000	322.7
4500	334.9
5000	344.9
5500	252.3
6000	358.0
6500	359.0
6700	359.8
6900	360.9
7100	361.5
7157	359.8

BY: SMITH & HARRIS

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017
(213) 483-2285

SUBSURFACE PRESSURE SURVEY

OWNER MAGMA POWER COMPANY
FIELD EAST MESA
WELL NAME 46-7
CASING 13-3/8" @ 2156'
ELEV.
DATE: 2-17-82
LINER DESCRIPTION: 10-3/4" SLOTTED LINER 2073-3072
ZERO POINT
DEPTH 3095'
ZONE
TUBING DETAIL:
INSTRUMENT PSIG
SERIAL NO. 12290
PUMP SHOE GAS ANCHOR INTAKE:
PURPOSE STATIC PRESSURE SURVEY
MAX. TEMP. °F @
REMARKS: FILL OF 318'

200 400 600 800 1000 1200 1400 1600
PRESSURE

DEPTH

STABLIZATION PERIOD
GROSS OIL RATE B/D
NET OIL RATE B/D
FORMATION GAS MCF D
GOR CFT/BBL
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES,	OBS	COR
CASING, PSI		
TUBING, PSI		

DEPTH	PRESSURE	GRADIENT
2000	806.34	
2200	885.56	
2400	968.31	
2600	1053.57	
2777	1125.00	

TIME ON BOTTOM 8:43 AM
TIME OFF BOTTOM 8:48 AM

BY: J. RASANI

MAGMA ENERGY, INC.

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

TELEPHONE 483-2285 • 483-5542

(2)

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER COMPANY FIELD EAST MESA WELL NAME 46-7

CASING 20" - 0' TO 93' ELEV. 30 DATE: 2-7-77

LINER DESCRIPTION: 13 3/8" - 0' TO 2156' ZERO POINT GRD. + 12'

10 3/4" - 2073' TO 3072' (LINER) DEPTH 3095'

ZONE

TUBING DETAIL:

INSTRUMENT KUSTER. ° FAHR.

SERIAL NO.

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE STATIC TEMPERATURE MAX. TEMP. 313 °F @ 3071

REMARKS: PRIOR TO CONDUCTING INJECTION TEST

STABLIZATION PERIOD 84 HRS.

GROSS OIL RATE B D

NET OIL RATE B D

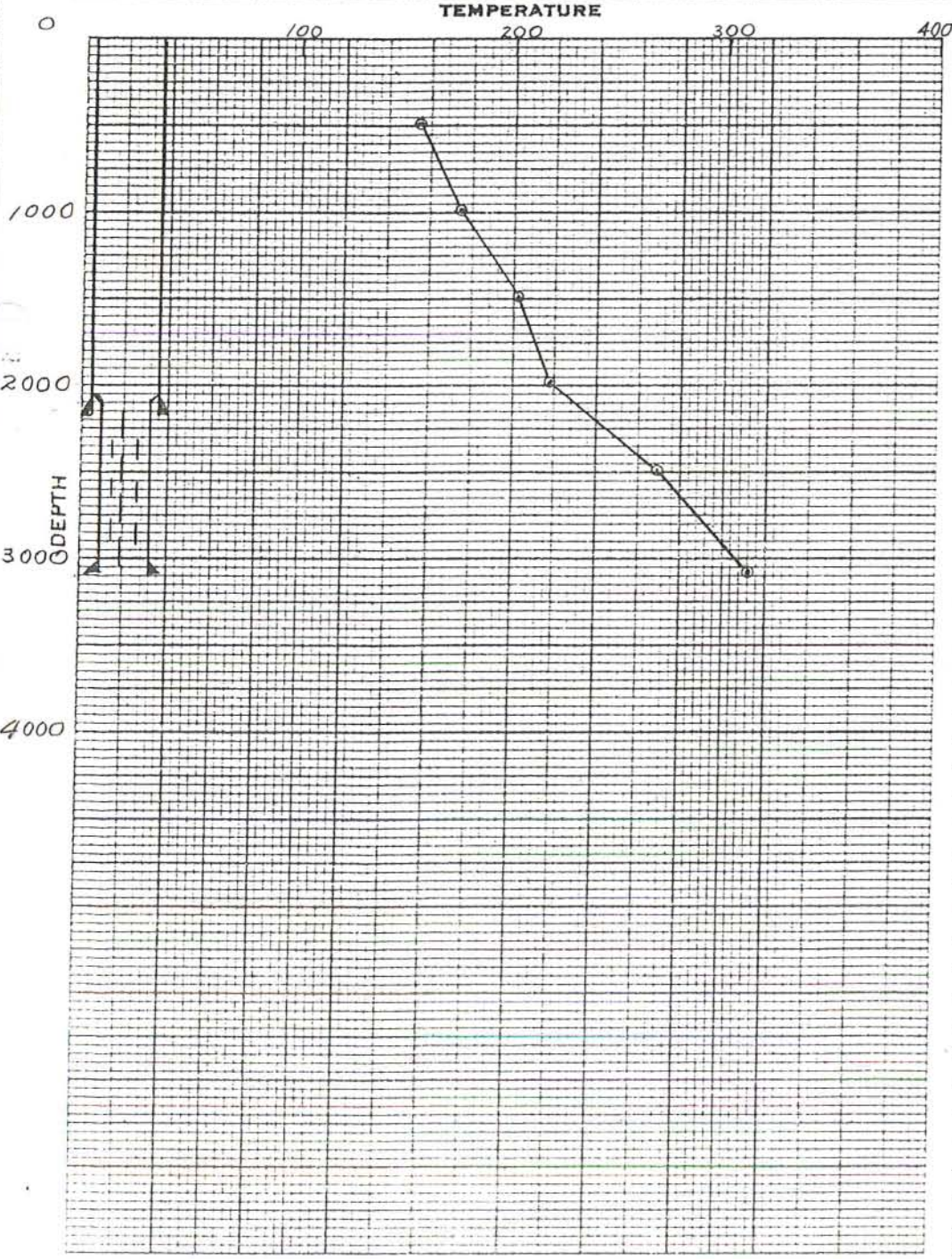
FORMATION GAS MCF D

GOR CFT BBL.

CIRCULATED GAS MCF/D

OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSIG	0	
TUBING, PSIG		



DEPTH	TEMP.	DEPTH	TEMP.
500'	155°F		
1000'	175		
1500'	202		
2000'	218		
2500'	271		
3071'	313		

BY: MIKE MAYS

IMPERIAL MAGMA

DOWN HOLE SURVEY

Well # 46-7

Date: 10-30-85

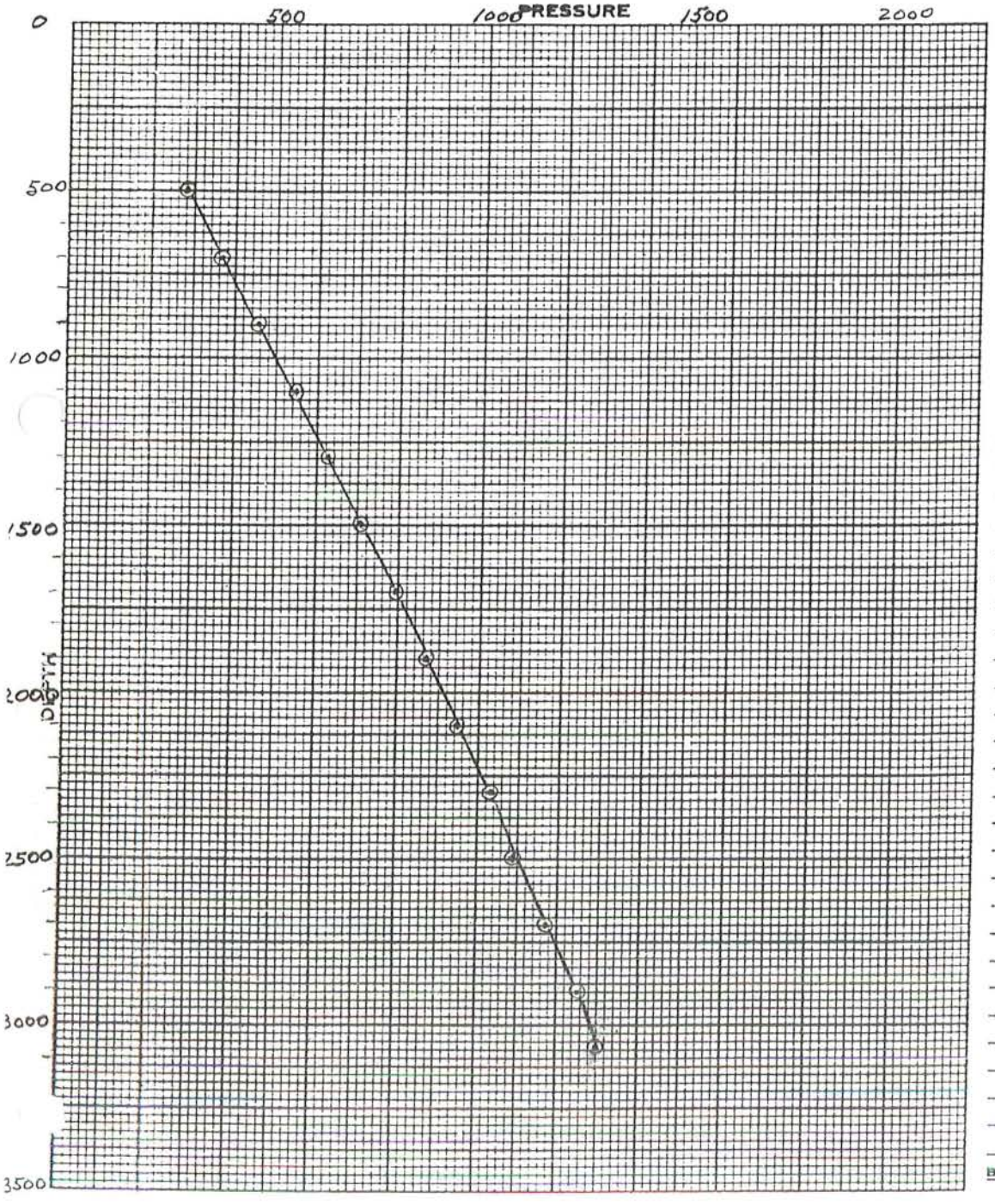
DEPTH	TEMPERATURE F°	PRESSURE PSI
500		228.07
1000		429.75
1200		511.82
1400	COULD NOT DETERMINE	594.59
1600	BASE LINE ON TEMP.	677.35
1800		760.11
2000		840.90
2200		923.66
2400		1005.95
2600		1087.34
2800		1178.65
2870		1216.34

MAGMA POWER COMPANY

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017
(213) 483-2285

SUBSURFACE PRESSURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME MAGMA/US 46-7
CASING 13 3/8" 2156' ELEV. 30' DATE: 8-20-77
LINER DESCRIPTION: 10 3/4" 2073' TO 3072' SLOTTED ZERO POINT GRD + 12'
DEPTH 3095
ZONE
TUBING DETAIL:
INSTRUMENT KUSTER PSI
SERIAL NO.
PUMP SHOE GAS ANCHOR INTAKE:
PURPOSE STATIC PRESS. SURVEY MAX. TEMP. 301 °F @ 3072'
REMARKS: (PRIOR TO INJECTING FROM 44-7 WELL)



STABLIZATION PERIOD
GROSS OIL RATE B/D
NET OIL RATE B/D
FORMATION GAS MCF D
GOR CFT/BBL.
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSI	55	
TUBING, PSI		

DEPTH	PRESSURE	GRADIENT
500'	280	
700	368	
900	454	
1100	544	
1300	622	
1500	705	
1700	794	
1900	868	
2100	947	
2300	1022	
2500	1096	
2700	1172	
2900	1250	
3072	1295	

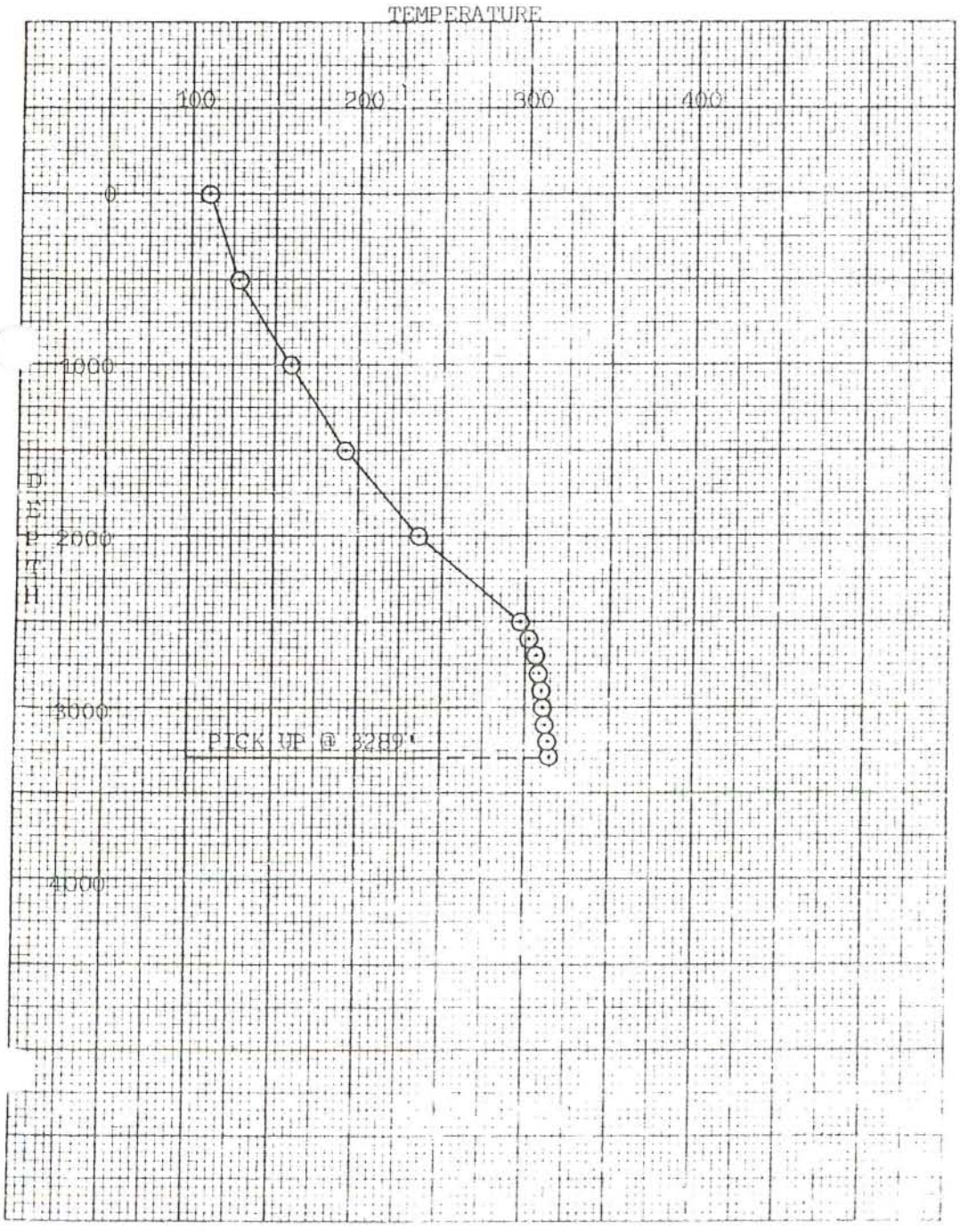
BY: E.Z. (COLLINS)

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER	MAGMA POWER COMPANY	FIELD	EAST MESA	WELL NAME	MAGMA 46-7A
CASING		ELEV.		DATE:	December 1,1978
LINER DESCRIPTION:				ZERO POINT	Ground level
PERFORATIONS:				MPP	
TUBING DETAIL:	None			DEPTH	ZONE
		PUMP SHOE			
WELL STATUS	Static	SHUT IN		ON PRODUCTION	
SURVEYED	TUB. ☐ ANN. ☐ Casing	ENGAGE STYLUS	12.40 pm	DISENGAGE STYLUS	2:26 pm
PICK UP @	3289'	TIME ON BOTTOM	2:07 pm	TIME OFF BOTTOM	2:12 pm
ELEMENT RANGE	110-473	SERIAL NO.	10059	CLOCK 3 hr	TURN 15
PURPOSE	STATIC TEMPERATURE GRADIENT SURVEY			MAX. °F 315.1	@ 3289'
REMARKS:				STABILIZATION PERIOD	



PRESSURES:	START	FINISH
DATE	12/1	
CASING PSI OBS	50	
CASING PSI COR	40	
TUBING PSI OBS	-	
TUBING PSI COR	-	
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	TEMP.
0	111.0
500	128.3
1000	160.1
1500	142.7
2000	236.5
2500	297.7
2600	302.2
2700	307.2
2800	308.6
2900	310.2
3000	211.6
3100	312.3
3200	313.5
3289	315.1

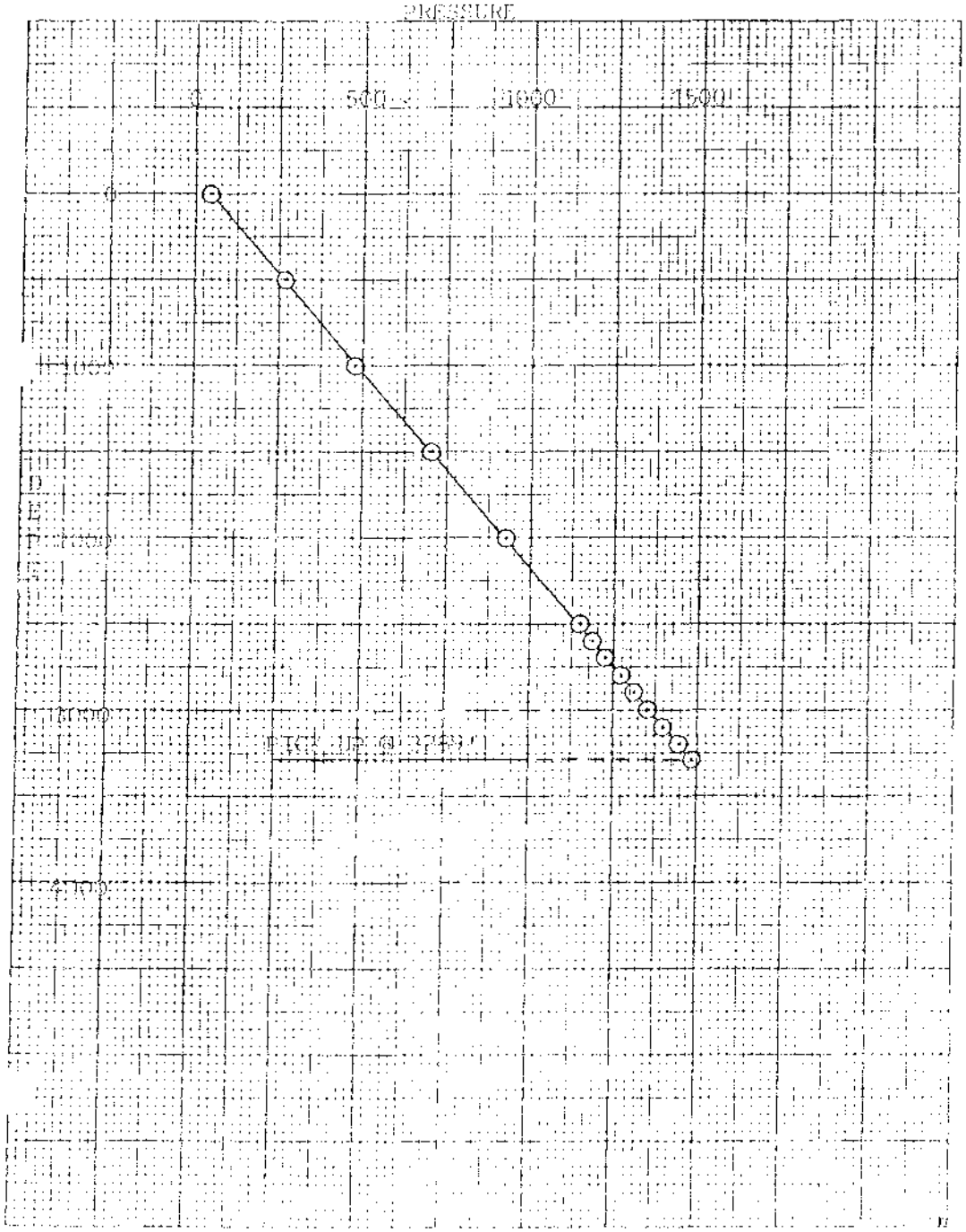
BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY	FIELD EAST MESA	WELL NAME MAGMA 46-7A	
CASING	ELEV.	DATE: December 1, 1978	
LINER DESCRIPTION:		ZERO POINT Ground level	
PERFORATIONS:		MPP	
TUBING DETAIL: None		DEPTH	ZONE
	PUMP SHOE		
WELL STATUS Static	SHUT IN	ON PRODUCTION	
SURVEYED TUB ☐ ANN. ☐ Casing	ENGAGE STYLUS 12:40 pm	DISENGAGE STYLUS 2:26 pm	
PICK UP @ 2289'	TIME ON BOTTOM 2:07 pm	TIME OFF BOTTOM 2:12 pm	
ELEMENT RANGE 3000#	SERIAL NO. 40826	CLOCK 12 hr.	TURN 7½
PURPOSE STATIC PRESSURE GRADIENT SURVEY		MAX. PF 315.1 @ 3289'	
REMARKS:		STABILIZATION PERIOD	



PRESSURES:	START	FINISH
DATE	12/1	
CASING PSI OBS	50	
CASING PSI COR	40	
TUBING PSI OBS	–	
TUBING PSI COR	–	
PRESS. STATUS	Static	
INSTRUMENT HUNG @		

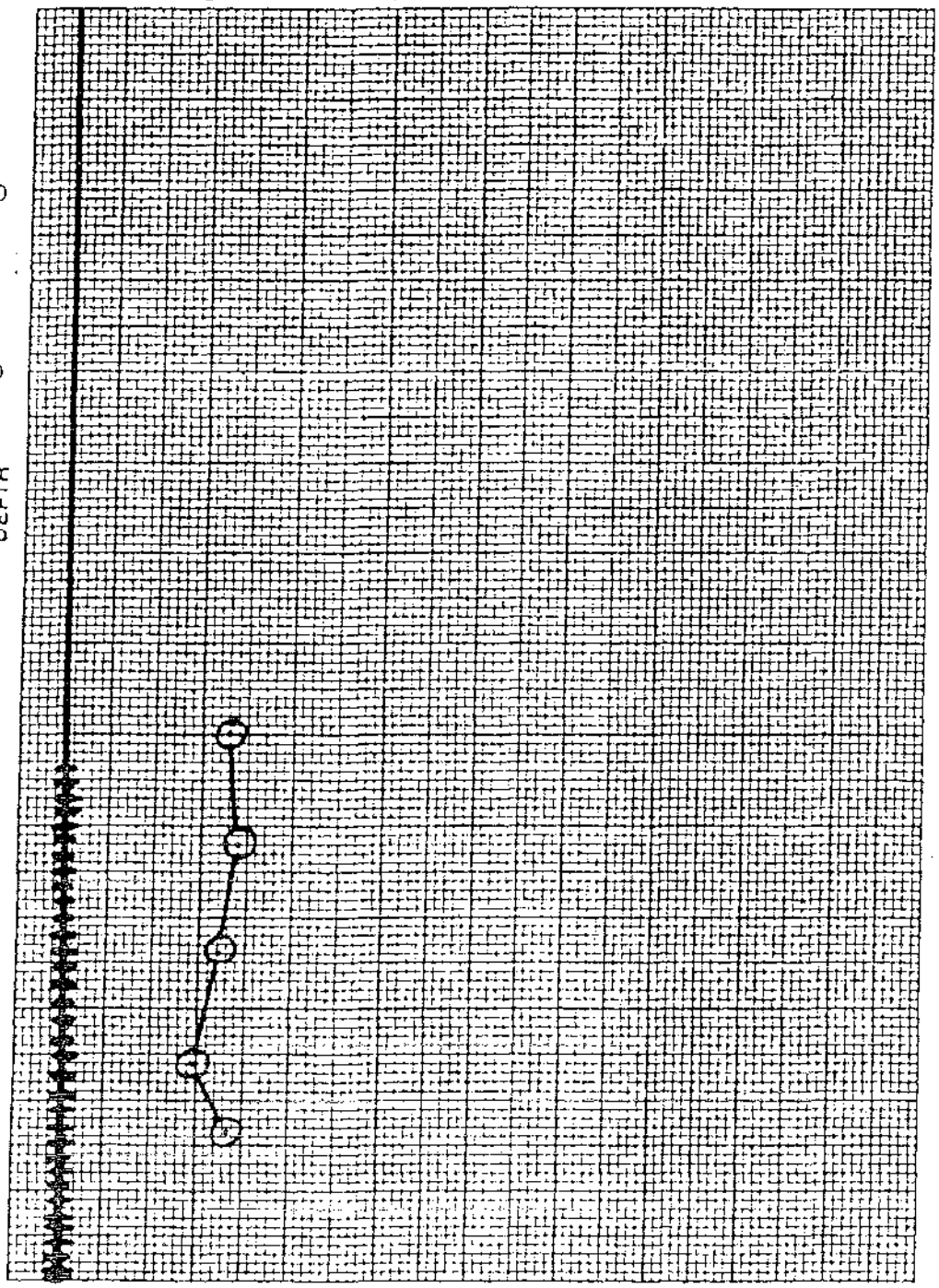
DEPTH	PRESS.	GRAD.
0	40	
500	269	.458
1000	485	.432
1500	708	.446
2000	928	.440
2500	1144	.432
2600	1187	.430
2700	1229	.420
2800	1272	.430
2900	1315	.430
3000	1358	.430
3100	1402	.440
3200	1445	.430
3289	1483	.427

BY: [illegible]

631 South Witmer Street
Los Angeles, California 90017
(213) 482-2285

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME 46-7A
CASING 13-3/8" @ 2194' | ELEV. | DATE 2-16-82
LINER DESCRIPTION: 10-3/4" SLOTTED LINER 2089' - 3495' | ZERO POINT
DEPTH 3500'
ZONE
TUBING DETAIL:
INSTRUMENT °FAH
SERIAL NO. 10054
PUMP SHOE | GAS ANCHOR | INTAKE:
PURPOSE STATIC TEMPERATURE SURVEY
MAX. TEMP. 237.96 °F @ 3080'
REMARKS: FILL OF 420'



STABLIZATION PERIOD
GROSS OIL RATE B.D.
NET OIL RATE B.D.
FORMATION GAS MCF D
GOR CFT BBL
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING. PSIG		
TUBING. PSIG		

DEPTH	TEMP.	DEPTH	TEMP.
2000	230.67		
2300	241.45		
2600	223.06		
2900	197.28		
3080	237.96		

TIME ON BOTTOM 9:55 AM
TIME OFF BOTTOM 10:01AM

BY: J.RASANI

MAGMA POWER COMPANY

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017
(213) 483-2285

SUBSURFACE PRESSURE SURVEY

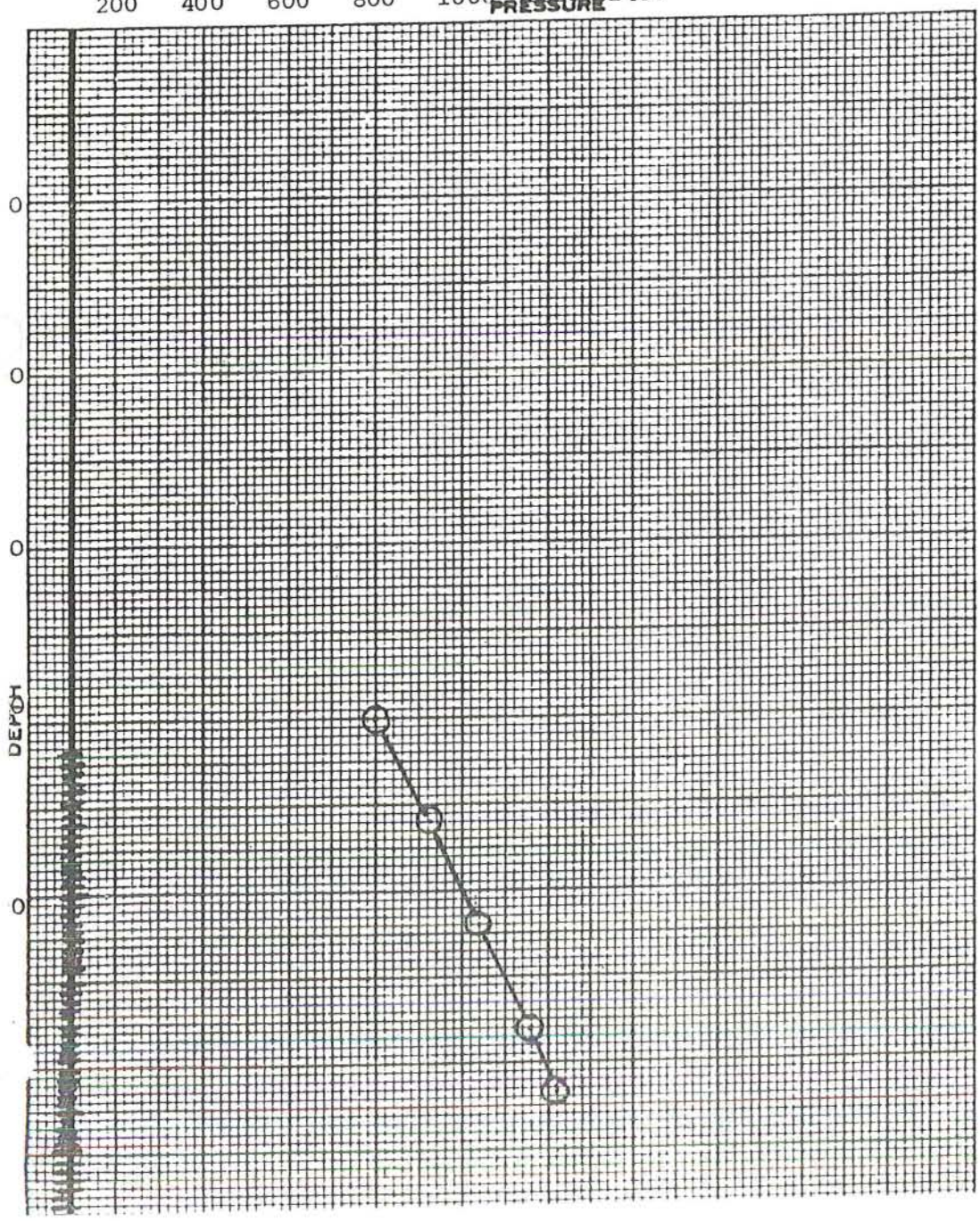
OWNER MAGMA POWER COMPANY
FIELD EAST MESA
WELL NAME 46-7A
CASING 13-3/8" @ 2194'
ELEV.
DATE: 2-16-82
LINER DESCRIPTION: 10-3/4" SLOTTED LINER 2089' - 3496'
ZERO POINT
DEPTH 3500'
ZONE
TUBING DETAIL:
INSTRUMENT PSIG
SERIAL NO. 14340
PUMP SHOE GAS ANCHOR INTAKE:
PURPOSE STATIC PRESSURE SURVEY
MAX. TEMP. 237.96 °F @ 3080'
REMARKS: FILL OF 420'

STABLIZATION PERIOD
GROSS OIL RATE B/D
NET OIL RATE B/D
FORMATION GAS MCF D
GOR CFT/BBL
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES,	OBS	COR
CASING, PSI		
TUBING, PSI		

DEPTH	PRESSURE	GRADIENT
2000	805.94	
2300	926.57	
2600	1041.52	
2900	1160.90	
3080	1226.64	

TIME ON BOTTOM 9:55 AM
TIME OFF BOTTOM 10:01AM



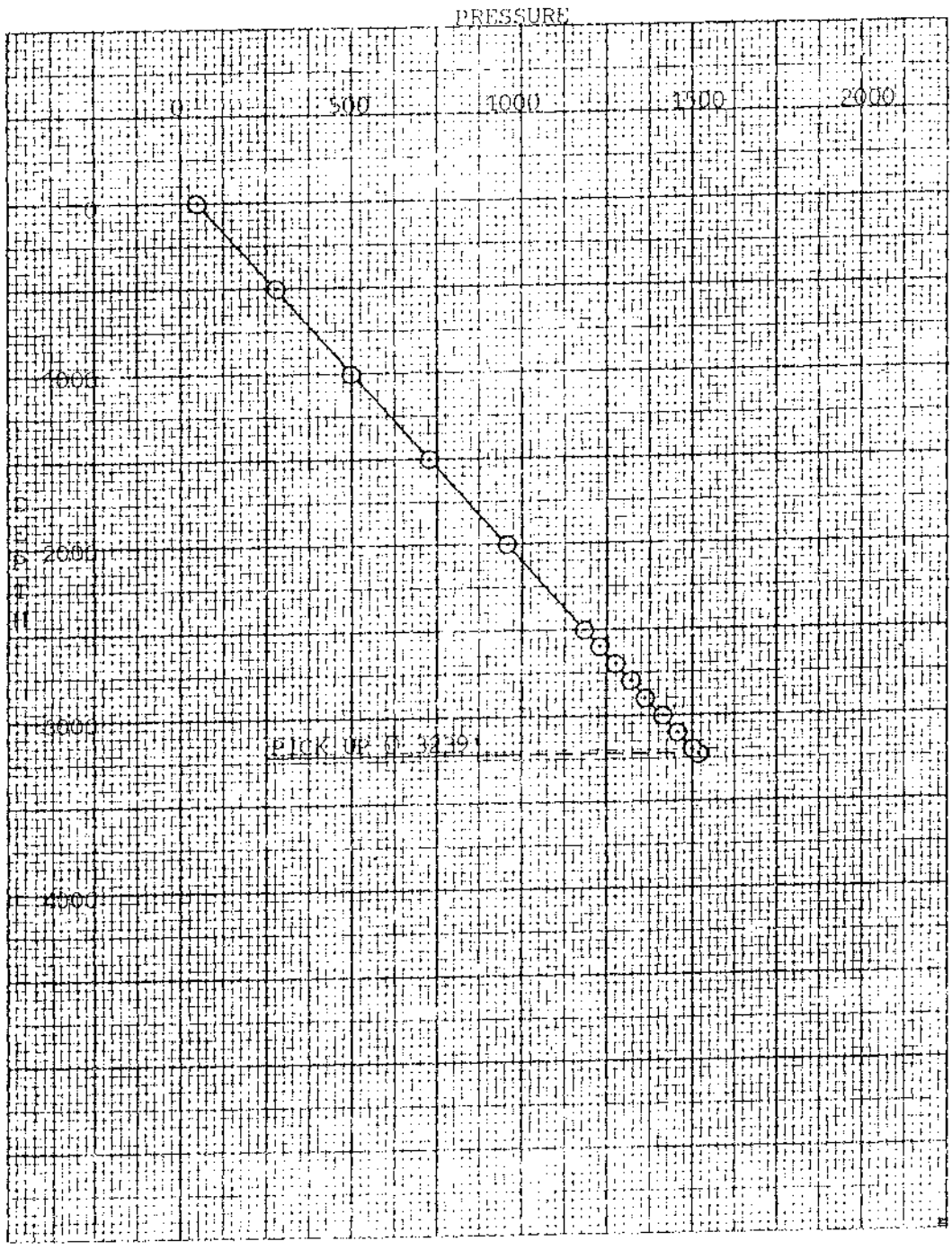
AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-226
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER MAGMA POWER COMPANY | FIELD EAST MESA | WELL NAME MAGMA 46-7B
CASING | ELEV. | DATE: December 1, 1978
LINER DESCRIPTION: | ZERO POINT Ground level
PERFORATIONS: | MPP
TUBING DETAIL: None | DEPTH ZONE
PUMP SHOE
WELL STATUS Static | SHUT IN | ON PRODUCTION
SURVEYED TUB. ☐ ANN. ☐ Casing | ENGAGE STYLUS 3:10 pm | DISENGAGE STYLUS 5:15 pm
PICK UP @ 3239' | TIME ON BOTTOM 4:52 pm | TIME OFF BOTTOM 4:57 pm
ELEMENT RANGE 3800# | SERIAL NO. 40826 | CLOCK 12 hr. TURN 7½
PURPOSE STATIC PRESSURE GRADIENT SURVEY | MAX. °F 337.2 @ 3239'
REMARKS: | STABILIZATION PERIOD

PRESSURES:	START	FINISH
DATE	12/1	
CASING PSI OBS	50	
CASING PSI COR	45	
TUBING PSI OBS		
TUBING PSI COR		
PRESS. STATUS	Static	
INSTRUMENT HUNG @		



DEPTH	PRESS.	GRAD.
0	45	
500	281	.472
1000	504	.446
1500	731	.454
2000	960	.458
2500	1185	.450
2600	1230	.450
2700	1276	.460
2800	1320	.440
2900	1367	.470
3000	1413	.460
3100	1458	.450
3200	1503	.450
3239	1521	.462

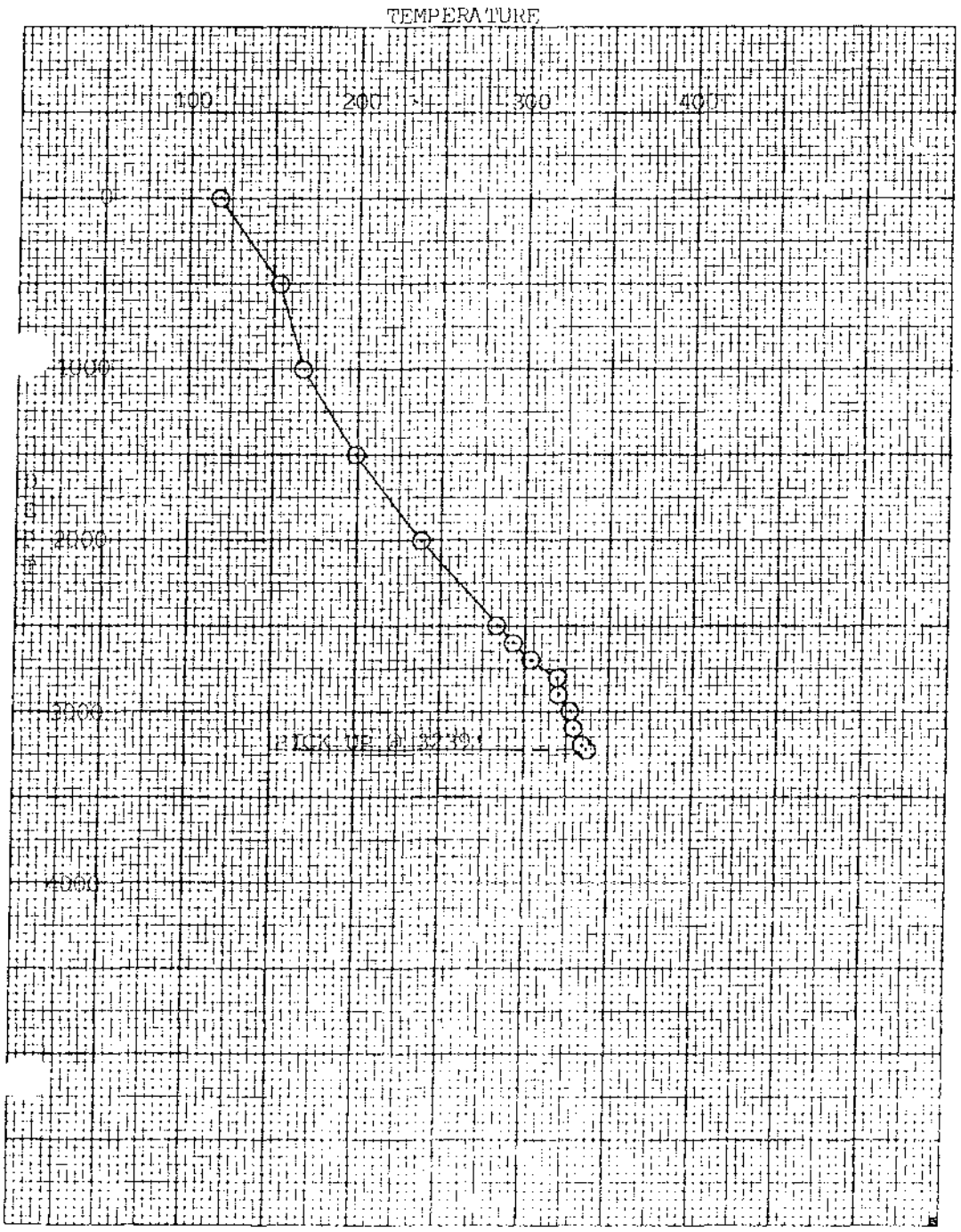
BY: SMITH & HARRIS

AGNEW AND SWEET WIRELINE SERVICE

SUBSURFACE SURVEY

AGNEW AND SWEET
24 HOUR PHONE 805-327-2267
3914 GILMORE AVENUE
BAKERSFIELD, CALIFORNIA
93308

OWNER	MAGMA POWER COMPANY	FIELD	EAST MESA	WELL NAME	MAGMA 46-7B
CASING		ELEV.		DATE:	December 1,1978
LINER DESCRIPTION:				ZERO POINT	Ground level
PERFORATIONS:				MPP	
TUBING DETAIL:	None			DEPTH	ZONE
		PUMP SHOE			
WELL STATUS	Static	SHUT IN		ON PRODUCTION	
SURVEYED	TUB. ☐ ANN. ☐ Casing	ENGAGE STYLUS	3:10 pm	DISENGAGE STYLUS	5:15 pm
PICK UP @	3239'	TIME ON BOTTOM	4:52 pm	TIME OFF BOTTOM	4:57 pm
ELEMENT RANGE	110-473	SERIAL NO.	10059	CLOCK	3 hr. TURN 15
PURPOSE	STATIC TEMPERATURE GRADIENT SURVEY			MAX. °F	337.2 @ 3239'
REMARKS:				STABILIZATION PERIOD	



PRESSURES:	START	FINISH
DATE	12/1	
CASING PSI OBS	50	
CASING PSI COR	45	
TUBING PSI OBS		
TUBING PSI COR		
PRESS. STATUS	Static	

INSTRUMENT HUNG @

DEPTH	TEMP.
0	118.0
500	153.2
1000	168.1
1500	199.9
2000	238.4
2500	283.4
2600	293.3
2700	304.1
2800	320.1
2900	321.5
3000	328.7
3100	330.5
3200	335.2
3239	337.2

BY: SMITH & HARRIS

IMPERIAL MAGMA

DOWN HOLE SURVEY

Well # 46-7B

Date: 11-01-85

DEPTH	TEMPERATURE F°	PRESSURE PSI
500	226.0	32.04
1000	226.0	231.84
1200	226.0	435.40
1400	226.0	509.85
1600	226.0	588.67
1800	226.5	665.52
2000	226.5	746.32
2200	226.5	838.93
2400	226.5	921.69
2600	226.5	998.54
2800	229.6	1081.38
3000	226.3	1162.77
3360	226.0	1240.18

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4635

EAST MESA PLANT

Hector

October 25, 1983

Mr. Edward Zajac
Magma Power Co,
P.O.Box 17760
Los Angeles, Ca. 90017

Dear Ski:

Enclosed are the gas anaylsis on Well# 84-7, as you requested. I could not obtain a decent sample on the anaylsis for June 16, 1983. As you can see, the gas volume for 84-7 is considerably lower than the other wells. In 84-7 it takes me 2½ hours to collect 500 mls of gas and with the other wells it only takes me 15 - 30 minutes. I think that due to the high pressure that this particular well is run, the gas tends to stay in solution more so than with the other wells. Since everything is lower in this well, I believe that these low gases are an indication of the 350 lbs. pressure that is maintained.

As you compare the different anaylsis on the different wells, please note that different pressures affect the individual parameters, such as gases, chlorides, and metals which may vary in quantity.

I am enclosing copies of previous anaylsis for you information.

Sincerely,

Hector Galarte
Hector Galarte
Lab Tech.

SAMPLES TAKEN ON 10/20/83

PARAMETER	U.S. 84-7	U.S. 44-7 2	U.S. 44-7B 3
ph	5.95	5.35	5.55
Conductivity	3804 umhos	7203 umhos	7174 umhos
Suspended solids	1.60 mg/l	1.80 mg/l	1.40 mg/l
TDS	2528 mg/l	6940 mg/l	6620 mg/l
Total Alkalinity	460 mg/l	372 mg/l	452 mg/l
Sulfate	170 mg/l	100 mg/l	100 mg/l
Chlorides	969 mg/l	3620 mg/l	3510 mg/l
Ammonia	7.0 mg/l	15.0 mg/l	13.0 mg/l
Silica	231 mg/l	240 mg/l	244 mg/l
Hydrogen sulfide	0.60 mg/l	0.90 mg/l	0.80 mg/l
Pressure (PSIG)	350	305	290
Temperature (deg.F)	350	360	362
Flow (GPM)	605	653	596
GASES			
Carbon dioxide	40.19%	74.64%	69.65%
Nitrogen	5.97%	7.64%	7.82%
Methane	10.87%	14.61%	18.90%
Ethane	0.13%	0.11%	0.06%
METALS			
Barium	0.42 mg/l	1.33 mg/l	1.67 mg/l
Calcium	9.0 mg/l	30.0 mg/l	19.0 mf/l
Iron	0.10 mg/l	0.20 mg/l	0.21 mg/l
Potassium	53.0 mg/l	182 mg/l	171 mg/l
Lithium	2.20 mg/l	15.4 mg/l	11.5 mg/l
Magnesium	0.19 mg/l	0.69 mg/l	0.50 mg/l
Sodium	416 mg/l	2383 mg/l	2250 mg/l
Silicon	108 mg/l	112 mg/l	114 mg/l
Strontium	1.59 mg/l	6.90 mg/l	3.73 mg/l
Lead	0.10 mg/l	0.10 mg/l	0.10 mg/l
Zinc	0.10 mg/l	0.18 mg/l	0.10 mg/l

October 25, 1983

The following are the gas anaylsis that have been taken on the gas lines coming from the annulus of each well.

The results are as follows:

GASES	U.S. 44-7	U.S. 44-7B	U.S. 48-7A	U.S. 48-7	U.S. 84-7
Carbon dioxide	73.04%	64.11%	71.92%	66.95%	68.17%
Nitrogen	7.64%	11.69%	7.64%	11.24%	9.33%
Methane	17.51%	22.55%	17.10%	15.10%	3.54%
Ethane	0.14%	0.13%	0.13%	0.06%	0.13%
Pressure (PSIG)	124	102	102	110	125

US 84- (Injection Well)

BRINE FROM PRODUCTION WELLS

MAGMA ELECTRIC CO.

DATE 5/29/84

Time	Well	Flow	Press.	Temp.	pH	Cond.	TDS	Cl^-	D.O.	Susp. Solids	Cal. Hard.	Total Hard.	Total Alk.	Silica	SO_4	NH_3	H_2S	Specific Gravity
Hr.	No.	GPM	PSIG	°F	-	umhos	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	———
19/84	6	540	365	350	5.85	3315	2515	1035	10ppb	0.68	14.4	27.0	465	225	165	6.0	0.90	1.00
22/84	6	641	285	345	5.78	4042	2820	1218	0	1.25	22.6	25.2	435	244	160	6.0	0.40	1.00

in comps

GASES

Well No.	H_2 %	Ar %	O_2 %	N_2 %	CH_4 %	CO_2 %	C_2H_6 %	H_2S %
19/84	-	-	-	51.70	11.85	36.02	0.20	-
22/84	-	-	-	37.08	12.33	50.06	0.21	-

METALS

Ar ppm	Boron ppm	Ba ppm	Ca ppm	Tot.Fe ppm	K ppm	Li ppm	Mg ppm	Si ppm	Na ppm	Sr ppm
-	-	-	6.0	0.10	58	2.81	0.13	105	844	1.50
-	-	-	9.10	0.13	72	2.02	0.10	114	988	1.67

Gas to Liquid Ratio	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
						⊗ 2/9 = 32.6 ⊗ 5/22 = 29.5					

⊗ = 32.6 = 0.500 liters of gas per 16.3 liters of liquid.
⊗ = 29.5 = 0.500 liters of gas per 14.75 liters of liquid.

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4635

EAST MESA PLANT

June 16, 1983

To: Edward Zajac

U.S. 84-7 (Injection Well)

Fr: Hector Galarte

Enclosed are the results on Well # U.S. 84-7, which as sampled on June 13, 1983. The wellhead was sampled at 340 psig, a flow rate of 698gpm and a emperature of 350 degrees. It's composition was as follows:

Parameter	mg/l
PH	5.90
TDS	2676
Conductivity	4110 umhos/cm
Total Alkalinity	436
Suspended solids	4.00
Calcium hardness ($CaCO_3$)	26
Sulfate	80
Chlorides	1045
Silca	244
Ammonia	6.00
Hydrogen Sulfide	0.40

METALS	PPM
Aluminum	<0.10
Barium	0.50
Calcium	10
Chromium	<0.10
Cobalt	0.12
Copper	<0.10
Iron	<0.10
Lead	0.15
Lithium	2.40
Magnesium	0.24
Manganese	<0.10
Nickel	<0.10

METALS	PPM
Potassium	58
Sodium	520
Strontium	2.31
Tin	< 0.10
Zinc	< 0.10

cc: A.W. Hoch
R.L. Tenney
Ray Collins

MAGMA ENERGY, INC.
631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

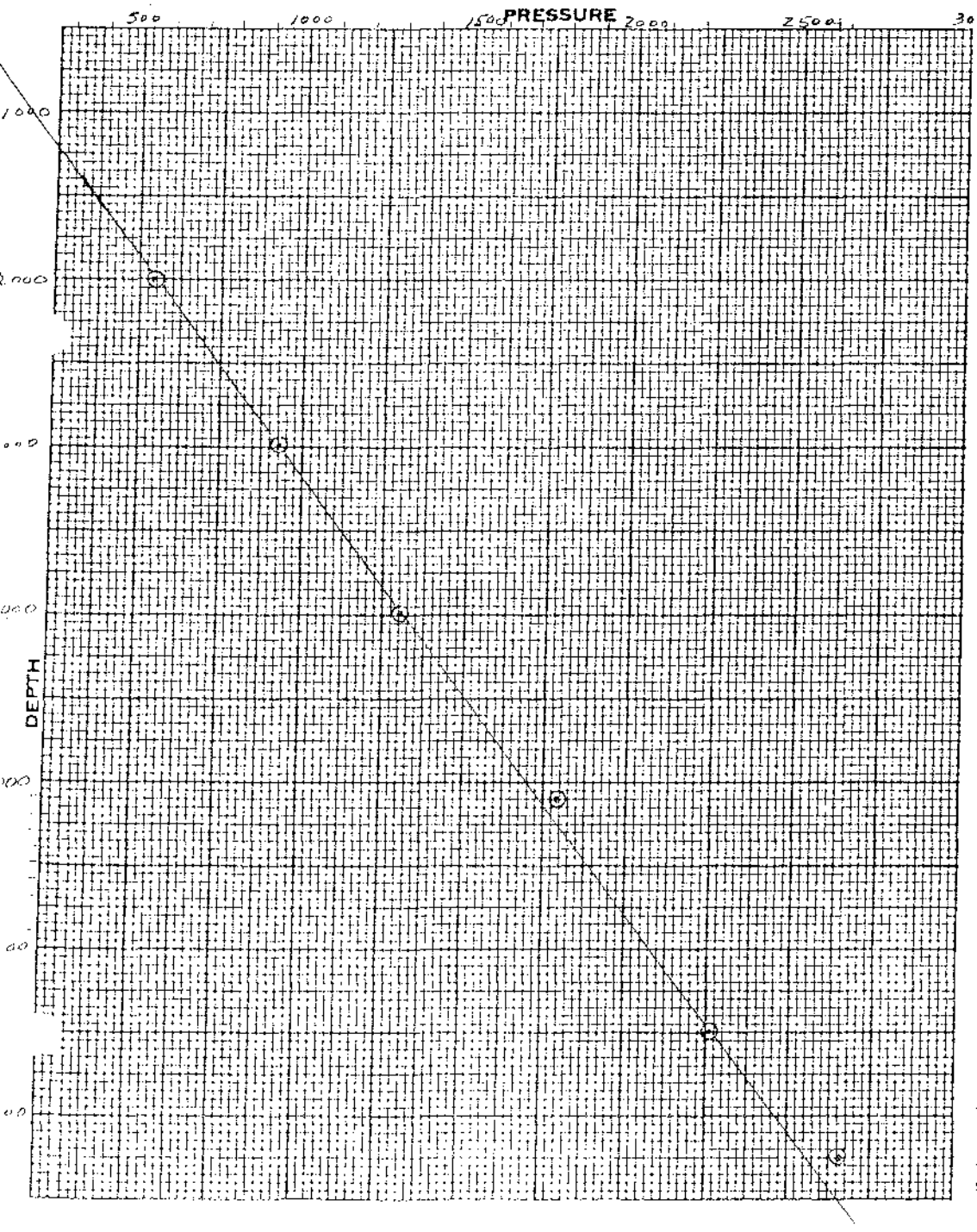
(1)

SUBSURFACE PRESSURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME 84-7
CASING 13 3/8" TO 2118' ELEV. DATE 3-20-83
LINER DESCRIPTION: 9 5/8" 2011' TO 4500' ZERO POINT 21' KB
7" 4373' TO 7520' DEPTH 7535'
7" SLOTTED 4500' TO 7520 ZONE
TUBING DETAIL:
PICK UP @ 7260' INSTRUMENT KUSTER PSIG
66 # CU. FT. SALT H_2O IN WELL SERIAL NO.
PUMP SHOE GAS ANCHOR INTAKE:
PURPOSE STATIC PRESS. SURVEY MAX. TEMP. 356 °F @ 7260'
REMARKS: WELL HAS HEAVY HUG OF SAND FILL

STABLIZATION PERIOD 13 DAYS
GROSS OIL RATE B/D
NET OIL RATE B/D
FORMATION GAS MCF D
GOR CFT/BBL
CIRCULATED GAS MCF/D
OIL DRY GRAVITY °API

PRESSURES	OBS	COR
CASING, PSI		
TUBING, PSI		



DEPTH	PRESSURE	GRADIENT
500'	87	
1000	284	
2000	542	
2500	737	
3000	929	
3500	1110	
4000	1302	
4500	1501	
4700	1613	
4900	1728	
5100	1784 ?	
5300	1854	
5500	1927	
5700	1998	
5900	2064	
6100	2129	
6300	2201	
6500	2256	
6700	2340	
6900	2415	
7100	2516	
7260	2635 ?	

BY: RAY COLLINS

(1)

MAGMA ENERGY, INC.

631 SOUTH WITMER STREET
LOS ANGELES, CALIFORNIA 90017

TELEPHONE 483-2285 • 483-5542

SUBSURFACE TEMPERATURE SURVEY

OWNER MAGMA POWER CO. FIELD EAST MESA WELL NAME 84-7

CASING 13 3/8" – 2118' ELEV. 30' DATE: 3-20-83

LINER DESCRIPTION: 9 5/8" – 2011' TO 4500' ZERO POINT 21' KB.

7" – 4500' TO 7520' DEPTH 7535'

7" SLOTTED 4373' TO 7520 ZONE

TUBING DETAIL:

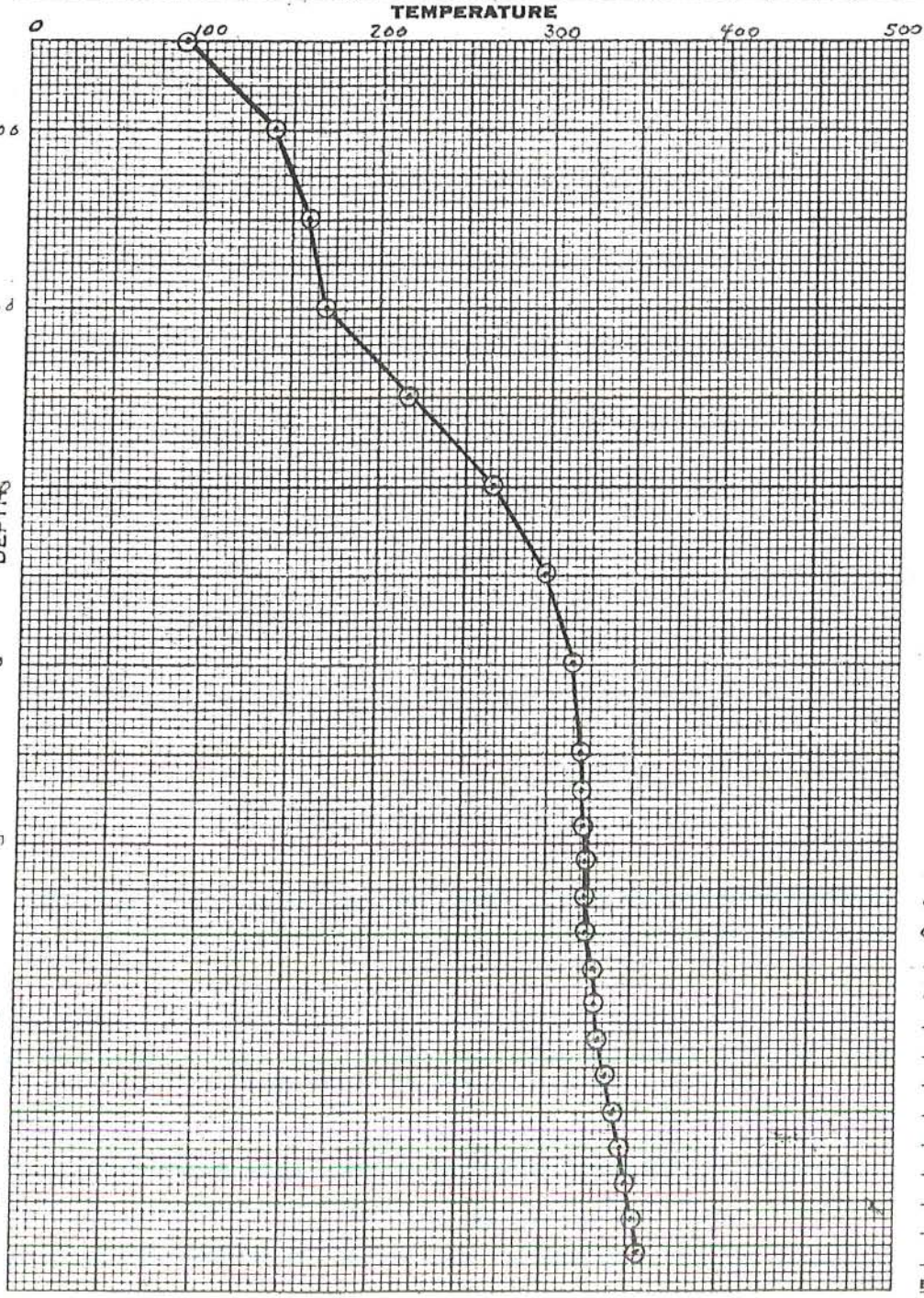
PICK UP 7260' INSTRUMENT ° FAHR

SERIAL NO.

PUMP SHOE GAS ANCHOR INTAKE:

PURPOSE STATIC TEMPERATURE SURVEY MAX. TEMP. 356 °F @ 7260'

REMARKS:



STABLIZATION PERIOD 13 DAYS

GROSS OIL RATE B D

NET OIL RATE B D

FORMATION GAS MCF D

GOR CFT BBL.

CIRCULATED GAS MCF D

OIL DRY GRAVITY °API

PRESSURES.	OBS	COR
CASING, PSIG		
TUBING, PSIG		

DEPTH	TEMP.	DEPTH	TEMP.
500'	90 °F		
1000'	140		
1500	160		
2000	170		
2500	217		
3000	267		
3500	298		
4000	315		
4500	320		
4700	321		
4900	322		
5100	323		
5300	323		
5500	324		
5700	328		
5900	330		
6100	333		
6300	339		
6500	344		
6700	347		
6900	350		
7100	353		
7260	356		

BY: RAY COLLINS

IMPERIAL MAGMA

DOWN HOLE SURVEY

Well #: 84-7

Date: 11-13-85

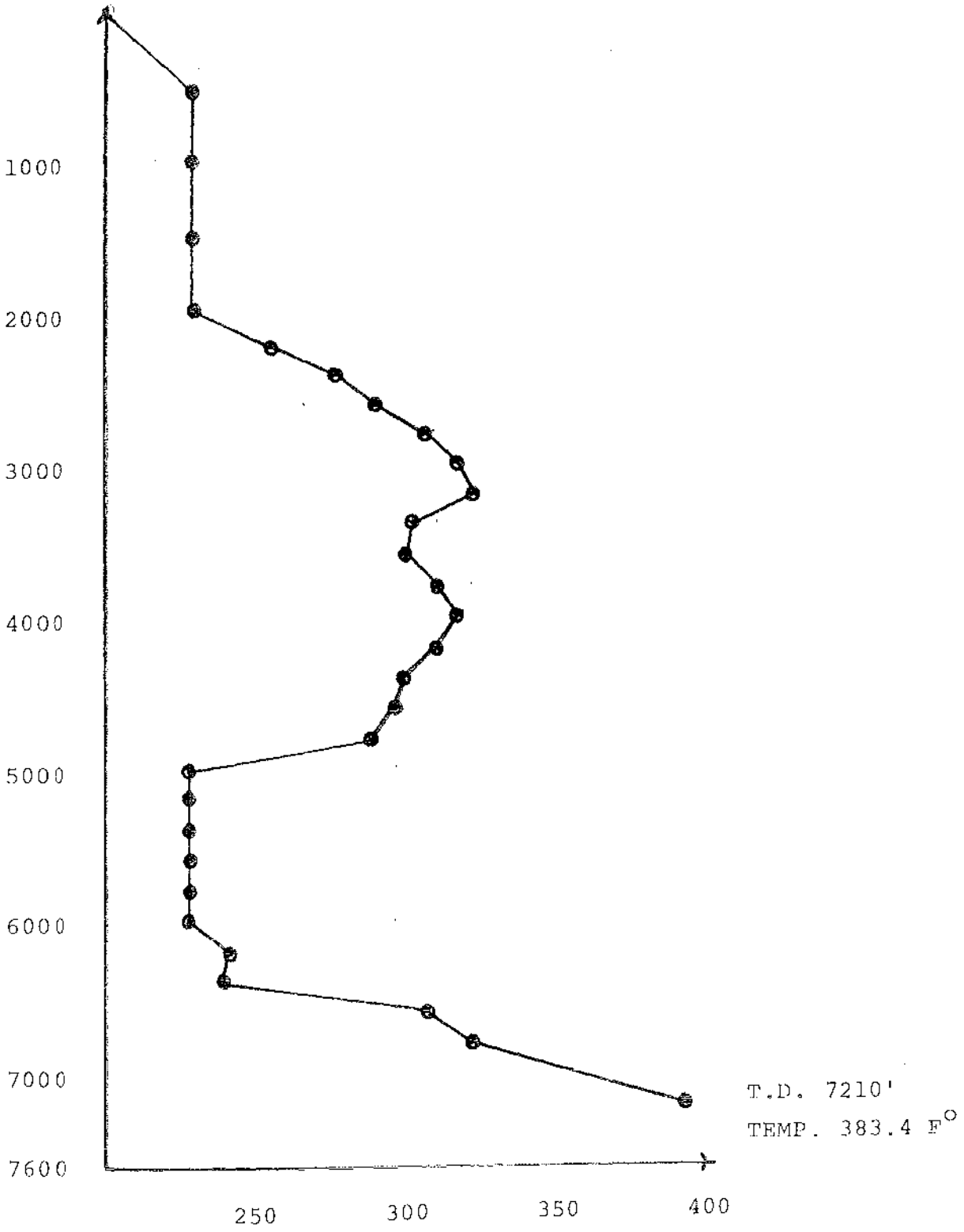
DEPTH	TEMPERATURE F°	PRESSURE PSI
500	228.2	209.22
1000	228.2	409.01
1500	228.2	601.35
2000	229.6	809.37
2200	257.9	886.22
2400	274.3	965.04
2600	288.1	1043.67
2800	305.1	1127.04
3000	316.7	1206.44
3200	321.4	1285.83
3400	302.9	1367.22
3600	299.5	1446.62
3800	310.0	1527.79
4000	317.0	1607.19
4200	308.7	1686.59
4400	295.1	1775.91
4600	288.4	1853.32
4800	276.8	1948.60
5000	228.2	2031.76
5200	228.2	2117.11
5400	228.2	2200.48
5600	228.5	2281.86
5800	228.5	2365.23
6000	228.5	2448.60
6200	240.1	2529.83
6400	236.5	2607.38
6600	306.7	2678.97
6800	310.3	2756.53
7000	357.1	2836.08
7200	383.4	2921.59

IMPERIAL MAGMA

WELL # 84-7

ıte: 11-13-85

TEMPERATURE PROFILE

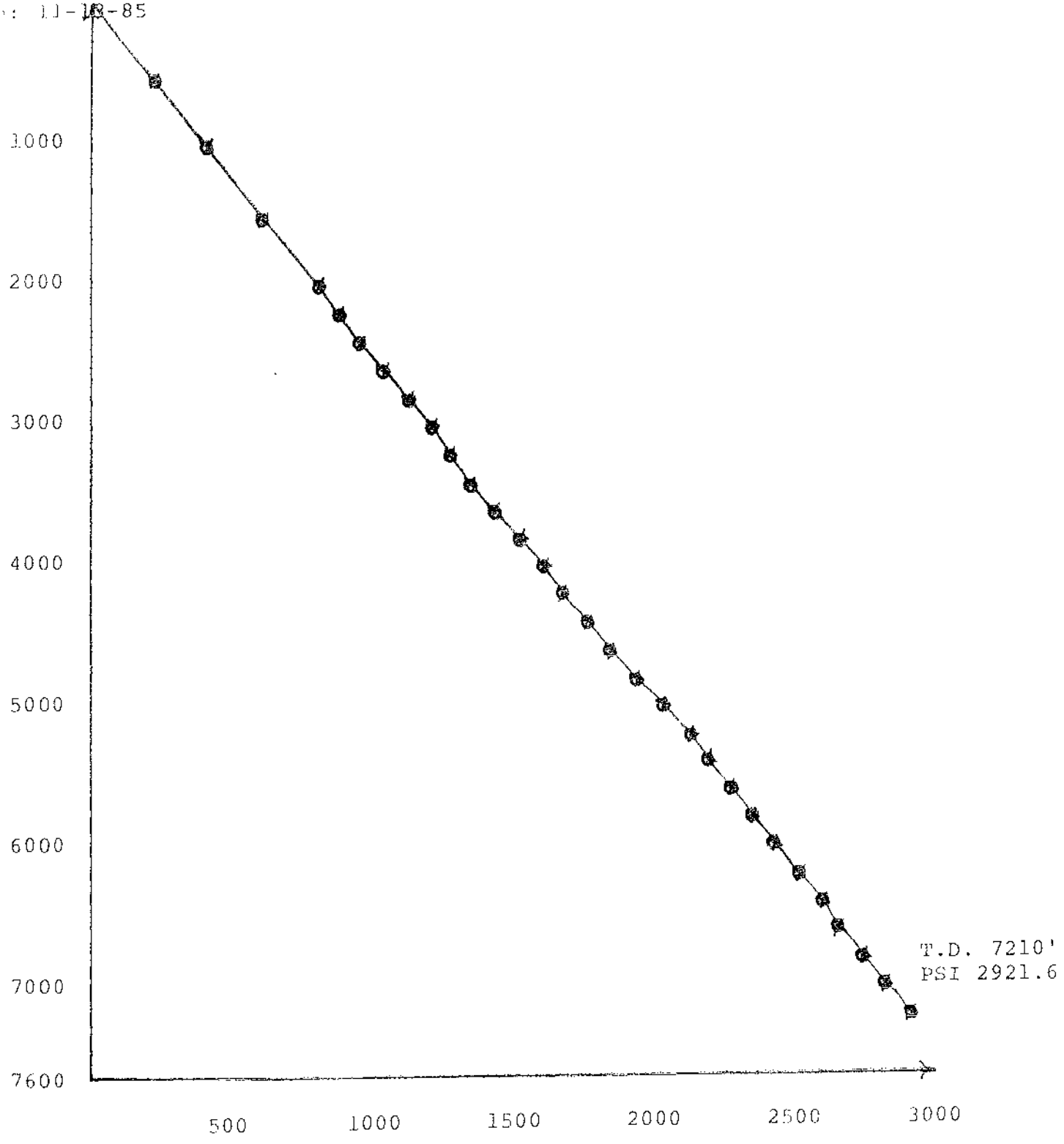


PRESSURE PROFILE

IMPERIAL MAGMA

WELL # 84-7

Date: 11-18-85



mv comp

BRINE SYSTEM REPORT SHEET

Magma Electric Co.

Date 1-28-86

Anaylsis: (In ppm)	Well # 61-7 (#8)	Well # 61-7 (#8)
Time	5/30/85	1/28/86
pH	5.70	5.75
TDS	2524	2648
Amonia (NH3)	11.0	10.0
Bicarbonate Alklinity	351	338
Calcium Hardness (as CaCO3)	31.0	26.0
Chlorides (Cl)	1185	1160
Dissolved Oxygen (D.O.)	ND	ND
Hydrogen Sulfide (H2S)	0.50	1.00
Silica (SiO2)	240	245
Sulfate (SO4)	110	108
Suspended Solids	1.20	1.71
Temperature (Deg. F)	352°	348°
Pressure (psig)	278	275
Flow (gpm)	118	171
Metals: (In ppm)		
Calcium (Ca)	13.0	10.0
Iron (Fe)	0.18	0.10
Lithium (Li)	3.00	2.87
Potassium (K)	89	85.0
Sodium (Na)	785	770
Strontium (Sr)	2.46	2.35
Gases: (Mole % by volume)		
H20 Vapor	3.45	3.87
Argon (Ar)	–	–
Nitrogen (N2)	22.11	21.23
Methane (CH4)	21.56	23.45
Carbon Dioxide (CO2)	51.94	51.31
Ethane (C2H6)	0.14	0.14
Propane (C4H8)	ND	ND
Iso-Butane (C4H10)	ND	ND
Norm. Butane (NC4H10)	ND	ND

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4635

EAST MESA PLANT

June 4, 1984

On May 30th, 1984, Well# 61-7 was sampled after 9 days of operation. The wellhead had an operating pressure of 270 psi, a temperature of 350 degrees and a flow of 331 gpm. The following analysis were found:

PARAMETER	Mg/1
pH	5.65
TDS	3755
Total Alkalinity	368
Suspended Solids	2.00
Calcium Hardness	56.0
Chlorides	1778
Ammonia	11.0
Hydrogen Sulfide	0.50
Silica	251
Sulfate	130

METALS	PPM
Calcium	22.4
Boron	7.89
Barium	0.98
Chromium	(0.10
Cobalt	(0.10
Copper	(0.10
Iron	0.16
Lead	(0.10
Lithium	4.27
Magnesium	0.51
Manganese	(0.10
Nickel	(0.10
Potassium	100
Sodium	1282
Strontium	2.52
Tin	(0.10
Zinc	(0.10

GASES	MOLE %
Carbon Dioxide	68.53 %
Methane	14.50
Nitrogen	14.02
Ethane	0.20

A.W. Hoch
T.C. Hinrichs

HOT HOLE INSTRUMENTS
For
IMPERIAL MAGMA
Well No. 61-7
3/29/84

DEPTH	TEMPERTURE	PRESSURE
500	286.1	293.9
1000	286.7	488.8
1500	287.5	684.0
2000	304.1	783.3
2500	326.8	894.1
3000	332.4	1099.4
3500	334.1	1304.6
4000	339.9	1522.8
4500	346.3	1723.1
5000	350.6	1923.5
5500	358.5	2109.8
6000	362.5	2308.2
6290	367.4	2421.3

East Mesa

Well 61-7 PW#8 Date: 4-28-84

Depth	Temp.	Press.
500'	180°	200
1000'	211°	402
1500'	256°	588
2000'	288°	783
2500'	303°	1127
3000'	333°	1154
3500'	340°	1339
4000'	348°	1522
4500'	352°	1708
5000'	358°	1897
5500'	360°	2073
6000'	364°	2152
6500'	372°	2314
6998'	377°	2472

#7

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4635

EAST MESA PLANT

July 10, 1984

Well # 63-7 (#7), was sampled on July 5, 1984 after 10 days of actual production. The wellhead had an operating pressure of 267 psig, a temperature of 350° and a flow of 293 gpm. The results were as follows:

PARAMETER	mg/1
ph	5.60
TDS	3535
Suspended solids	1.10
Total alkalinity	345
Calcium hardness ($CaCo_3$)	62.0
Total hardness	75.0
Chlorides	1617
Ammonia	12.0
Hydrogen sulfide	0.70
Nitrate	9.90
Silica	220
Sulfate	140

in comp

METALS	PPM
Barium	0.75
Boron	9.38
Calcium	25.0
Chromium	0.04
Cobalt	0.11
Copper	0.08
Iron	0.25
Lead	0.10
Lithium	3.78
Magnesium	0.44
Manganese	0.09

METALS	PPM
Nickel	0.08
Potassium	97.0
Sodium	1077
Strontium	2.79
Tin	0.06
Zinc	0.23

GASES	MOLE %
Argon	0.30
Carbon Dioxide	52.37
Methane	20.02
Nitrogen	24.10
Ethane	0.20

cc: A.W. Hoch
T.C. Hinrichs
R.C. Collins
D. Downs

in comp

SHEET

Magma Electric Co.

Date 1-28-86

Anaylsis: (In ppm)	Well #63-7 (#7)	Well #63-7 (#7)
Time	5/23/85	1/28/86
pH	5.79	5.65
TDS	3756	3828
Amonia (NH3)	9.0	11.0
Bicarbonate Alklinity	314	304
Calcium Hardness (as CaCO3)	45.0	48
Chlorides (Cl)	1814	1820
Dissolved Oxygen (D.O.)	ND	ND
Hydrogen Sulfide (H2S)	0.60	1.00
Silica (SiO2)	220	222
Sulfate (SO4)	108	104
Suspended Solids	3.60	1.45
Temperature (Deg. F)	353°	350°
Pressure (psig)	310	265
Flow (gpm)	218	171
Metals: (In ppm)		
Calcium (Ca)	29	19.0
Iron (Fe)	0.15	0.10
Lithium (Li)	3.24	3.00
Potassium (K)	120	116
Sodium (Na)	1175	1178
Strontium (Sr)	3.91	3.10
Gases: (Mole % by volume)		
H20 Vapor	4.48	4.06
Argon (Ar)	-	-
Nitrogen (N2)	23.46	20.33
Methane (CH4)	19.85	23.34
Carbon Dioxide (CO2)	52.05	52.15
Ethane (C2H6)	0.16	0.12
Propane (C4H8)	ND	ND
Iso-Butane (C4H10)	ND	ND
Norm. Butane (NC4H10)	ND	ND

HOT HOLE INSTRUMENTS
For
IMPERIAL MAGMA
Well No. 63-7
6/2/84

DEPTH	TEMPERTURE	PRESSURE
500	Less-148	218.9
1000	149.0	428.1
1500	186.0	631.9
2000	220.0	843.7
2500	256.0	1039.1
3000	282.0	1200.3
3500	298.0	1400.7
4000	305.0	1545.6
4500	313.0	
5000	320.0	
5500	331.0	
6000	338.0	
6500	348.0	
7000	352.0	
7450	361.0	

Clock on Pressure Tool stopped at 4000 feet.

HOT HOLE INSTRUMENTS
For
IMPERIAL MAGMA
Well No. 63-7
2/29/84

DEPTH	TEMPERTURE	PRESSURE
500	225.8	169.3
1000	244.7	375.4
1500	285.8	568.4
2000	298.9	778.5
2500	316.7	969.1
3000	324.1	1159.6
3500	331.5	1359.9
4000	336.4	1553.6
4500	340.5	1760.6
5000	343.1	1853.4

No Time/Depth Sheet, depths were estimated by looking a surveys run on 2/29/84 on this well.

HOT HOLE INSTRUMENTS
For
IMPERIAL MAGMA
Well No. 63-7 #7
5/31/83

DEPTH	TEMPERTURE	PRESSURE
500	176.0	
1000	176.0	
1500	177.0	
2000	209.7	
2500	247.2	
3000	277.4	
3500	298.6	
4000	312.8	
4500	324.1	
5000	329.5	
5500	338.2	
6000	356.7	
6500	360.2	
7000	369.8	
7484	378.5	

Temperture only, no clock for Pressure Tool.

MAGMA ELECTRIC CO.
P. O. BOX 325
HOLTVILLE, CALIFORNIA 92250
(714) 356-4638

Jan. 22, 1985

EAST MESA PLANT

FROM: HECTOR GALARTE
TO: FRED TEETER

SUBJECT: WELL #U.S. 88-7 (6) (Production Well)

On January 21, 1985, Well #88-7 was sampled after 9 days of continueous operation, at Mr. Teeter's request. The well had a temperature of 348°F, a pressure of 305 psig and a flow rate of 603 gpm. The following anaylsis were conducted:

PARAMETER	mg/l
ph	5.85
Conductivity	5495 Umhos
TDS	4180
Suspended Solids	1.70
Calcium Hardness (as $CaCo_3$)	50.0
Hydroxide Alklinity	NF
Carbonate Alklinity	NF
Bicarbonate Alklinity	308
Chlorides	2193
Sulfate	136
Silica	229
Ammonia (NH_3)	12.0
Hydrogen Sulfide (H2S)	1.50
Nitrate	11.70
Specific Gravity	1.020 at 25°C
GASES	**PERCENT**
Nitrogen	37.10
Methane	14.86
Carbon Dioxide (CO_2)	42.62
Ethane	0.14
METALS	**PPM**
Boron	6.94
Barium	1.40
Calcium	20.0
Iron	0.25
Lithium	4.11
Magnesium	0.30
Potassium	113
Sodium	1438
Strontium	2.64

There were also traces of Co, Cu, Mn, Pb, Cr, Ni, Sb and Zn. All were less than 0.10 ppm.

At 305 psig, there was little evidence of gas breakout. It took 14.11 liters of brine liquid to collect 62.5 mls of gas.

cc: A.W Hoch
T.C. Hinrichs
Fred Teeter
Dennis Downs
Hector Galarte

BRINE SYSTEM REPORT SHEET

Magma Electric Co.

Date 1-15-86

Anaylsis: (In ppm)	Well #6 1-22-85	Well #6 1-14-86
Time	0920	1415
pH	5.85	5.80
TDS	4065	4032
Amonia (NH3)	12	12
Bicarbonate Alklinity	308	300
Calcium Hardness (as CaCO3)	51	50
Chlorides (Cl)	2193	2149
Dissolved Oxygen (D.O.)	ND	ND
Hydrogen Sulfide (H2S)	1.50	1.50
Silica (SiO2)	229	230
Sulfate (SO4)	136	113
Suspended Solids	1.70	1.40
Temperature (Deg. F)	348	347
Pressure (psig)	305	300
Flow (gpm)	603	371
Metals: (In ppm)		
Calcium (Ca)	20	21
Iron (Fe)	0.25	0.10
Lithium (Li)	4.11	3.82
Potassium (K)	113	107
Sodium (Na)	1438	1417
Strontium (Sr)	2.64	2.71
Gases: (Mole % by volume)		
H20 Vapor	2.46	2.18
Argon (Ar)	-	-
Nitrogen (N2)	37.10	37.31
Methane (CH4)	14.86	15.50
Carbon Dioxide (CO2)	42.62	44.91
Ethane (C2H6)	0.14	0.10
Propane (C4H8)	ND	ND
Iso-Butane (C4H10)	ND	ND
Norm. Butane (NC4H10)	ND	ND

AGNEW and SWEET

24 HOUR PHONE 805-327-2267
4205 ATLAS COURT
BAKERSFIELD, CALIFORNIA

SUB-SURFACE TEMPERATURE SURVEY

CO. IMPERIAL MAGMA		RUN #1 FIELD EAST MESA		WELL 88-7	
EFF DEPTH 7900'		WELL STAT	Static/Flow	TOOL HUNG	7000'
CASING	0 -7900'	CASING PRESS	250/900	ON BOTTOM	10:32
LINER	-	TUBING PRESS		OFF BOTTOM	10:45
DATE	100884	ELEMENT RANGE	109 - 518	ZERO POINT	20'
ELEVATION		ZONE		SHUT-IN	18:00
MAX TEMP	356.3 F	PICK-UP	7893'	ON-PROD	11:02
PERF	-	CAL SER NO.	10286	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	Static Press/Temp Gradient		

SURVEY DATA

CO. IMPERIAL MAGMA — RUN #1 FIELD EAST MESA — WELL 88-7

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
7:58	0	100.4	0.000	9:10	5000	325.2	.005
8:10	500	136.4	.056	9:20	5500	327.2	.004
8:15	1000	163.7	.055	9:30	6000	331.1	.008
8:20	1500	189.1	.051	9:41	6500	339.2	.016
8:25	2000	214.4	.051	9:50	7000	345.0	.012
8:30	2500	246.2	.063	10:01	7200	349.9	.024
8:35	3000	290.3	.088	10:10	7400	352.1	.011
8:40	3500	314.5	.048	10:20	7600	353.1	.005
8:50	4000	317.5	.006	10:31	7800	355.1	.010
9:00	4500	322.6	.010	10:45	7893	356.3	.013

Temperature File #01EA88-7

SURVEY DATA

CO. IMPERIAL MAGMA — RUN A1 FIELD EAST MESA — WELL 88-7

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
7:58	0	25.8	0.000	9:10	5000	2186.6	.433
8:10	500	242.0	.433	9:20	5500	2403.3	.433
8:16	1000	458.2	.432	9:30	6000	2620.5	.434
8:20	1500	674.7	.433	9:40	6500	2837.8	.435
8:26	2000	889.5	.430	9:50	7000	3054.4	.433
8:31	2500	1104.9	.431	10:00	7200	3141.0	.433
8:35	3000	1320.6	.431	10:10	7400	3227.6	.433
8:40	3500	1536.9	.432	10:20	7600	3314.1	.432
8:50	4000	1753.9	.434	10:30	7800	3400.7	.433
9:00	4500	1970.3	.433	10:45	7893	3441.0	.434

Prerssure File #A1EA88-7

PRUETT INDUSTRIES INC
8915 ROSEDALE HWY, BAKERSFIELD, CA. 93308
(805) 589-2768

SUB-SURFACE PRESSURE SURVEY

CO. MAGMA POWER			RUN 01 FIELD EAST MESA		WELL 88-7
EFF DEPTH			WELL STAT	STATIC	TOOL HUNG
CASING		-	CASING PRESS		ON BOTTOM 3:20
LINER		-	TUBING PRESS		OFF BOTTOM 3:30
DATE	040685		ELEMENT RANGE	0 - 4220	ZERO POINT
ELEVATION			ZONE		SHUT-IN
MAX TEMP			PICK-UP	7666'	ON-PROD
PERF		-	CAL SER NO.	4088N	MPP
TUBING		-			
UNITS	ENGLISH		PURPOSE	STATIC PRESS GRADIENT	

SURVEY DATA

CO. MAGMA POWER — RUN 01 FIELD EAST MESA — WELL 88-7

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	500	196.4	0.000	1:00	5250	2041.0	.396
1:00	750	305.2	.435	1:00	5500	2135.7	.379
1:00	1000	413.6	.434	1:00	5750	2222.2	.346
1:00	1500	625.7	.424	1:00	6000	2313.0	.363
1:00	2000	811.9	.372	1:00	6250	2406.0	.372
1:00	2500	1009.9	.396	1:00	6500	2497.1	.364
1:00	3000	1187.9	.356	1:00	6750	2588.4	.365
1:00	3500	1368.3	.361	1:00	7000	2682.0	.374
1:00	4000	1561.6	.386	1:00	7250	2775.8	.375
1:00	4500	1757.0	.391	1:00	7500	2874.2	.394
1:00	4750	1849.5	.370	1:00	7660	2936.4	.389
1:00	5000	1942.1	.370	0:00	0	0.0	0.000

BY J HANEY / G POWELL

PRUETT INDUSTRIES INC
8915 ROSEDALE HWY, BAKERSFIELD, CA. 93308
(805) 589-2768

SUB-SURFACE TEMPERATURE SURVEY

CO. MAGMA POWER			RUN 1A FIELD EAST MESA		WELL 88-7
EFF DEPTH			WELL STAT	STATIC	TOOL HUNG
CASING		-	CASING PRESS		ON BOTTOM 3:20
LINER		-	TUBING PRESS		OFF BOTTOM 3:30
DATE	040685		ELEMENT RANGE	58 - 622	ZERO POINT
ELEVATION			ZONE		SHUT-IN
MAX TEMP			PICK-UP	7666'	ON-PROD
PERF		-	CAL SER NO.	27911	MPP
TUBING		-			
UNITS	ENGLISH		PURPOSE	STATIC TEMP GRADIENT	

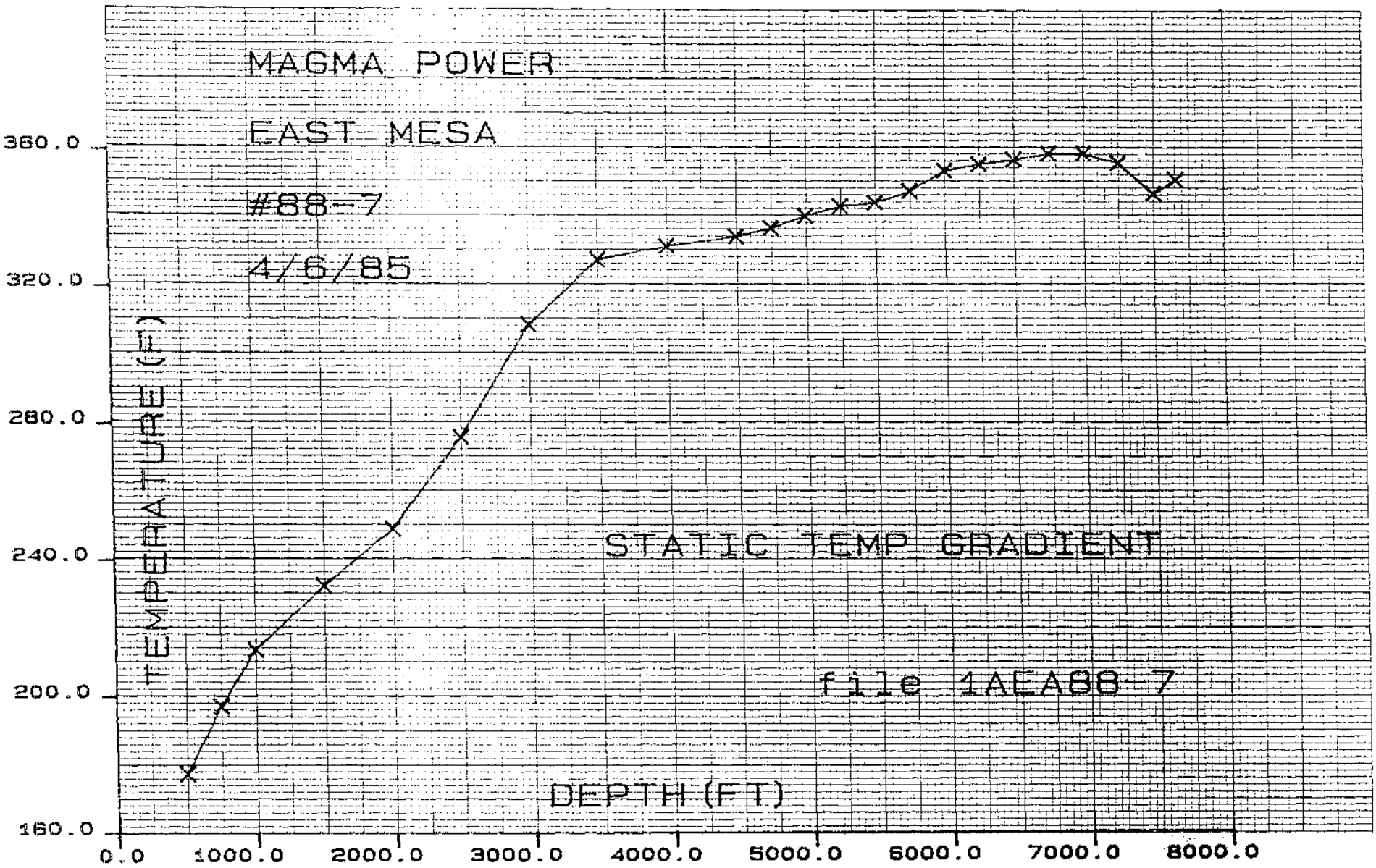
SURVEY DATA

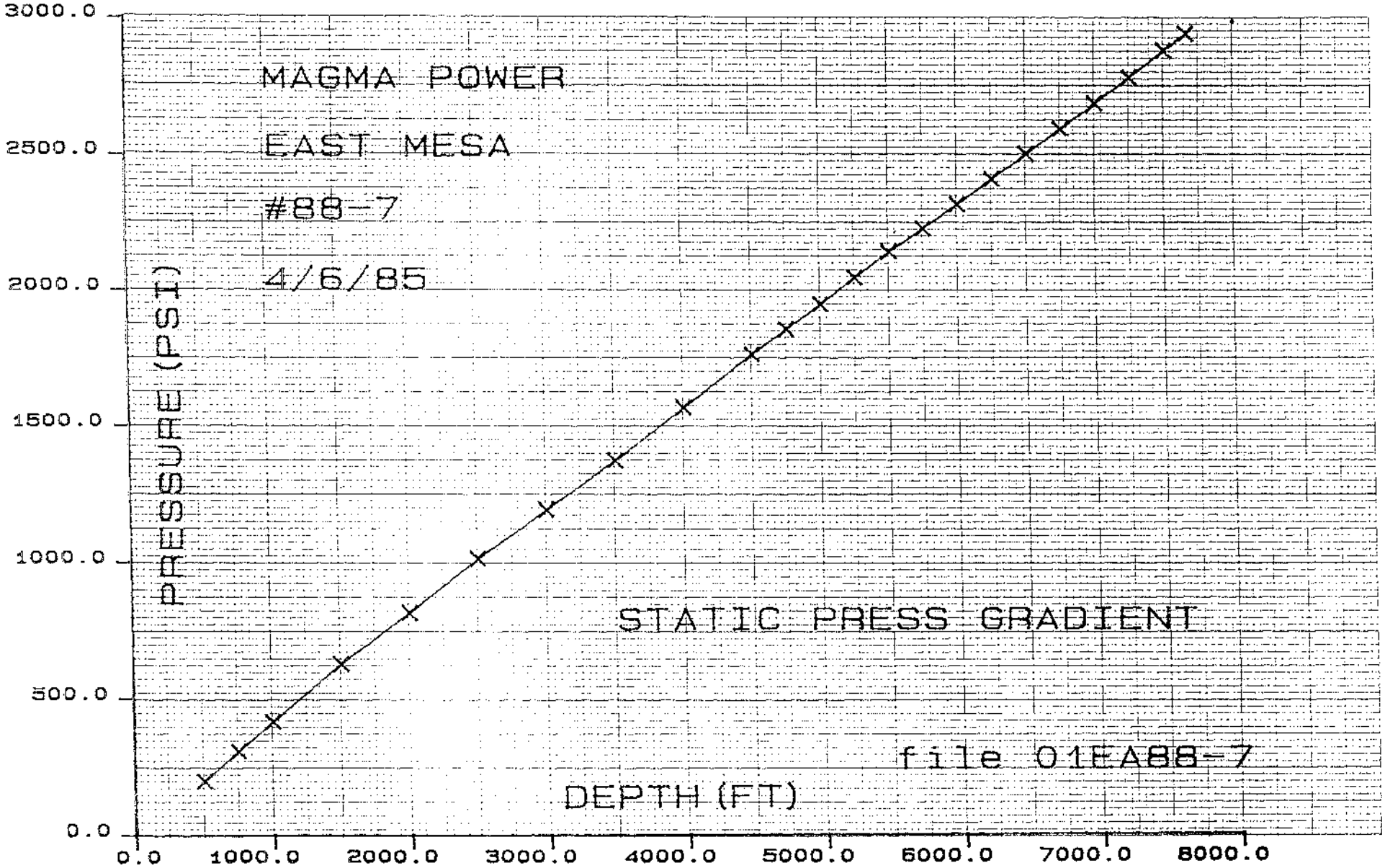
CO. MAGMA POWER — RUN 1A FIELD EAST MESA — WELL 88-7

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	500	177.6	0.000	1:00	5250	343.0	.011
1:00	750	197.2	.078	1:00	5500	344.0	.004
1:00	1000	213.6	.066	1:00	5750	347.4	.013
1:00	1500	232.2	.037	1:00	6000	353.5	.024
1:00	2000	249.0	.034	1:00	6250	355.4	.008
1:00	2500	275.7	.053	1:00	6500	356.8	.006
1:00	3000	308.5	.066	1:00	6750	358.5	.007
1:00	3500	327.6	.038	1:00	7000	358.5	0.000
1:00	4000	331.4	.008	1:00	7250	355.7	-.011
1:00	4500	334.1	.005	1:00	7500	346.5	-.037
1:00	4750	336.6	.010	1:00	7660	350.7	.026
1:00	5000	340.2	.014	0:00	0	0.0	0.000

THE CHART FOR THIS SURVEY WAS IN BAD CONDITION DUE TO HIGH WELL TEMPERATURES AND LEAKING OF THE TOOL. WE FEEL THE READINGS ARE GOOD, THEY WERE JUST DIFFICULT TO OBTAIN.
BY J HANEY / G POWELL

BAKERSFIELD, CA
(805) 589-2768





MAGMA POWER CORP.

WELL # 81-7 PW#9

JAN. 12,1986

PRESSURE/TEMPERATURE DATA

DEPTH	TEMPERATURE °F	PRESSURE PSIG
500		202.02
1000	236.5	425.87
1500	272.0	614.24
1600	282.0	652.46
1700	289.0	693.41
1800	294.5	734.36
1900	299.0	769.85
2000	304.2	810.79
2100	307.8	849.01
2200	312.5	889.96
2300	316.1	928.18
2400	320.3	969.13
2500	324.2	1010.72
2600	326.4	1048.23
2700	330.3	1083.06
2800	333.1	1123.25
2900	339.0	1163.44
3000	345.1	1203.63
3100	348.6	1230.42
3200	351.5	1278.65
3300	354.9	1313.48
3400	356.5	1353.67
3500	357.3	1391.18
3600	358.1	1423.33
3700	358.9	1466.20
3800	359.7	1495.68
3900	360.3	1543.90
4000	360.8	1584.09

MAGMA POWER CORP.
WELL # 81-7 PW#9
JAN. 12, 1986

PRESSURE/TEMPERATURE DATA

DEPTH	TEMPERATURE °F	PRESSURE PSIG
4100	361.9	1624.28
4200	362.4	1659.12
4300	363.5	1696.63
4400	364.0	1736.82
4500	364.2	1777.01
4600	364.5	1814.52
4700	364.5	1852.03
4800	364.5	1889.54
4900	365.0	1929.73
5000	367.2	1969.92
5100	367.4	2005.32
5200	367.7	2034.57
5300	367.7	2082.45
5400	372.5	2117.02
5500	374.6	2151.60
5600	375.1	2194.15
5700	376.7	2228.73
5750	379.6	2244.68

Feb. 3, 1986

SUBJECT: WELL #83-7

After 12 days of being in production, Well #83-7, was sampled and anaylized for it's brine composition. All of the anaylsis listed below are reported in ppm, except the gases, which are reported in mole percent by volume.

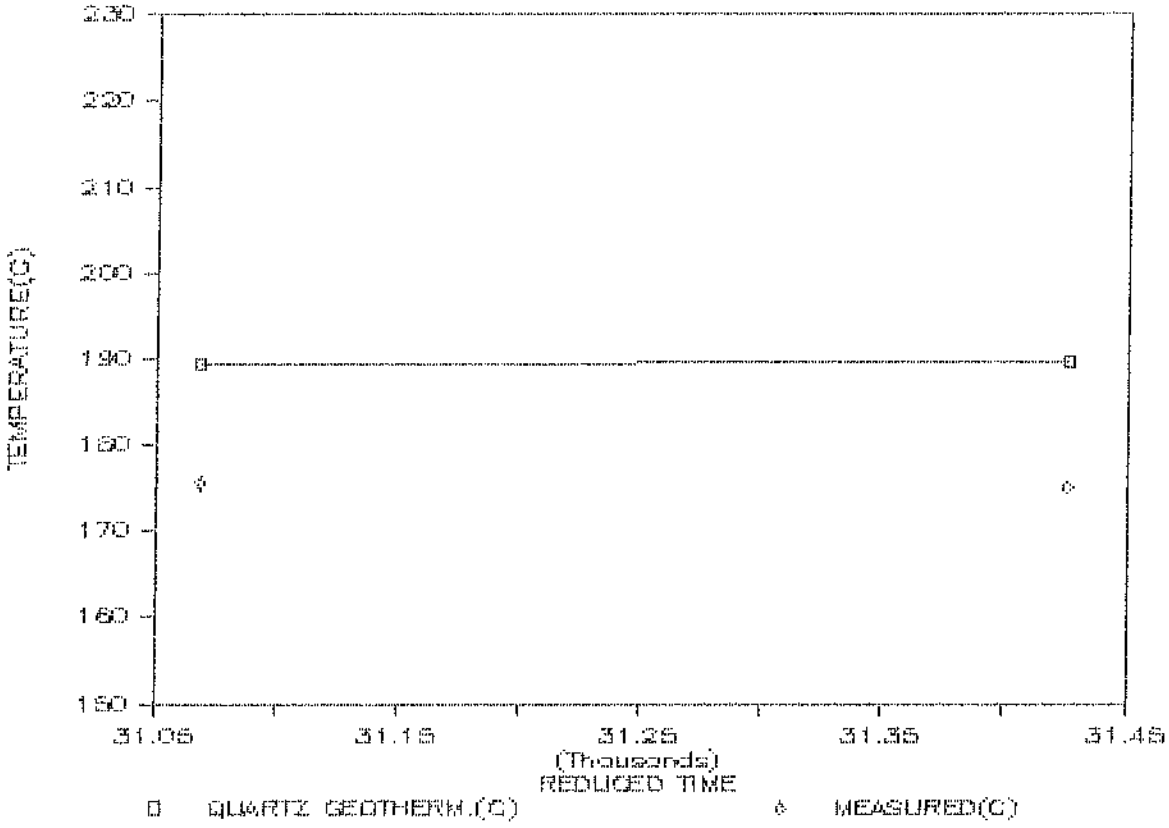
ANAYLSIS (in ppm)	WELL 83-7 (10)
pH	5.62
TDS	2660
Ammonia (NH3)	10.0
Bicarbonate alklinity	396
Calcium Hardness (as CaCO3)	25.0
Chlorides	1080
Hydrogen Sulfide (H2)	0.60
Silica (Sio2)	208
Sulfate (SO4)	56
Suspended solids	1.82
Temperature (deg. F)	347
Wellhead pressure (psig)	265
Flow (gpm)	302
METALS: (ppm)	
Calcuim (Ca)	10.0
Iron (Fe)	0.15
Lithium (Li)	2.40
Potassium (K)	48
Sodium (Na)	663
Strontium (Sr)	1.50
GASES: (Mole % by volume)	
H2O vapor	3.80%
Nitrogen	25.74%
Methane	23.07%
Carbon Dioxide	47.21%
Ethane	0.18%

Hector Galarte
HECTOR GALARTE

cc: Andy Hoch
Tom Hinrichs
Russ Tenney
Dennis Downs
Fred Teeters

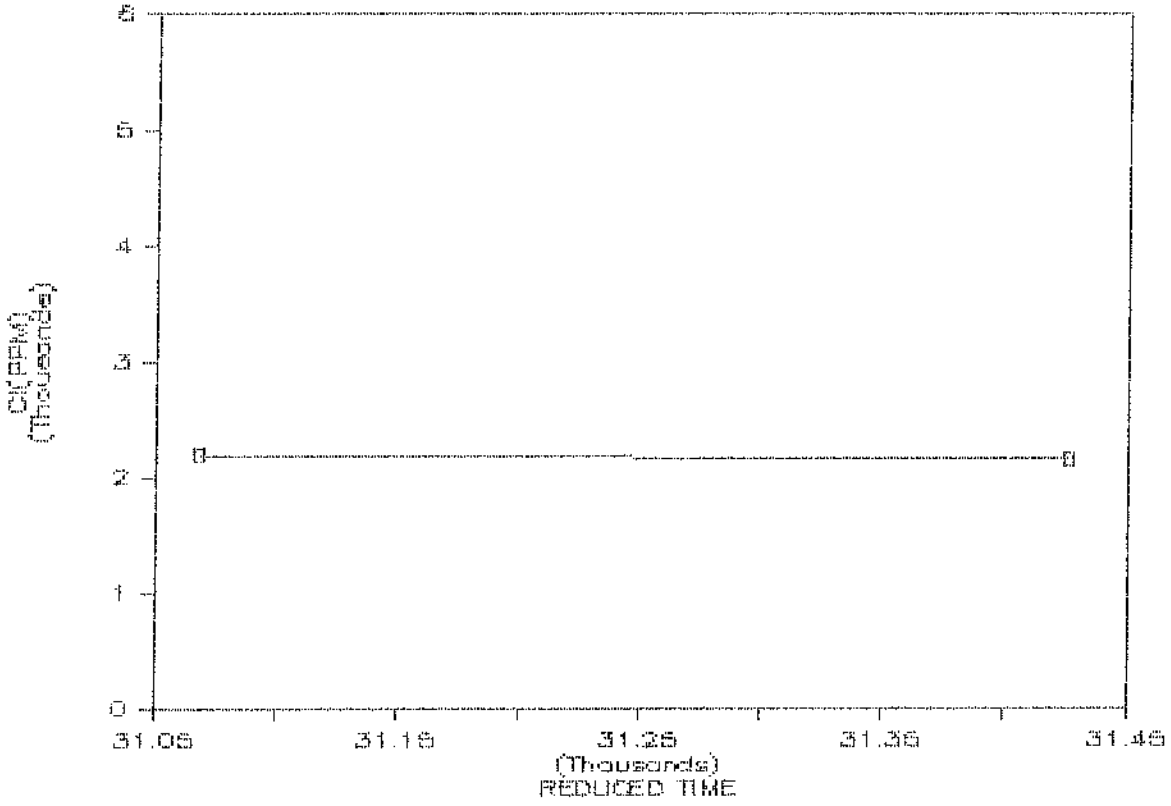
MAGMA HOLDINGS, EAST MESA

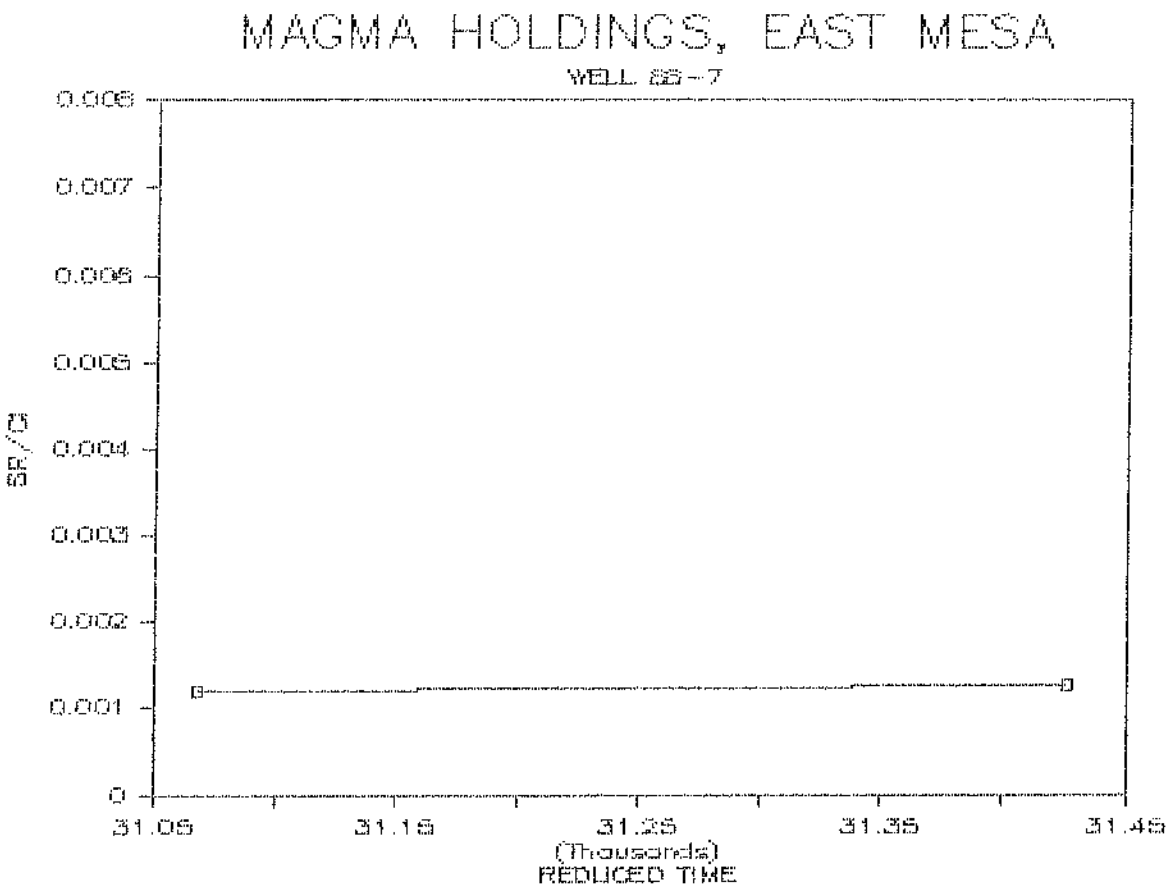
WELL 85-7

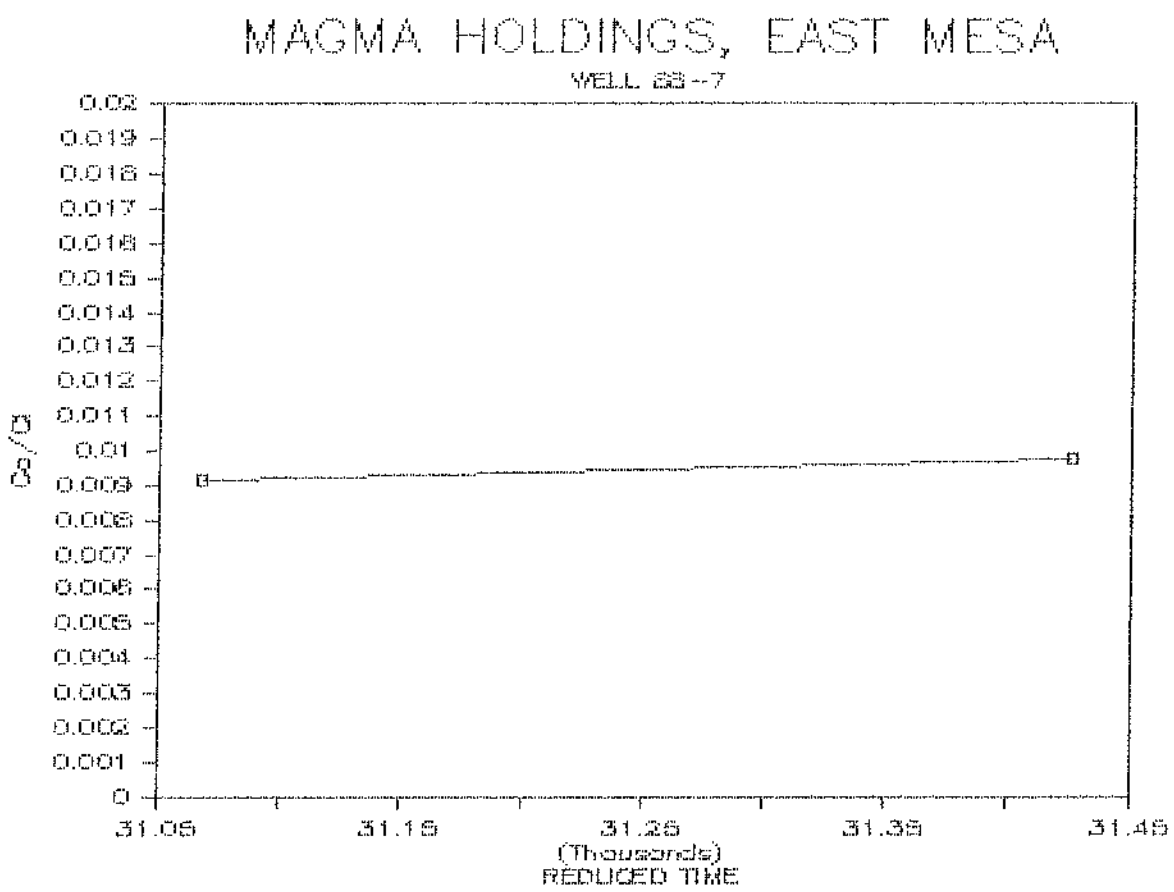


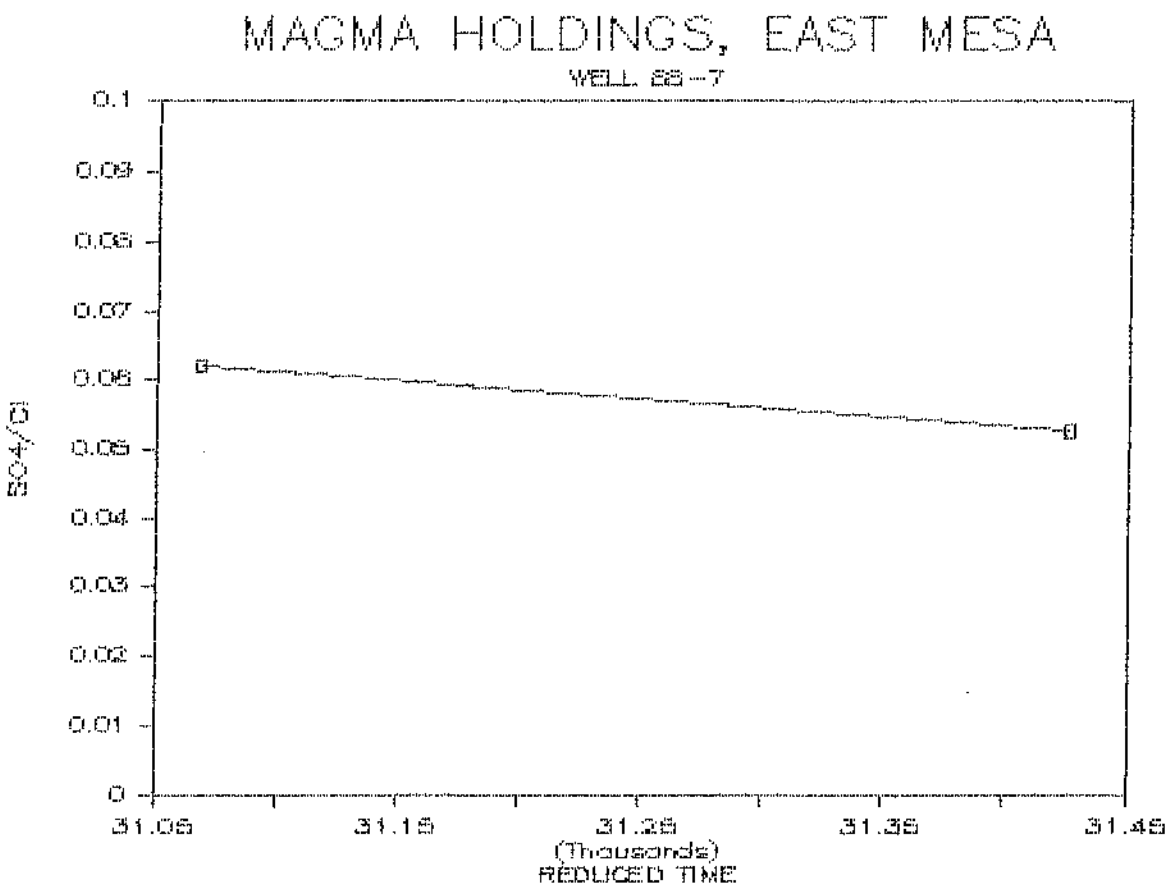
MAGMA HOLDINGS, EAST MESA

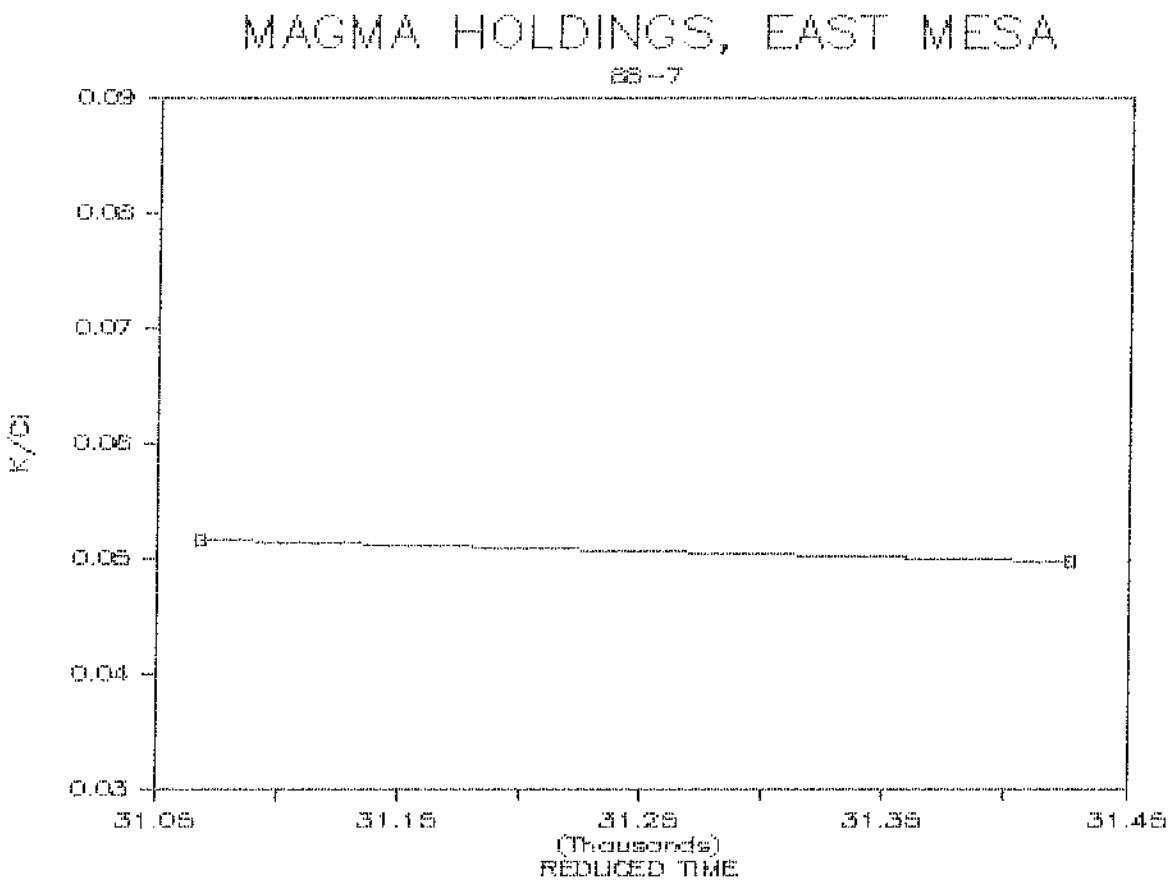
WELL 88-7



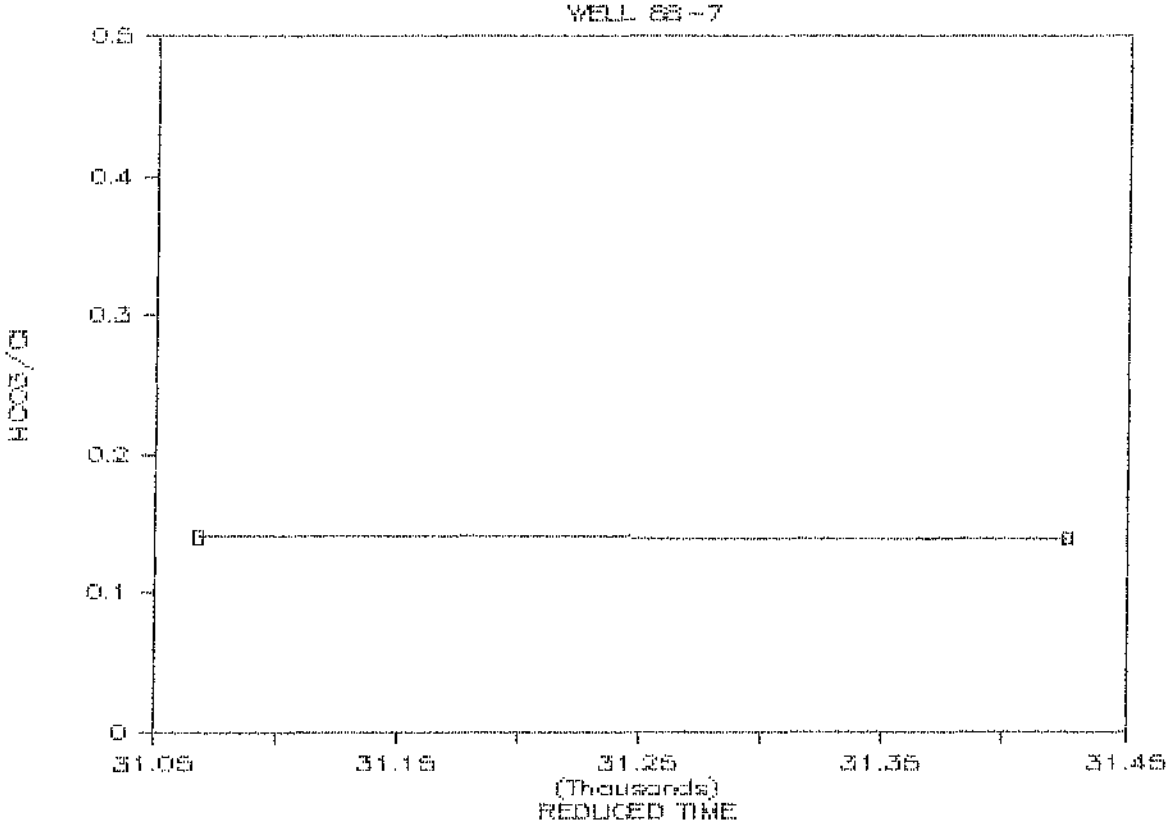

MAGMA HOLDINGS, EAST MESA
WELL 23-7
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
SR/Q
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME

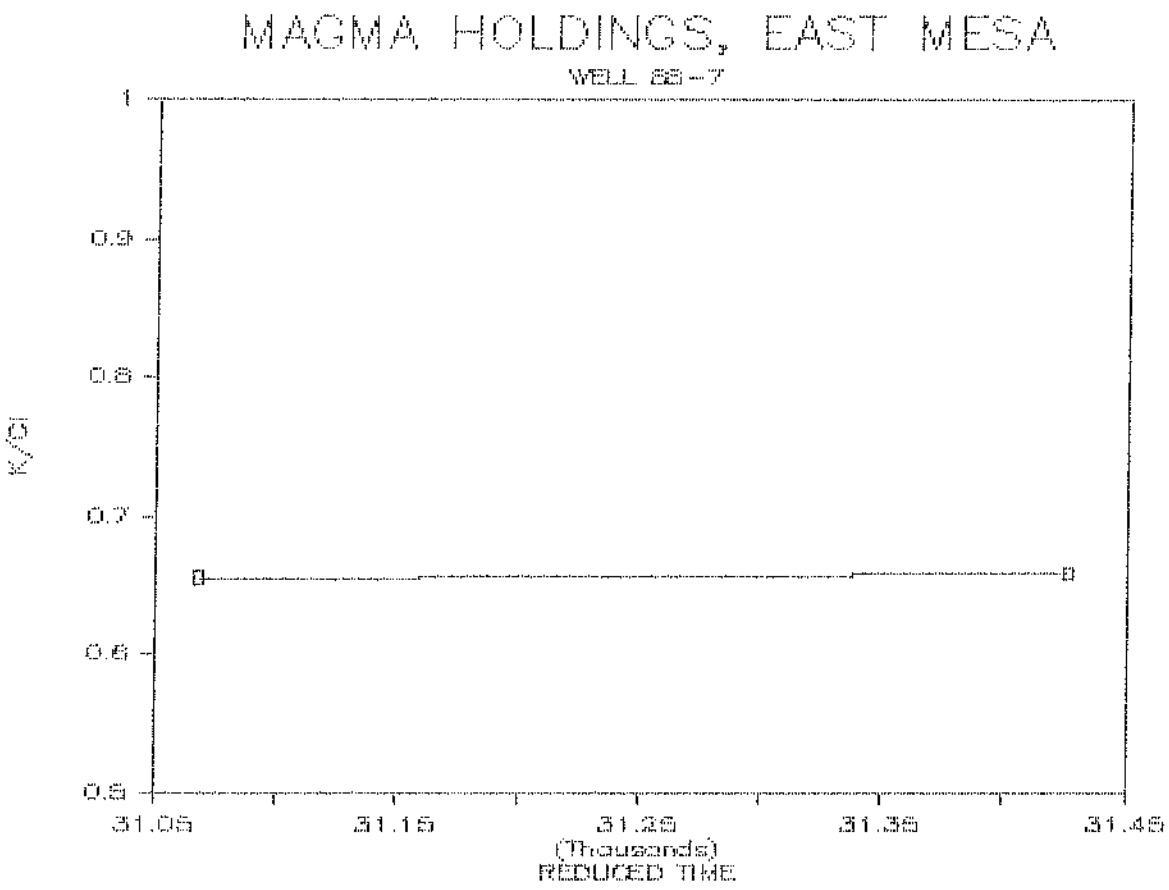

MAGMA HOLDINGS, EAST MESA
WELL 23-7
0.02
0.019
0.018
0.017
0.016
0.015
0.014
0.013
0.012
0.011
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME


MAGMA HOLDINGS, EAST MESA
WELL 28-7
SO4/Cl
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME


MAGMA HOLDINGS, EAST MESA
68-7
0.09
0.08
0.07
0.06
0.05
0.04
0.03
K/Qg
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME

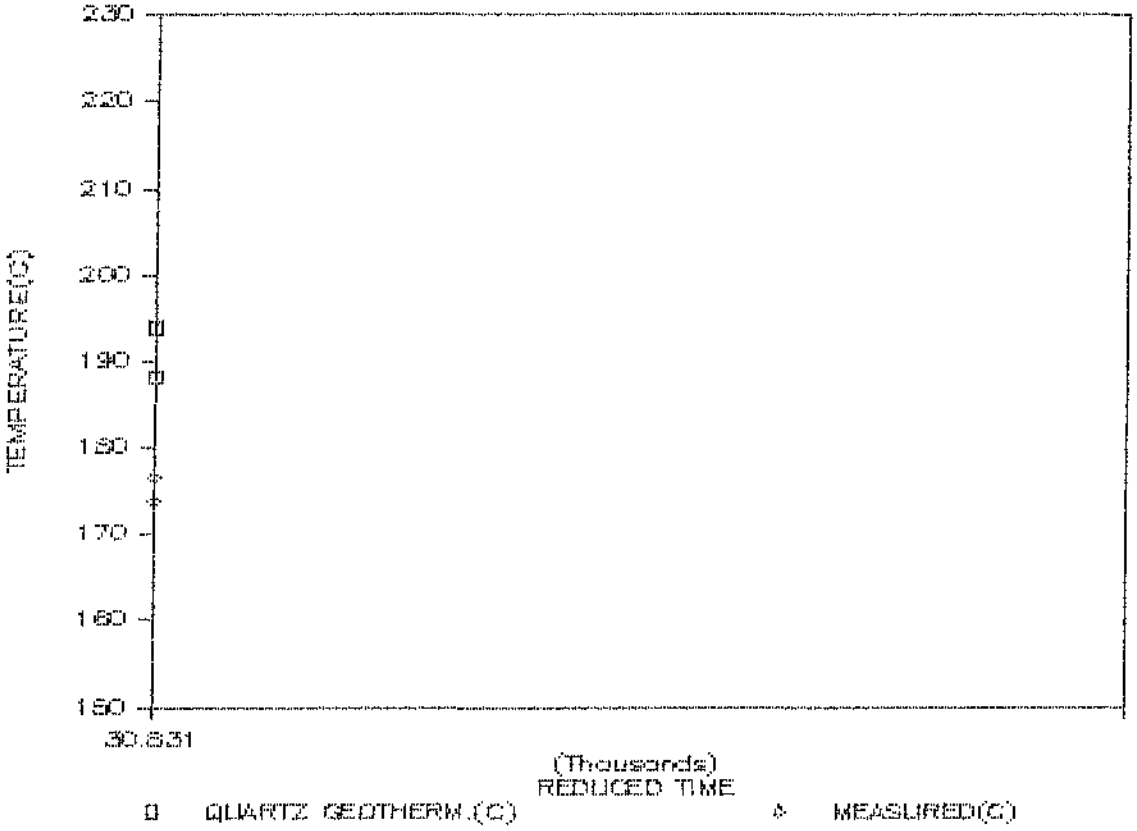
MAGMA HOLDINGS, EAST MESA




MAGMA HOLDINGS, EAST MESA
WELL 88-7
1
0.9
0.8
0.7
0.6
0.5
K/Ko
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME

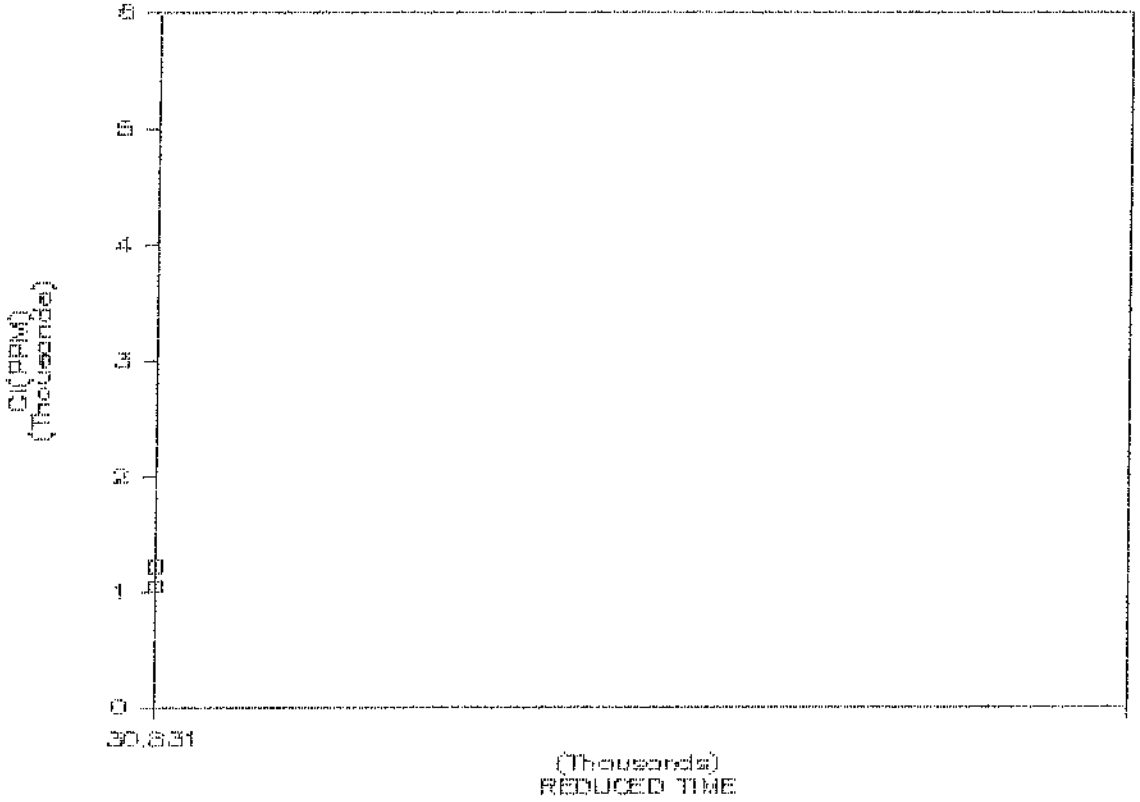
MAGMA HOLDINGS, EAST MESA

WELL 84-7



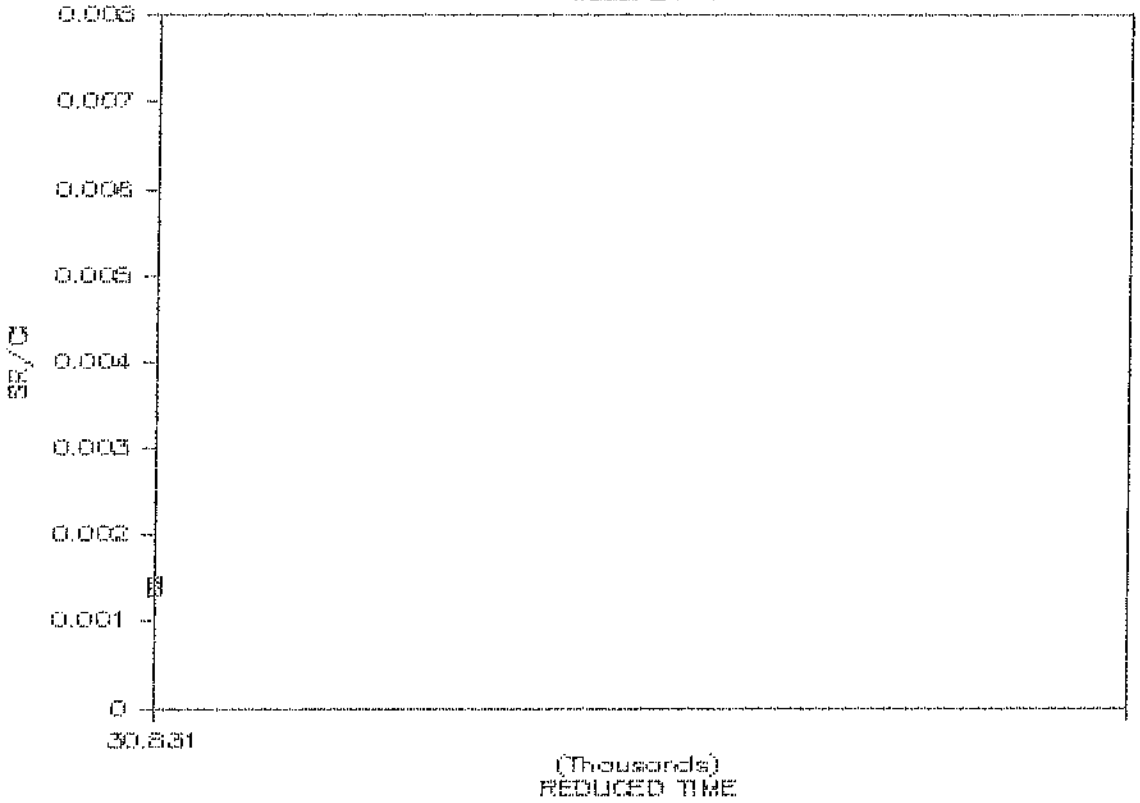
MAGMA HOLDINGS, EAST MESA

WELL 54-7



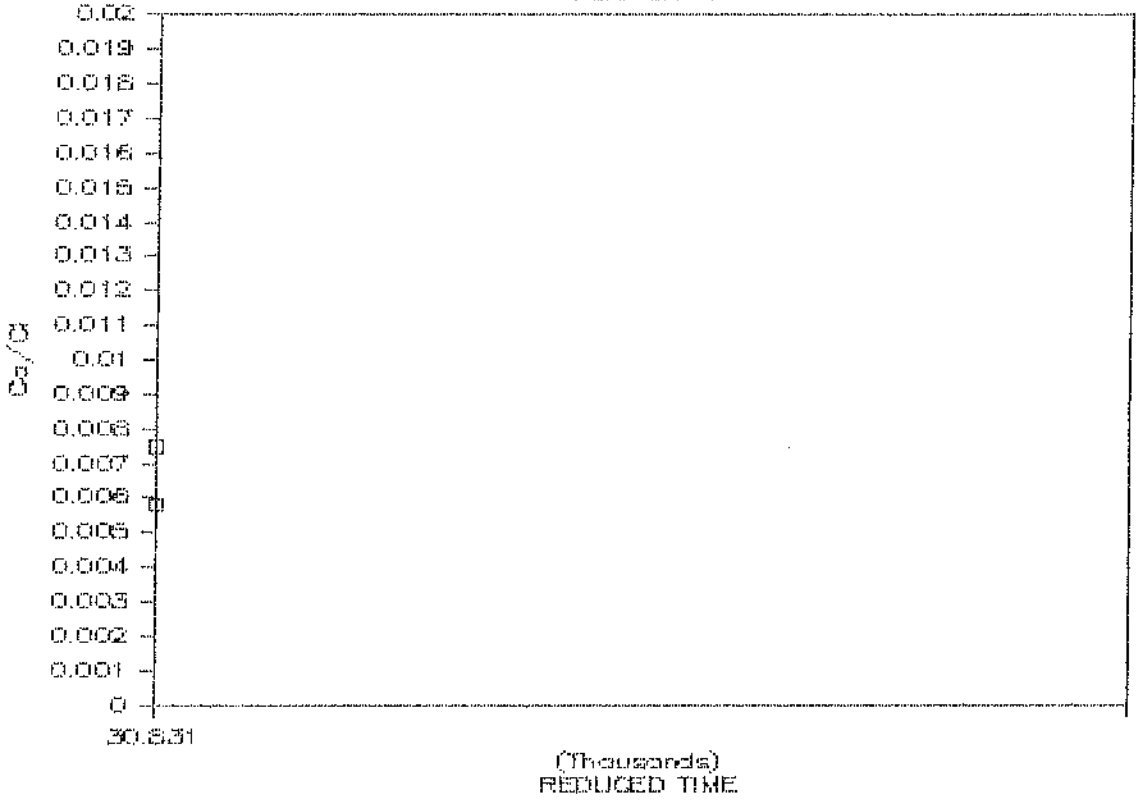
MAGMA HOLDINGS, EAST MESA

WELL 84-7

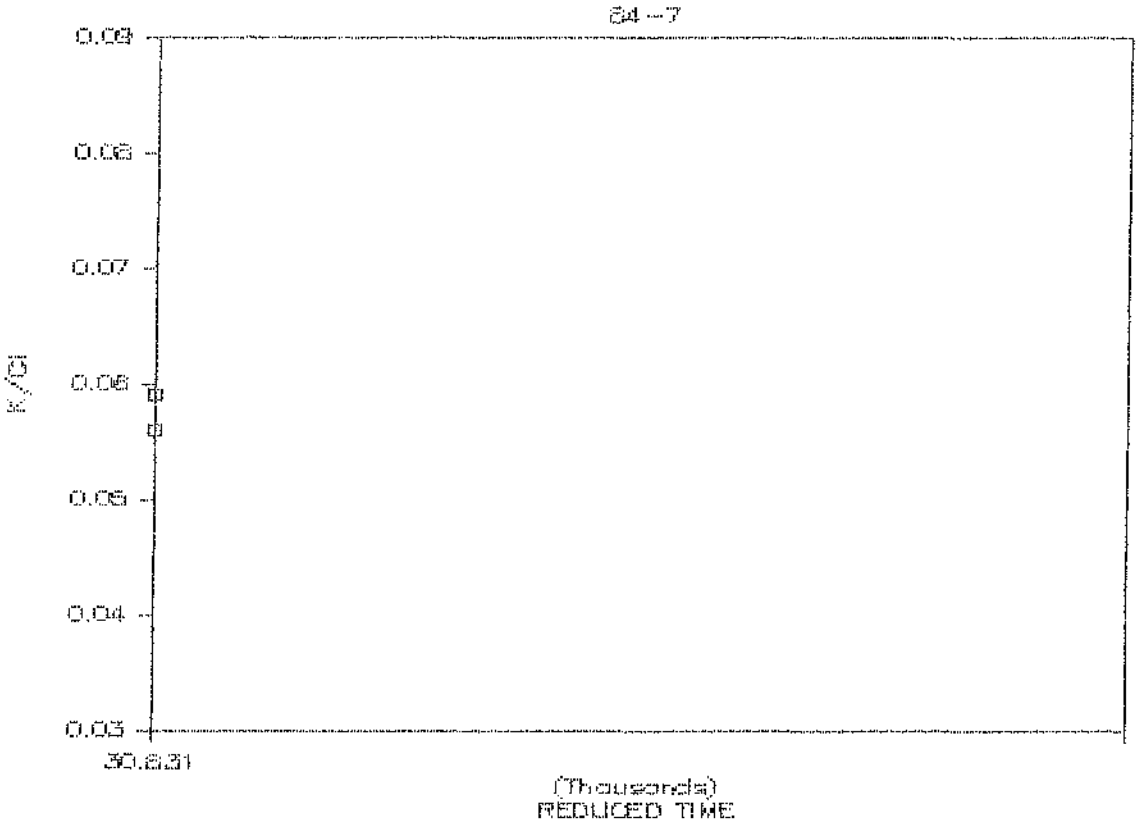


MAGMA HOLDINGS, EAST MESA

WELL 84-7

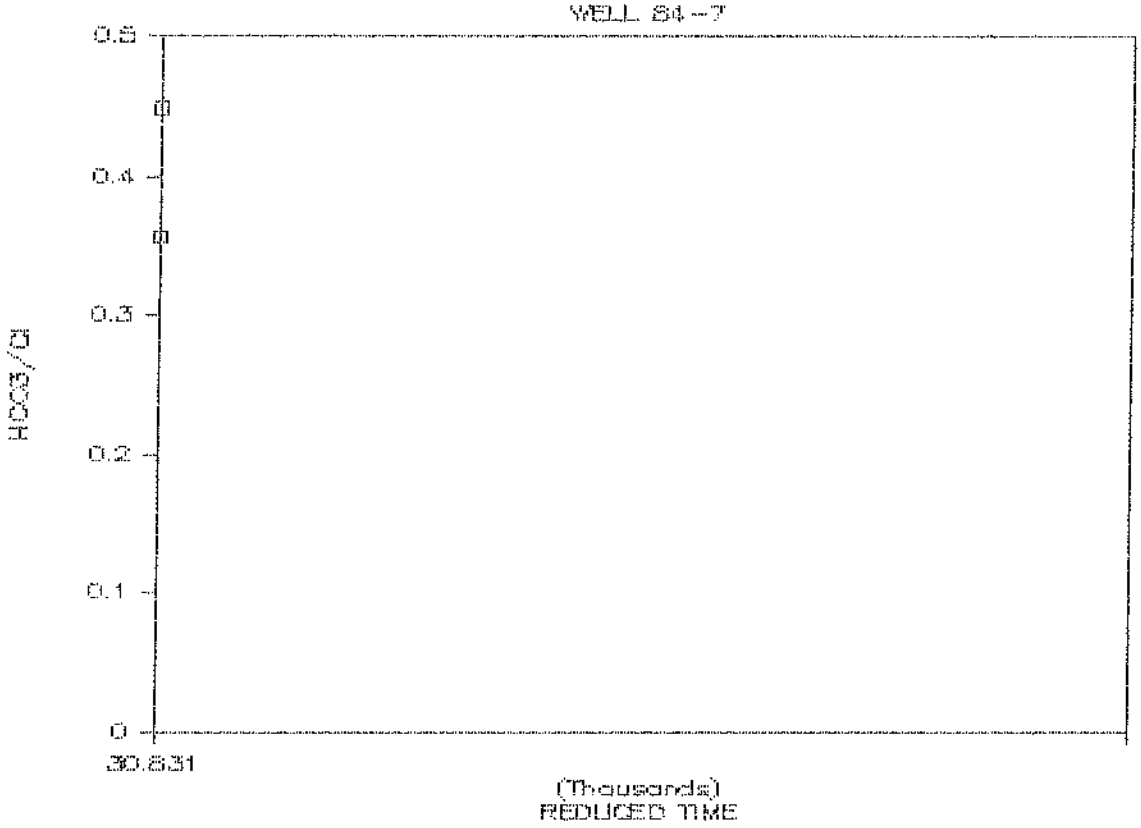


MAGMA HOLDINGS, EAST MESA



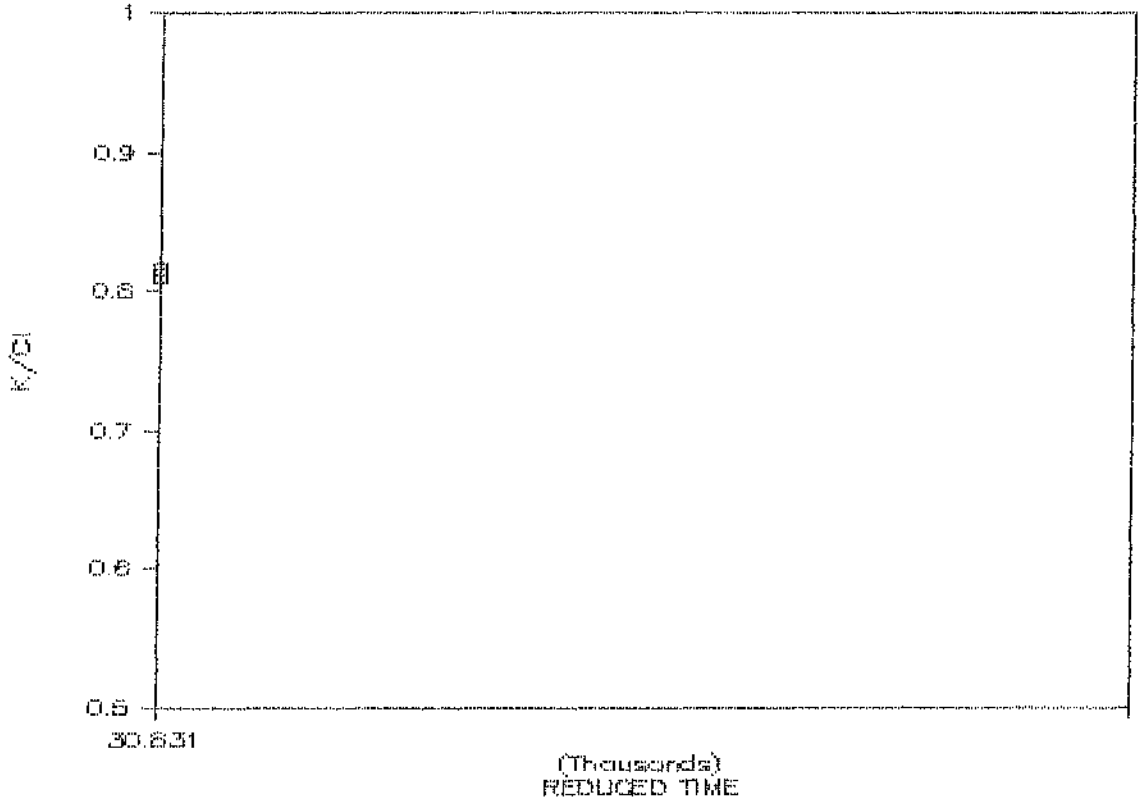
MAGMA HOLDINGS, EAST MESA

WELL 84-7

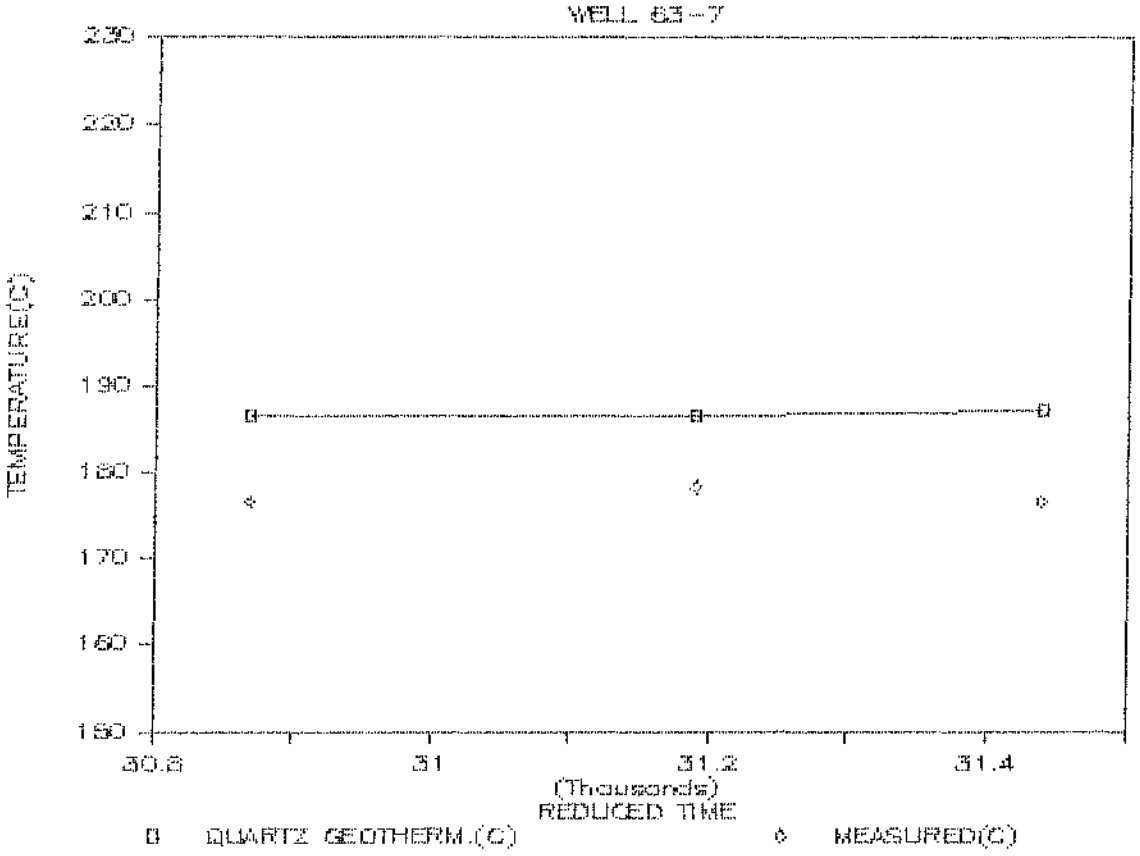


MAGMA HOLDINGS, EAST MESA

WELL 84-7

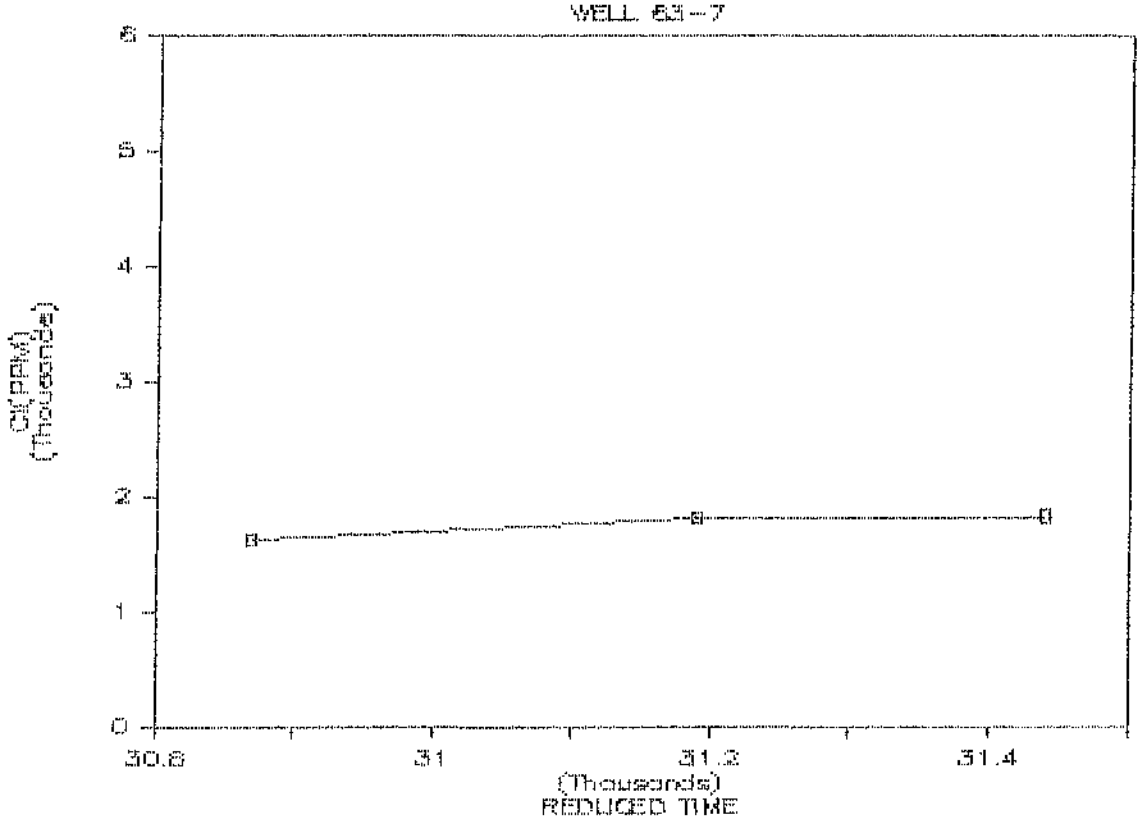


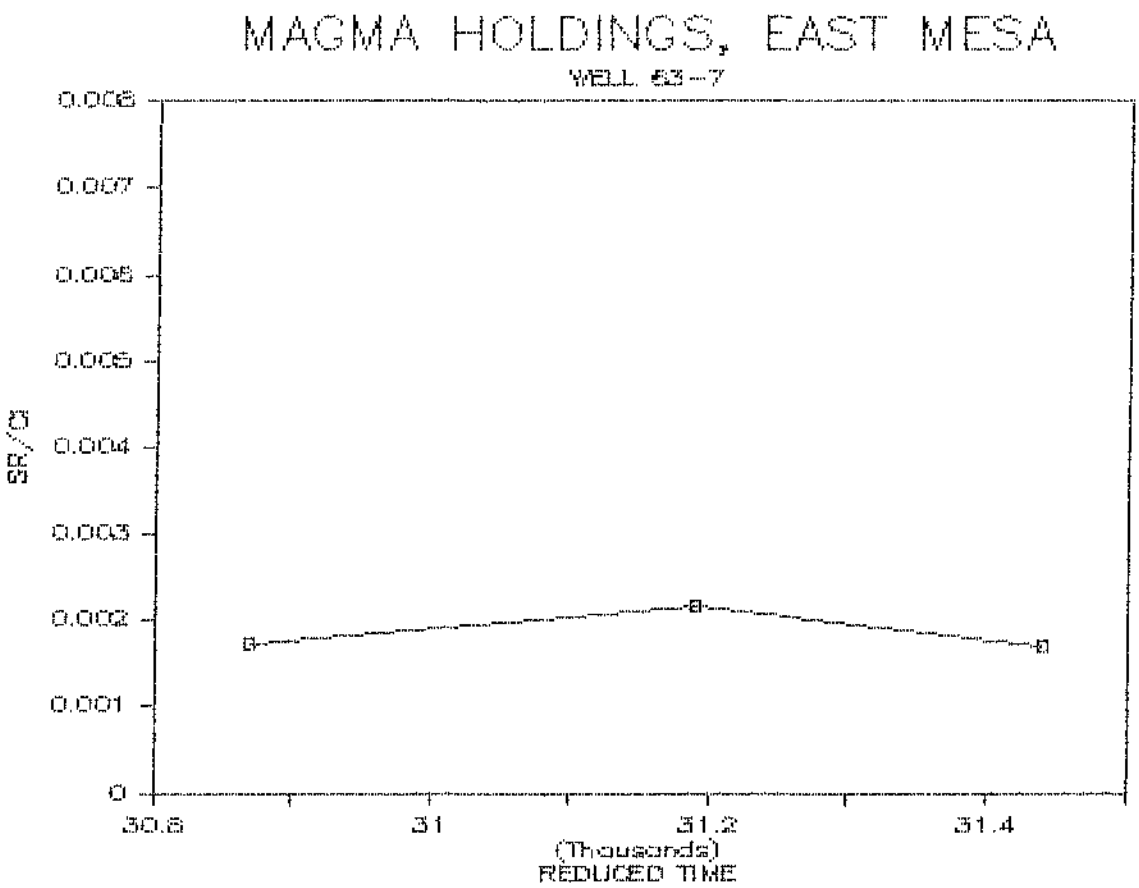
MAGMA HOLDINGS, EAST MESA



MAGMA HOLDINGS, EAST MESA

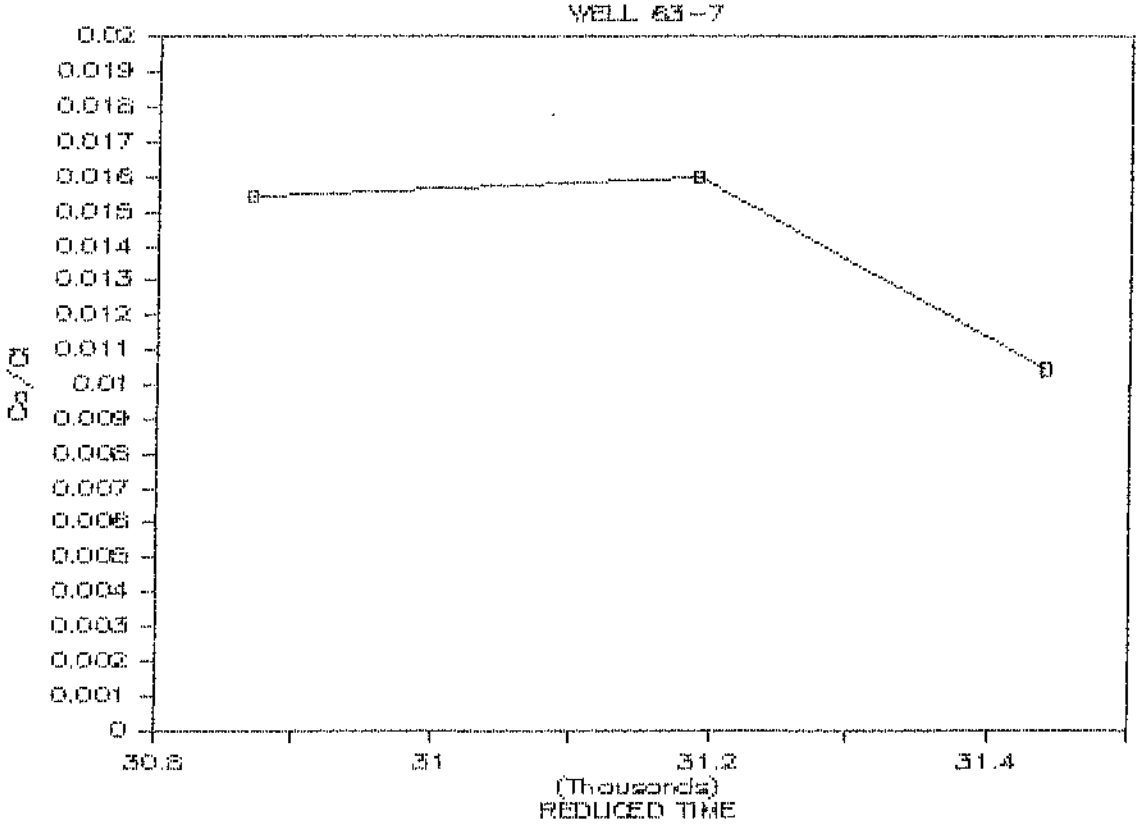
WELL 63-7

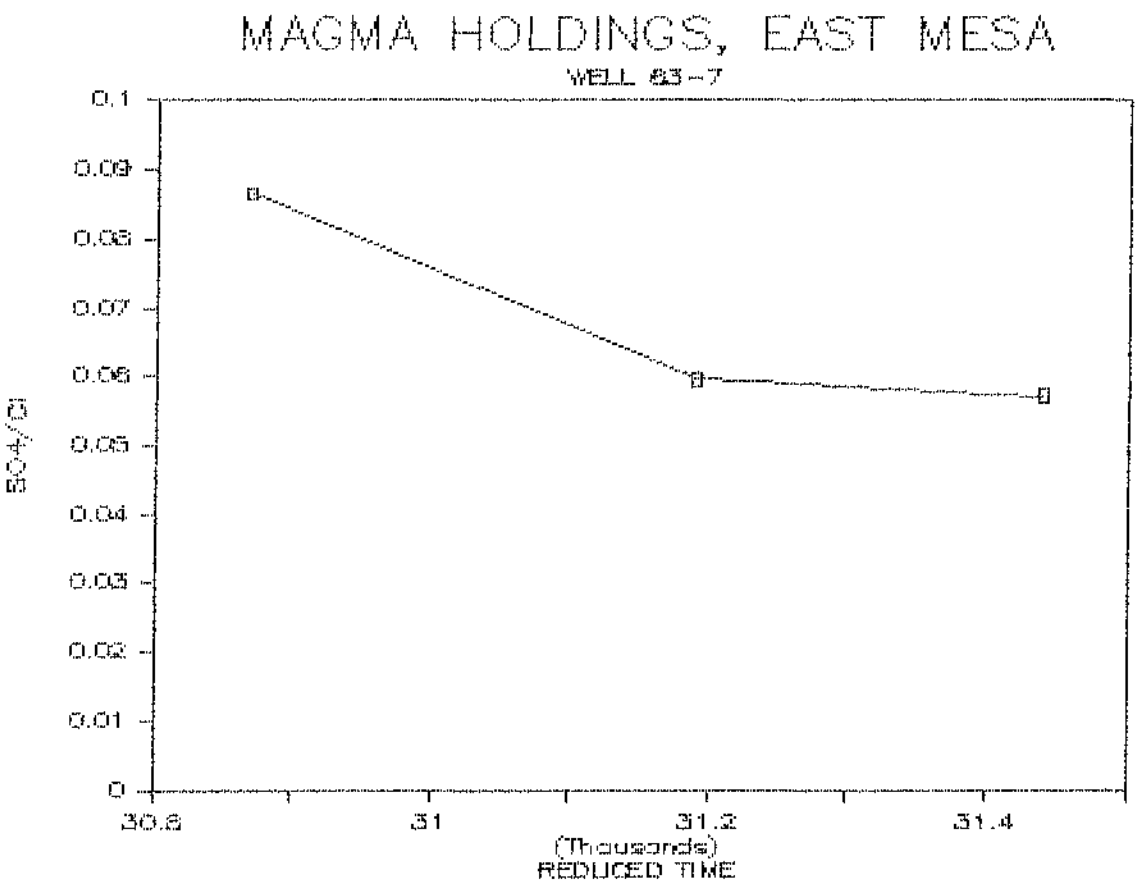



MAGMA HOLDINGS, EAST MESA
WELL 63-7
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
GR/CS
30.6
31
31.2
31.4
(Thousands)
REDUCED TIME

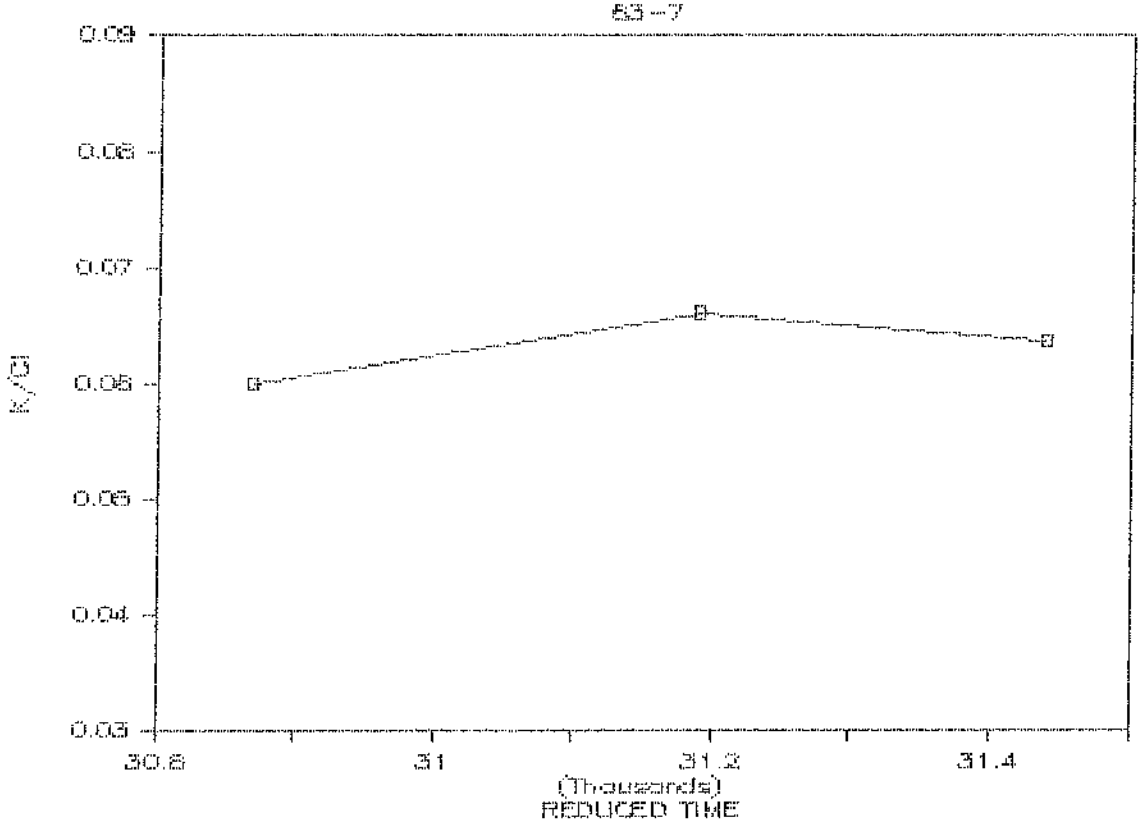
MAGMA HOLDINGS, EAST MESA

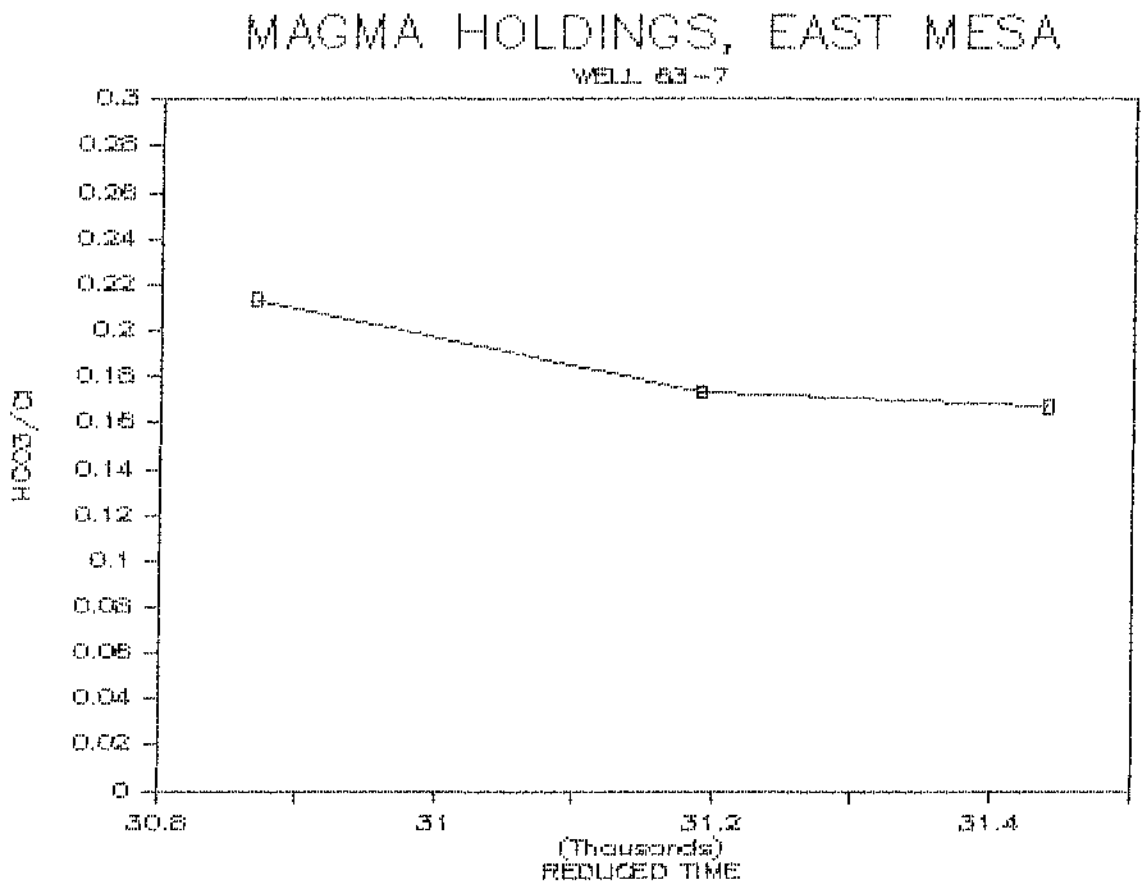
WELL #3-7

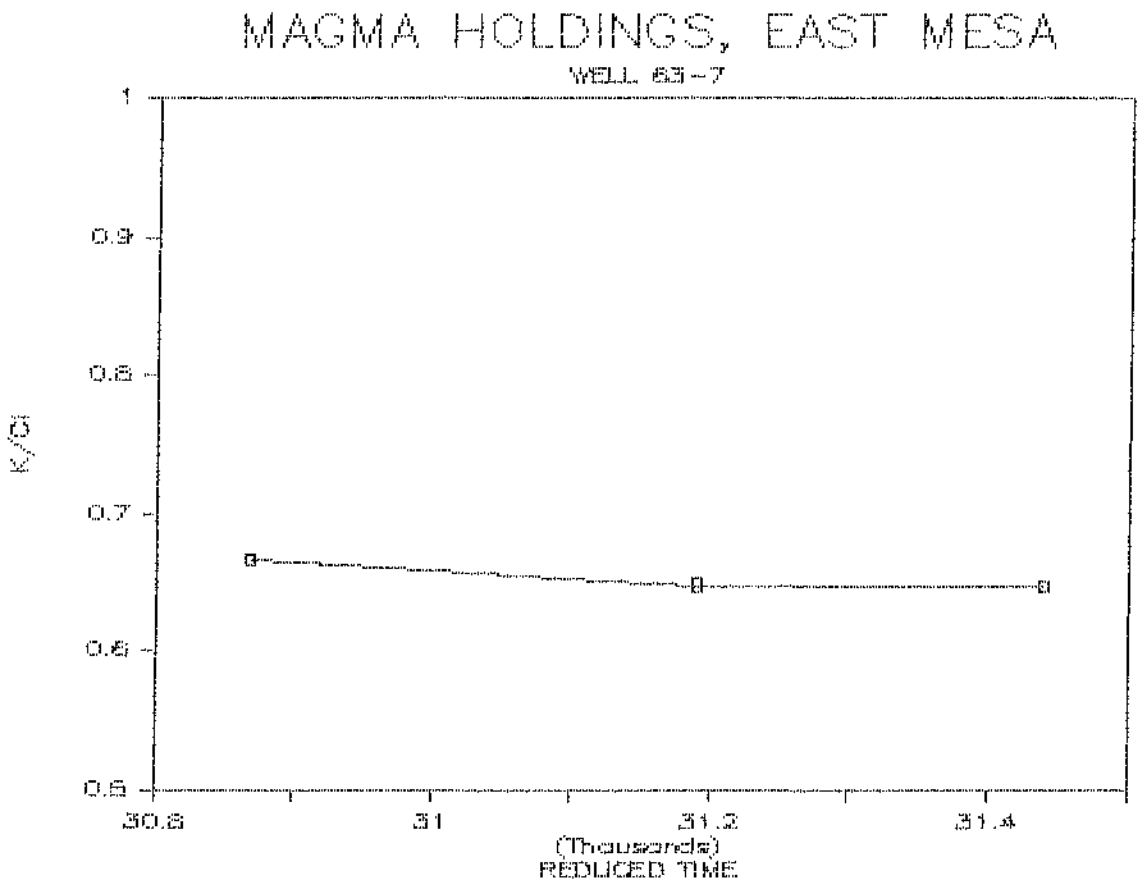



MAGMA HOLDINGS, EAST MESA
WELL #3-7
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
SO4/Cl
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

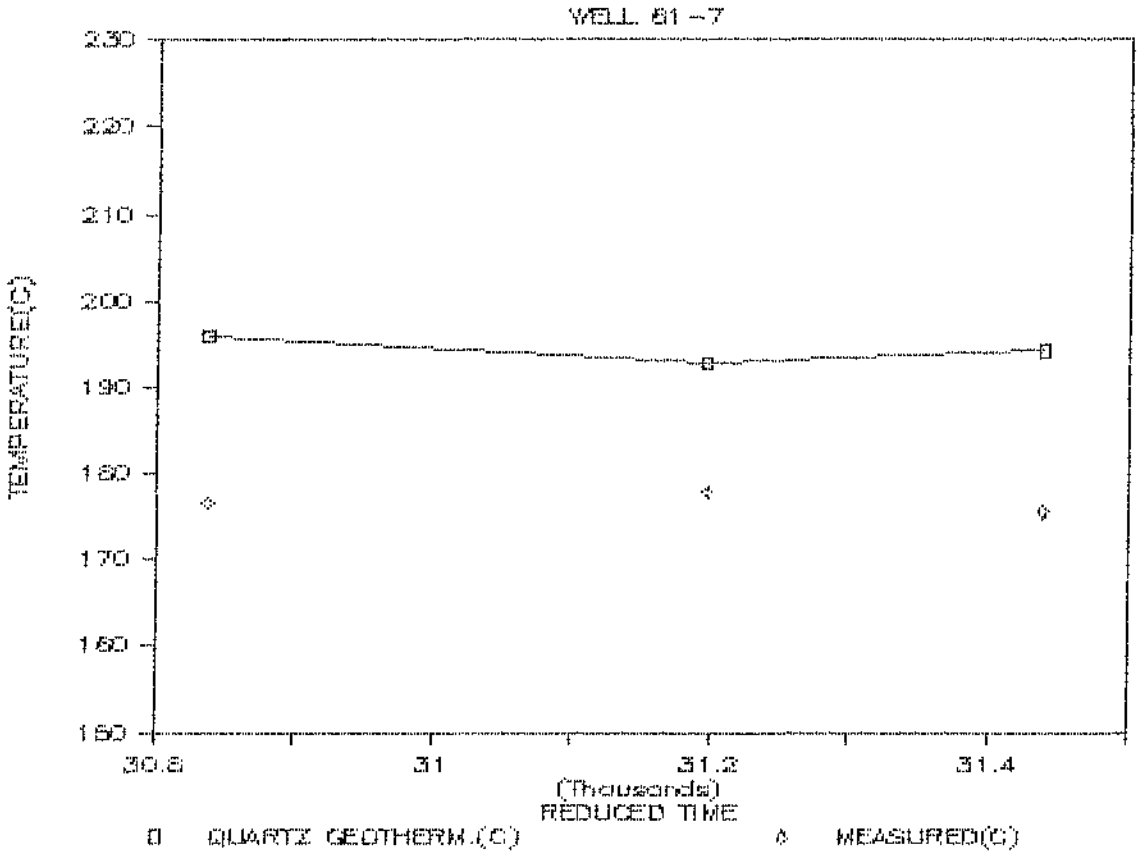
MAGMA HOLDINGS, EAST MESA




MAGMA HOLDINGS, EAST MESA
WELL 63-7
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
MCFD/BOPH
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

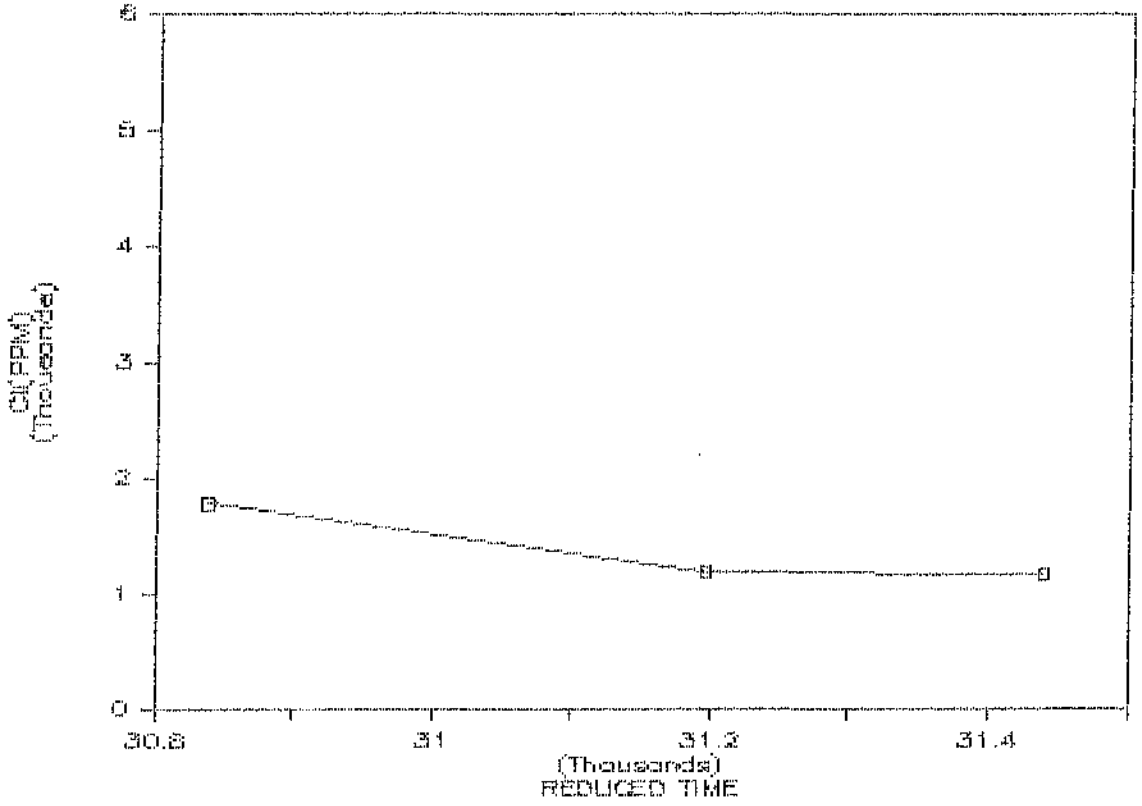

MAGMA HOLDINGS, EAST MESA
WELL 65-7
1
0.9
0.8
0.7
0.6
0.5
P/Z
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

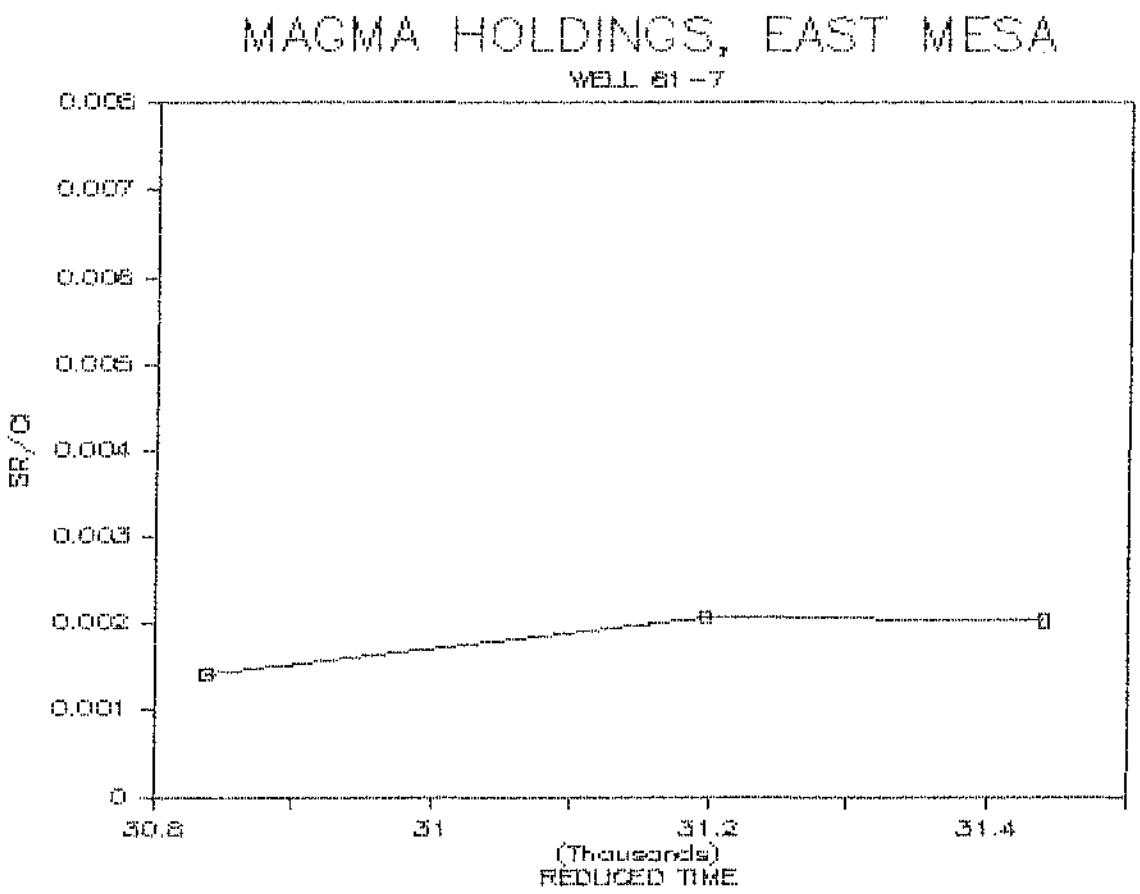
MAGMA HOLDINGS, EAST MESA



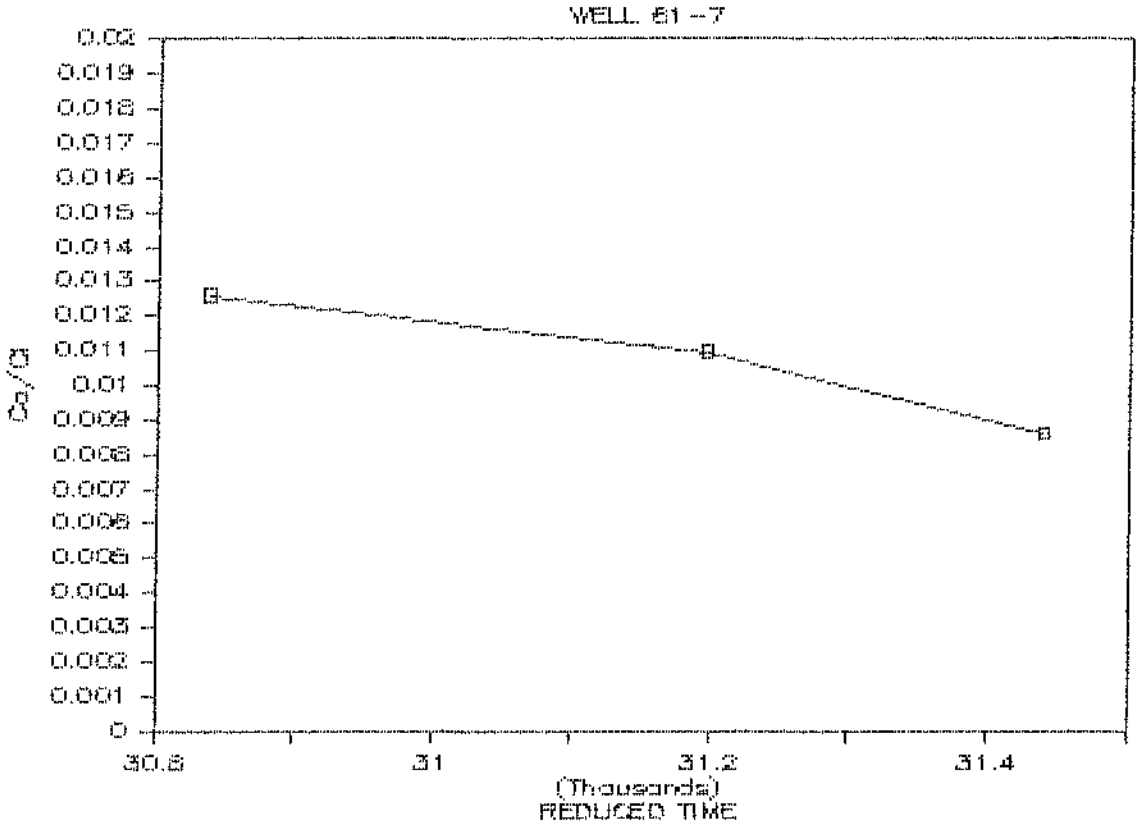
MAGMA HOLDINGS, EAST MESA

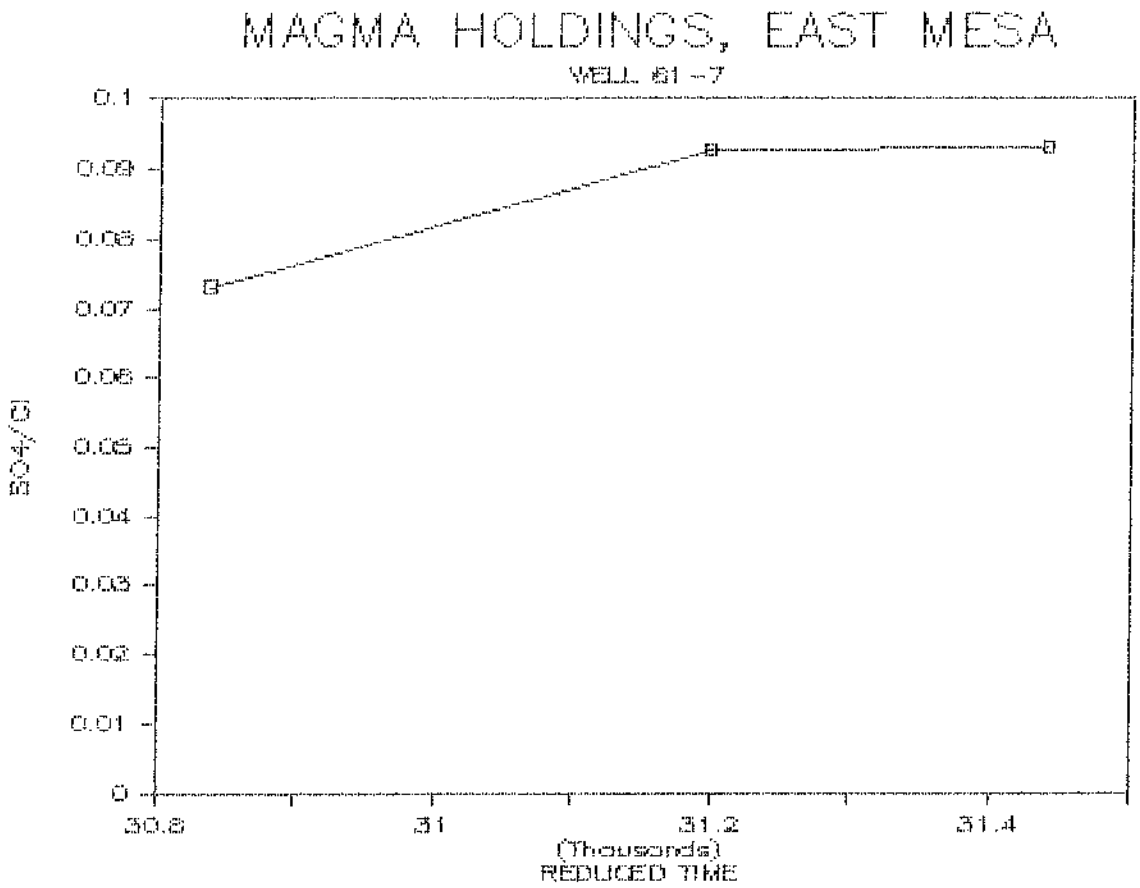
WELL 61 -7

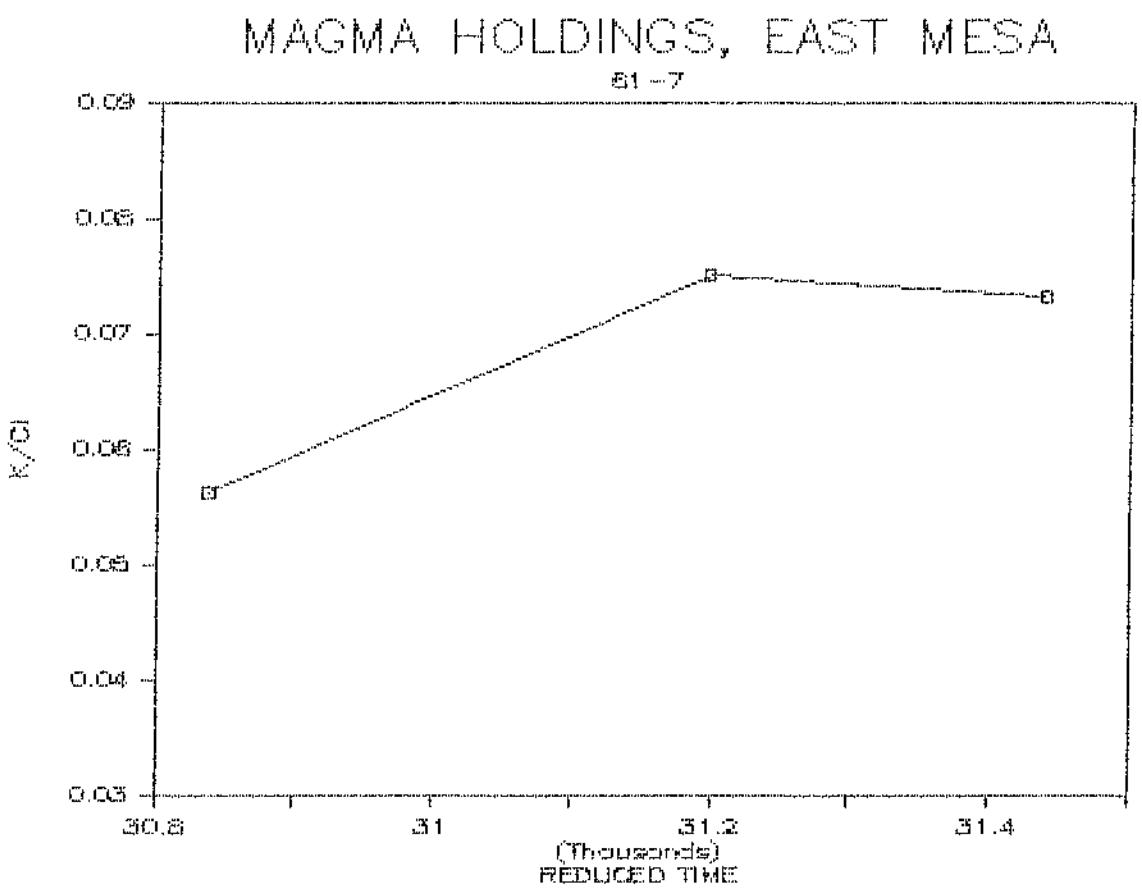



MAGMA HOLDINGS, EAST MESA
WELL 61-7
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
SR/O
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

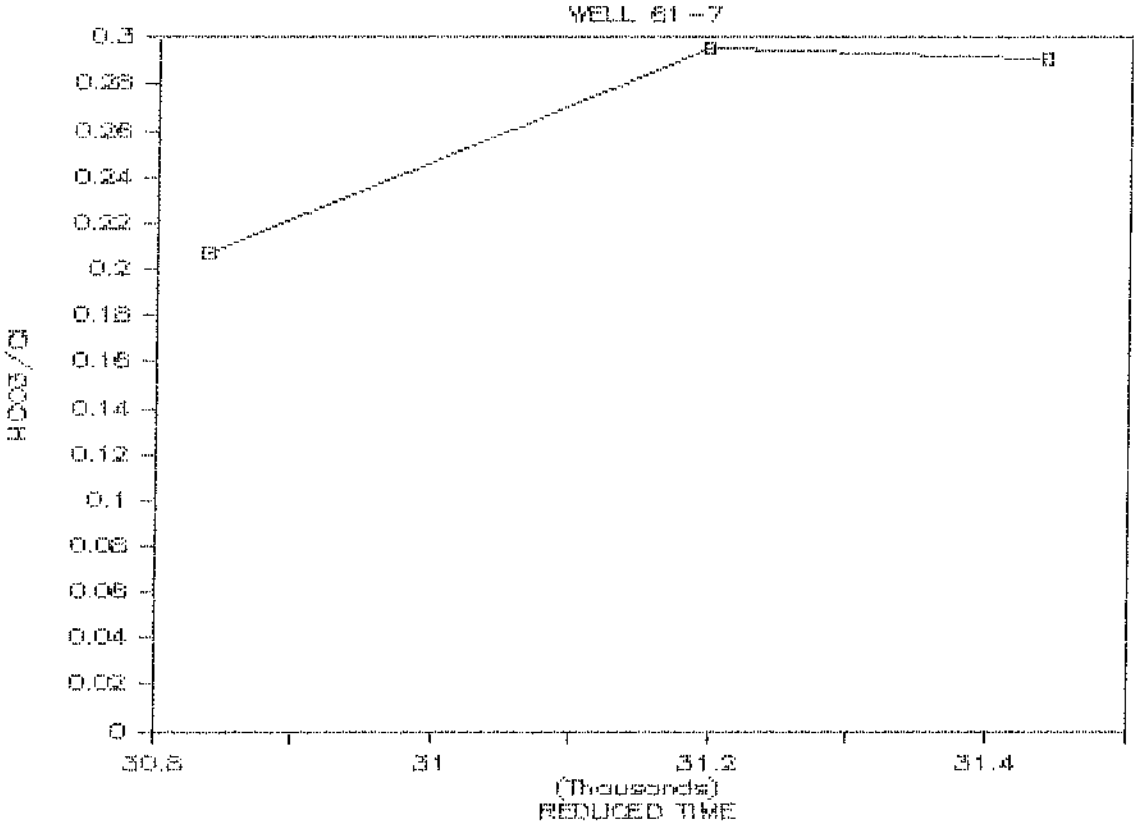
MAGMA HOLDINGS, EAST MESA

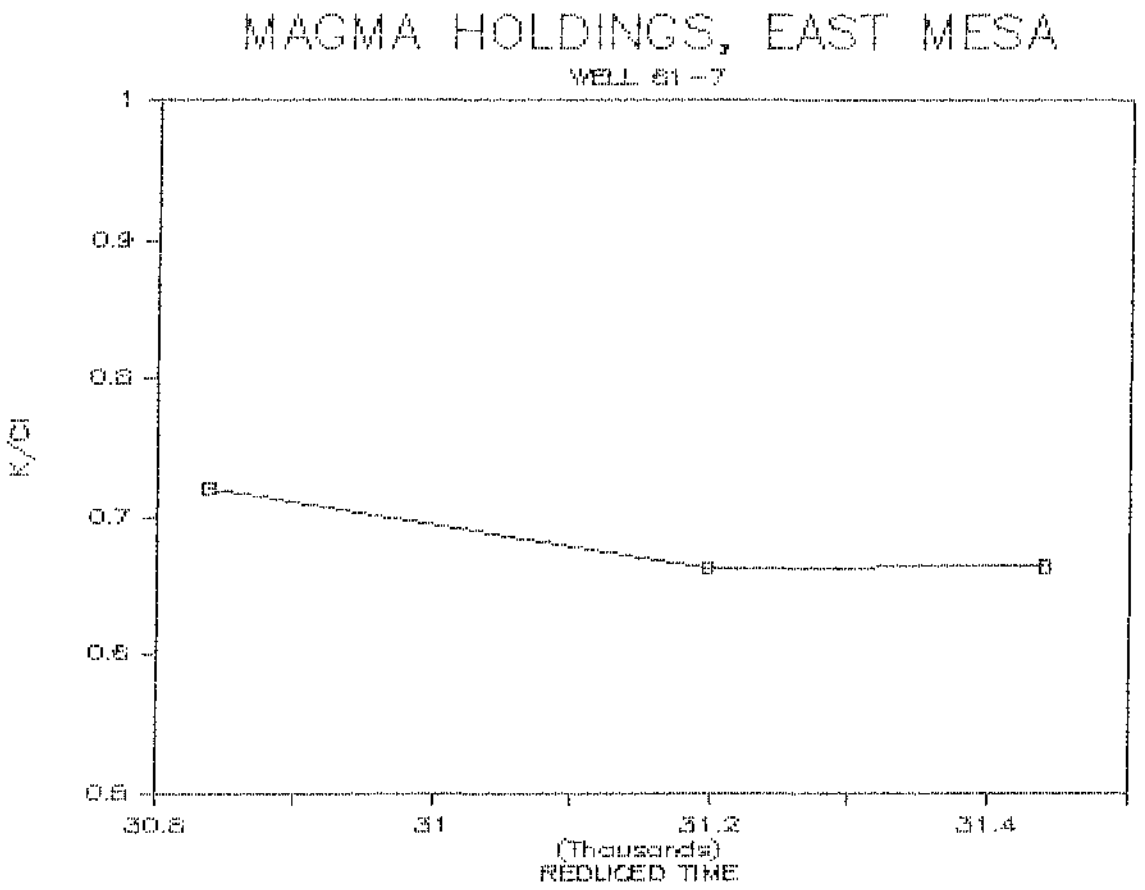



MAGMA HOLDINGS, EAST MESA
WELL 61-7
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
SO4/Cl
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME


MAGMA HOLDINGS, EAST MESA
61-7
0.09
0.08
0.07
0.06
0.05
0.04
0.03
K/Q
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

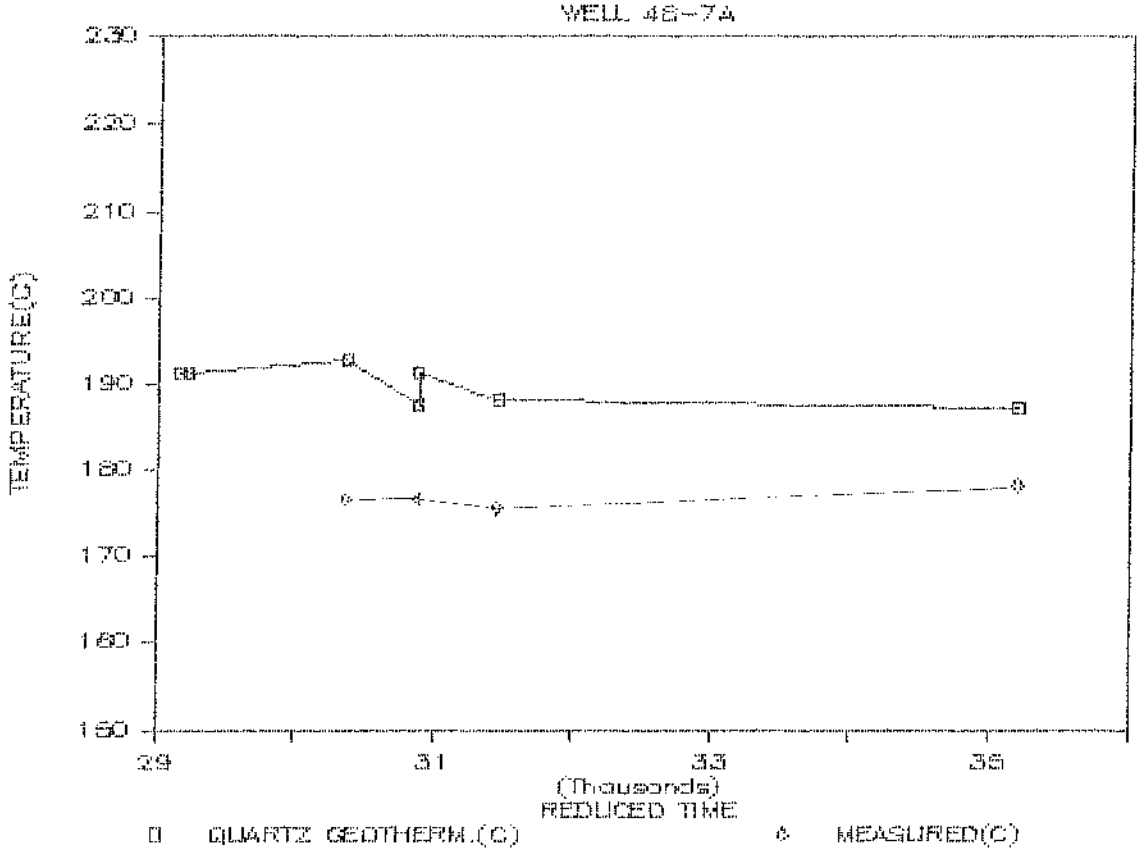
MAGMA HOLDINGS, EAST MESA



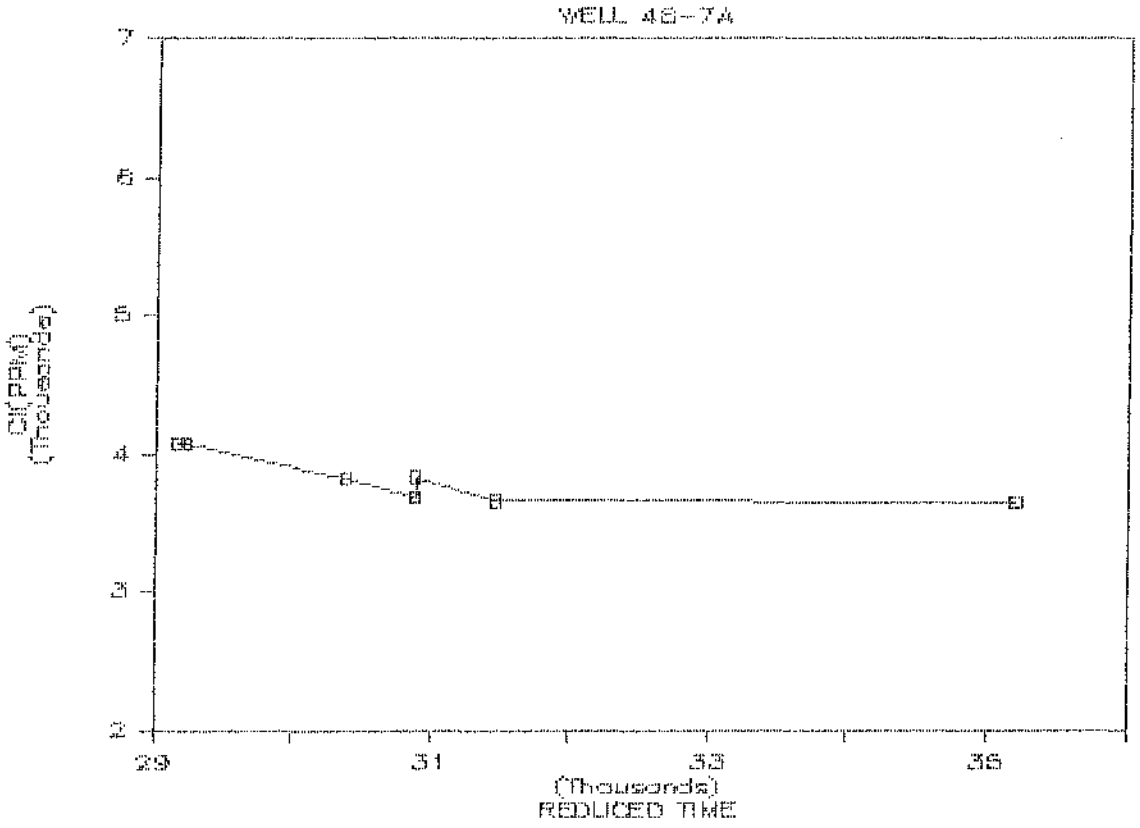

MAGMA HOLDINGS, EAST MESA
WELL 81 - 7
1
0.9
0.8
0.7
0.6
0.5
P/Z
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME

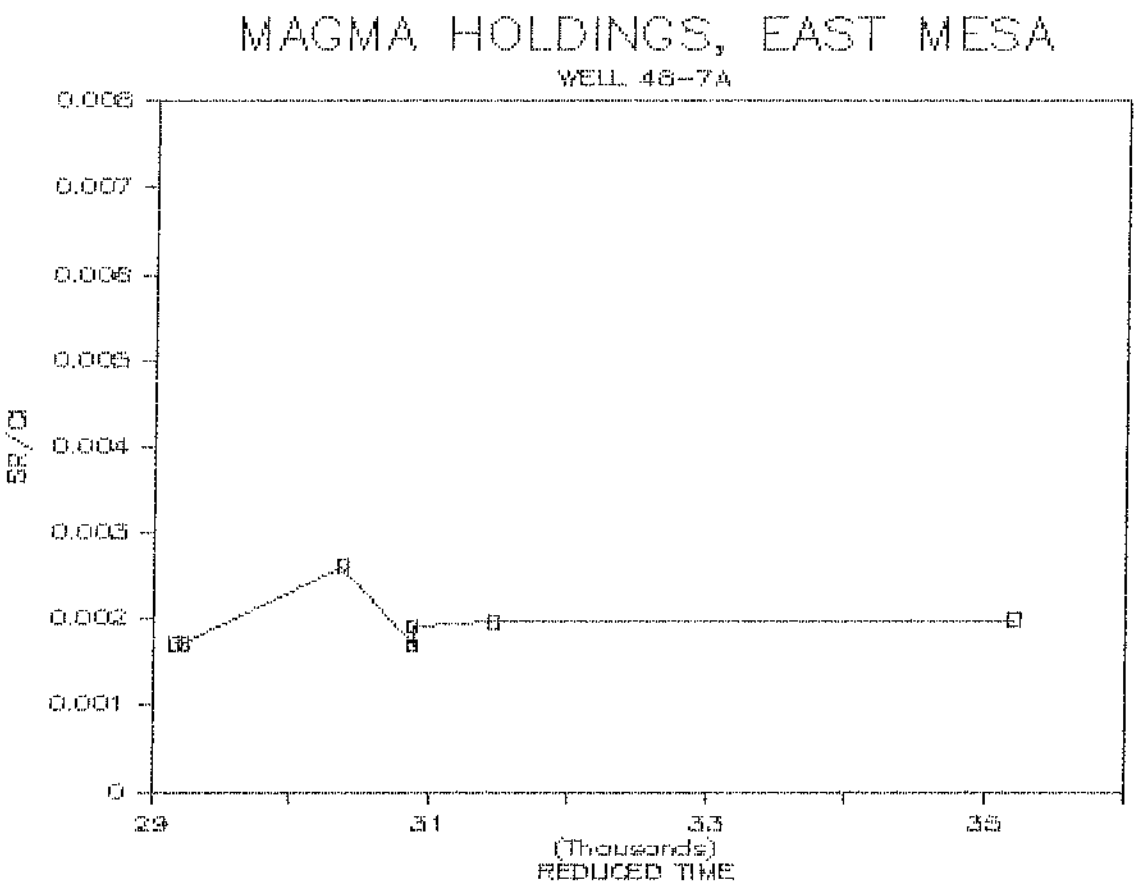
MAGMA HOLDINGS, EAST MESA

WELL 46-7A



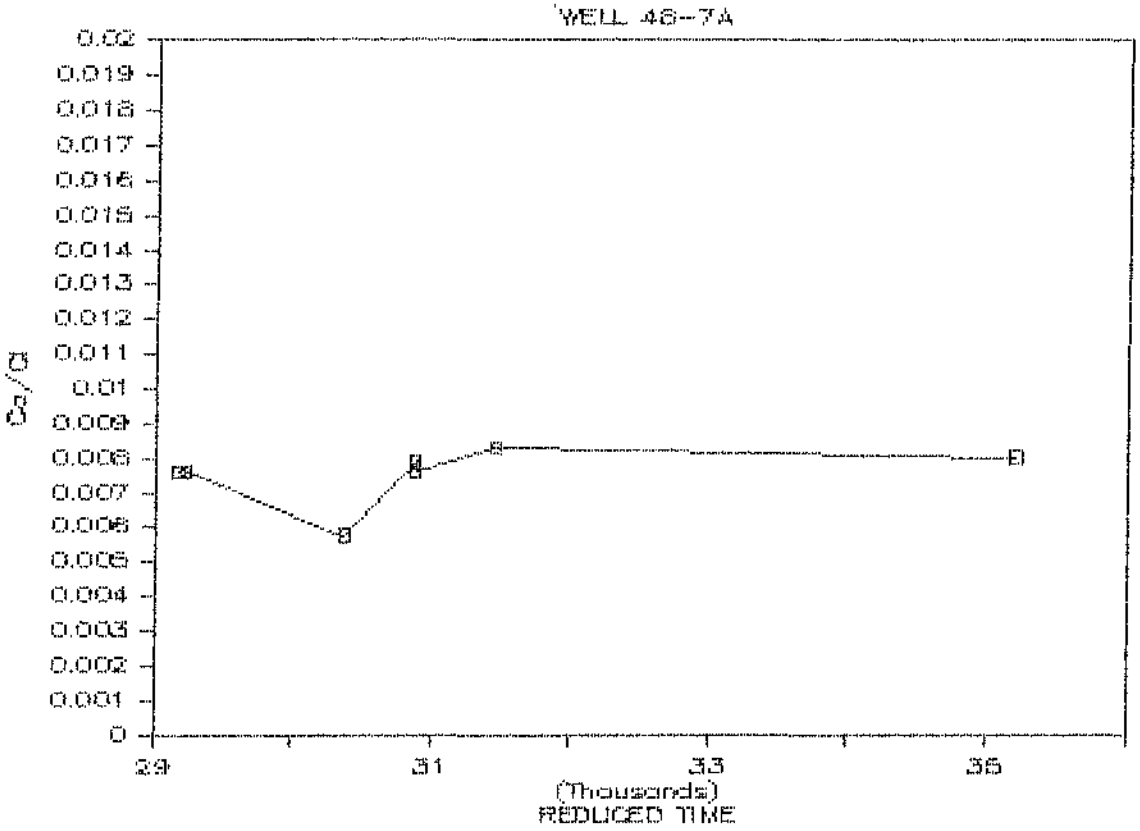
MAGMA HOLDINGS, EAST MESA



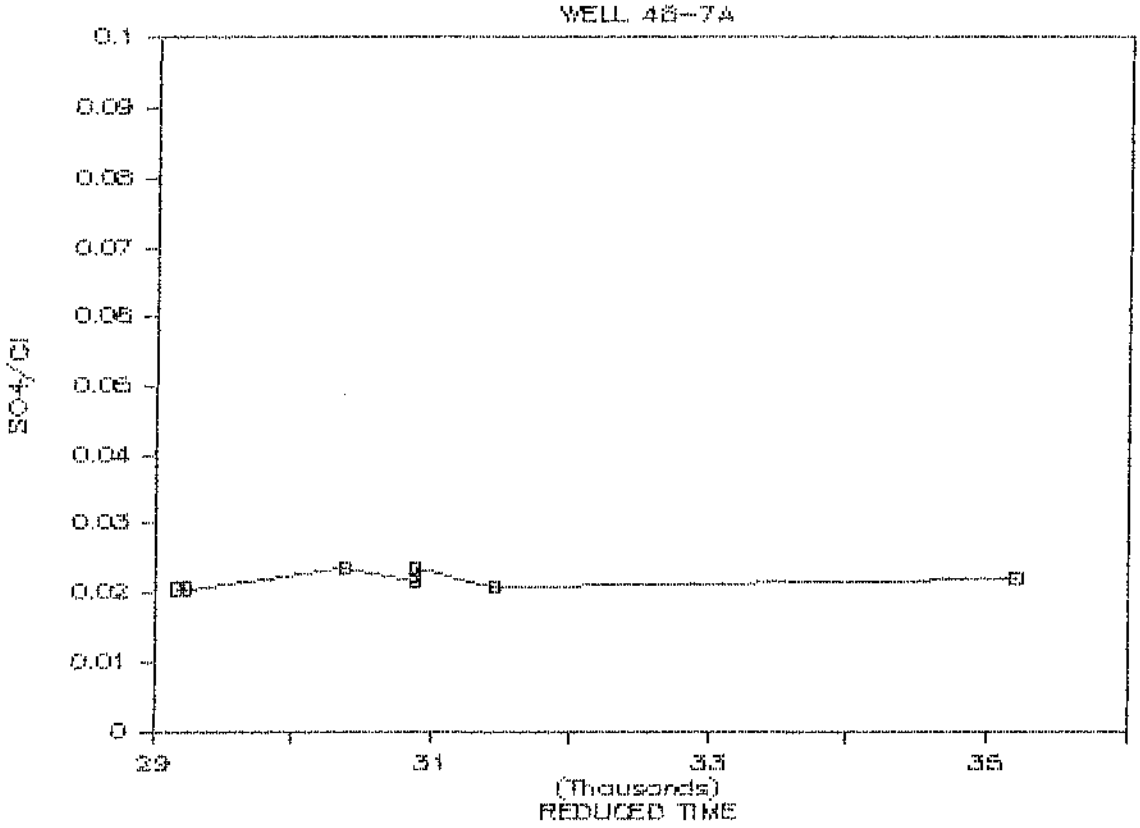

MAGMA HOLDINGS, EAST MESA
WELL 46-7A
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Q/ΔP
29
31
33
35
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

WELL 46-7A

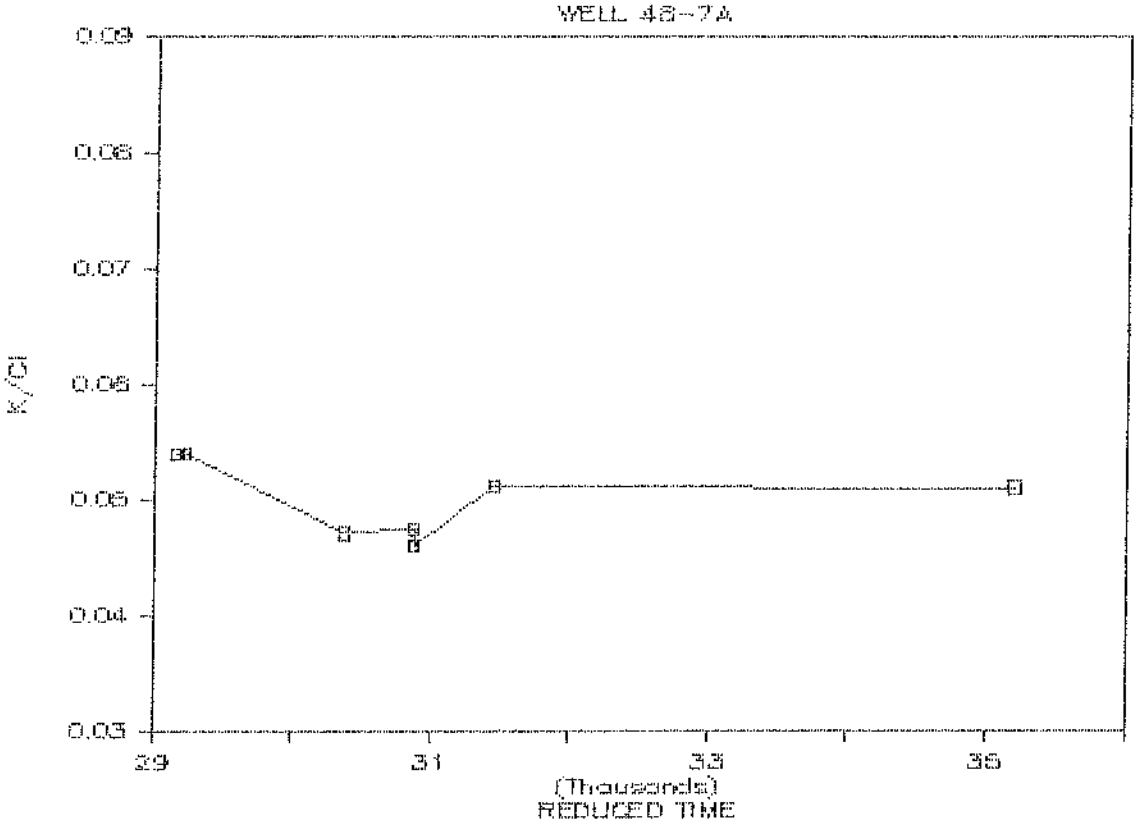


MAGMA HOLDINGS, EAST MESA



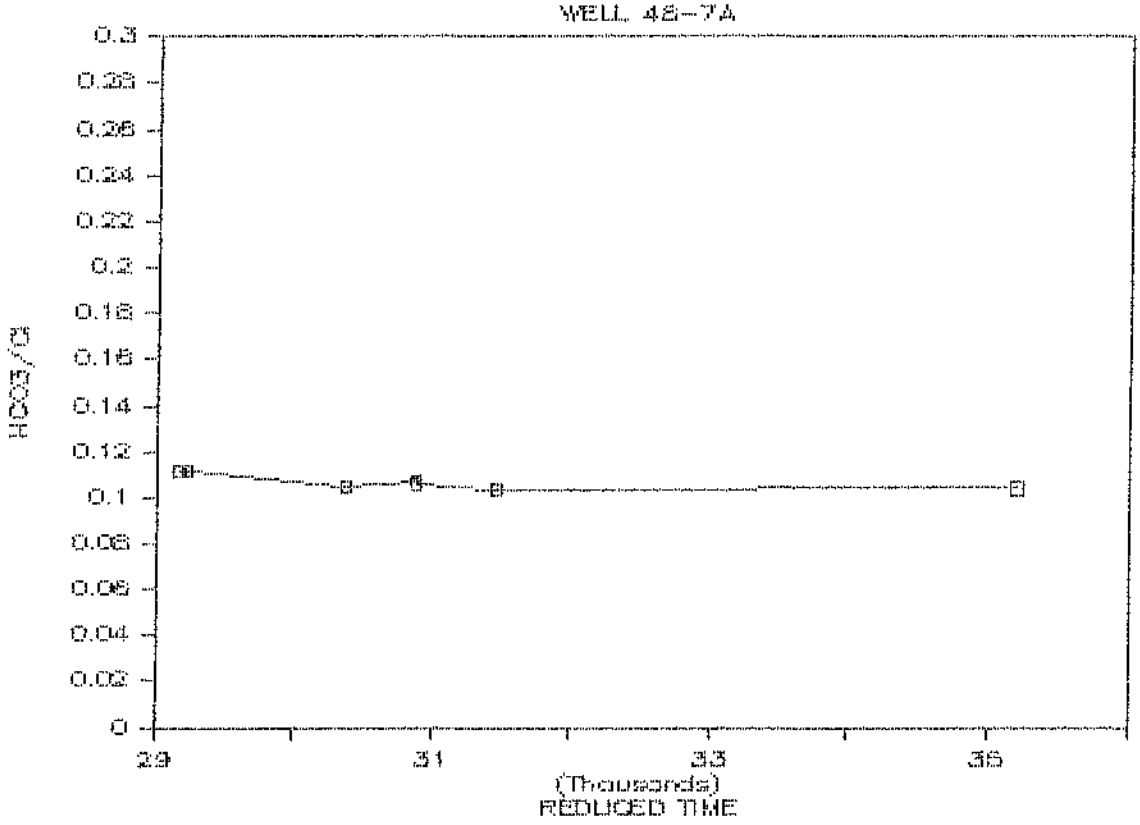
MAGMA HOLDINGS, EAST MESA

WELL 48-7A



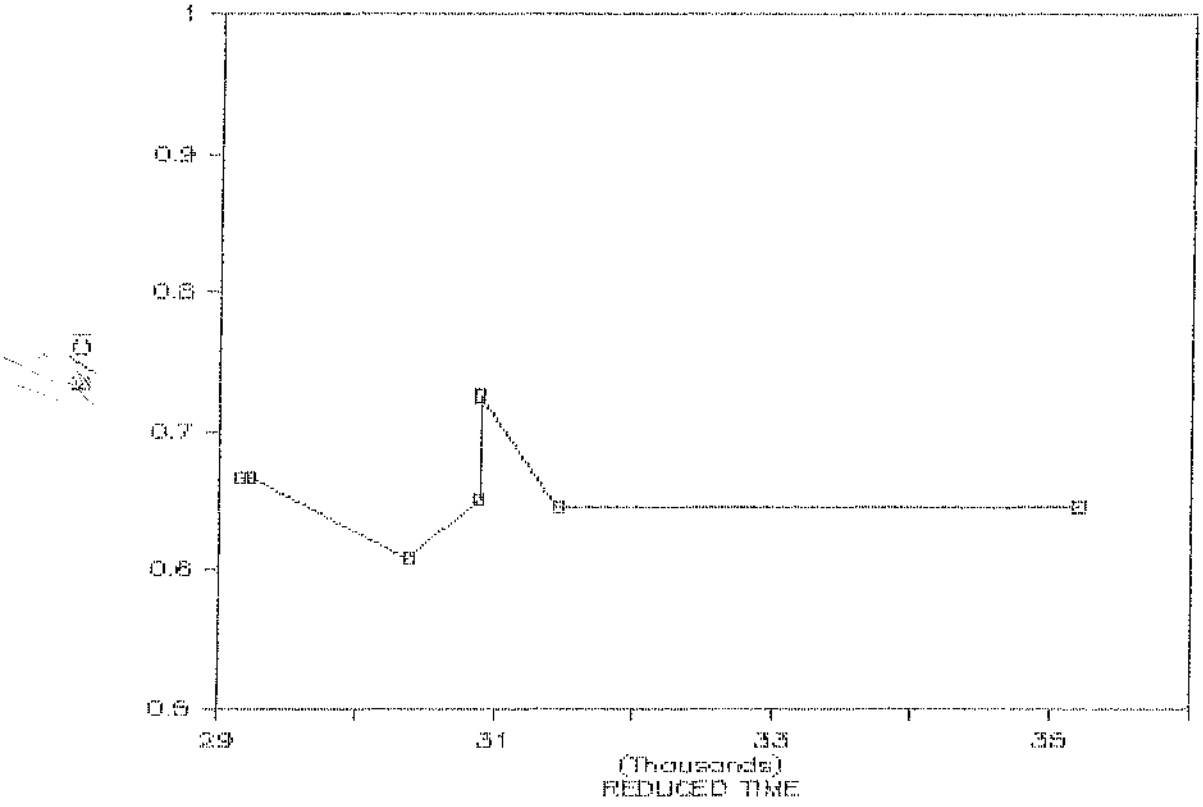
MAGMA HOLDINGS, EAST MESA

WELL 48-7A



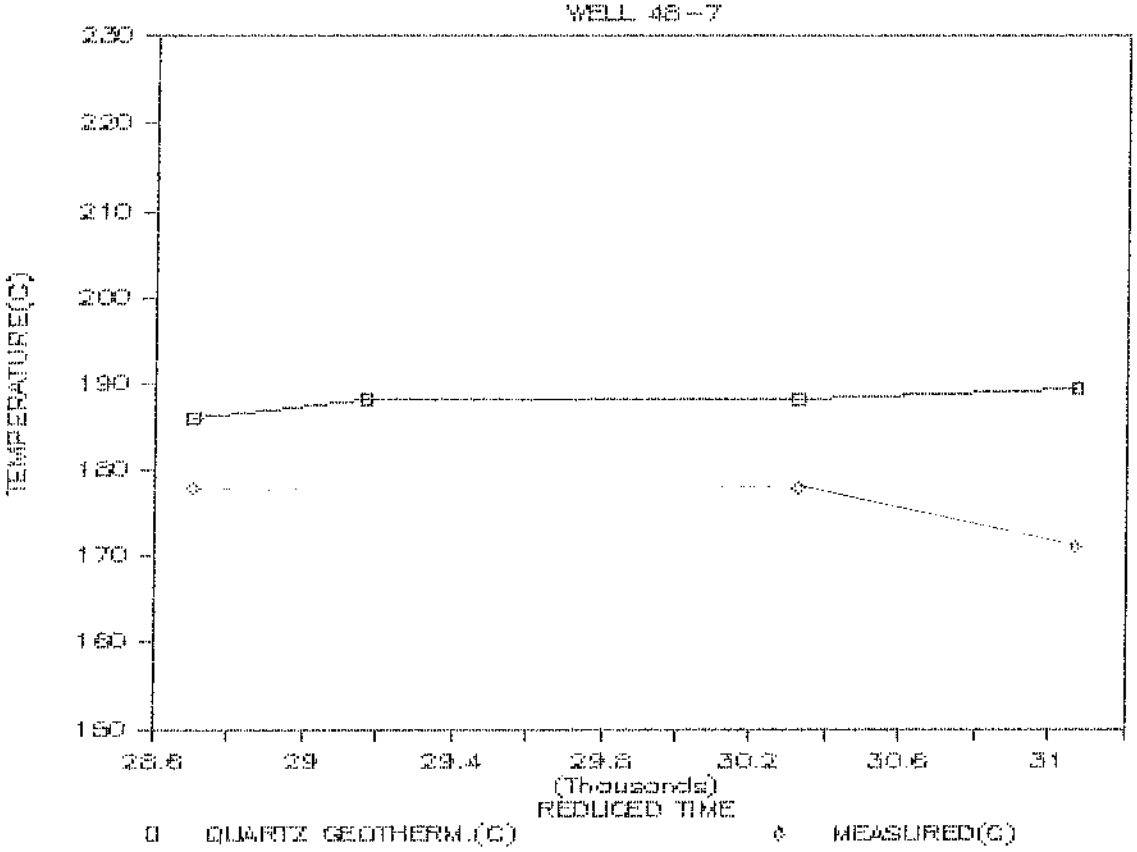
MAGMA HOLDINGS, EAST MESA

WELL 46-7A

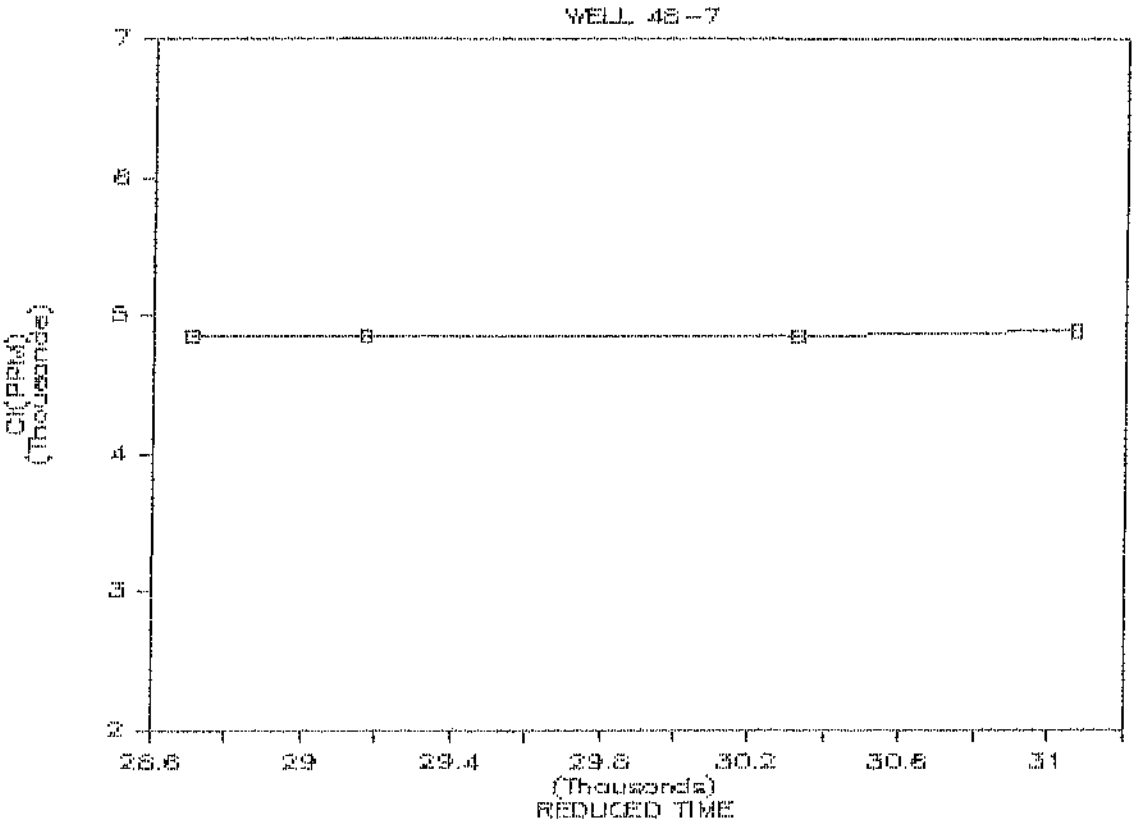


MAGMA HOLDINGS, EAST MESA

WELL 48-7

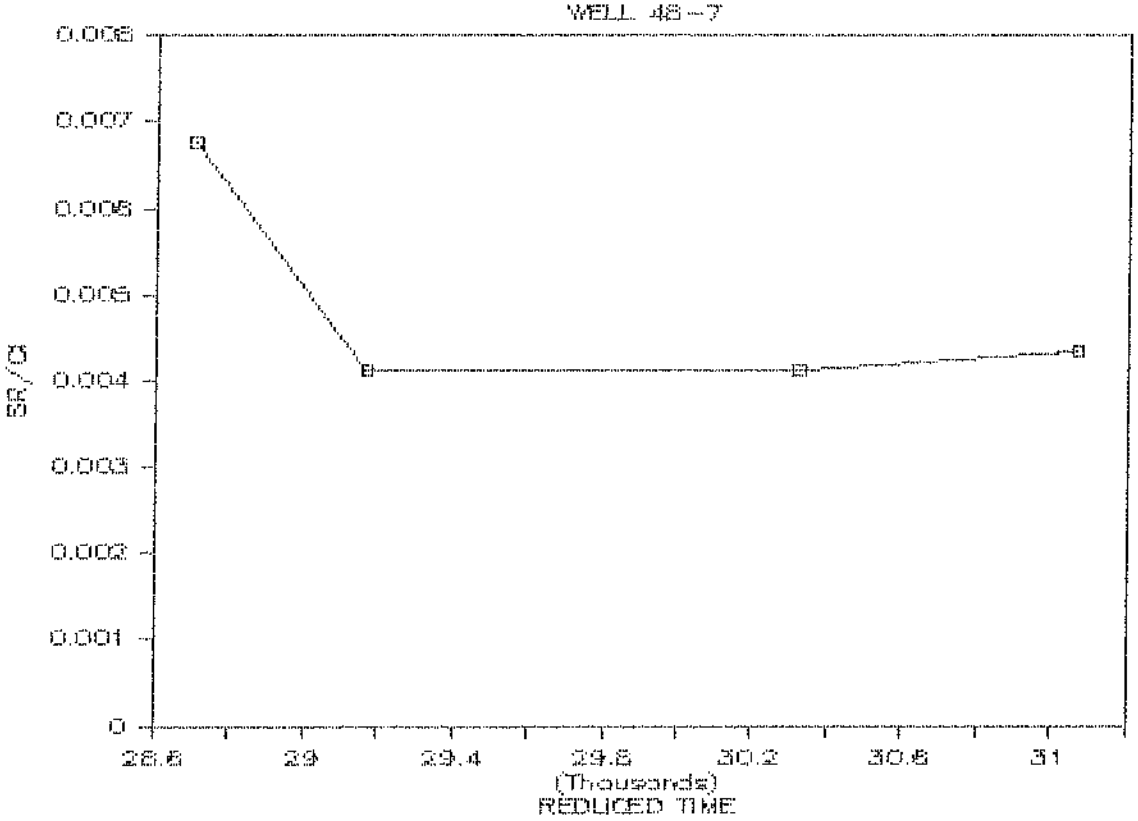


MAGMA HOLDINGS, EAST MESA

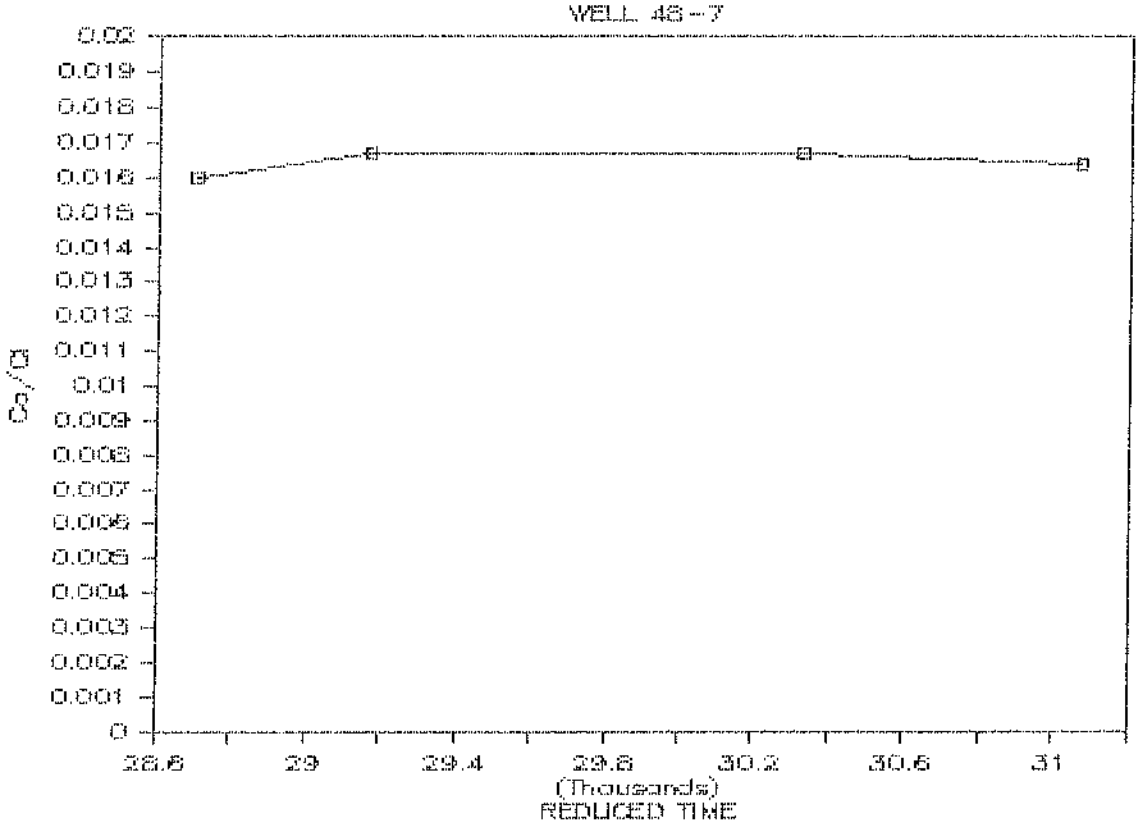


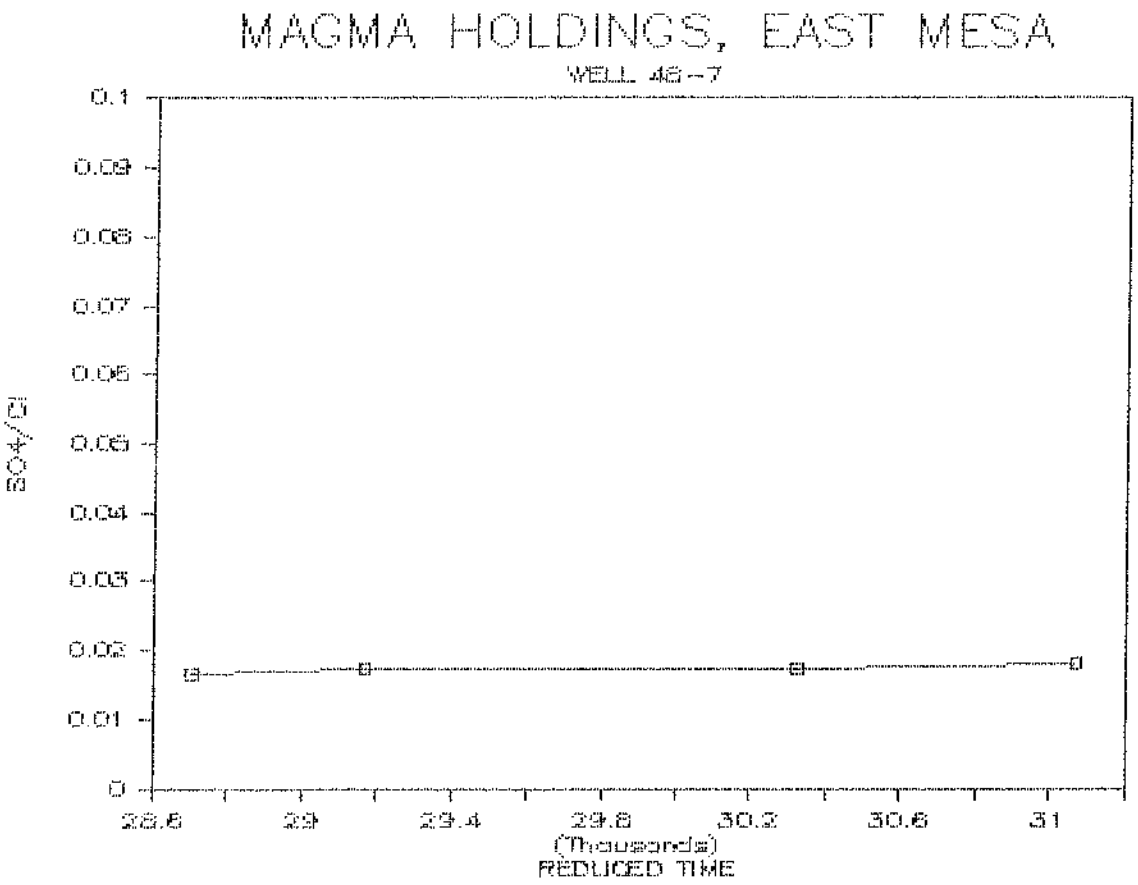
MAGMA HOLDINGS, EAST MESA

WELL 48-7



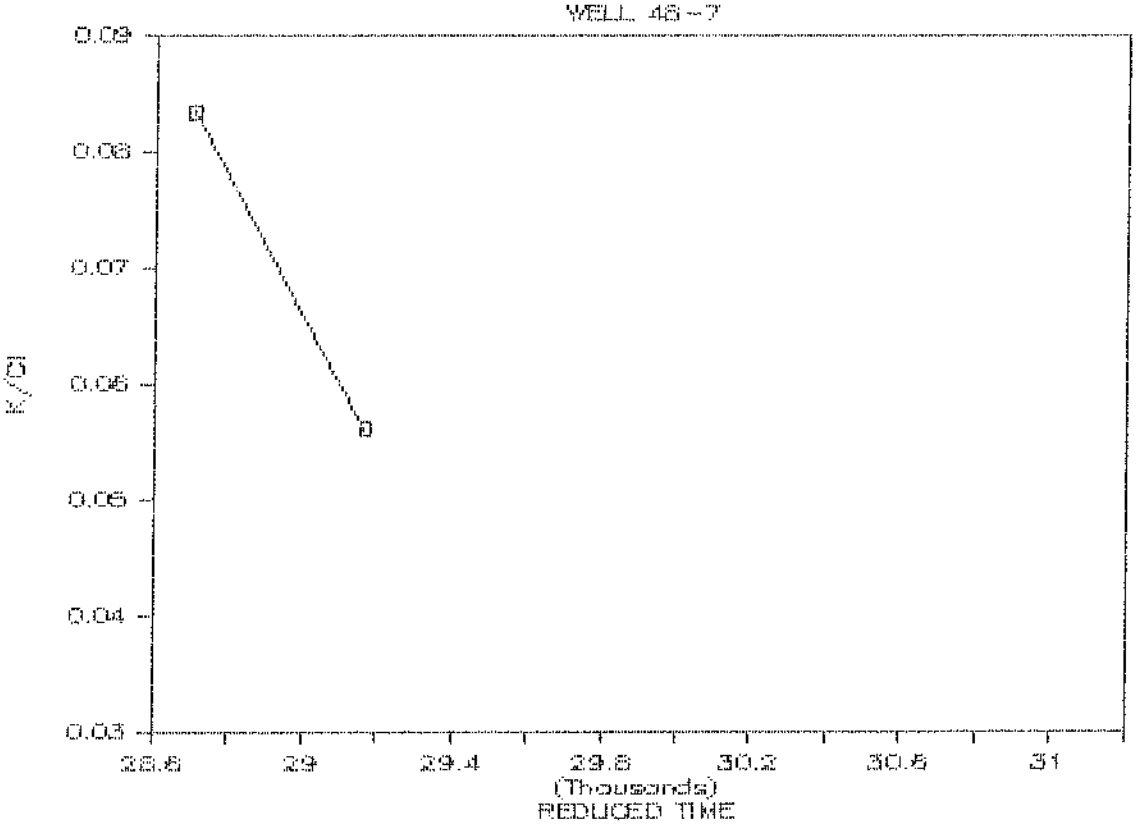
MAGMA HOLDINGS, EAST MESA

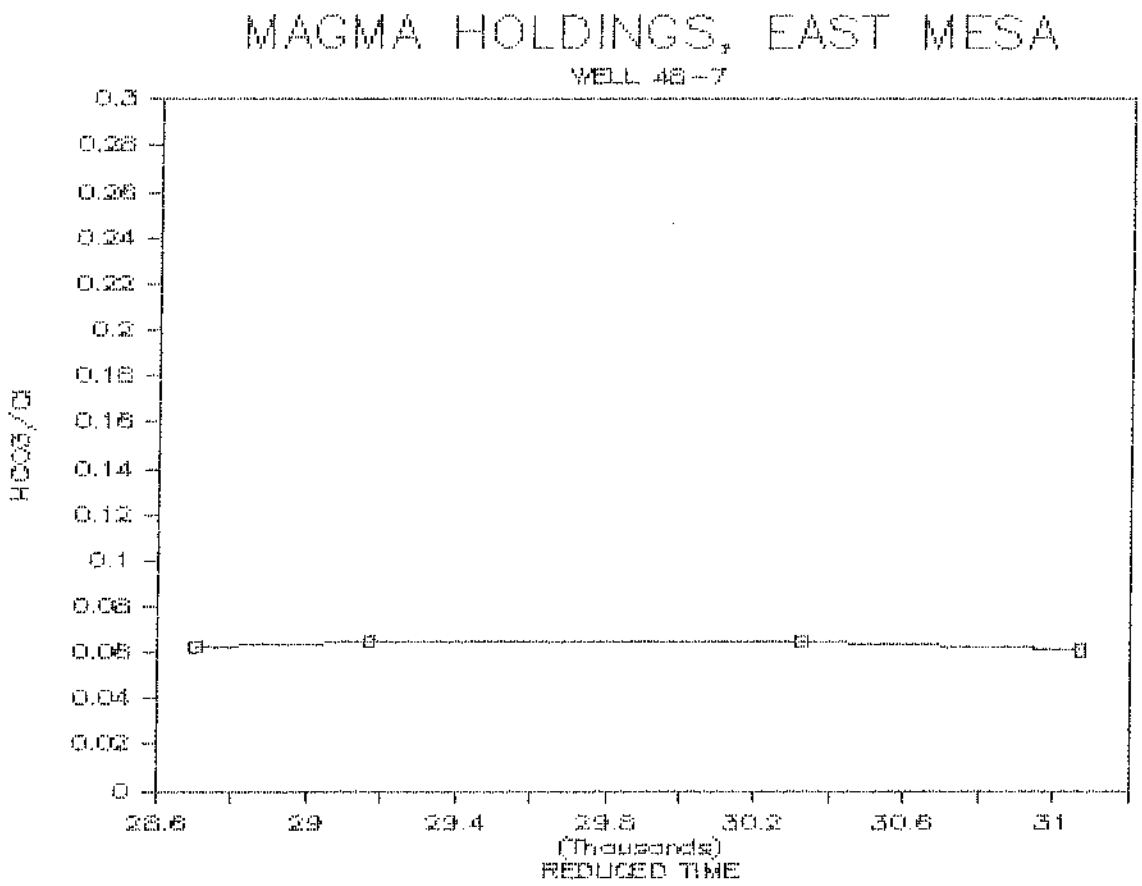



MAGMA HOLDINGS, EAST MESA
WELL 46-7
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
SO4/CL
28.6
29
29.4
29.8
30.2
30.6
31
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

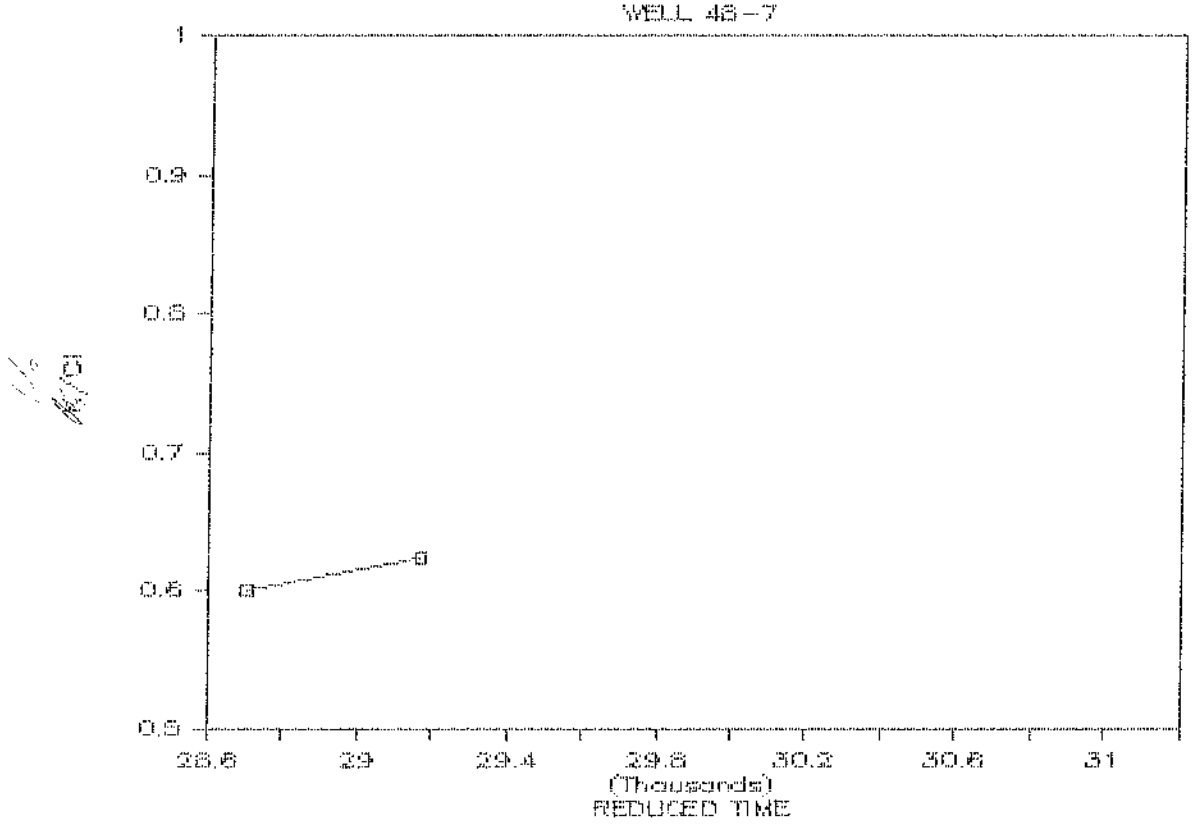
WELL 48-7




MAGMA HOLDINGS, EAST MESA
WELL 48-7
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
H2O3/D
28.6
29
29.4
29.8
30.2
30.6
31
(Thousands)
REDUCED TIME

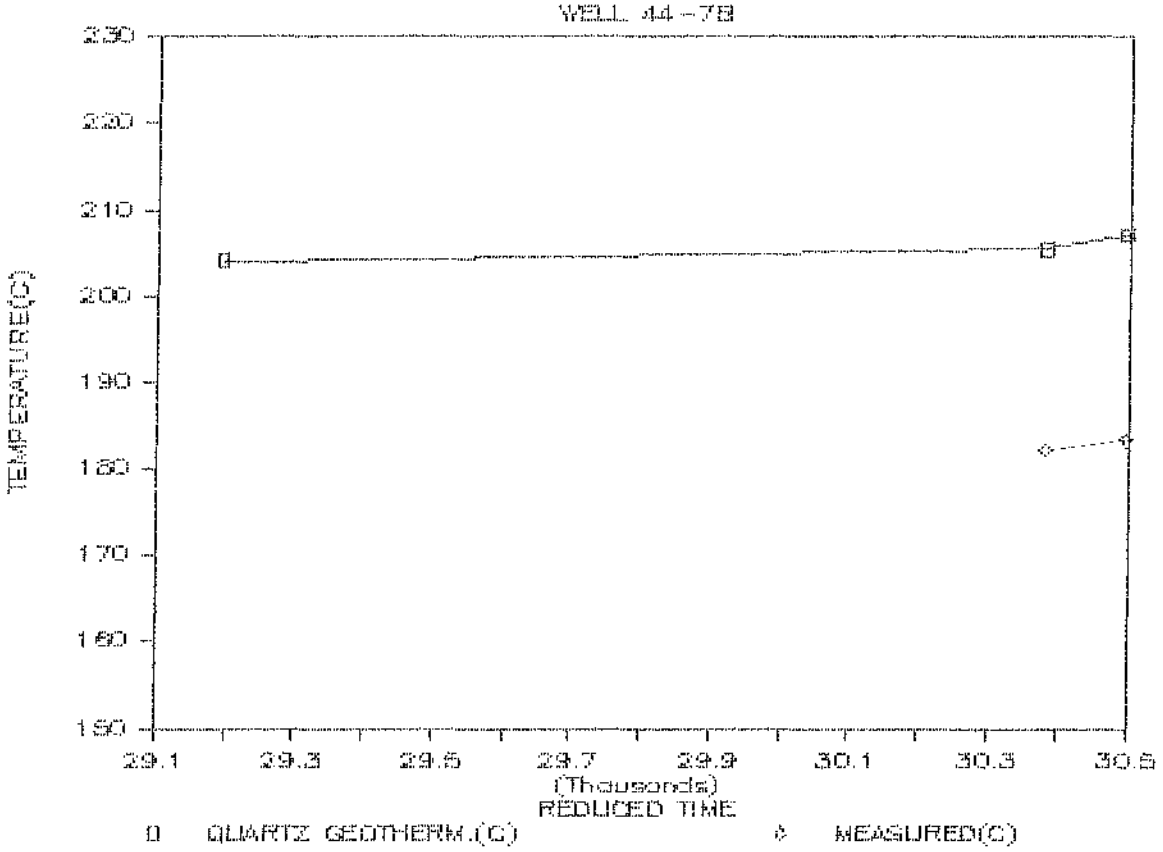
MAGMA HOLDINGS, EAST MESA

WELL 48-7



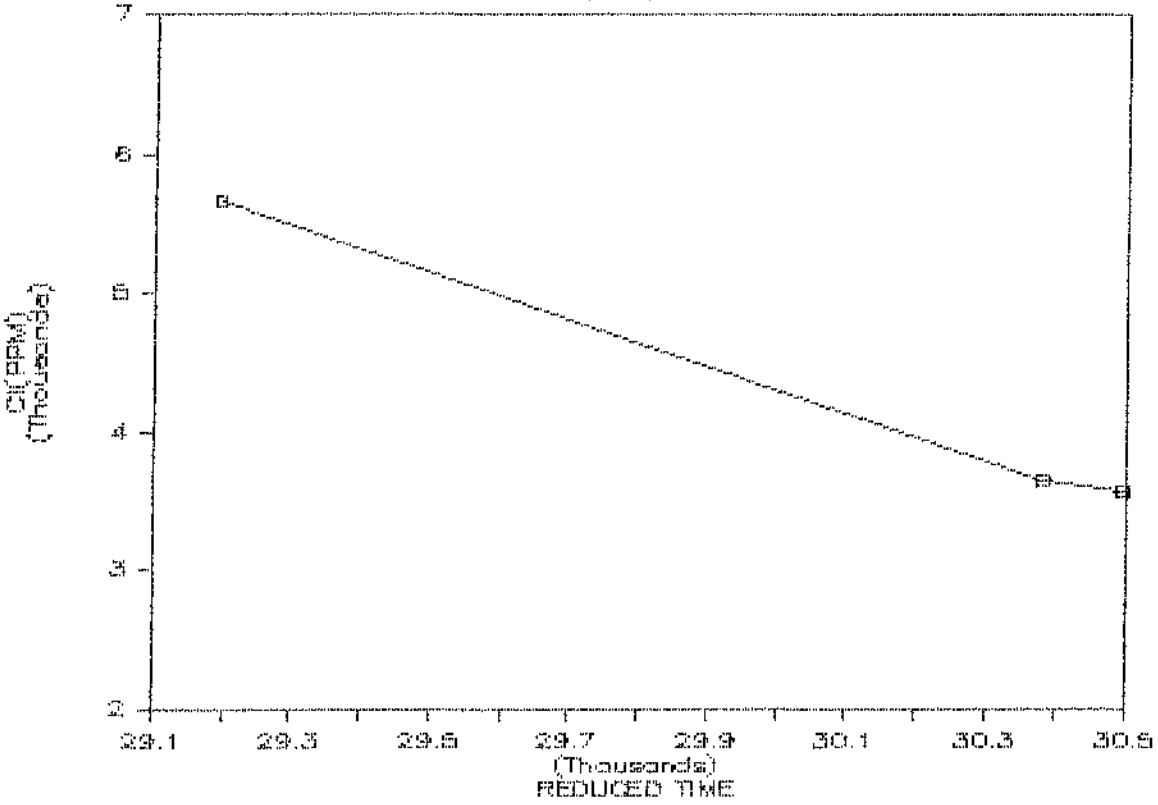
MAGMA HOLDINGS, EAST MESA

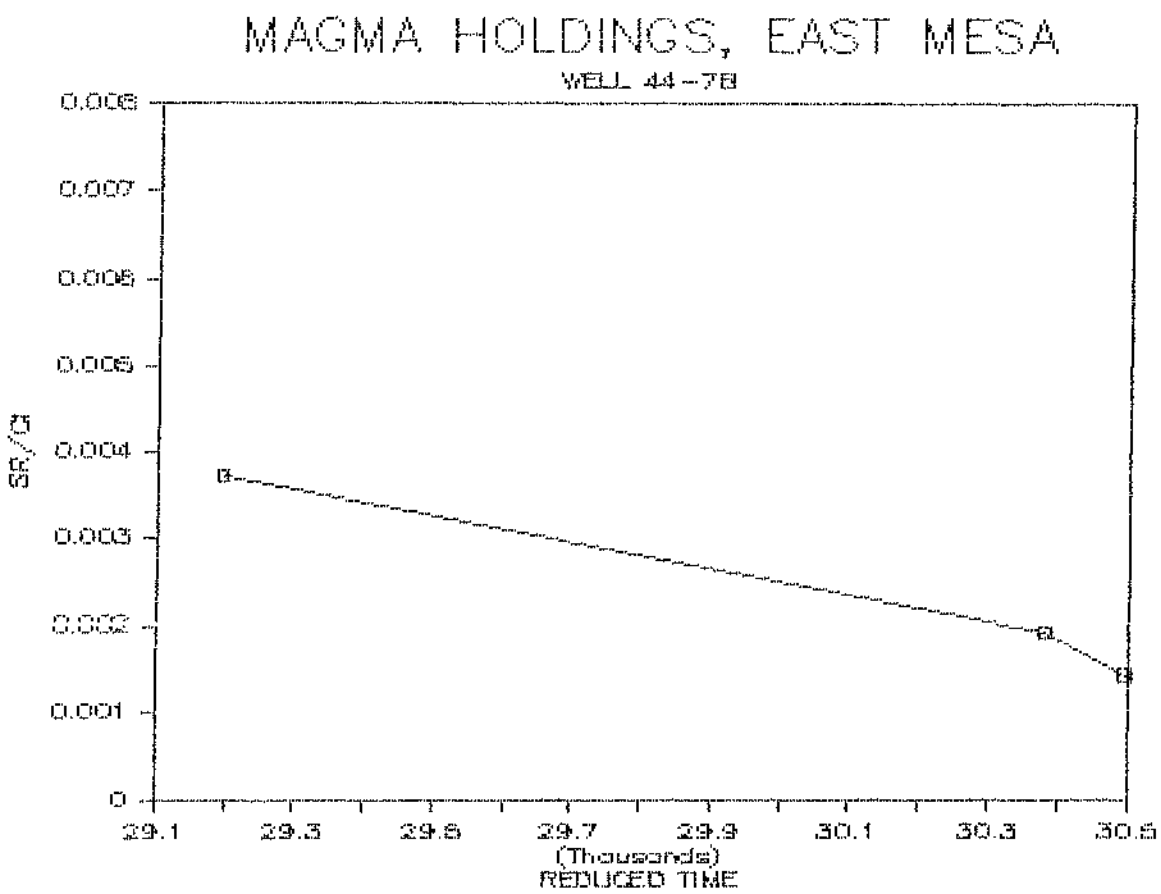
WELL 44-7B



MAGMA HOLDINGS, EAST MESA

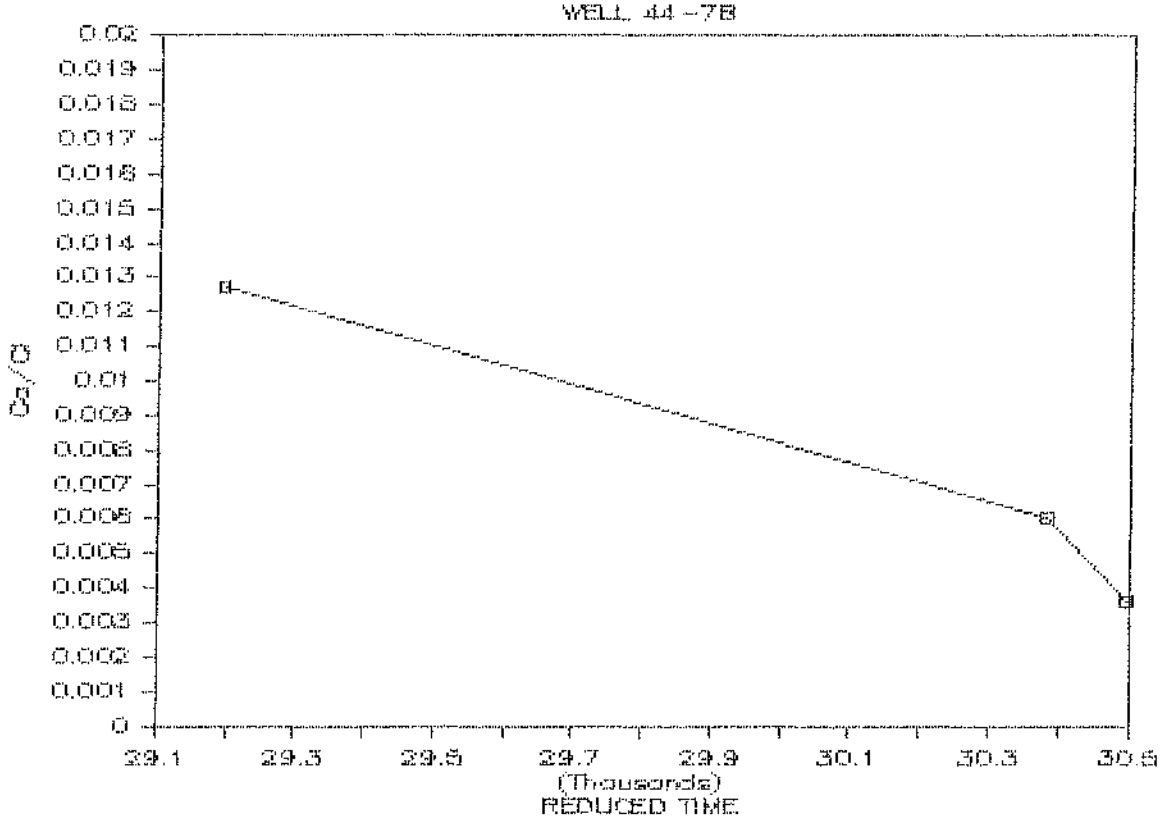
WELL 44-7B

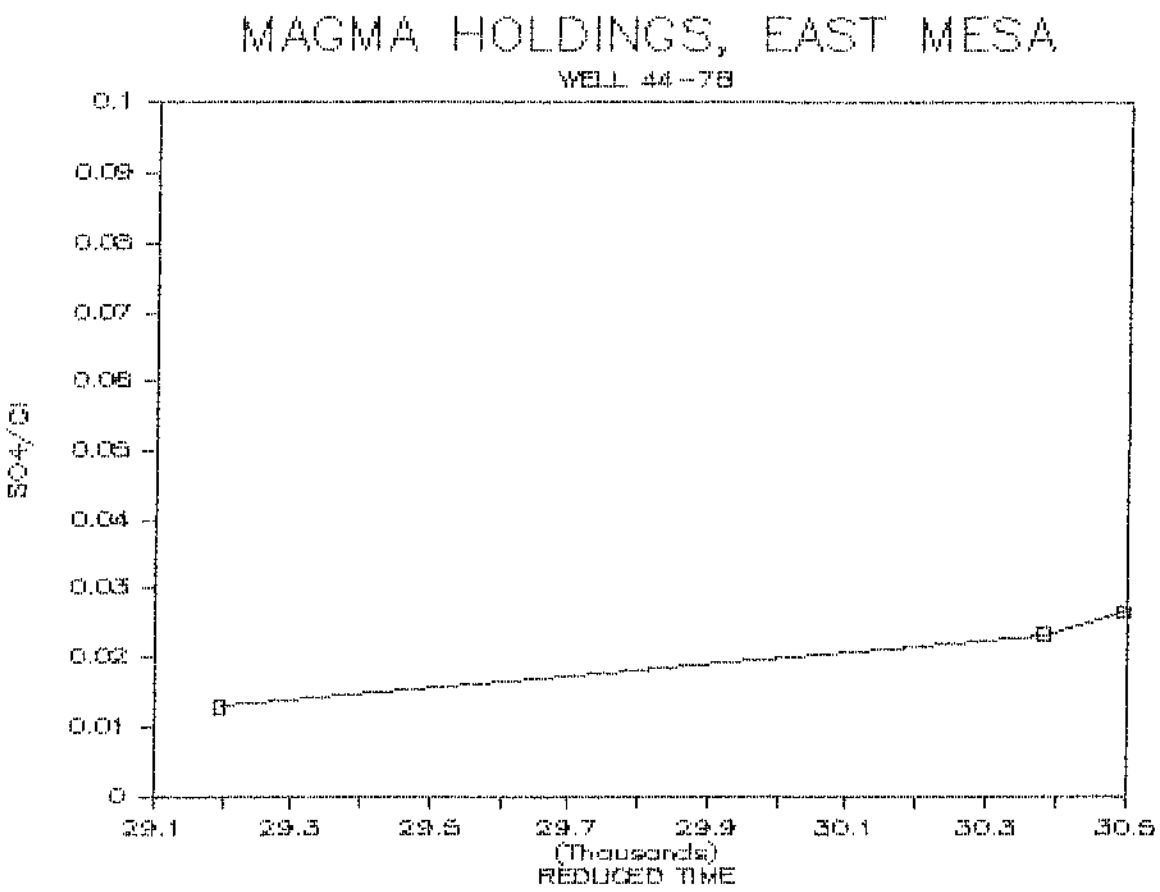


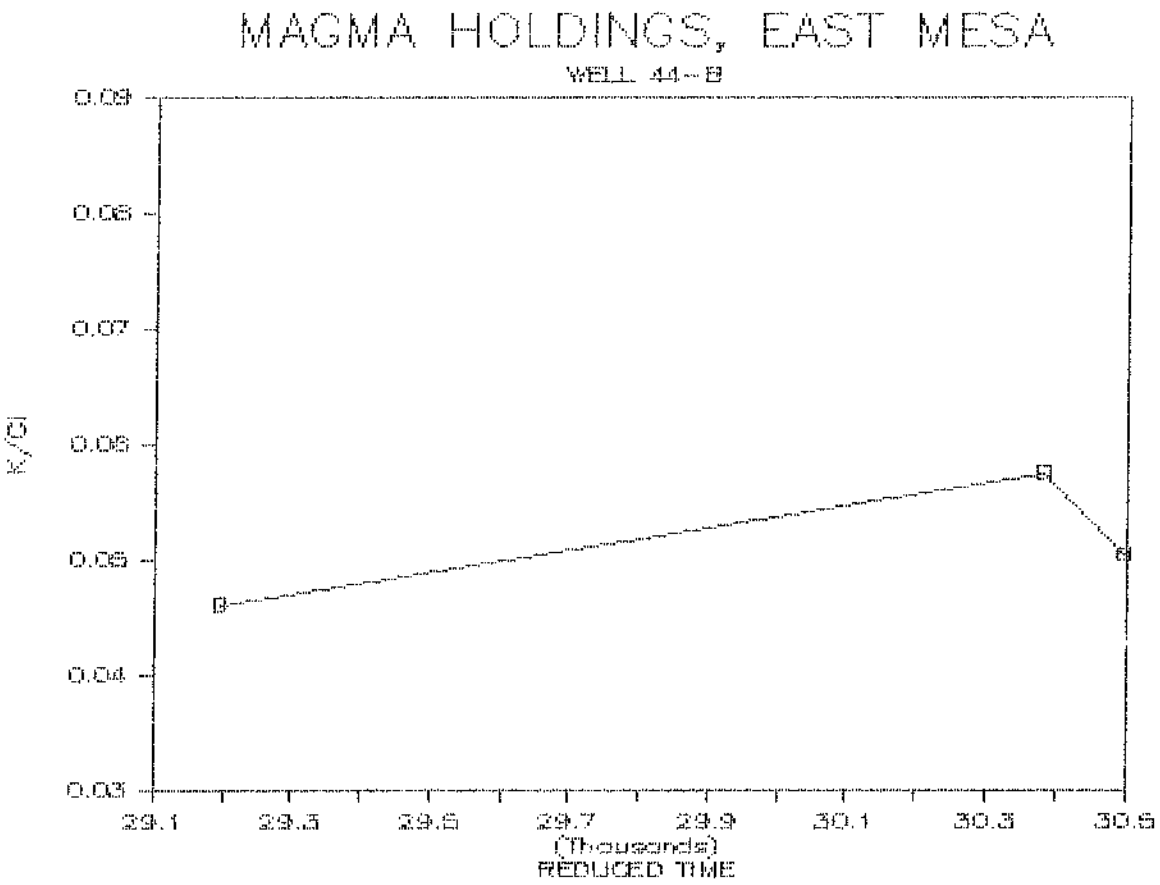

MAGMA HOLDINGS, EAST MESA
WELL 44-7B
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
ΔP/ΔT
29.1
29.3
29.5
29.7
29.9
30.1
30.3
30.5
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

WELL 44-7B

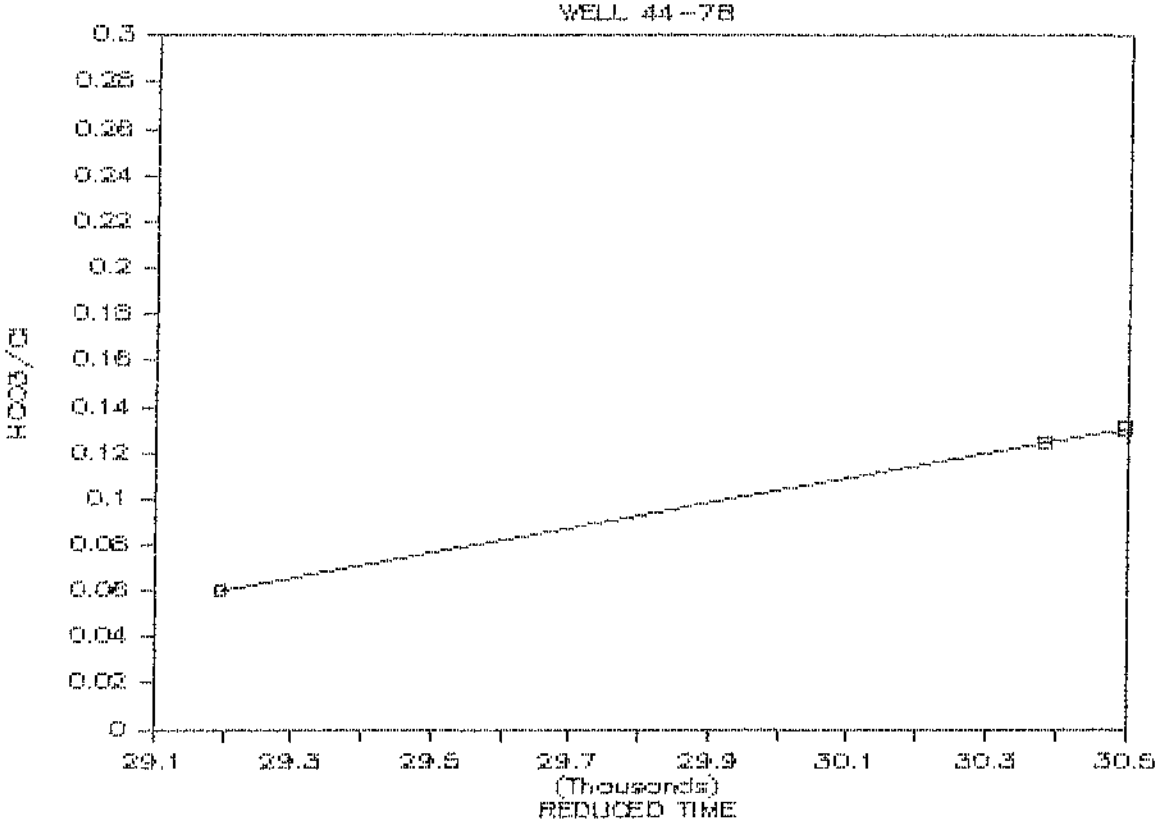


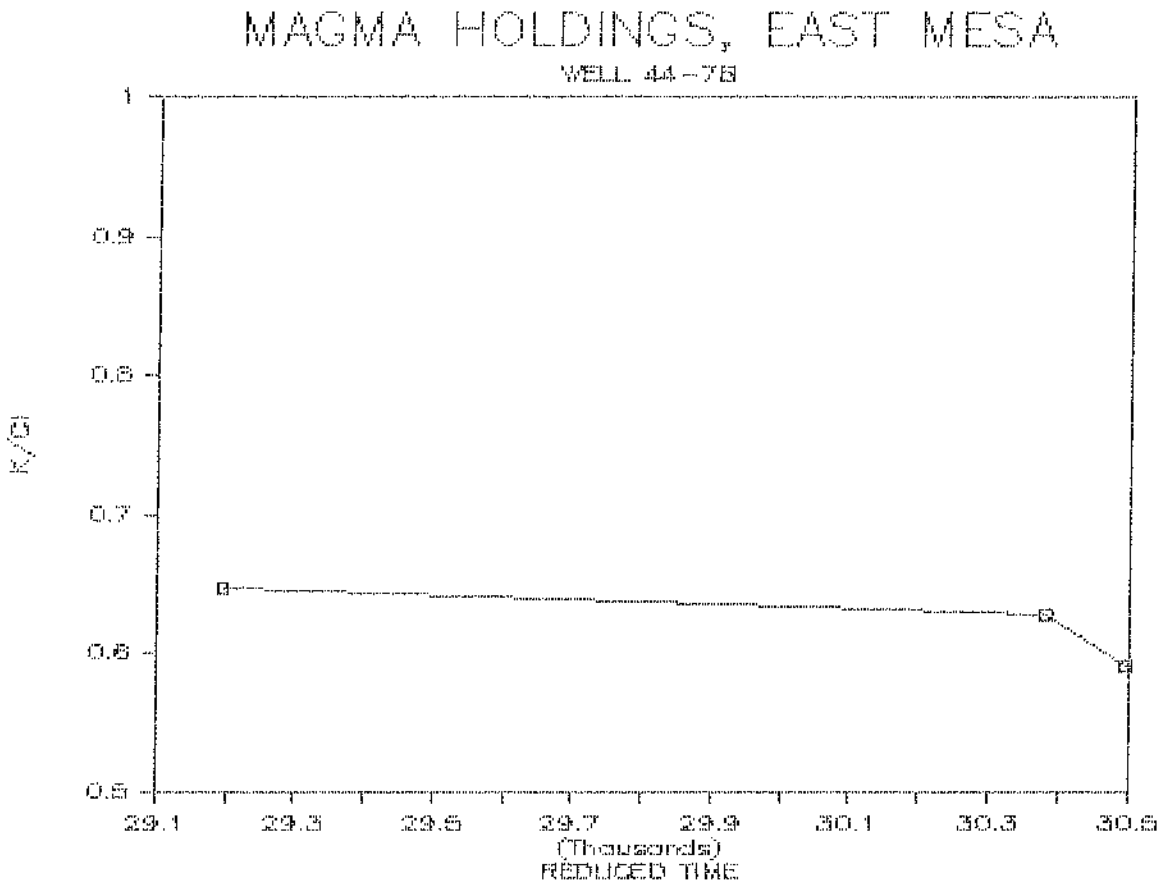

MAGMA HOLDINGS, EAST MESA
WELL 44-7B
SO4/CO3
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
29.1
29.3
29.5
29.7
29.9
30.1
30.3
30.5
(Thousands)
REDUCED TIME


MAGMA HOLDINGS, EAST MESA
WELL 44-B
0.09
0.08
0.07
0.06
0.05
0.04
0.03
P/Q
29.1
29.3
29.5
29.7
29.9
30.1
30.3
30.5
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

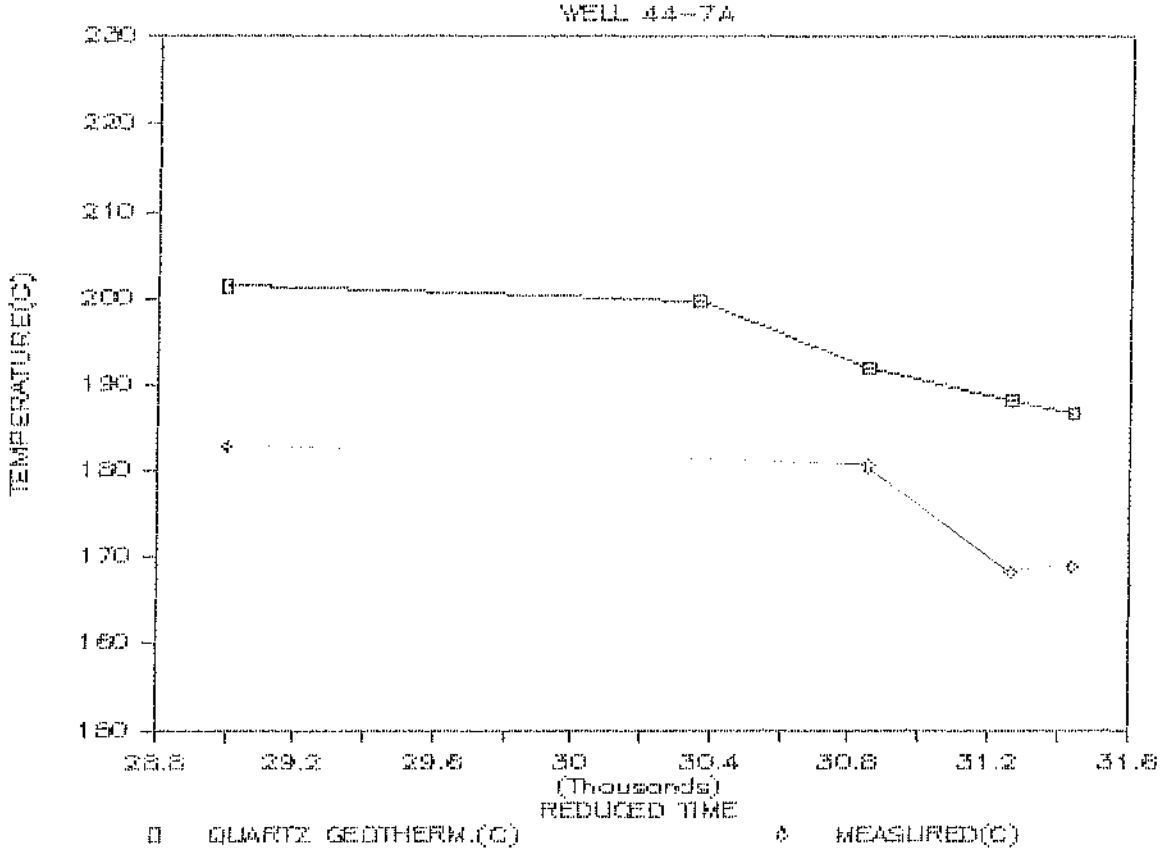
WELL 44-7B




MAGMA HOLDINGS, EAST MESA
WELL 44-7B
1
0.9
0.8
0.7
0.6
0.5
P/Q
29.1
29.3
29.5
29.7
29.9
30.1
30.3
30.5
(Thousands)
REDUCED TIME

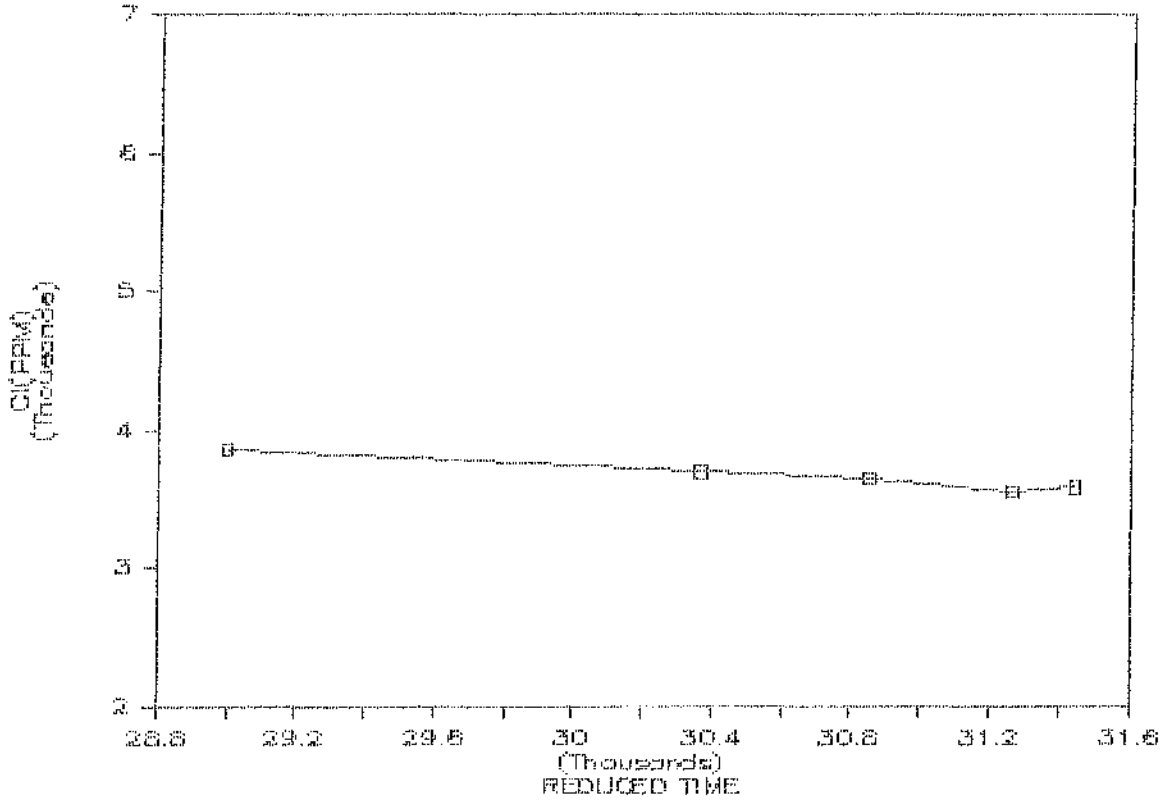
MAGMA HOLDINGS, EAST MESA

WELL 44-7A



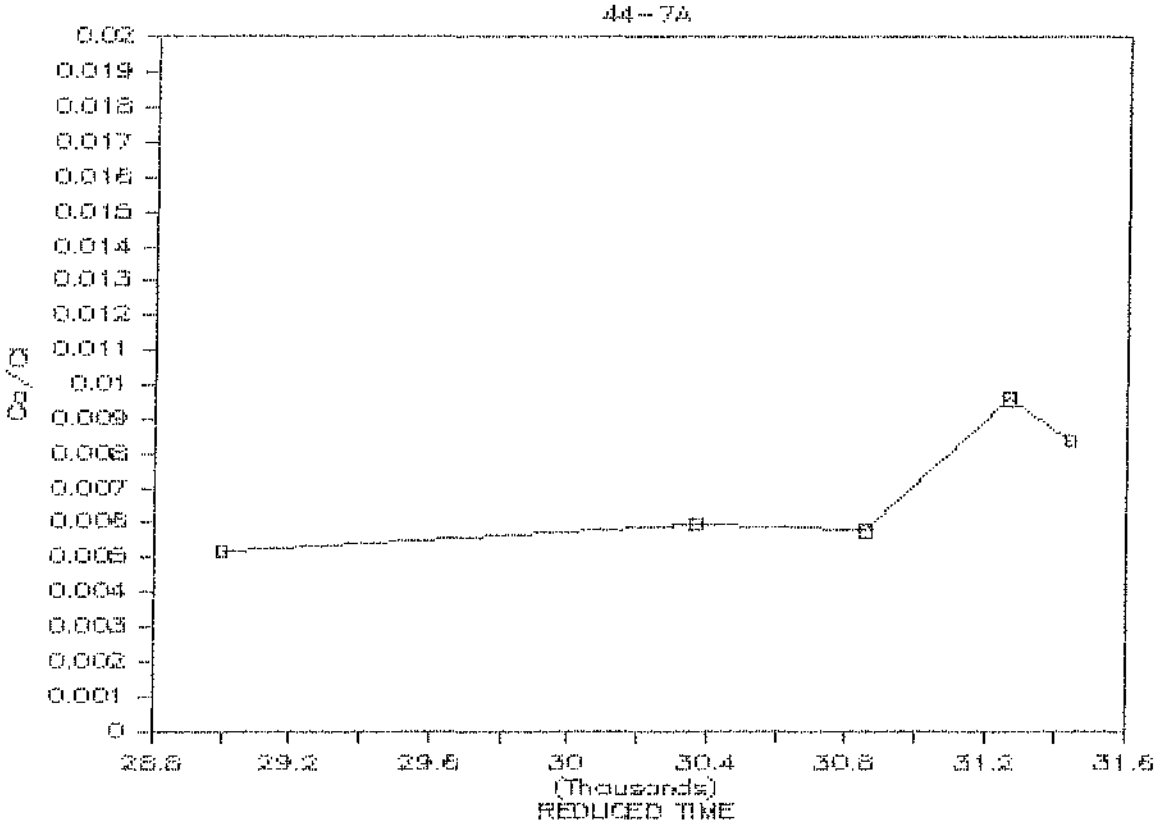
MAGMA HOLDINGS, EAST MESA

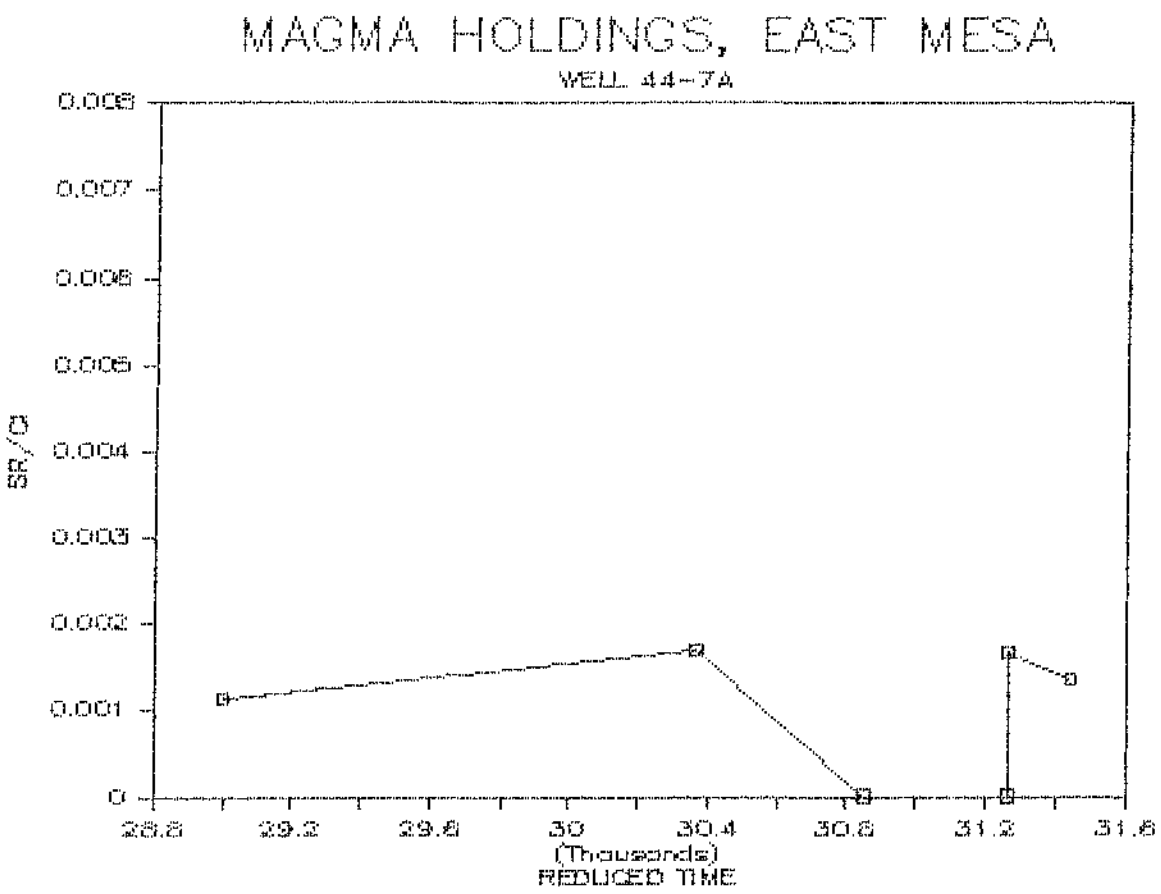
WELL 44-7A

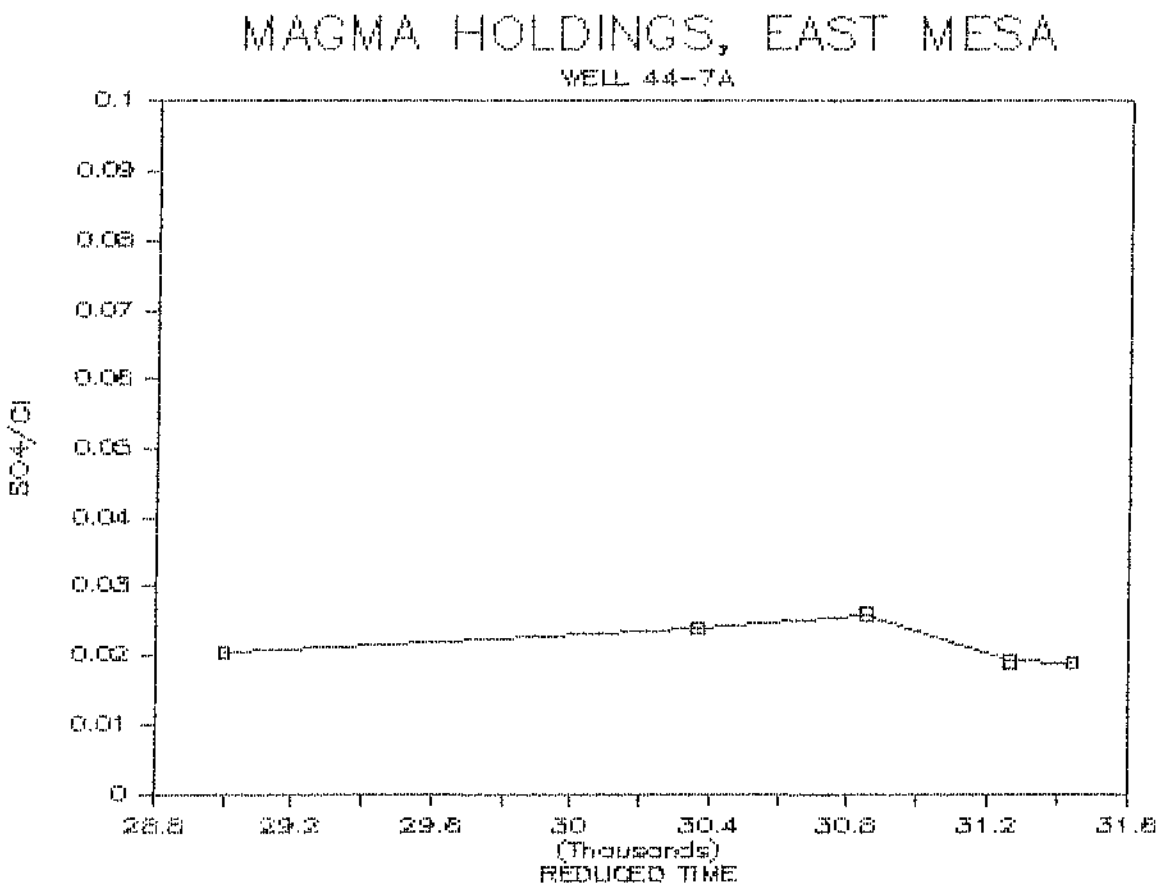


MAGMA HOLDINGS, EAST MESA

44-7A

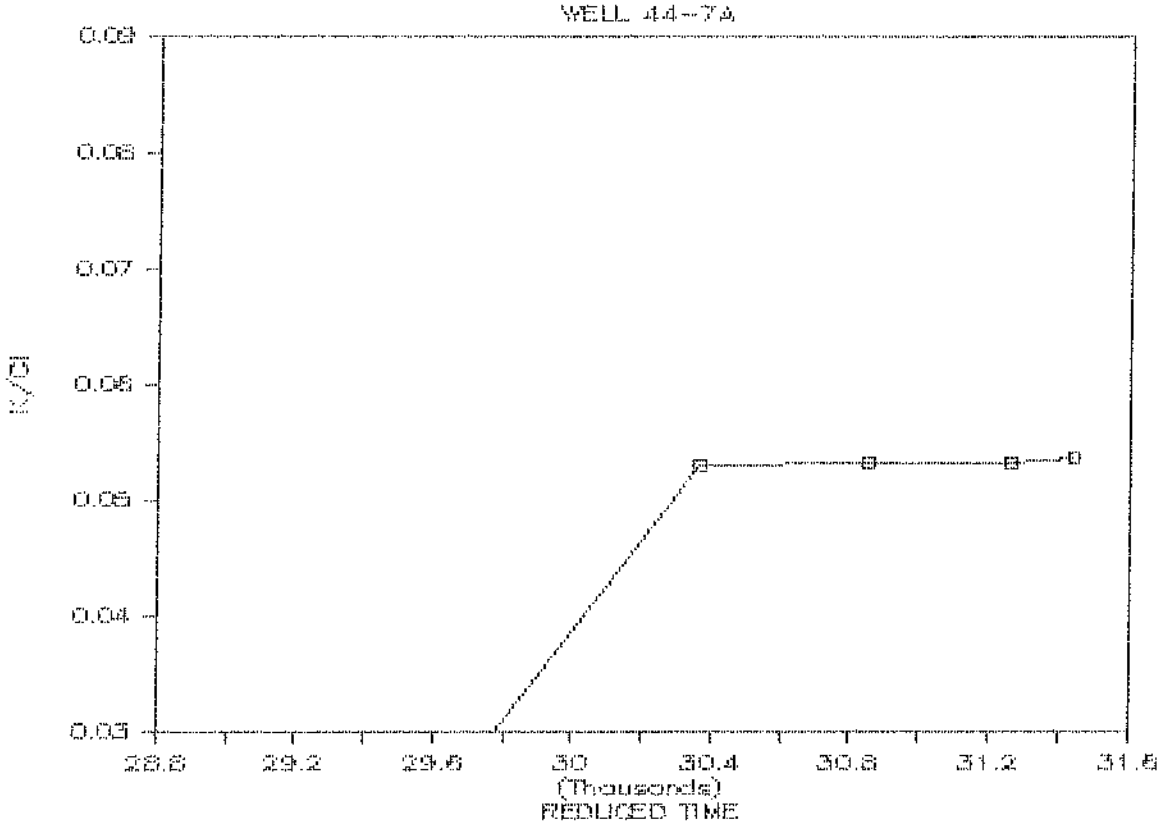


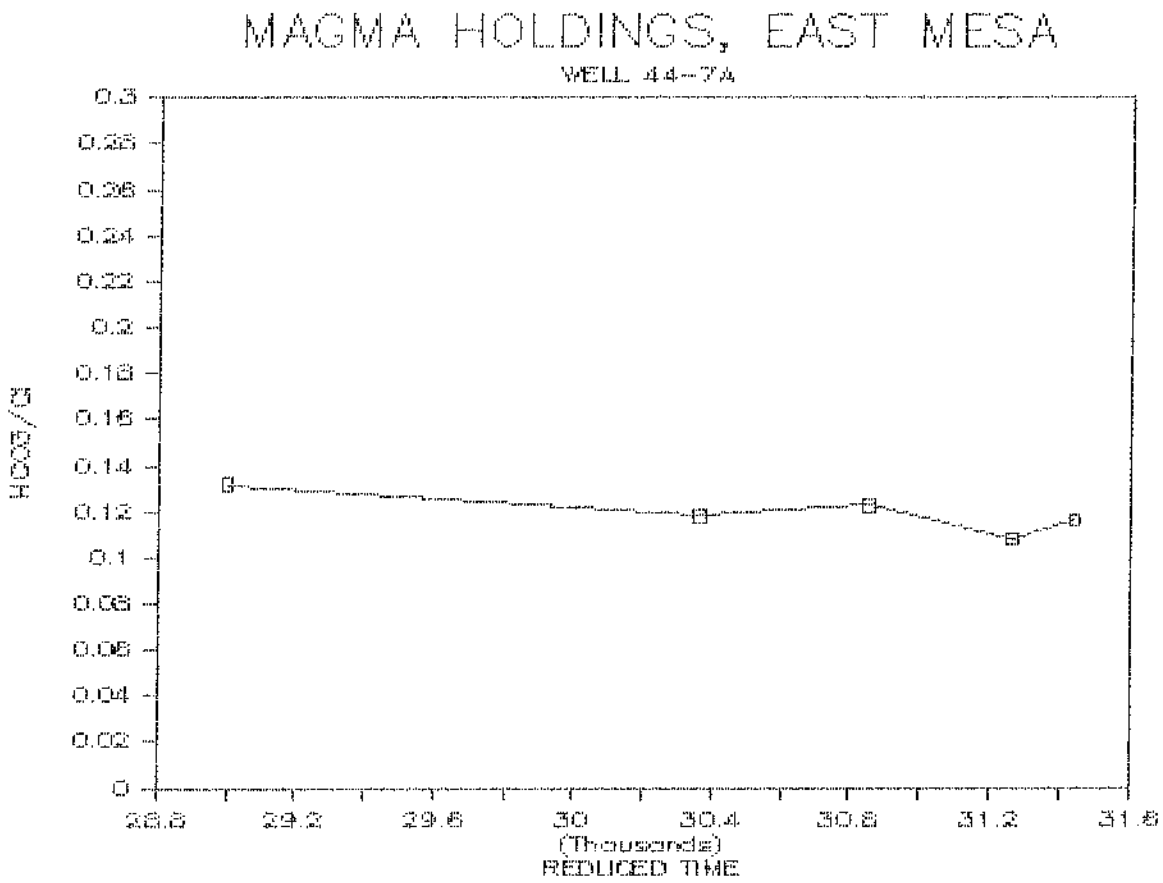

MAGMA HOLDINGS, EAST MESA
WELL 44-7A
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
DP / DQ
28.8
29.2
29.6
30
30.4
30.8
31.2
31.6
(Thousands)
REDUCED TIME

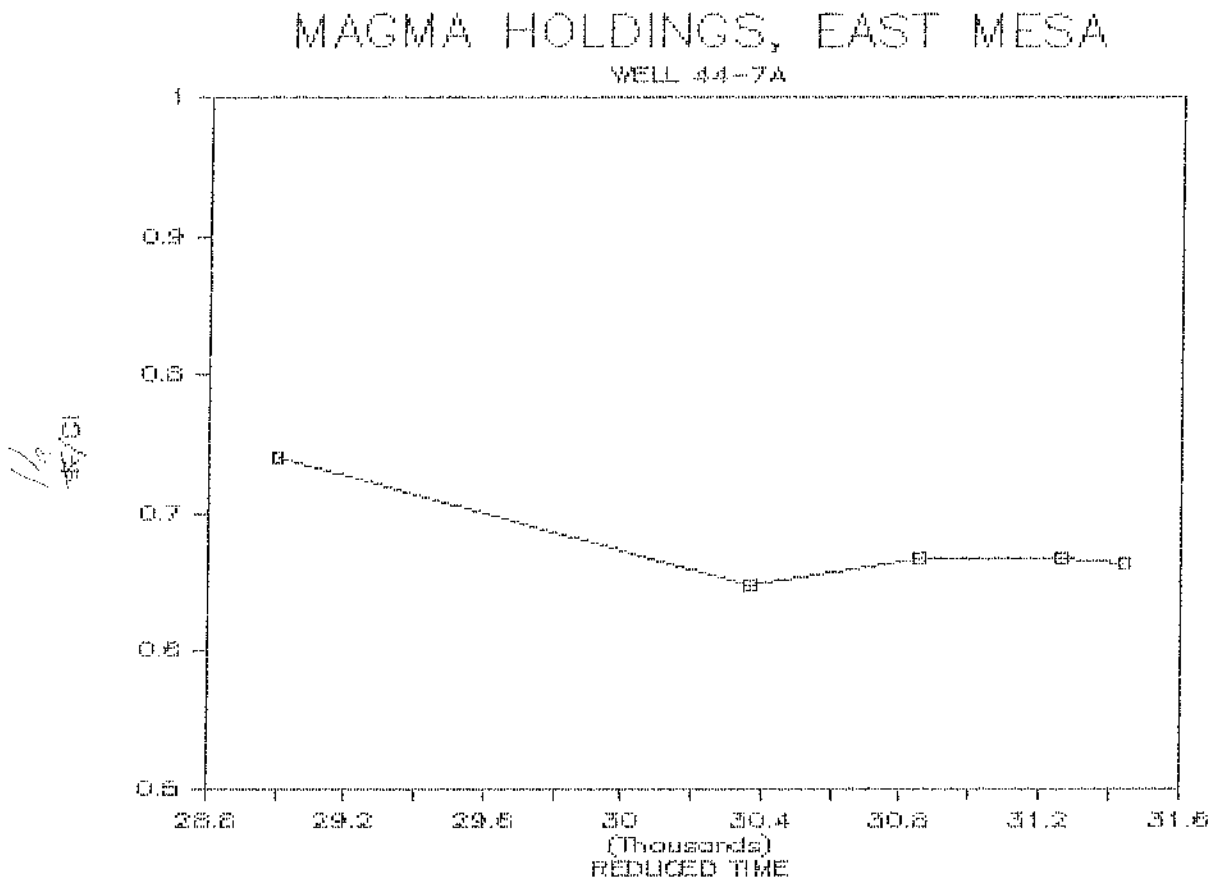

MAGMA HOLDINGS, EAST MESA
WELL 44-7A
SO4/Cl
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
28.8
29.2
29.6
30
30.4
30.8
31.2
31.6
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

WELL 44-7A

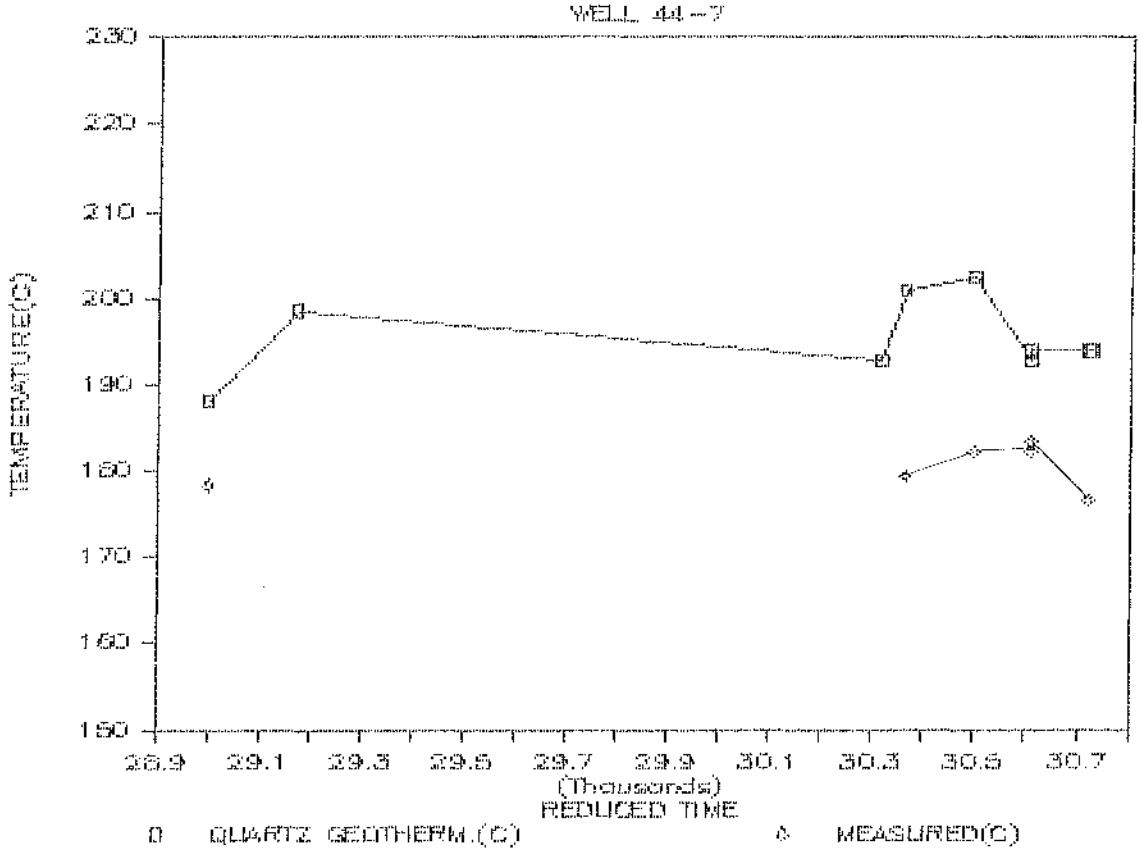



MAGMA HOLDINGS, EAST MESA
WELL 44-7A
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
H2O3/Q
28.8
29.2
29.6
30
30.4
30.8
31.2
31.6
(Thousands)
REDUCED TIME


MAGMA HOLDINGS, EAST MESA
WELL 44-7A
1
0.9
0.8
0.7
0.6
0.5
28.8
29.2
29.6
30
30.4
30.8
31.2
31.6
(Thousands)
REDUCED TIME

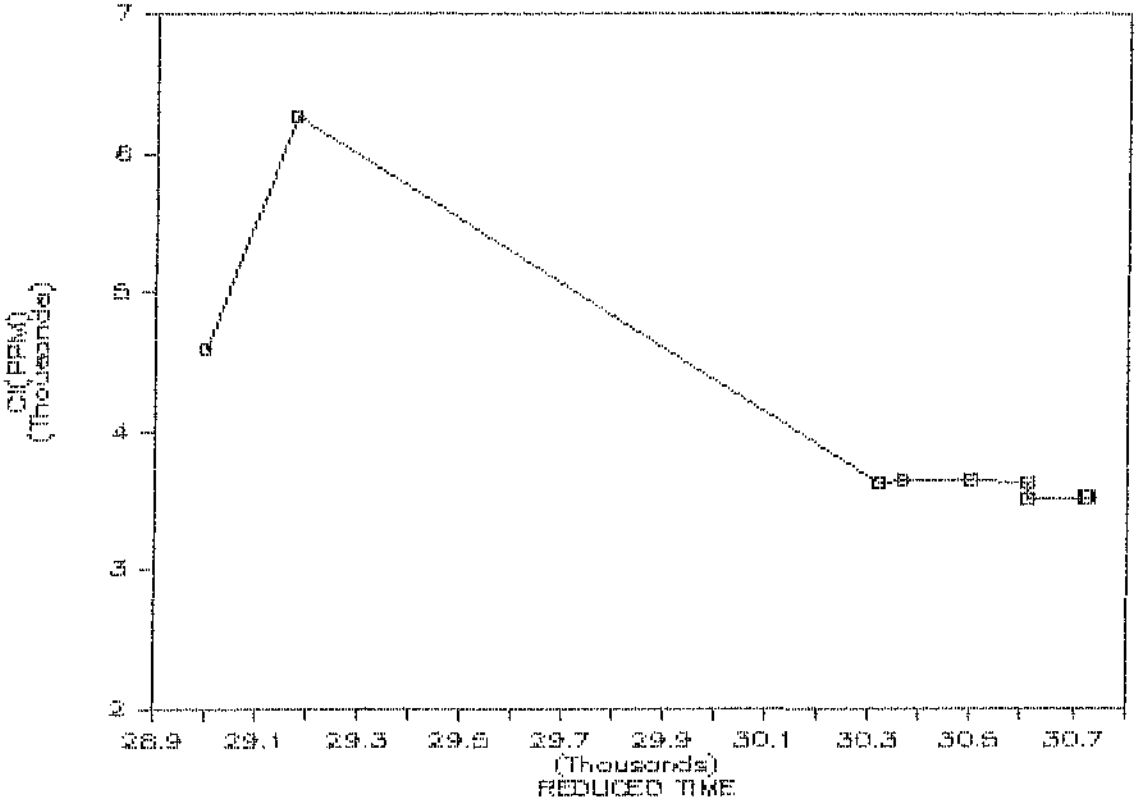
MAGMA HOLDINGS, EAST MESA

WELL 44-7



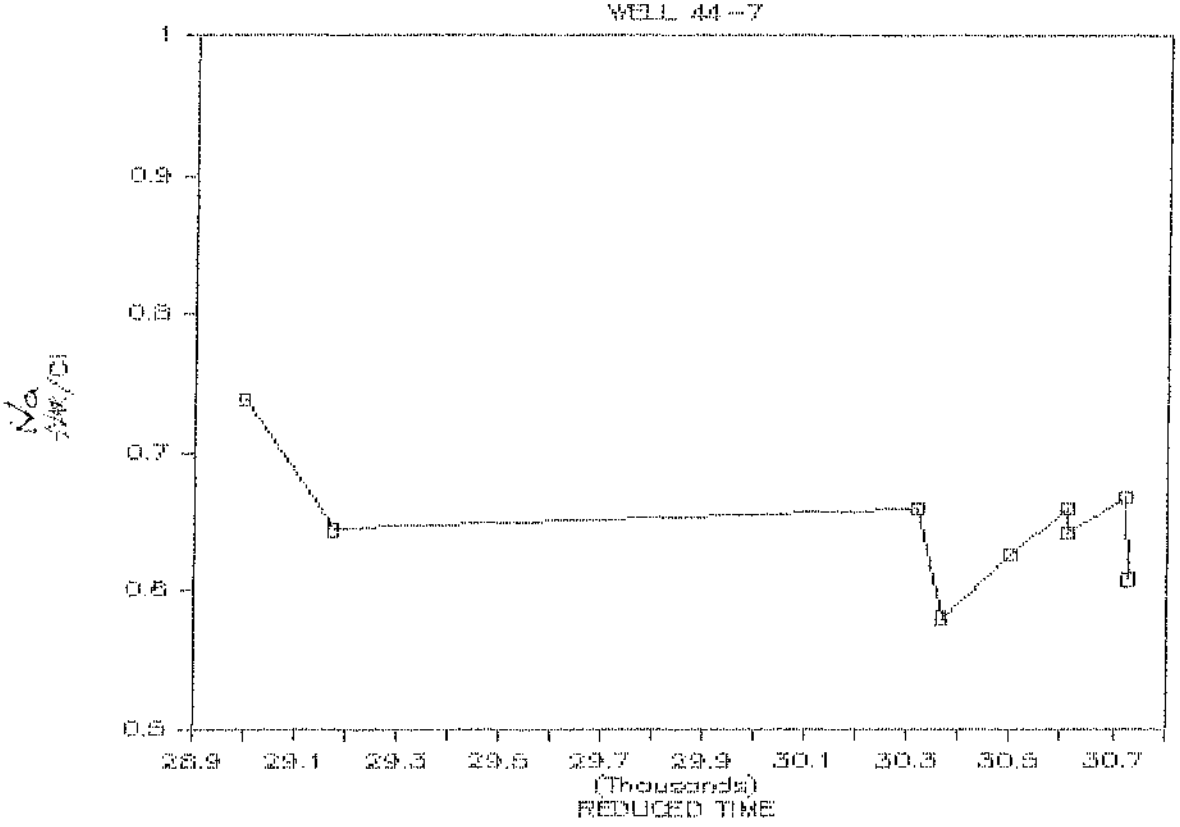
MAGMA HOLDINGS, EAST MESA

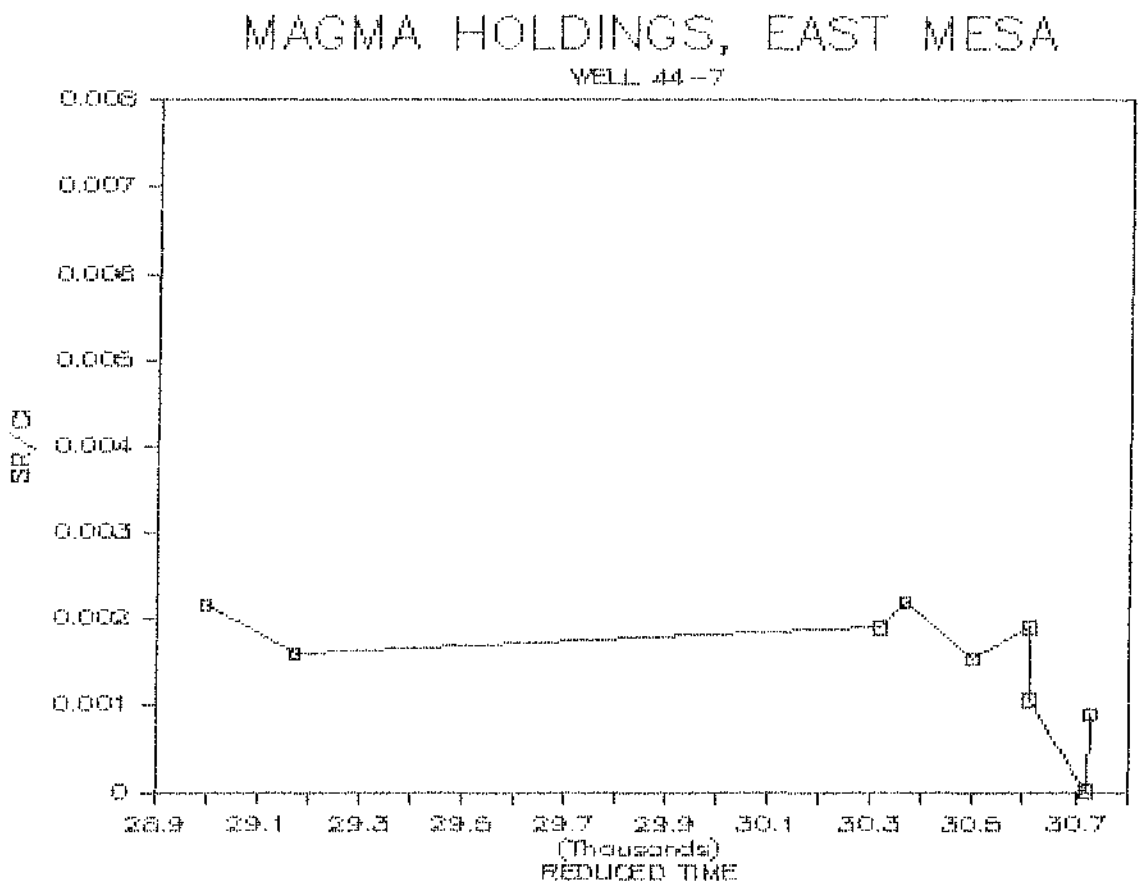
WELL 44-7



MAGMA HOLDINGS, EAST MESA

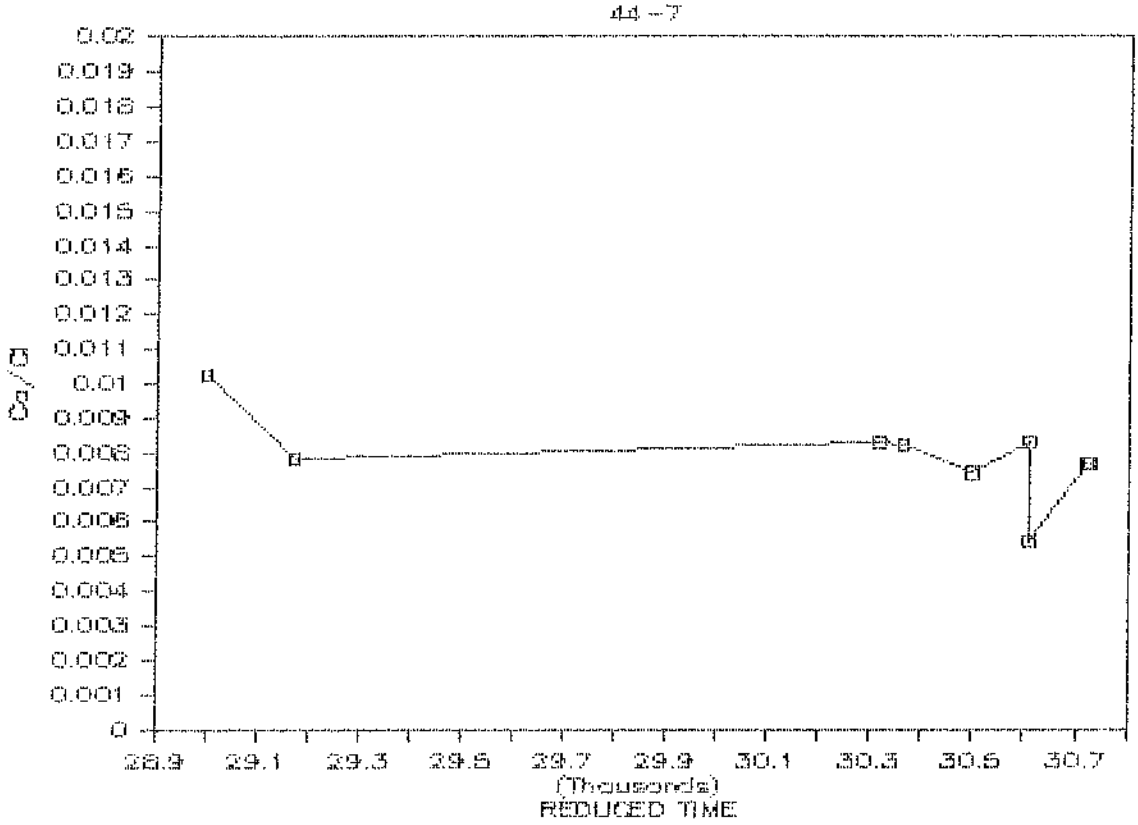
WELL 44-7



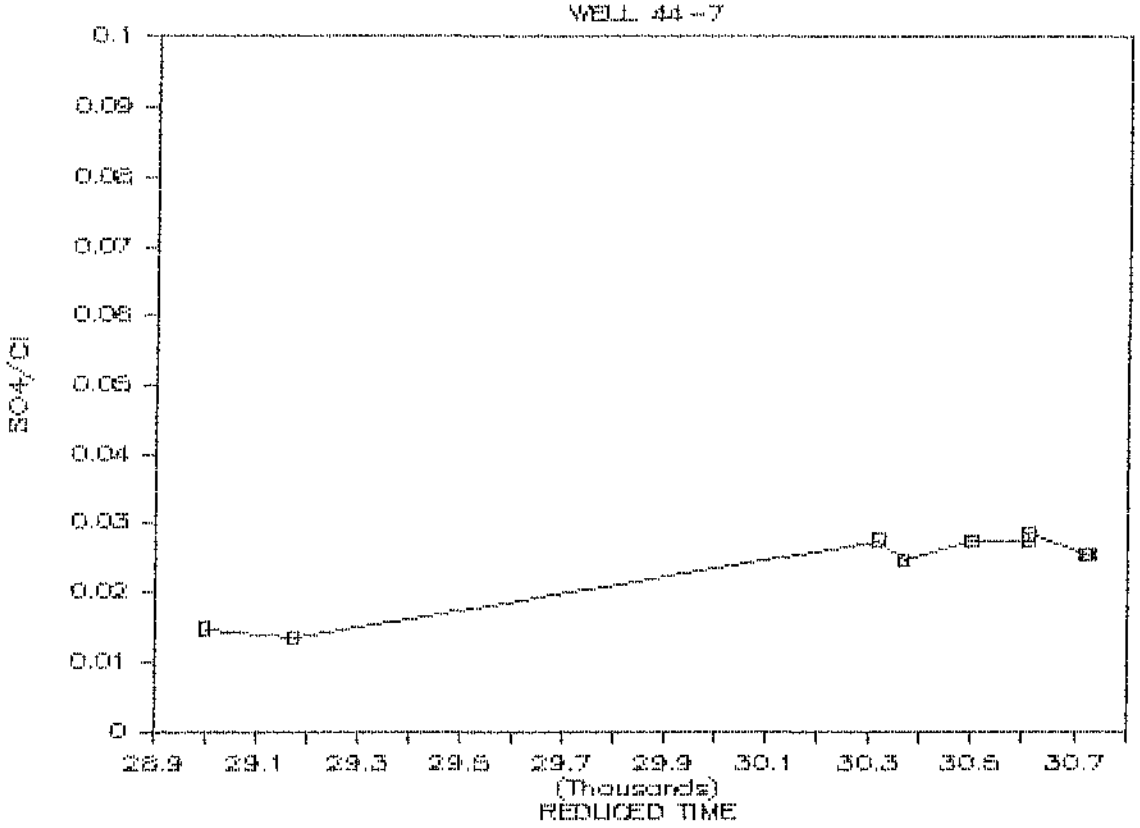

MAGMA HOLDINGS, EAST MESA
WELL 44-7
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
dP/dt
28.9
29.1
29.3
29.5
29.7
29.9
30.1
30.3
30.5
30.7
(Thousands)
REDUCED TIME

MAGMA HOLDINGS, EAST MESA

44-7

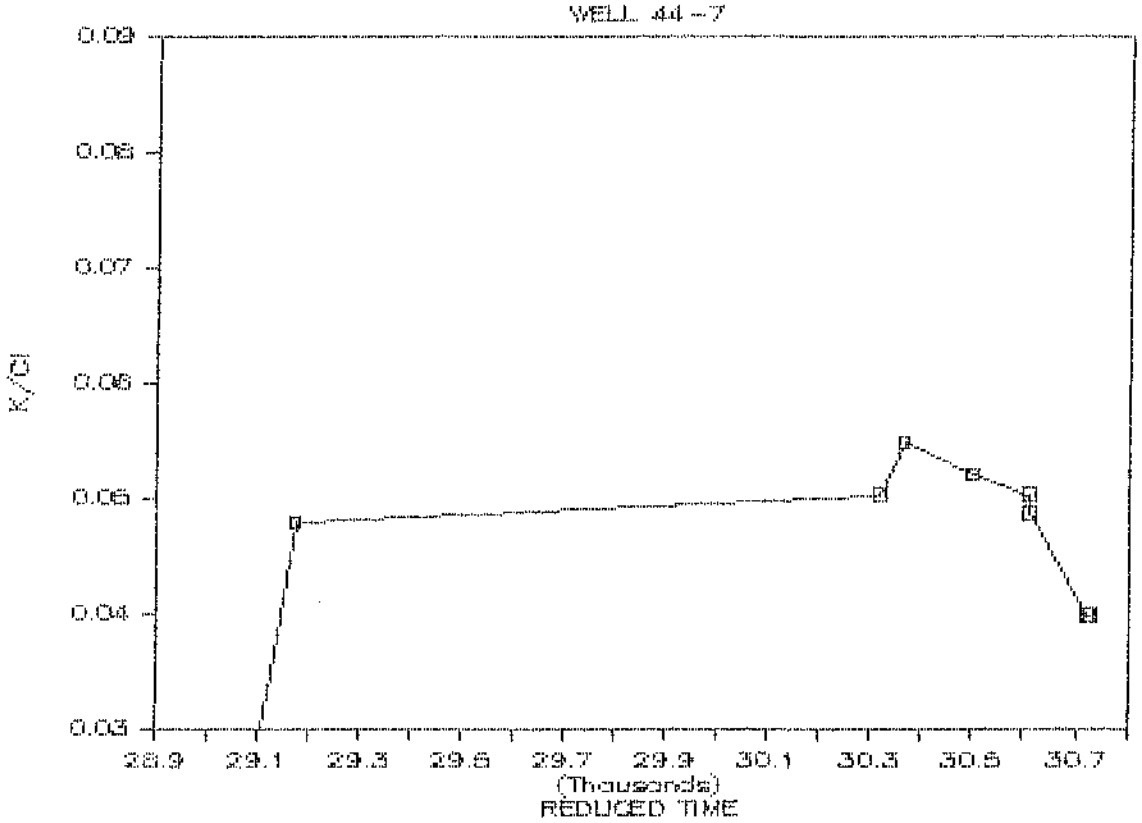


MAGMA HOLDINGS, EAST MESA



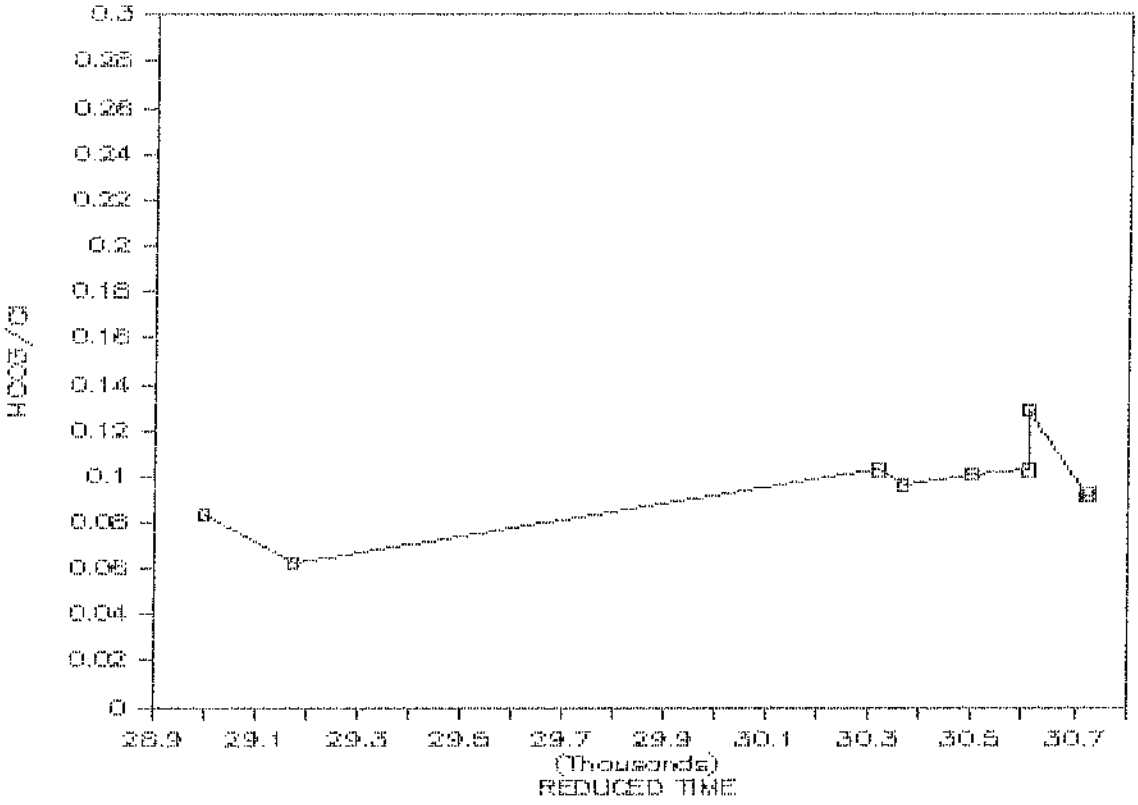
MAGMA HOLDINGS, EAST MESA

WELL 44-7



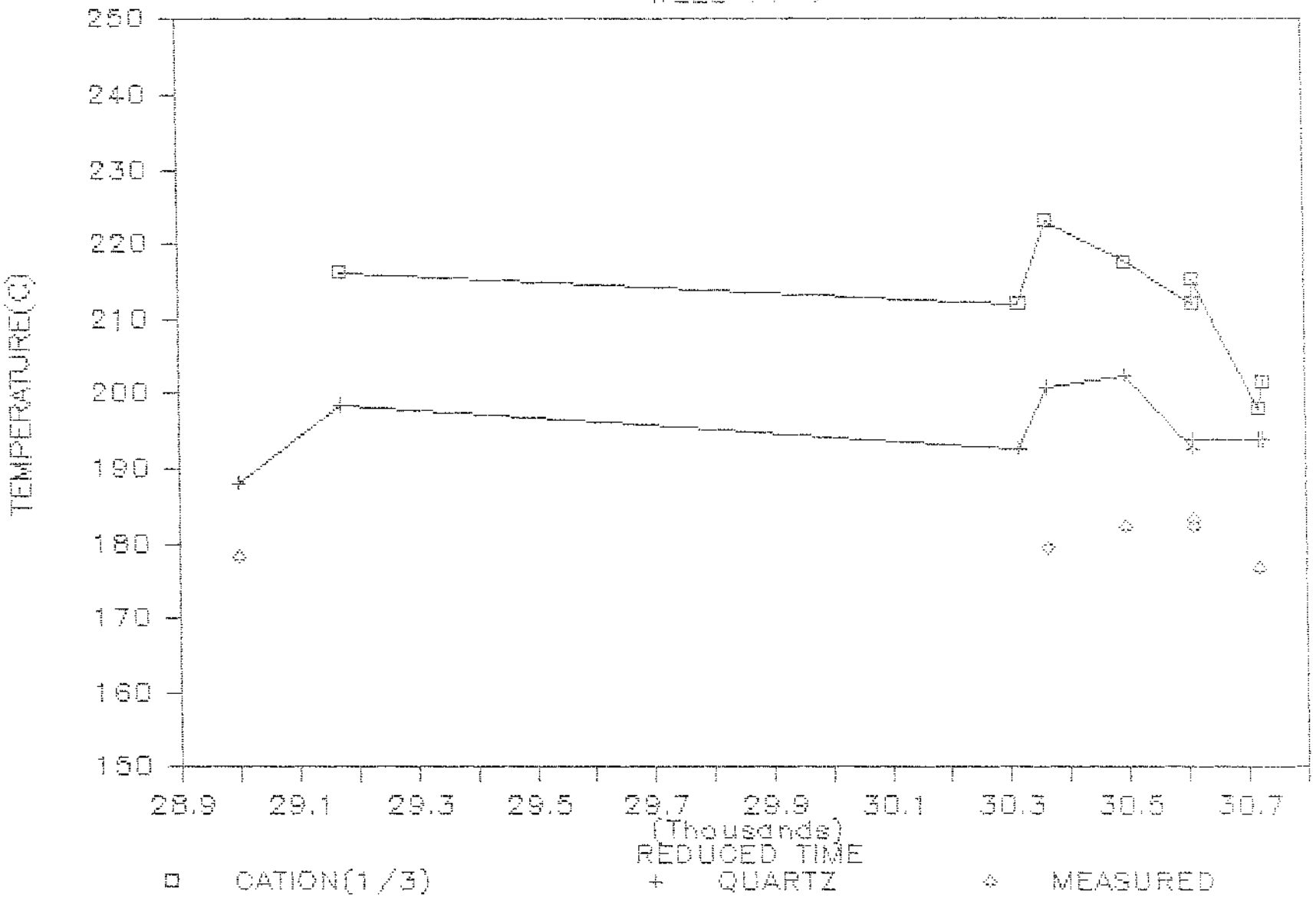
MAGMA HOLDINGS, EAST MESA

WELL 44-7



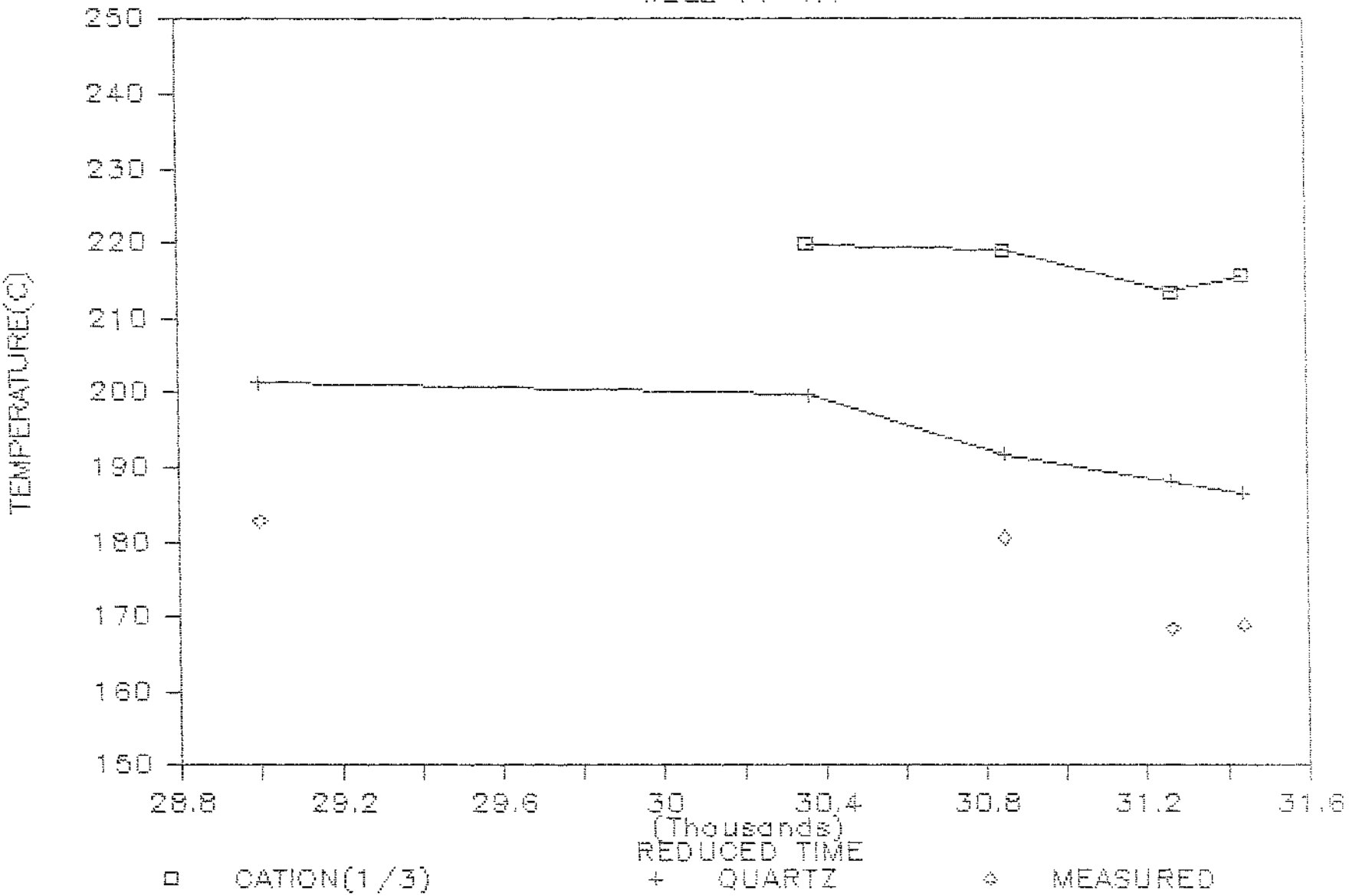
MAGMA HOLDINGS, EAST MESA

WELL 44-7



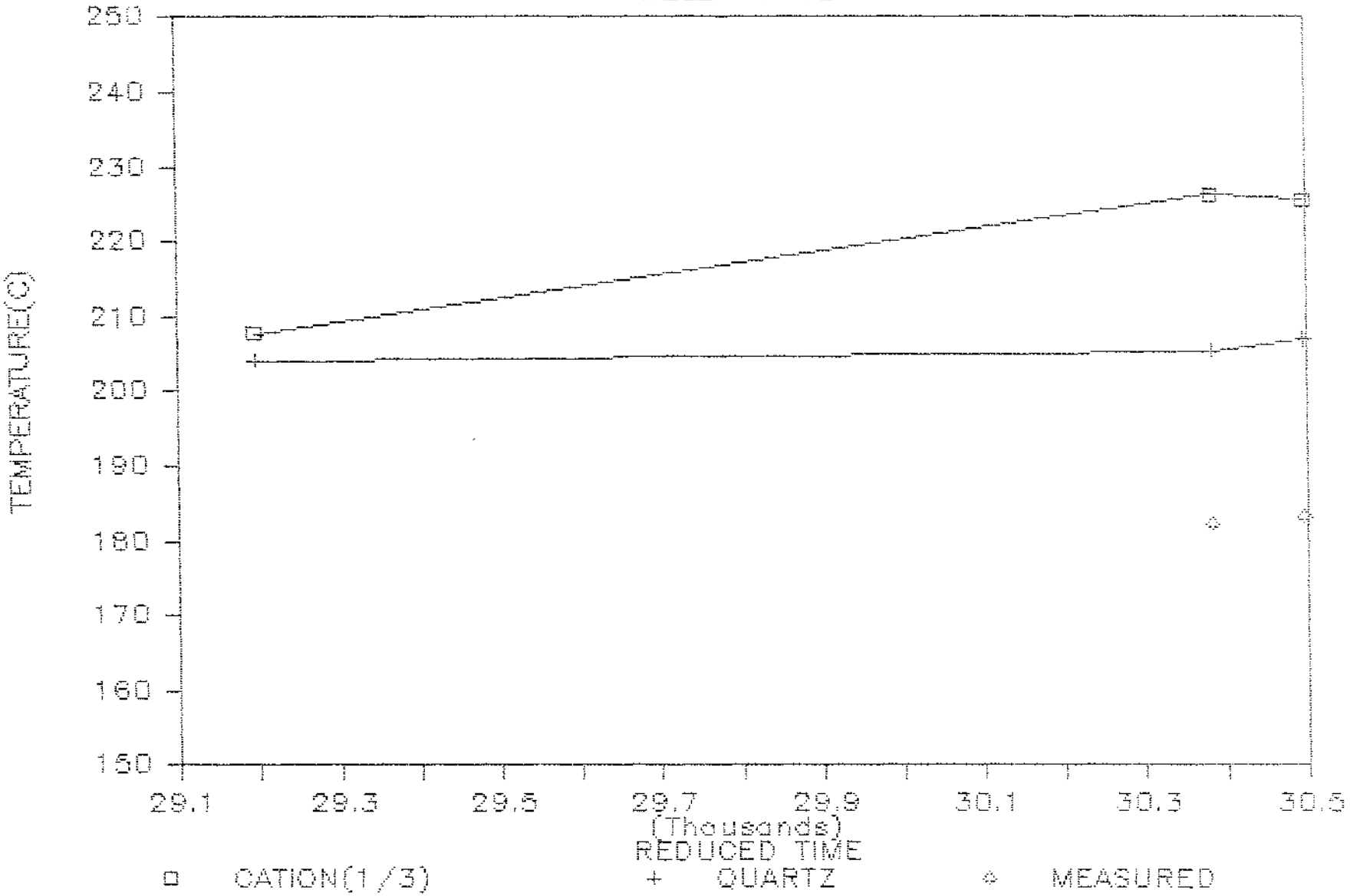
MAGMA HOLDINGS, EAST MESA

WELL 44-7A

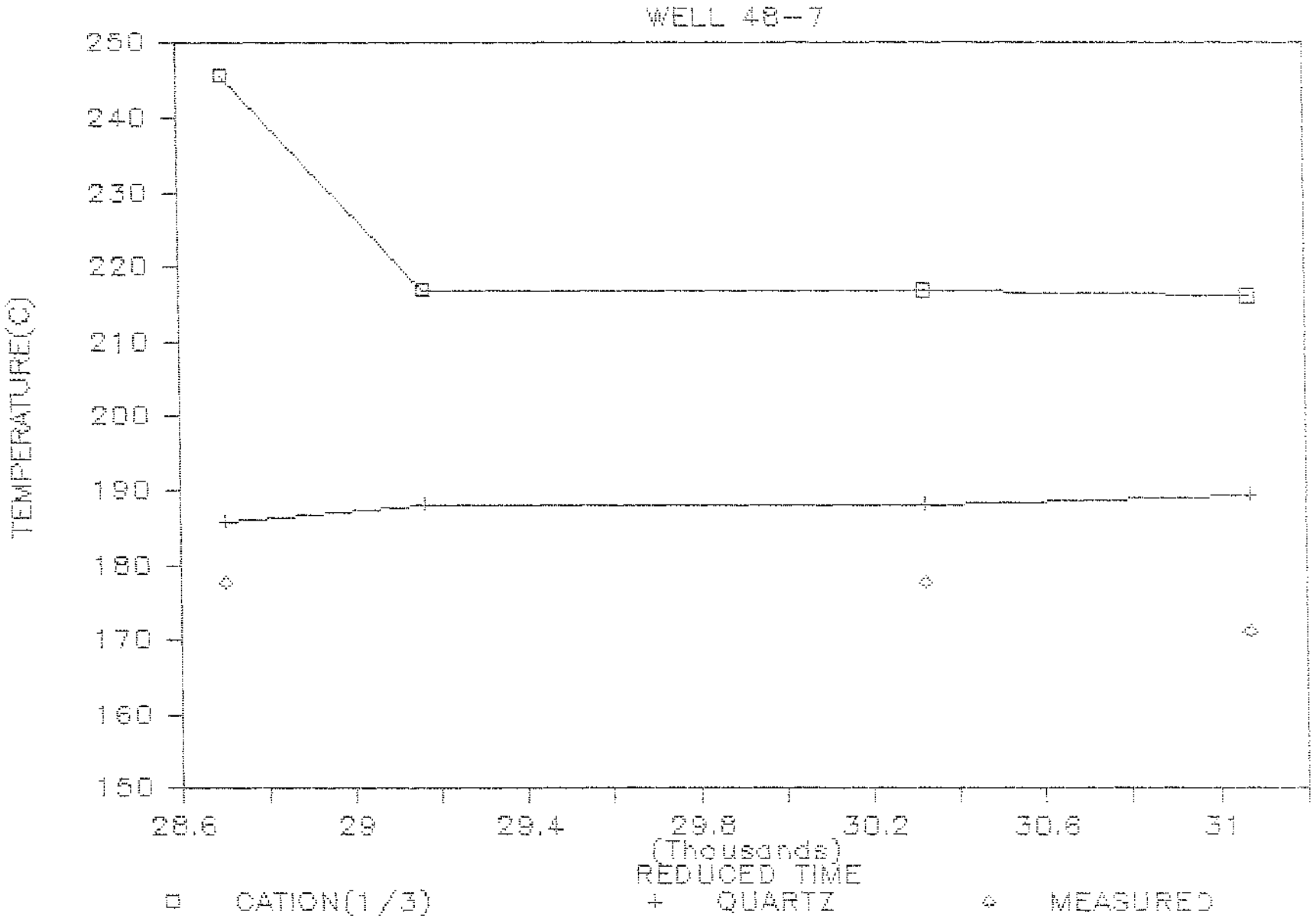


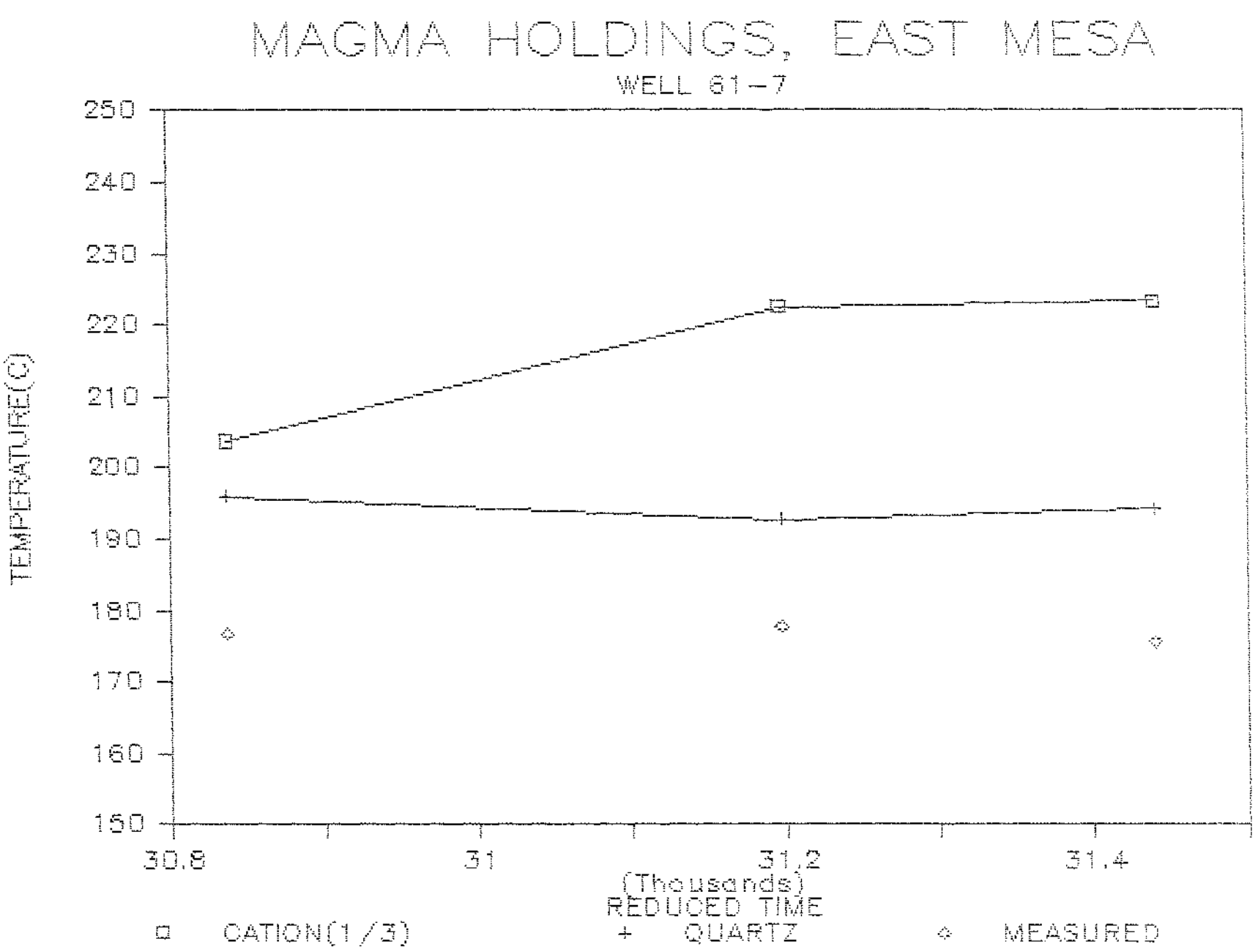
MAGMA HOLDINGS, EAST MESA

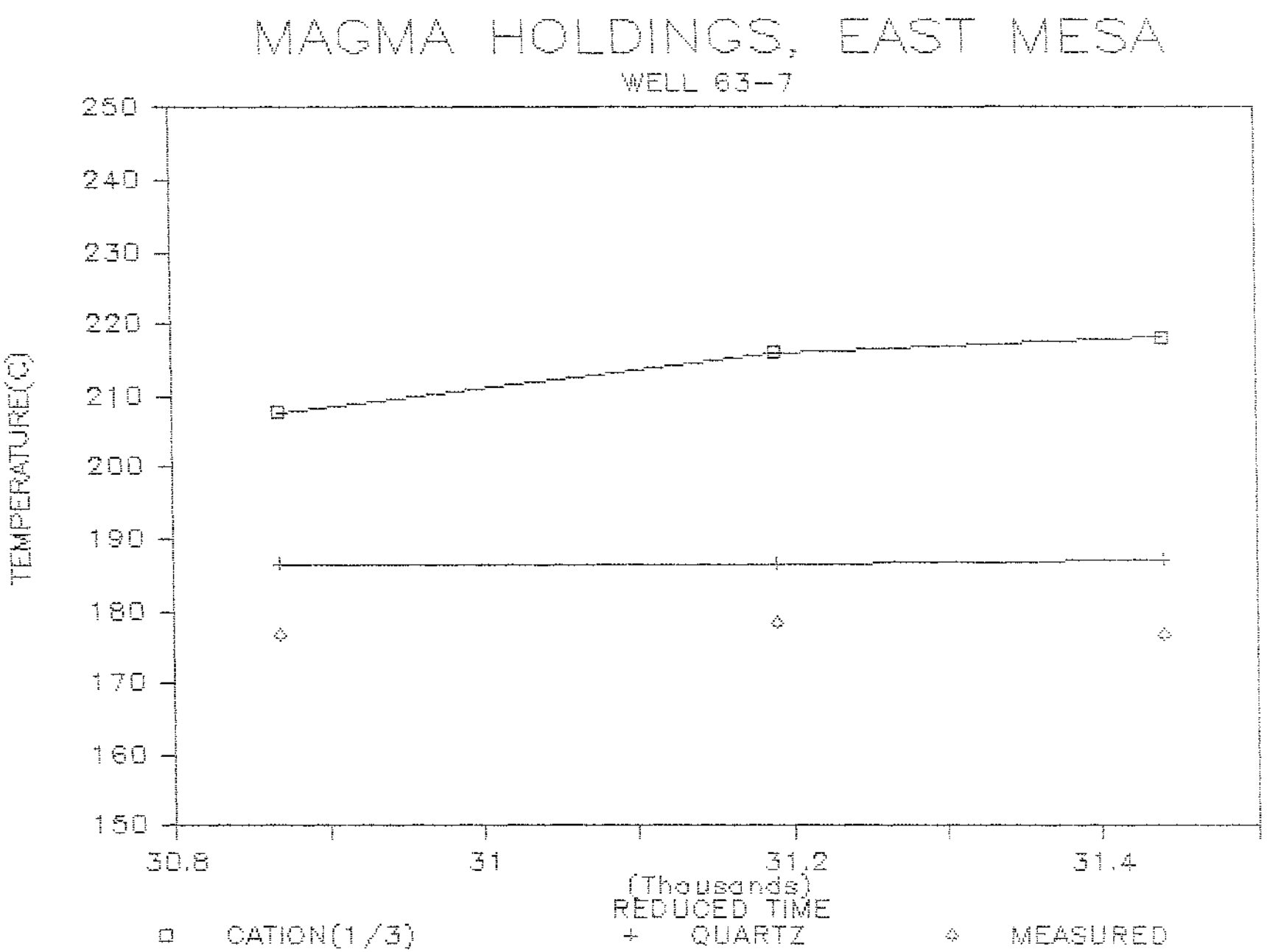
WELL 44-7B



MAGMA HOLDINGS, EAST MESA

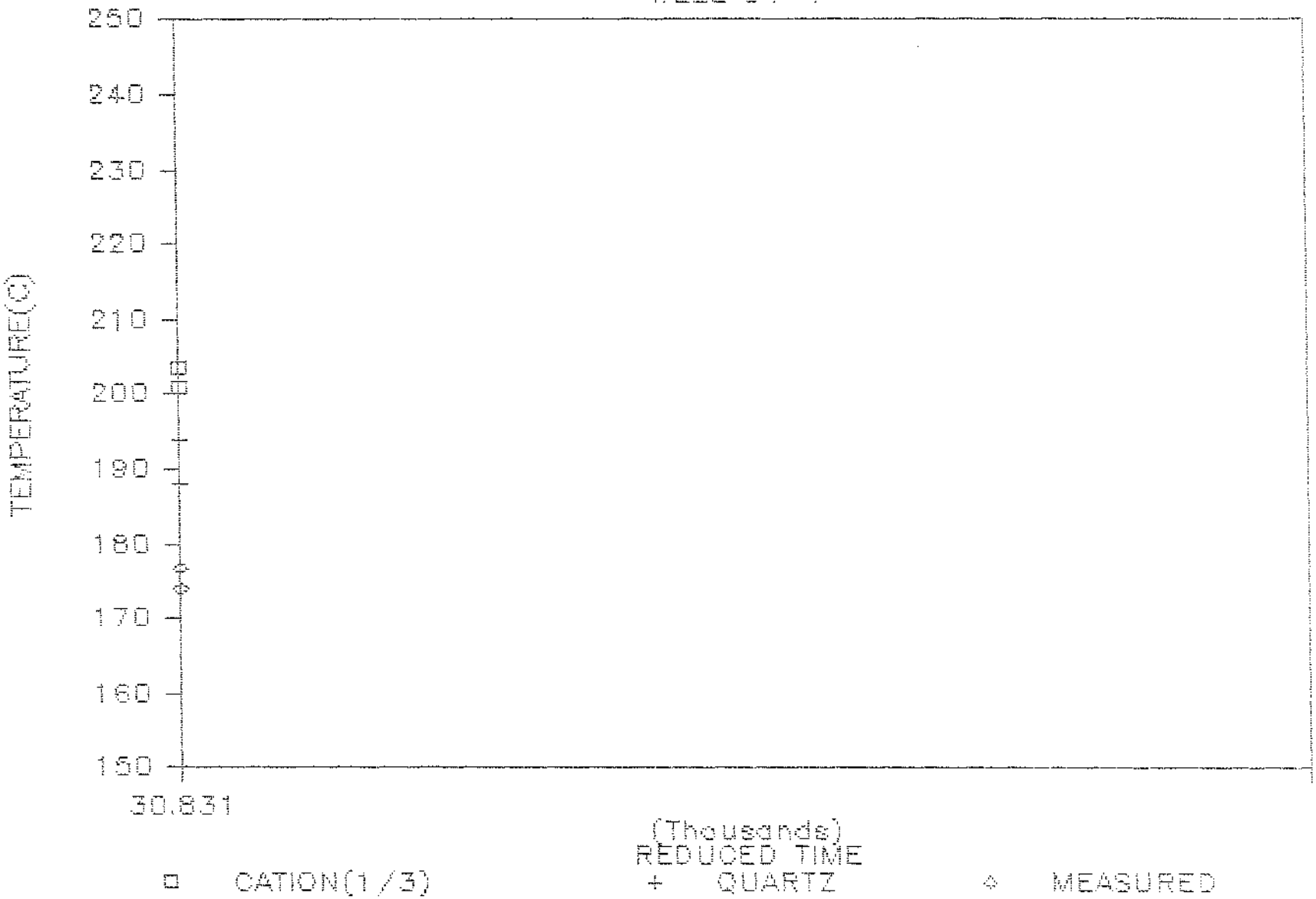



MAGMA HOLDINGS, EAST MESA
WELL 61-7
250
240
230
220
210
200
190
180
170
160
150
TEMPERATURE(C)
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME
CATION(1/3)
QUARTZ
MEASURED


MAGMA HOLDINGS, EAST MESA
WELL 63-7
TEMPERATURE(C)
250
240
230
220
210
200
190
180
170
160
150
30.8
31
31.2
31.4
(Thousands)
REDUCED TIME
CATION(1/3)
QUARTZ
MEASURED

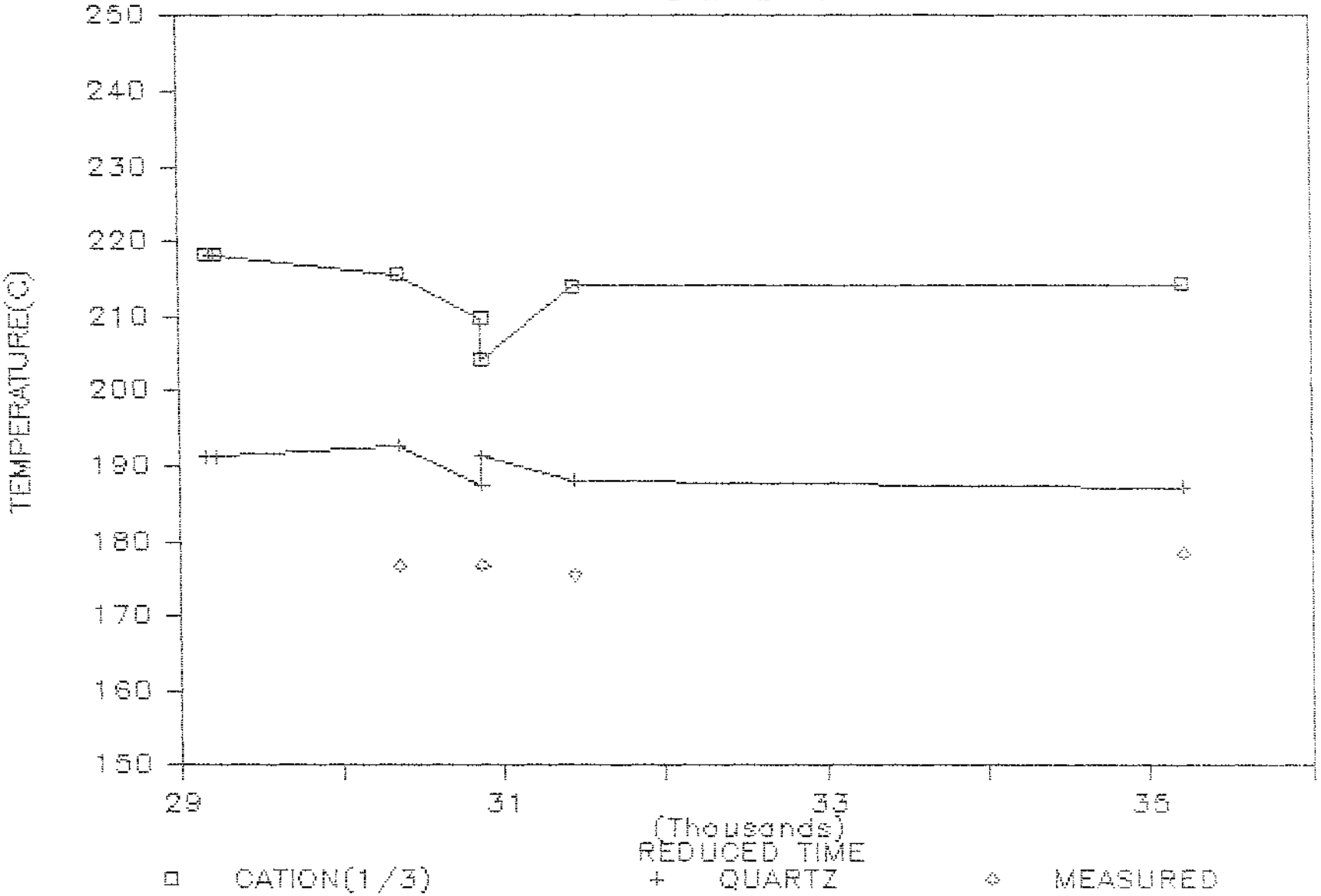
MAGMA HOLDINGS, EAST MESA

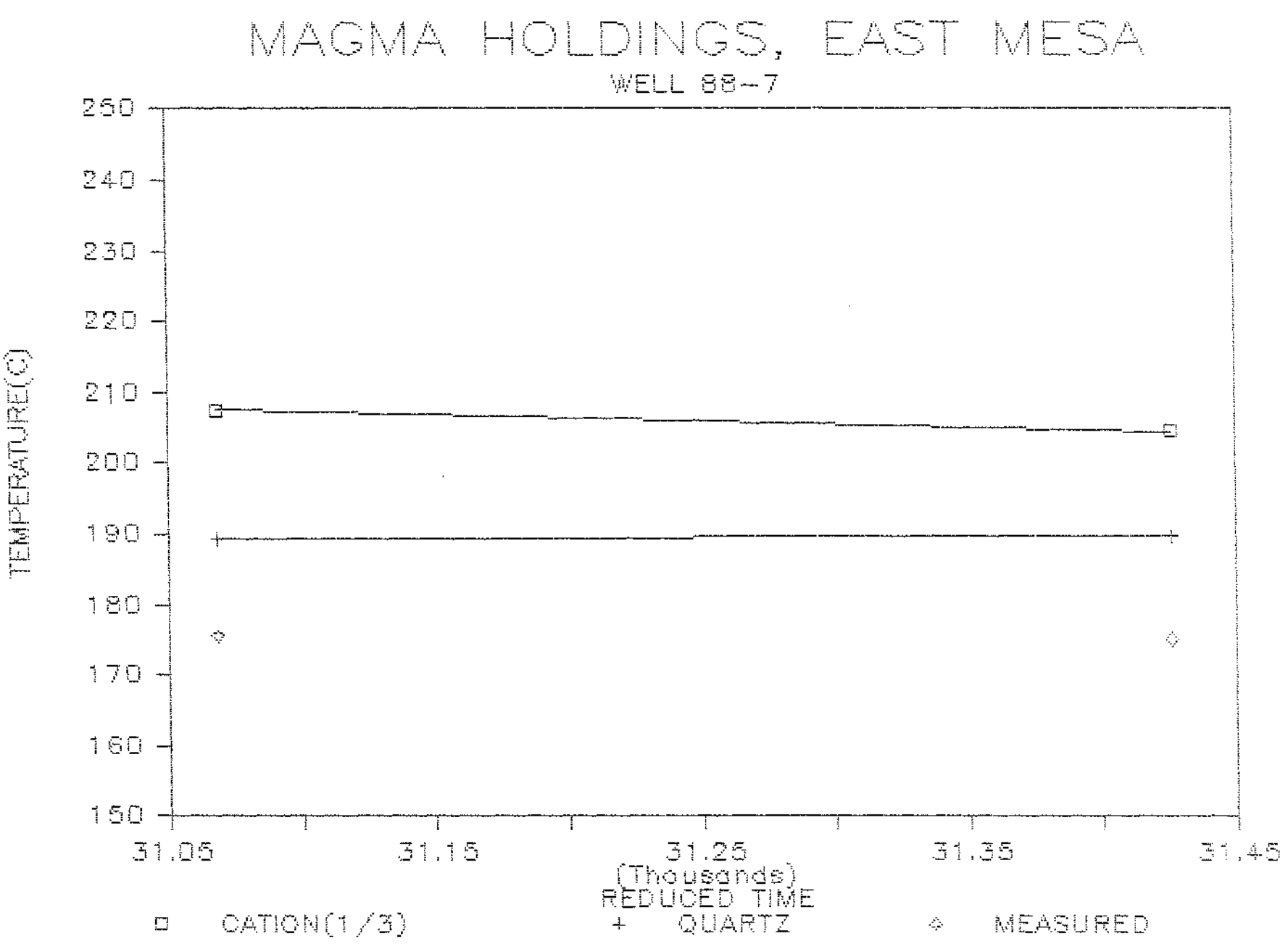
WELL 84-7



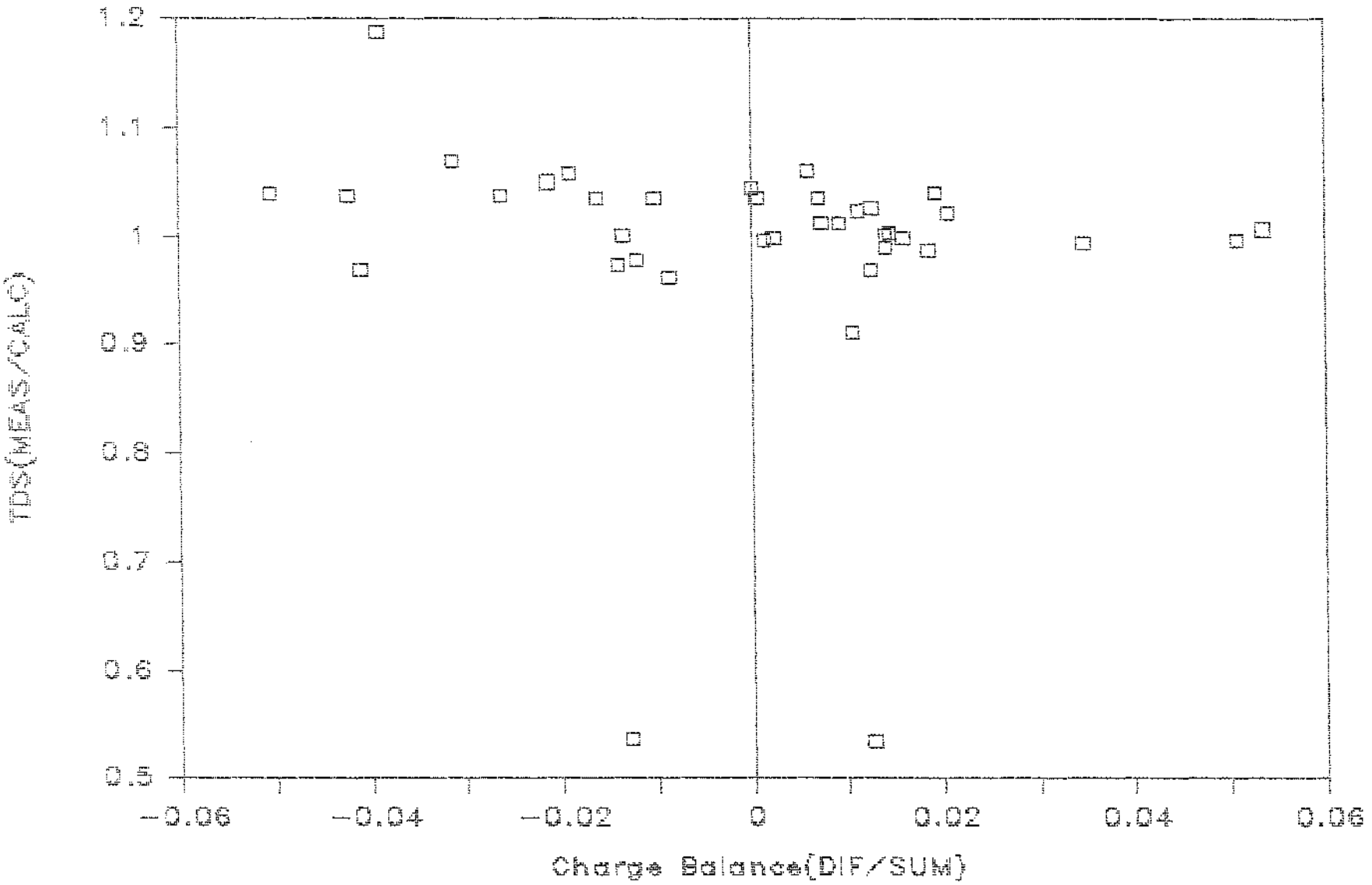
MAGMA HOLDINGS, EAST MESA

WELL 48-7A

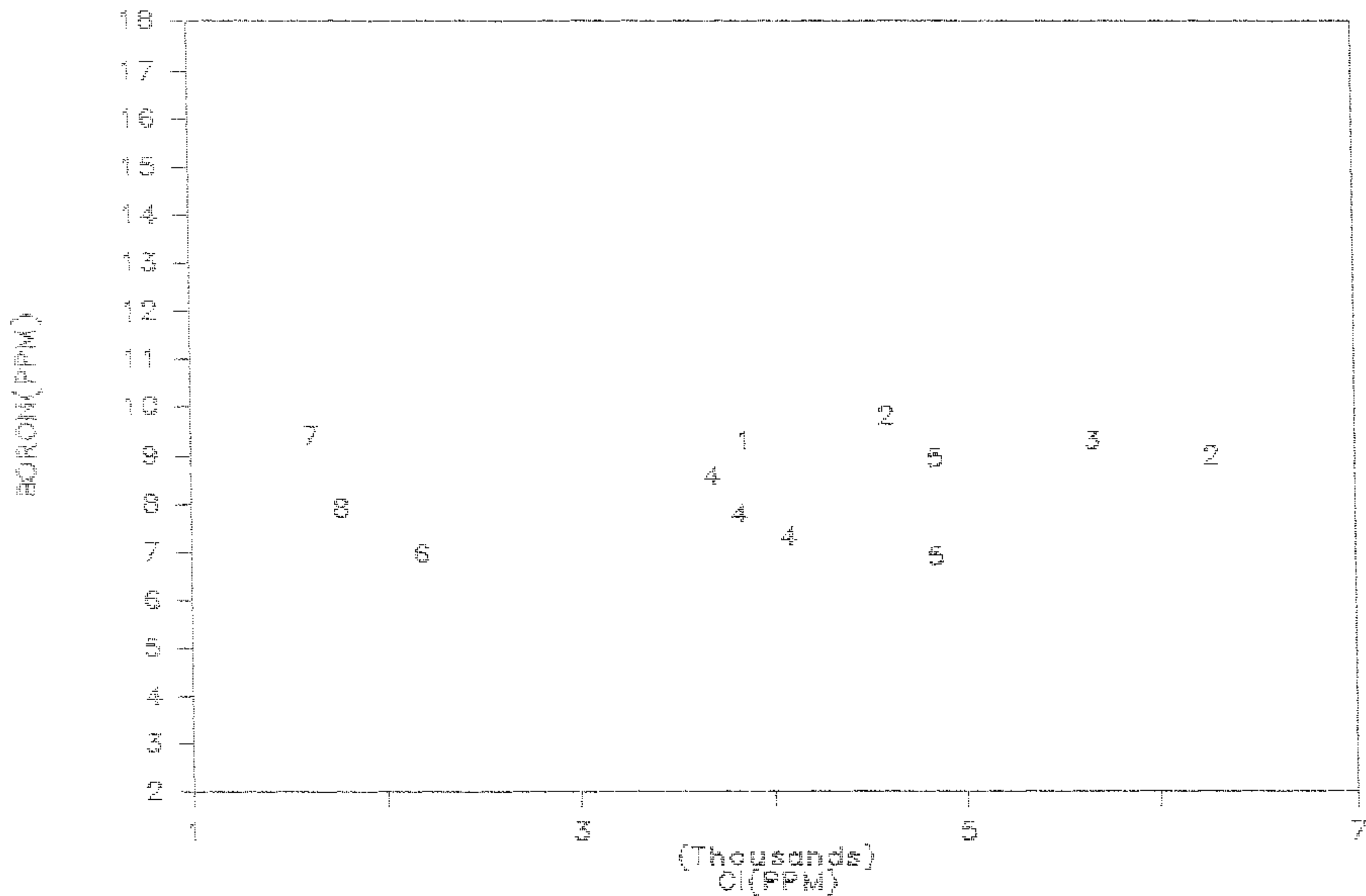


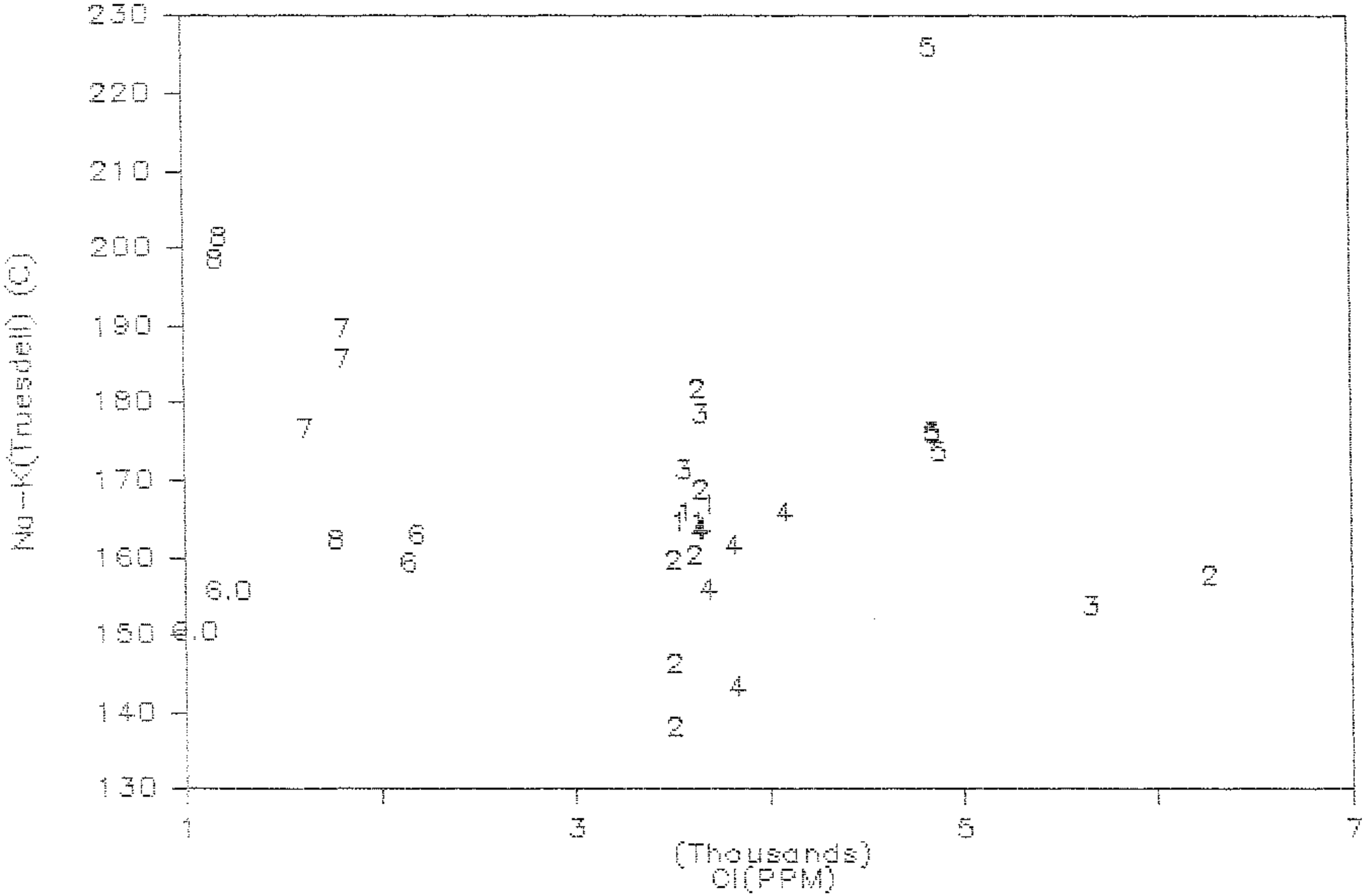

MAGMA HOLDINGS, EAST MESA
WELL 88-7
TEMPERATURE(C)
250
240
230
220
210
200
190
180
170
160
150
31.05
31.15
31.25
31.35
31.45
(Thousands)
REDUCED TIME
CATION(1/3)
QUARTZ
MEASURED

MAGMA HOLDINGS, EAST MESA FIELD



MAGMA HOLDINGS, EAST MESA FIELD

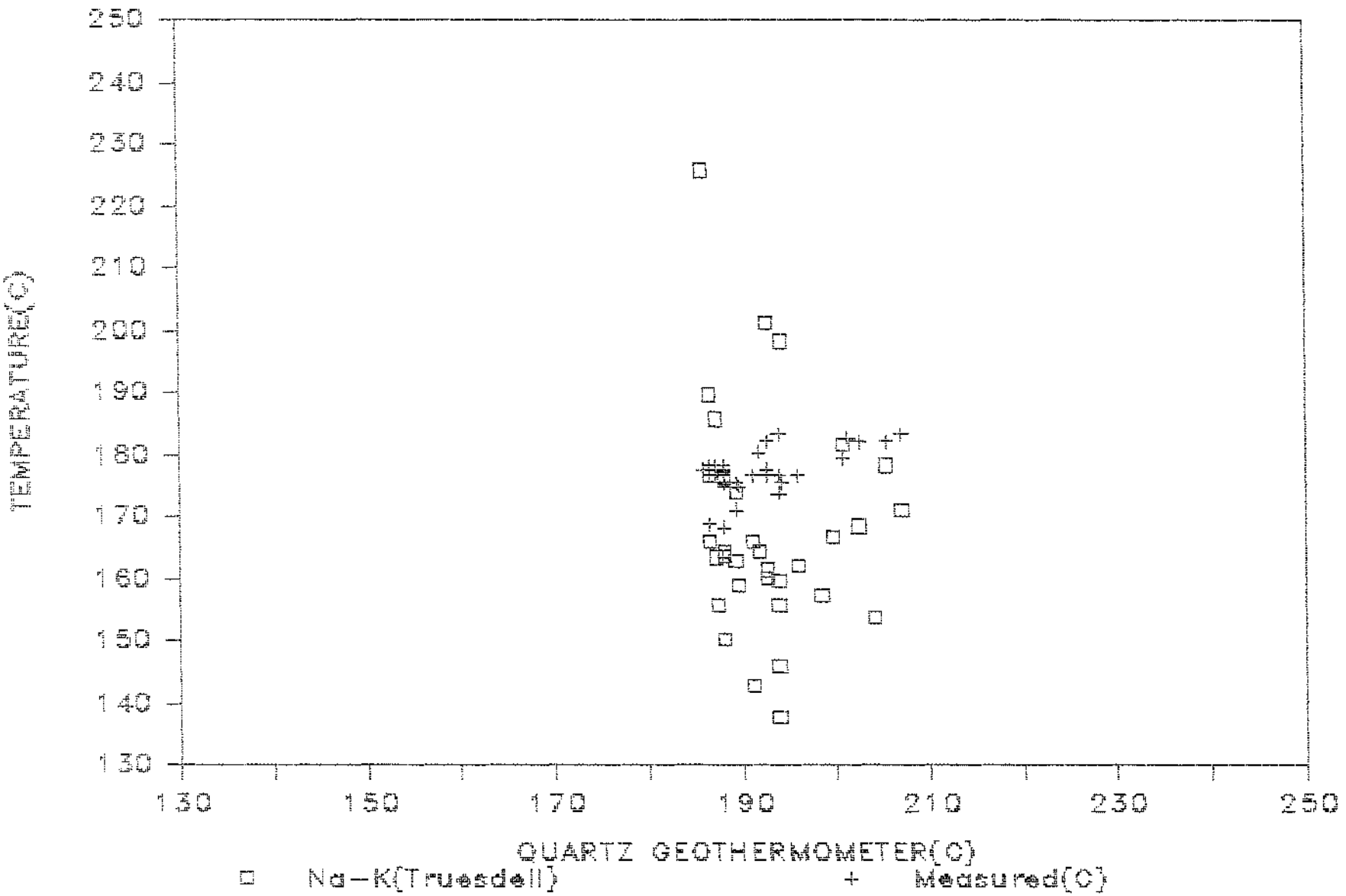




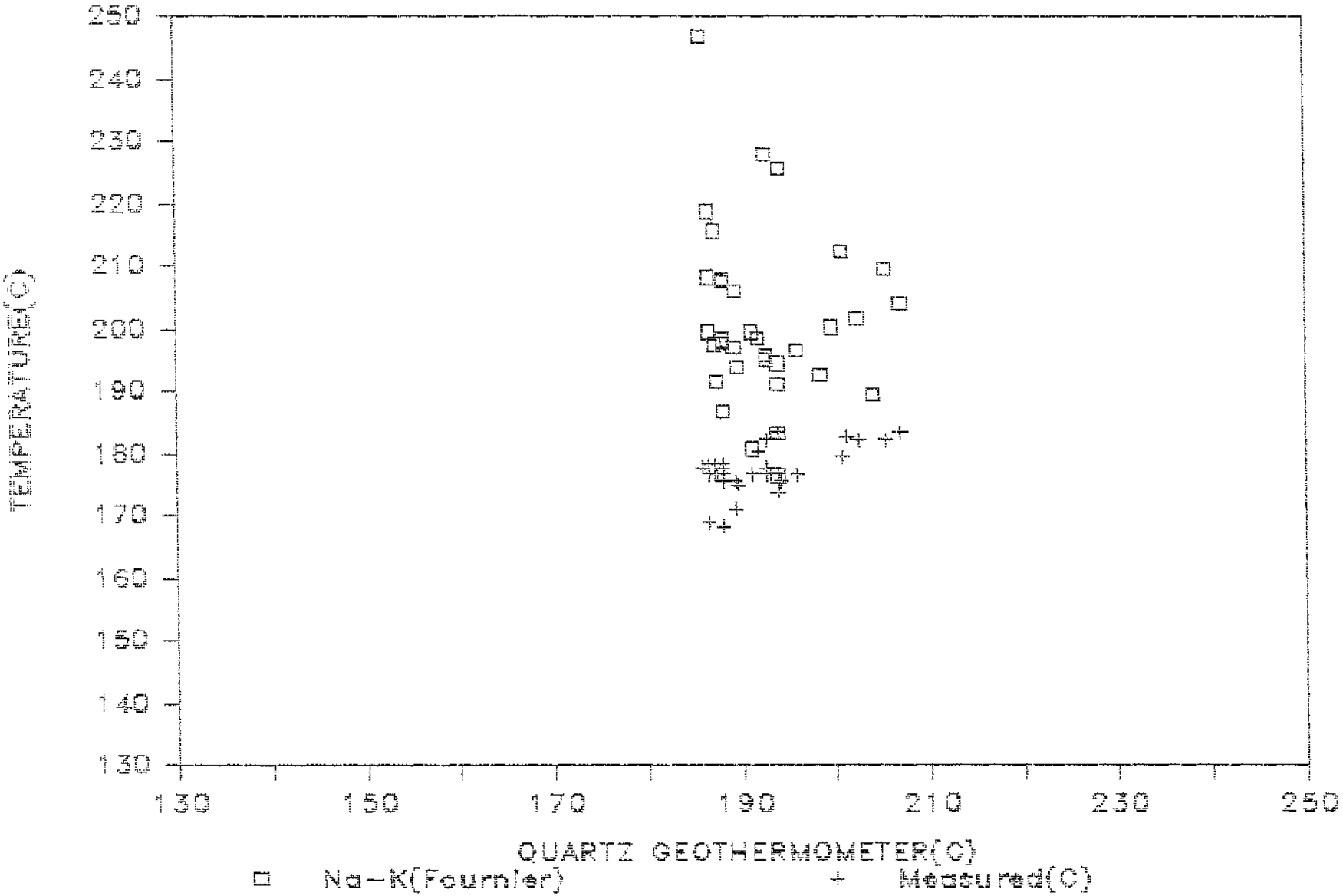
Mg-K(Truesdell) (C)
230
220
210
200
190
180
170
160
150
140
130
1
3
5
7
(Thousands)
Cl(PPM)

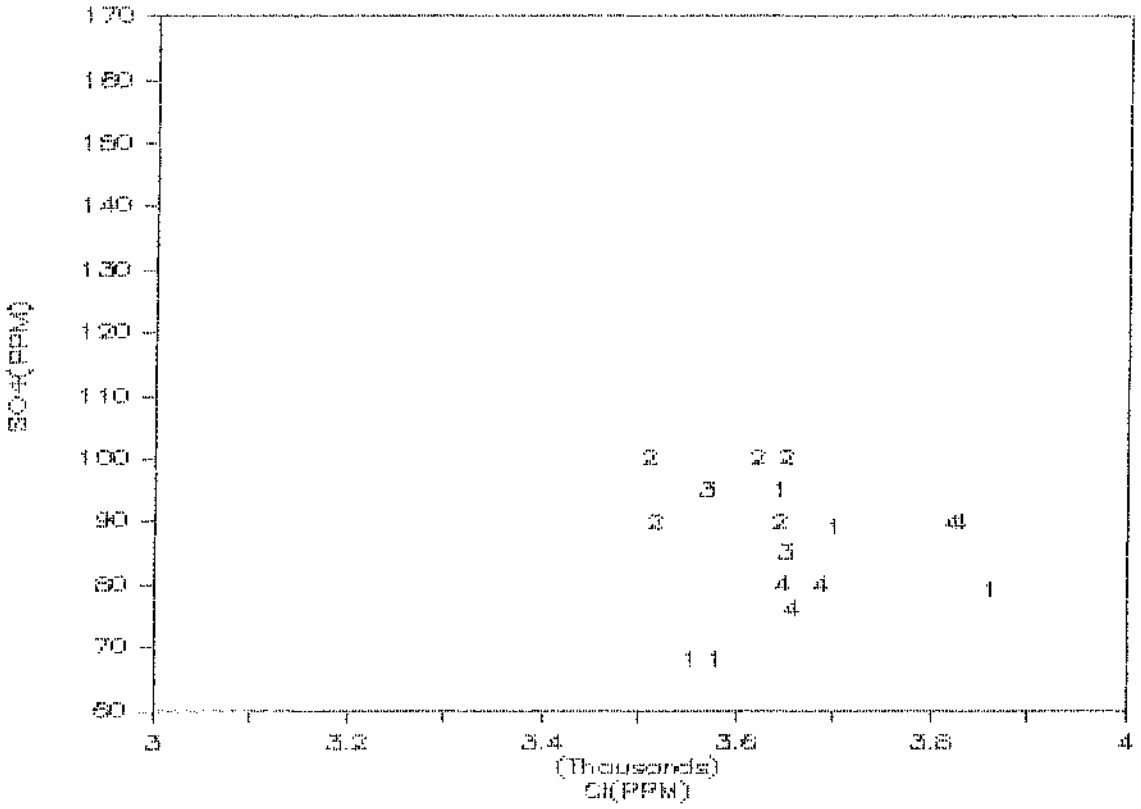
MAGMA HOLDINGS' EAST MESA FIELD
QUARTZ GEOTHERMOMETER(C)
(Thousands)
Oil (ppm)

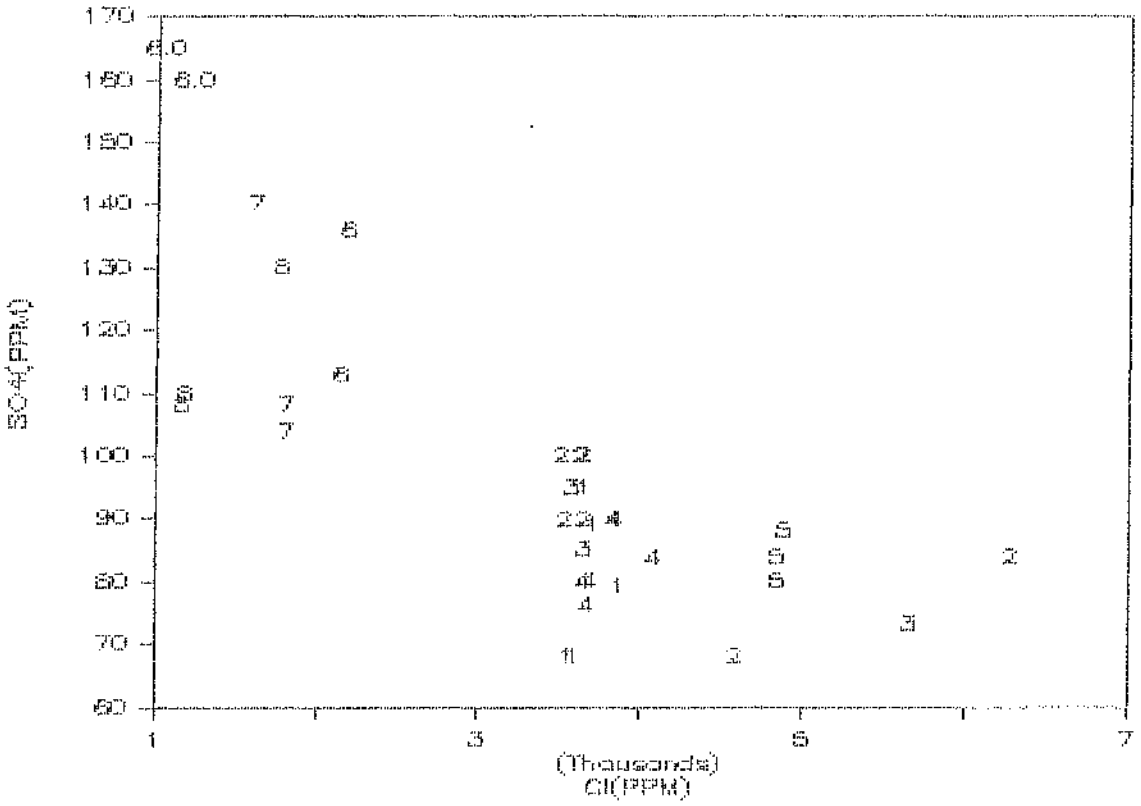
MAGMA HOLDINGS, EAST MESA FIELD

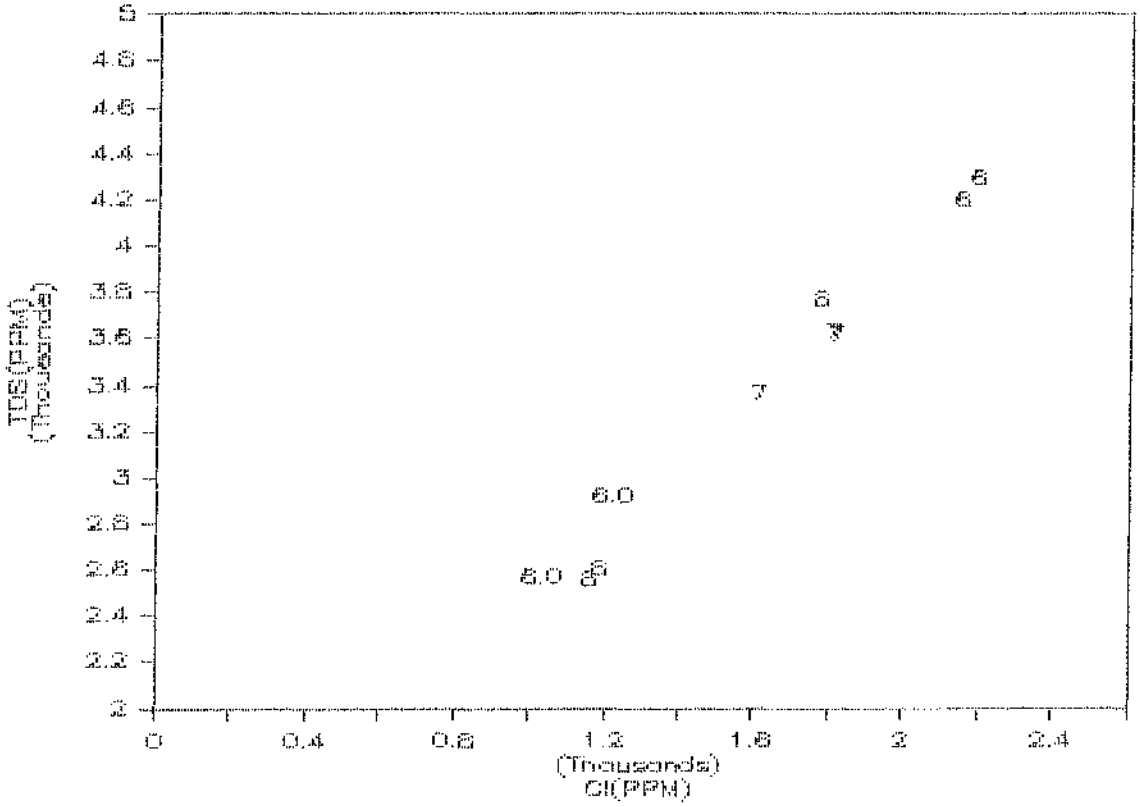


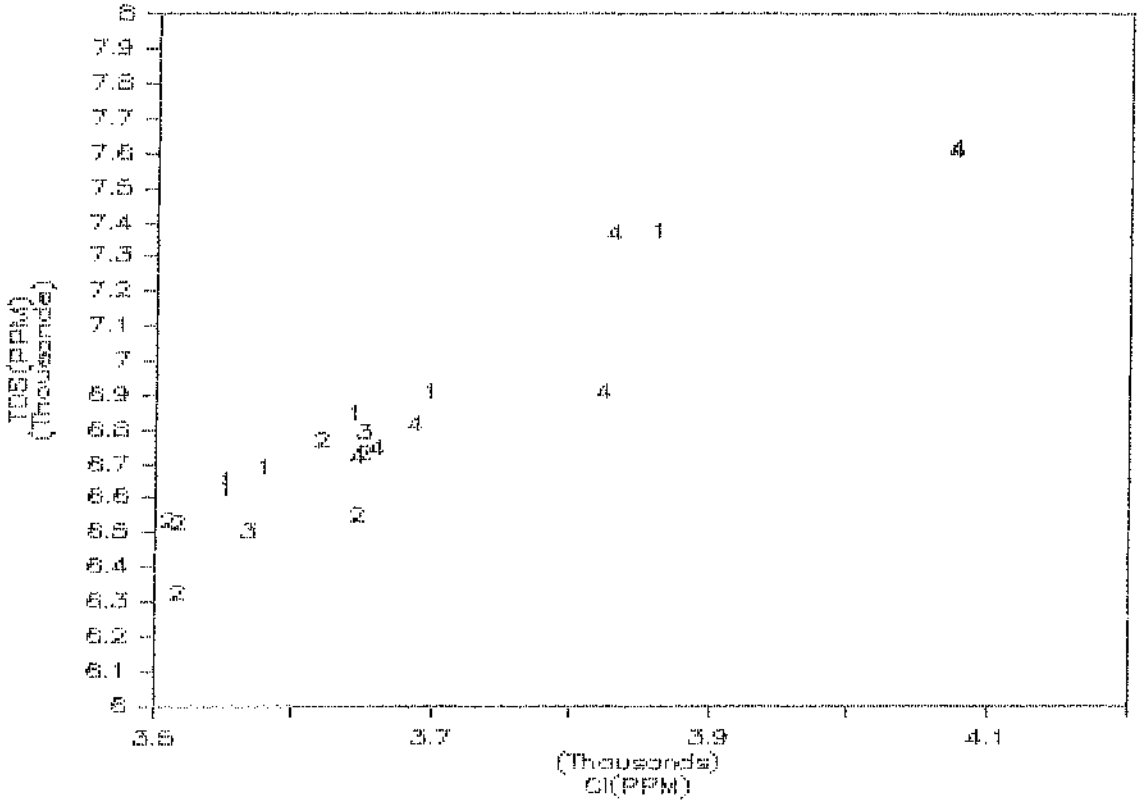
MAGMA HOLDINGS, EAST MESA FIELD

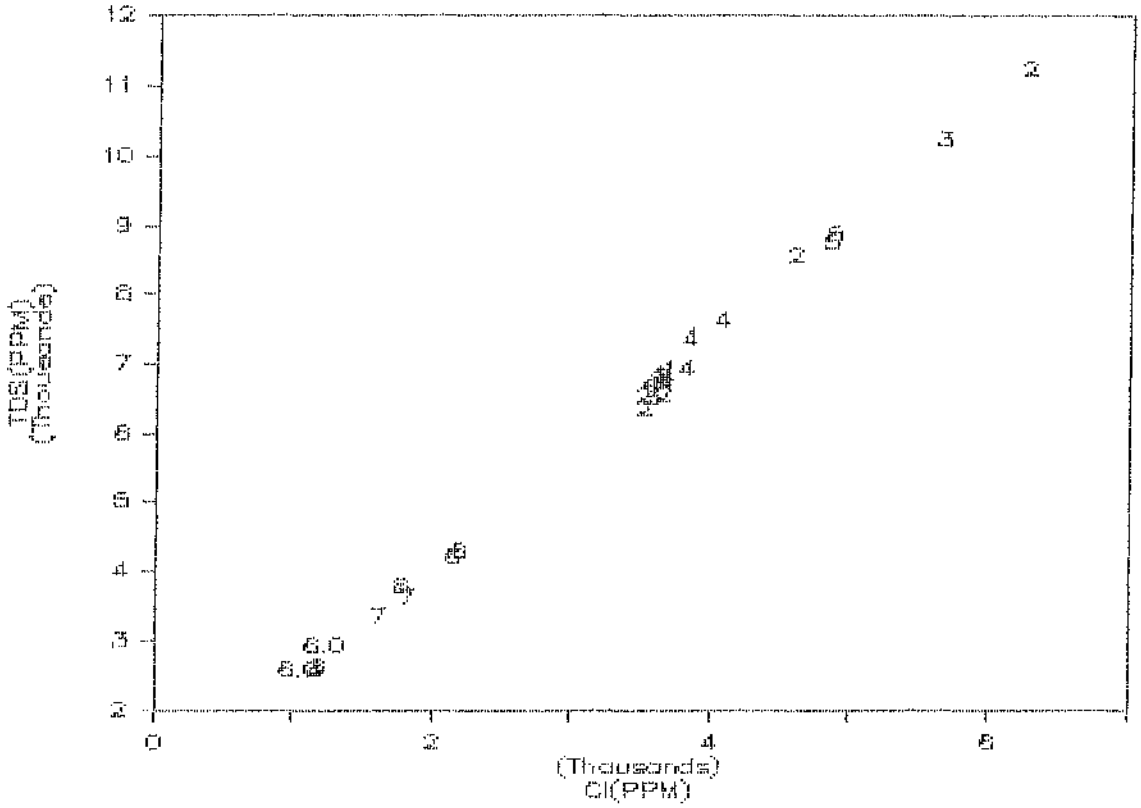



170
160
150
140
130
120
110
100
90
80
70
60
SO4(PPM)
3
3.2
3.4
3.6
3.8
4
(Thousands)
Cl(PPM)


170
160
150
140
130
120
110
100
90
80
70
60
1
3
5
7
SO4(PPM)
(Thousands)
Cl(PPM)


TDS(PPM)
(Thousands)
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
6
6
6
7
6.0
6.0
6
0
0.4
0.8
1.2
1.6
2
2.4
(Thousands)
Cl(PPM)


TOS(PPM)
(Thousands)
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
3.5
3.7
3.9
4.1
(Thousands)
Cl(PPM)


TDS(PPM)
(Thousands)
(Thousands)
Cl(PPM)

MAGMA HOLDINGS, EAST MESA FIELD