

R.O. ENGBRETSSEN

JUL 09 1981

Union Geothermal Co. of New Mexico

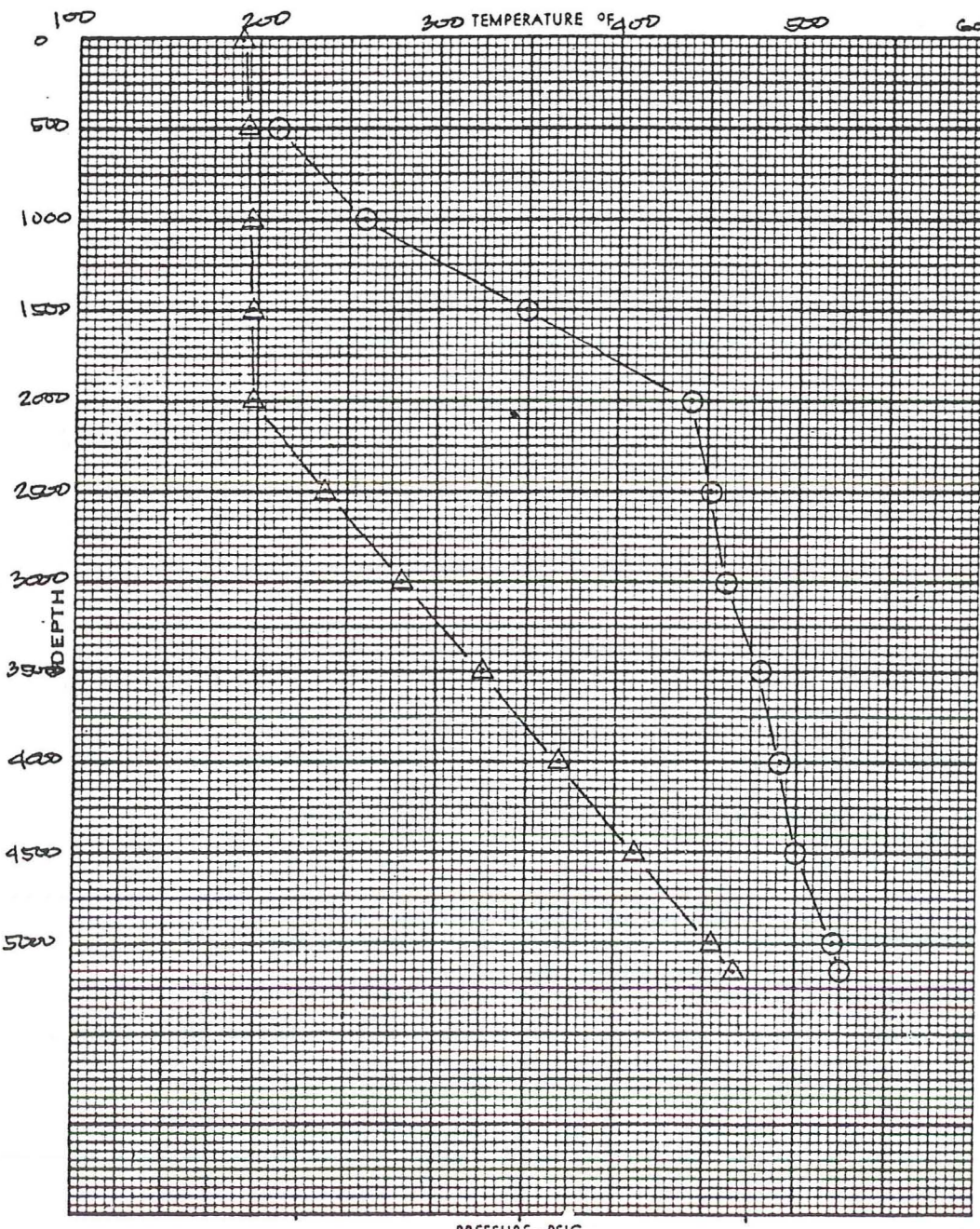
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY



OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CANYON WELL NAME DATA NO 18
 CASING 13 2/3" @ 660' ELEV. 8734.5' DATE: 7-6-81
 LINER DESCRIPTION: 7 5/8" SURFACE TO 2013' ; 7" @ 1853 TO TD ZERO POINT GL + 8'
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 2050 PSI INSTRUMENT 03-618 FAHR.
 _____ KP6 9235 SERIAL NO. KTB 10222

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5150 FT. MAX. TEMP. 525 °F @ 5150'
 REMARKS: _____



STABILIZATION PERIOD

PRESSURES	GAUGE	BOMB
CASING, PSI	348	365

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	73	365	-
500	211	376	-
1000	258	383	-
1500	349	389	-
2000	441	392	-
2500	452	551	0.318
3000	460	725	0.341
3500	479	901	0.351
4000	491	1073	0.34
4500	500	1242	0.34
5000	521	1415	0.34
5150	525	1466	0.34

○ TEMPERATURE
 △ PRESSURE

BY: _____

R.O. ENGBRETS

FEB 04 1982



Union Geothermal Co. of New Mexico

B18-S17 P/T

SURVEY DATE: 2-3-82

TITLE BACA No 18 TEMP/PRESS GRADIENT SURVEY TO 5150 FT.

TEMP. EL. S/N : KTB 23338 PRESS. EL. S/N : KPG 17014
RANGE : 1-680°F RANGE : 2500 PSI
CALIBRATED : 10-16-81 CALIBRATED : 11-18-81
CLOCK: 12 HRS. : S/N: 14087 CLOCK: 12 HRS. : S/N: 23778

WHP AT START OF SURVEY : 345 PSIG
WHP AT END OF SURVEY : 345 PSIG
OPENED WELL TO ELEMENT : 1300 HRS.
POH : 1524 HRS.

TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY
MOS., DAYS, HRS., MINS.

DATE AND TIME OF LATEST S. I. (FT. NO.) HRS. 19

Table with columns: Station, Depth, Time at Sta., TEMPERATURE (Defl., °F), PRESSURE (Defl., Corr. Defl., PSIG), REMARKS. Rows 1-12 showing data for depth 0 to 5150 ft.

R. O. ENGBRETSSEN

FEB 04 1982

Union Geothermal Co. of New Mexico

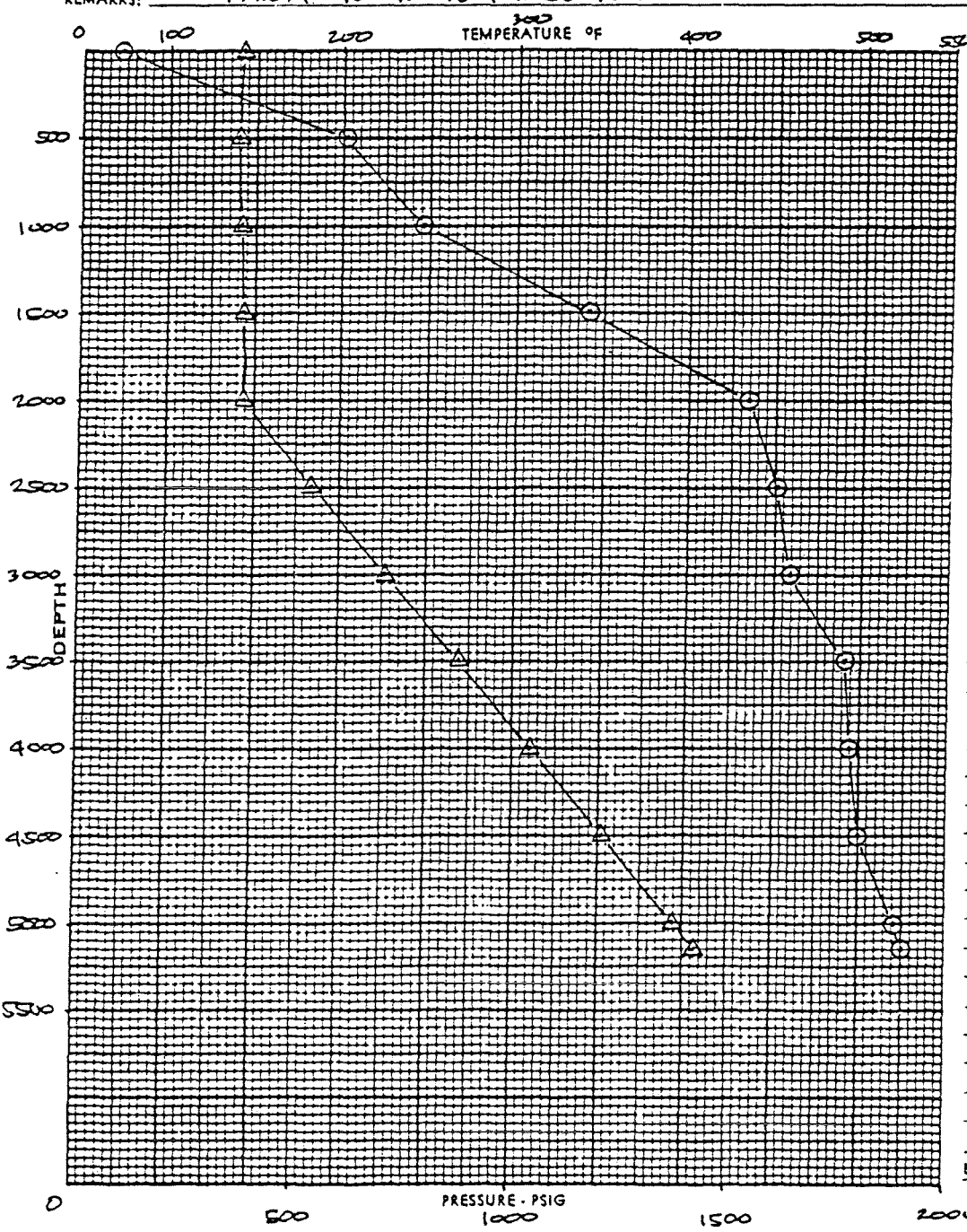
B18-S17 P/T

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD PERONDO CREEK WELL NAME BACA # 18
 CASING 13 3/8" @ 600'; 9 5/8" SURFACE TO 2013' ELEV. 8734.5' DATE: 2-3-82
 LINER DESCRIPTION: 7" @ 1853 TO 5240' ZERO POINT S' + GL DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 2500 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 17014 SERIAL NO. KTB 23322

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5150 FT. MAX. TEMP. 525 °F @ 5150'
 REMARKS: PRIOR TO WATER INJECTION



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI	345	366

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	46	366	-
500	202	362	-
1000	247	371	-
1500	342	376	-
2000	434	379	-
2500	451	537	0.316
3000	458	708	0.342
3500	491	876	0.336
4000	494	1042	0.332
4500	527	1209	0.334
5000	521	1377	0.336
5150	525	1428	0.340

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

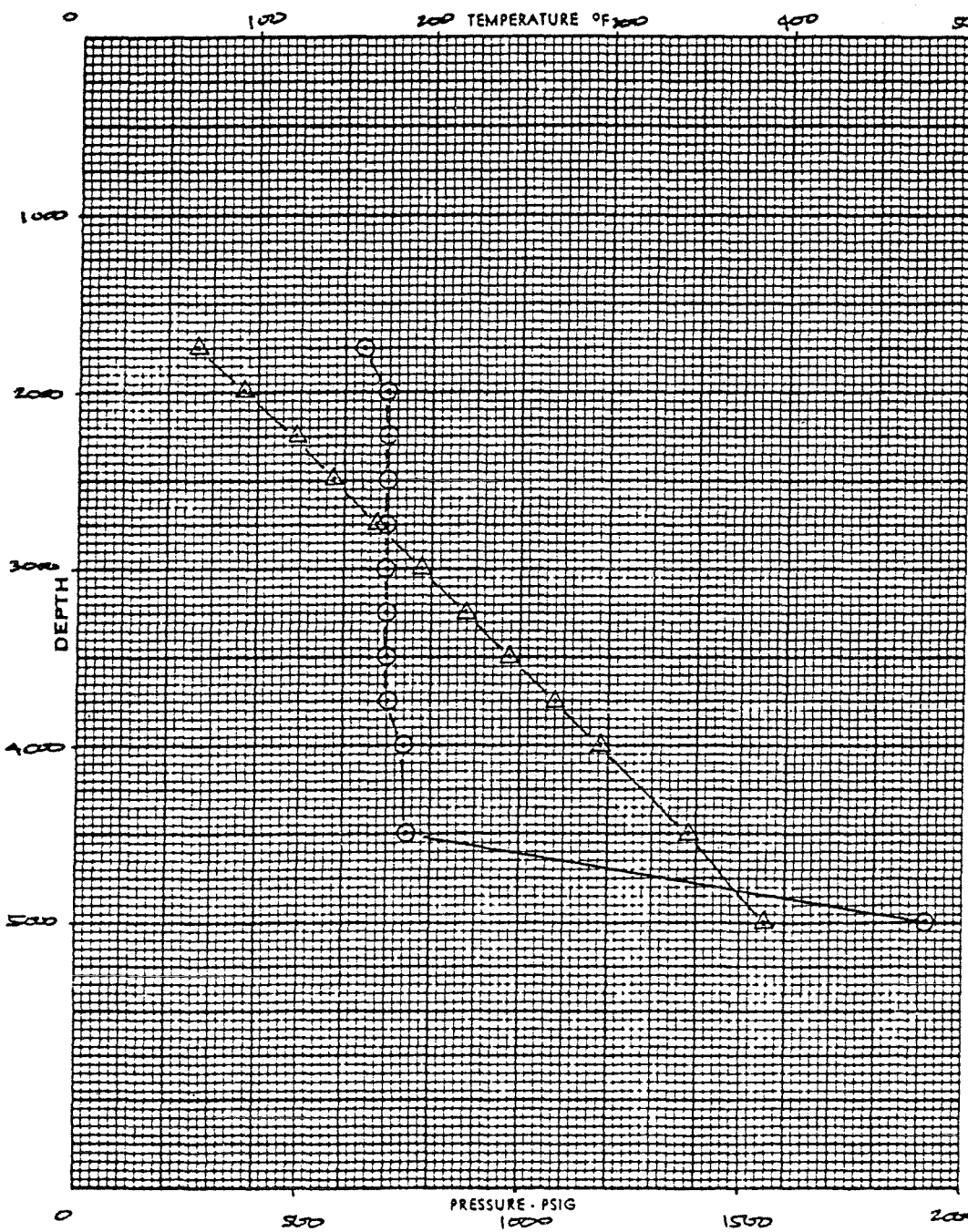
B18-518 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA # 18
 CASING 13 3/8" C 660'; 9 5/8" SURFACE TO 2013' ELEV. 8734.5 DATE: 3-1-82
 LINER DESCRIPTION: 7" e 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____

3250 PSI INSTRUMENT 1-G80 FAHR.
 KPL 22300 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEYS TO 5000 FT. MAX. TEMP. 478 °F @ 5240'
 REMARKS: (WATER INJECTION GOING ON)



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
1750	161.3	267	-
2000	173.5	370	0.412
2250	"	490	0.480
2500	"	576	0.344
2750	"	677	0.404
3000	"	778	0.404
3250	"	878	0.400
3500	174.7	977	0.396
3750	175.6	1081	0.416
4000	184.1	1183	0.408
4250	186.5	1383	0.400
5000	478	1557	0.348

○ TEMPERATURE
 △ PRESSURE

BY: _____

JPR

03 09 82

BACA NO 18 SPINNER SURVEY

SPINNER SN: 123

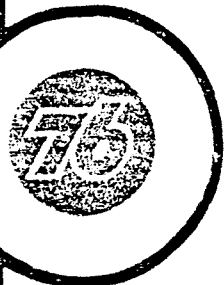
CLOCK SN: 24304

VHP @ START/END OF SURVEY: 13th Hg. V&C.

OPENED WELL TO SPINNER: 1334 HRS.

PULL OUT OF HOLE: 1417 HRS.

STATION	DEPTH FT.	EXACT TIME @ STATION	NO OF MARKS	RPM	REMARKS
1	1750	1334.30 - 1337.30	5	166.7	9 $\frac{5}{8}$ " CASING
2	2000	1338 - 1341	12	400	7" SLOTTED
3	2250	1341.30 - 1344.30	11	366.7	7" SLOTTED
4	2500	1345 - 1348	13	433.3	7" BLANK
5	2750	1348.30 - 1351.30	11	366.7	7" BLANK
6	3000	1352 - 1355	10	333.3	7" SLOTTED
7	3250	1355.30 - 1358.30	8	266.7	}
8	3500	1359 - 1402	7	233.3	
9	3750	1402.30 - 1405.30	4	133.3	7" BLANK
10	4000	1406 - 1409	0	-	
11	4300	1410 - 1413	0	-	INJECTION RATE = 236 GPM
12	5000	1414 - 1417	0	-	



Union Geothermal Co. of New Mexico

B18-519

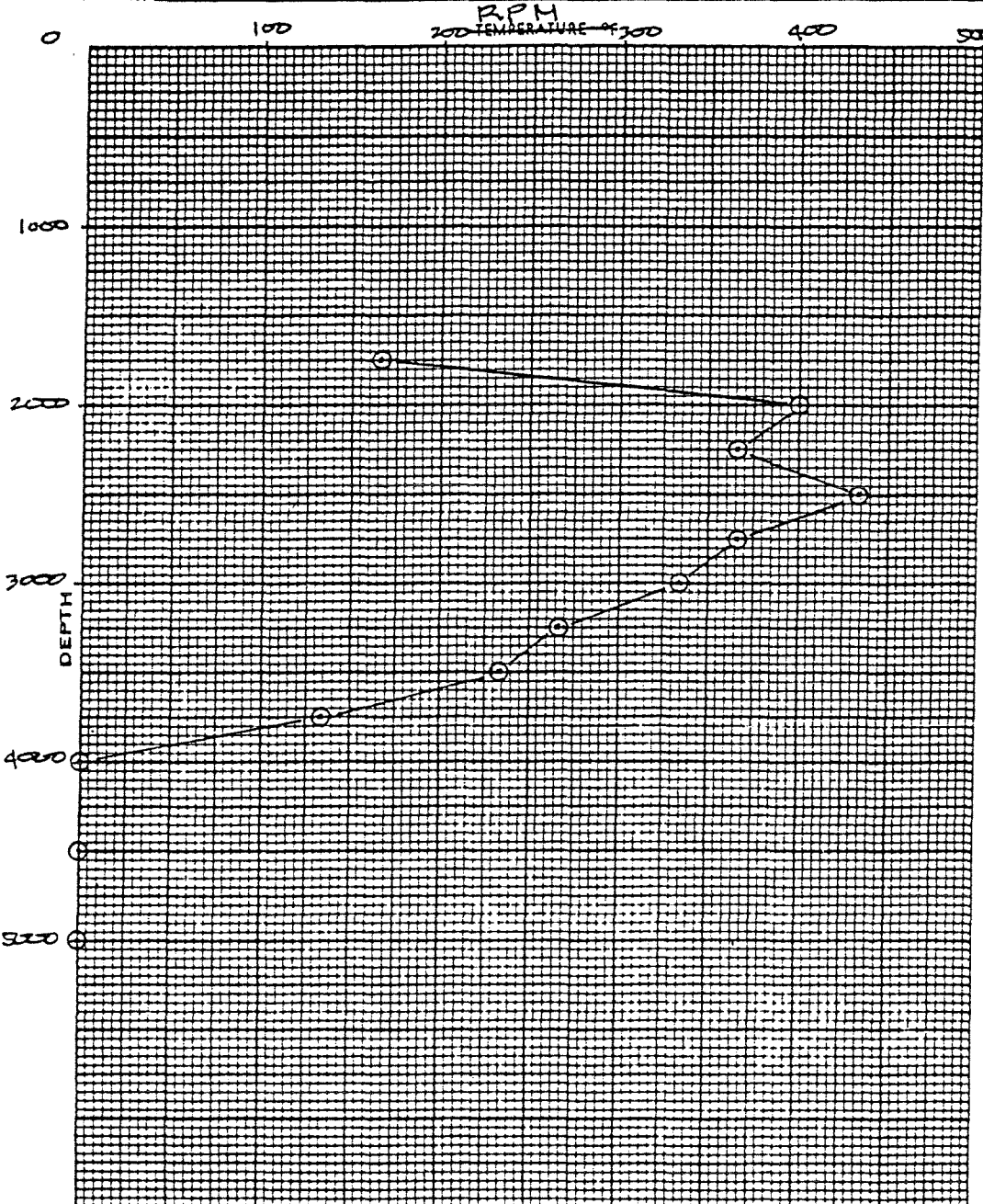
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACK # 18
 CASING 1 3/8" @ 660' ; 7 5/8" SURF. @ 293' ELEV. 8134.5' DATE: 3-9-82
 LINER DESCRIPTION: 7" @ 1553' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____ INSTRUMENT CROWD SPINNER FAHR.
 SERIAL NO. 123

PURPOSE SPINNER SURVEYS TO 5000 FT. MAX. TEMP. _____ °F @ _____

REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH	TEMP.	PRESS.	GRAD.

DEPTH	NR OF MARK	RPM
1750	5	166.7
2000	12	400
2250	11	366.7
2500	13	433.3
2750	11	366.7
3000	10	333.3
3250	8	266.7
3500	7	233.3
3750	4	133.3
4000	0	-
4500	0	-
5000	0	-

INJECTION RATE
= 236 GPM

BY: _____



Union Geothermal Co. of New Mexico

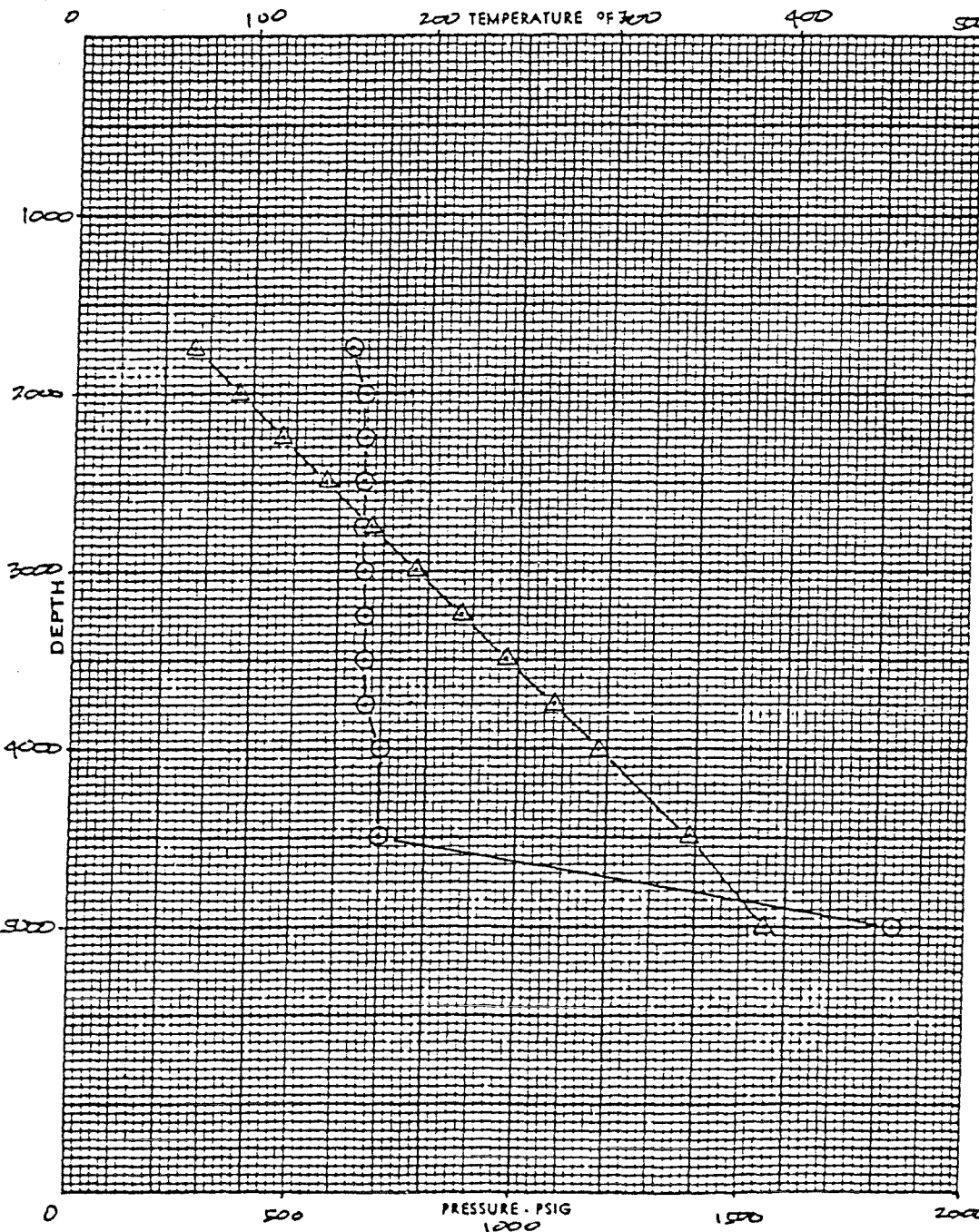
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S 20 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA W 18
 CASING 13 3/8" @ 660'; 9 5/8" SURFACE - 2013' ELEV. 8734.5' DATE: 9-12-82
 LINER DESCRIPTION: _____ ZERO POINT KB
1" @ 1853' - 5240' DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPC 2338U SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 459 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
1750	157	264	-
2000	164	370	0.474
2250		472	0.402
2500		572	0.400
2750		675	0.412
3000	165	775	0.400
3250	166	876	0.404
3500	166	977	0.404
3750	167	1081	0.416
4000	175	1181	0.402
4250	175	1388	0.414
5000	459	1557	0.338

○ TEMPERATURE
 △ PRESSURE

BY: _____

BACA DE 18 SPINNER SURVEY

SPINNER SN: 123

CLOCK SN: 24304

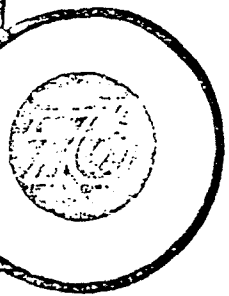
WHP @ START/END OF SURVEY: 15" Hg VAC.

OPENED WELL TO SPINNER: 1324 HRS.

POH: 1425:31 HRS.

STATION	DEPTH FT.	EXACT TIME @ STATION	NO OF MARKS	RPM	REMARKS
1	1750	1326.19-1329.19	5	166.7	9 ⁵ / ₈ " CASING
2	2000	1329.35-1332.35	13	433.3	7" SLOTTED
3	1900	1334.16-1337.16	12	400.0	7" BLANK
4	2250	1337.34-1340.34	12	400.0	7" SLOTTED
5	2500	1341.10-1344.10	11	366.7	7" BLANK
6	2750	1344.32-1347.32	10	333.3	7" BLANK
7	3000	1347.54-1351.54	14	350.0	7" SLOTTED, 4 HRS. STOP
8	3250	1352.15-1355.15	10	333.3	" "
9	3500	1355.37-1358.37	7	233.3	" "
10	3750	1359.00-1402.00	6	200.0	7" BLANK
11	4000	1402.23-1405.23	4	133.3	" "
12	4500	1406.06-1409.06	0		
13	5000	1409.46-1412.46	0		
14	1000	1422.31-1425.31	13		

INJECTION RATE = 230 GPM



Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

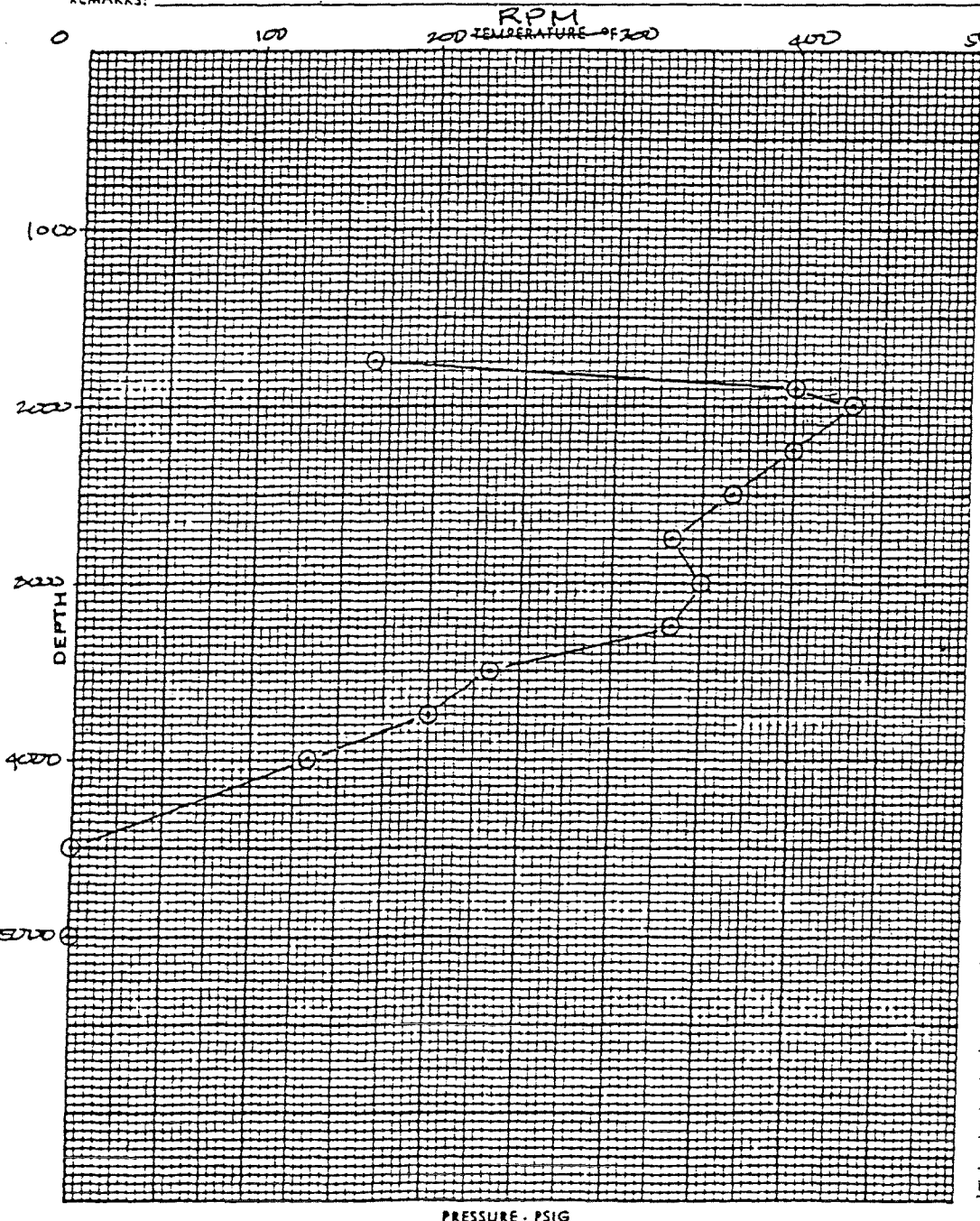
B18-S-21

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD ROUND CREEK WELL NAME BACA # 18
 CASING 13 3/8" @ 660' ; 7 5/8" SURF. - 2013' ELEV. 8732.5' DATE: 4-12-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB DEPTH 5240'

HOLE DESCRIPTION: _____ INSTRUMENT CRELAD SPINNOA FAHR.
 SERIAL NO. 123

PURPOSE SPINNER SURVEY TO 5000 FT. MAX. TEMP. _____ °F @ _____

REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH	TEMP. NO. OF	PRESS. GRAD.
DEPTH	MARK	RPM
1750	5	166.7
2000	13	423.3
1900	12	400.0
2250	12	400.0
2500	11	366.7
2750	10	333.3
3000	14	300.0
3250	10	333.3
3500	7	333.3
3750	6	200.0
4000	4	133.3
4500	0	—
5000	0	—

INJECTION RATE
= 230 GPM

BY: _____



R. O. ENGBRETSSEN

APR 16 1982 RUN NO. B18-322 P/P

Union Geothermal Co. of New Mexico

SURVEY DATE: 4-13-82

TITLE BACK NO. 18 P/P FALL OFF SURVEY TO 3750 FT.

PRESS. EL. S/N : KPC 9222 PRESS. EL. S/N : KPC 22390
 RANGE : 9600 PSI RANGE : 3250 PSI
 CALIBRATED : 7-9-80 CALIBRATED : 7-1-81
 CLOCK: 12 HRS.: S/N: 12889 CLOCK: 12 HRS.: S/N: 14087

WHP AT START OF SURVEY : 14.5" Hg. vac. PSIG
 WHP AT END OF SURVEY : 7" " " PSIG
 OPENED WELL TO ELEMENT: 0814 HRS.
 POH : 1558 HRS.

TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY

 MOS., DAYS, HRS., MINS.

DATE AND TIME OF LATEST S. I. (FT. NO.) 0856 HRS. 4-13-1982
WATER INJ.

Station	Depth	Time at Sta. <small>HRS.</small>	PRESSURE			PRESSURE			REMARKS
			Defl.	Corr. Defl.	PSIG	Defl.	Corr. Defl.	PSIG	
1	3750	0841	0.456	0.468	1084.9	0.654	0.669	1083.9	CORRECTION ON DEFLECTION WAS BASED @ 200°F
		0856	0.456	0.468	1084.9	0.654	0.669	1083.9	
		0901	0.439	0.451	1046	0.634	0.649	1051	
		0906	0.433	0.445	1032	0.622	0.637	1031	
		0911	0.431	0.443	1028	0.618	0.633	1025	
		0921	0.429	0.441	1023	0.616	0.631	1021	
		0931	0.427	0.439	1018	0.614	0.629	1018	
		0941	0.427	0.439	1018	0.613	0.628	1016	
		0956	0.425	0.437	1014	0.612	0.627	1015	
		1011	0.424	0.436	1011	0.610	0.625	1011.5	
		1026	0.424	0.436	1011	0.610	0.625	1011.5	
		1041	0.423	0.435	1009	0.609	0.624	1010	
		1056	0.423	0.435	1009	0.608	0.623	1008	
		1126	0.422	0.434	1007	0.607	0.622	1007	
		1156	0.422	0.434	1007	0.606	0.621	1005	
		1226	0.421	0.433	1004.5	0.606	0.621	1005	
		1256	0.421	0.433	1004.5	0.605	0.620	1003	



R. O. ENGBRETSSEN

APR 16 1982

RUN NO. B18-S23 P/P

Union Geothermal Co. of New Mexico

SURVEY DATE: 4-13/14-82

TITLE BACA NO 18 P/P FALL OFF SURVEY TO 3750'

PRESS. EL. S/N : KPG 9222 PRESS. EL. S/N : KPG 22390
 RANGE : 4600 PSI RANGE : 3250 PSI
 CALIBRATED : 7-9-80 CALIBRATED : 9-1-81
 CLOCK: 12 HRS.: S/N: 18336 CLOCK: 12 HRS.: S/N: 23781

WHP AT START OF SURVEY : 5.5" Hg. VAC. PSIG
 WHP AT END OF SURVEY : 0.5 PSI PSIG
 OPENED WELL TO ELEMENT: 1705 HRS.
 POH : 0650 HRS.

TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY
 _____ MOS., _____ DAYS, _____ HRS., _____ MINS.

DATE AND TIME OF LATEST S. I. (PT. NO. _____) 0856 HRS. 4-13-1982
 WATER INJ.

Station	Depth	Time at Sta.	PRESSURE			PRESSURE			REMARKS
			Defl.	Corr. Defl.	PSIG	Defl.	Corr. Defl.	PSIG	
1	3750'	1710	0.418	0.430	998	0.601	0.616	997	CORRECTION ON DEFLECTION ARE BASED @ 200°F
		1810	0.418	0.430	998	0.601	0.616	"	
		1910	0.417	0.429	995.5	0.601	0.616	"	
		2010	0.417	0.429	"	0.600	0.615	995	
		2110	0.417	0.429	"	0.600	0.615	"	
		2210	0.416	0.428	993	0.600	0.615	"	
		2310				0.599	0.614	993.5	
		2410				0.599	0.614	"	
		0110				0.598	0.613	992	
		0210				0.598	0.613	"	
		0310				0.597	0.612	990	
		0410				0.597	0.612	"	
		0451				0.597	0.612	"	



Union Geothermal Co. of New Mexico

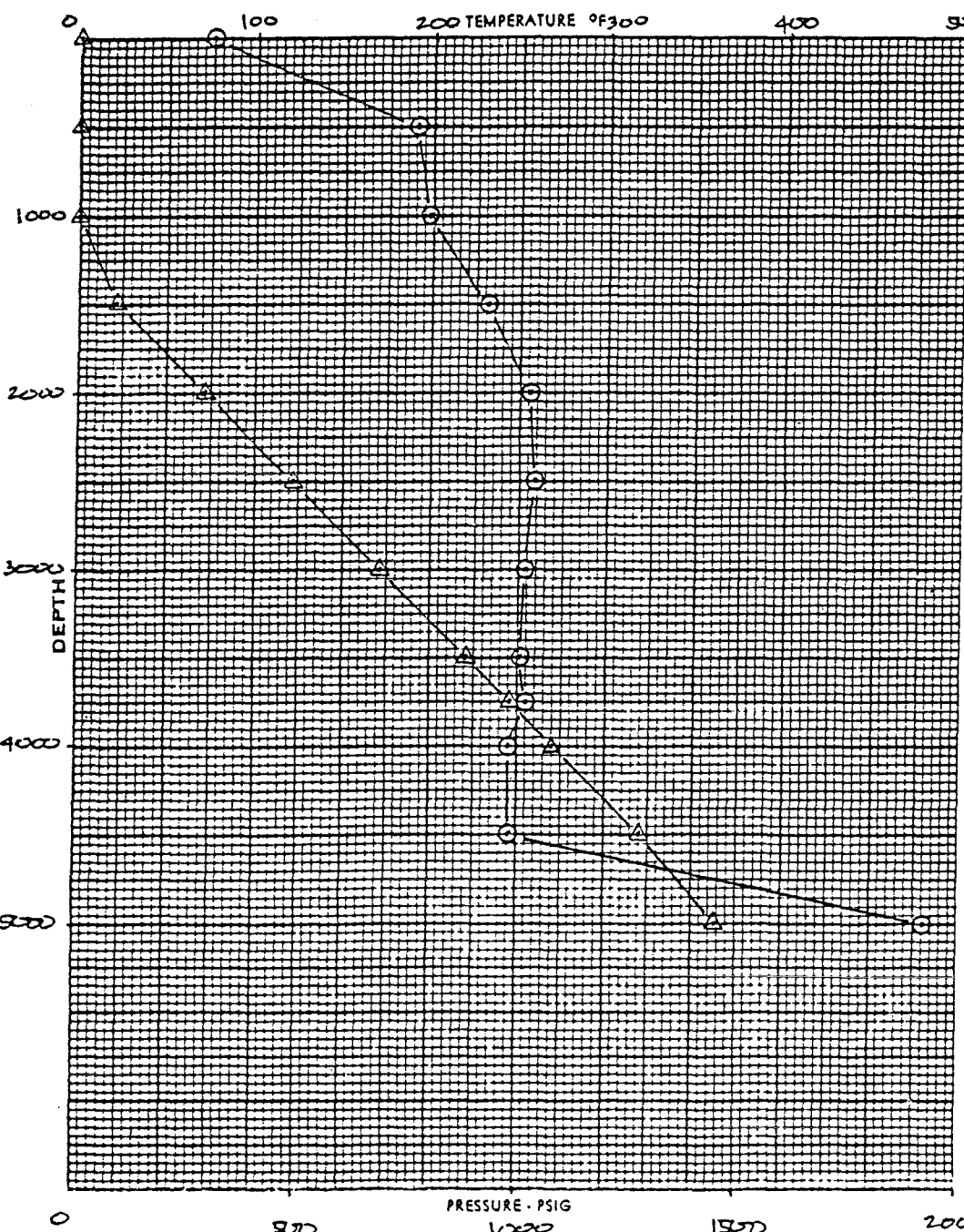
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18 - 524 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA No 18
 CASING 13 3/8" @ 660' ; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 4-14-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-G80 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 481 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	75	-	-
500	101	-	-
1000	108	-	-
1500	232	88	-
2000	257	288	0.400
2500	258	490	0.404
3000	253	687	0.394
3500	261	883	0.3920
3750	265	983.0	0.4036
4000	245	1082	0.3924
4500	246	1283	0.402
5000	481	1454	0.342

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

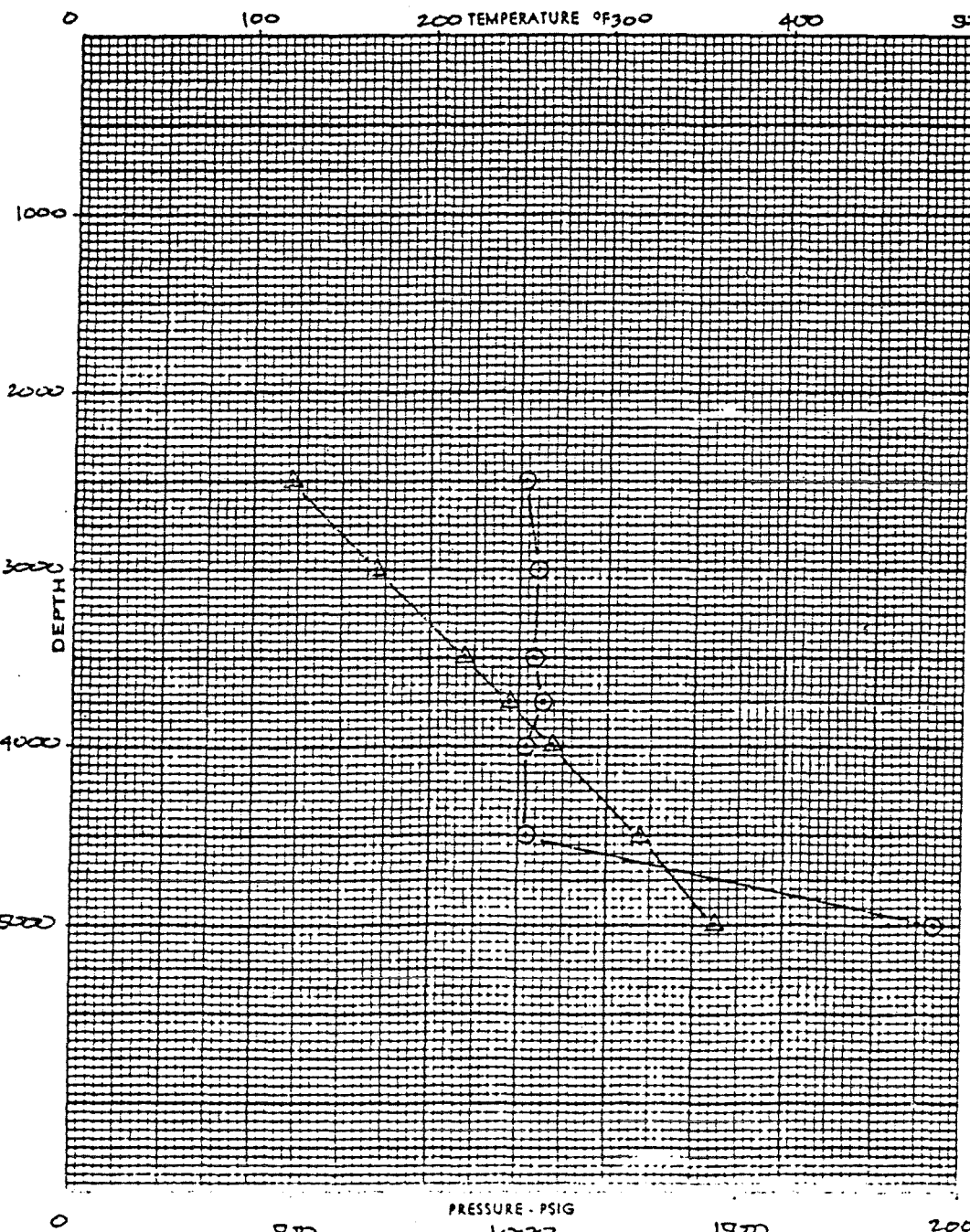
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-525 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA No 18
 CASING 13 3/8" @ 660' ; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 4-16-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 483 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
2500	253	487	-
3000	261	680	0.3860
3500	258	878	0.3960
3750	263	980.7	0.408
4000	254	1076	0.3812
4500	255	1275	0.3980
5000	483	1449	0.3480

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

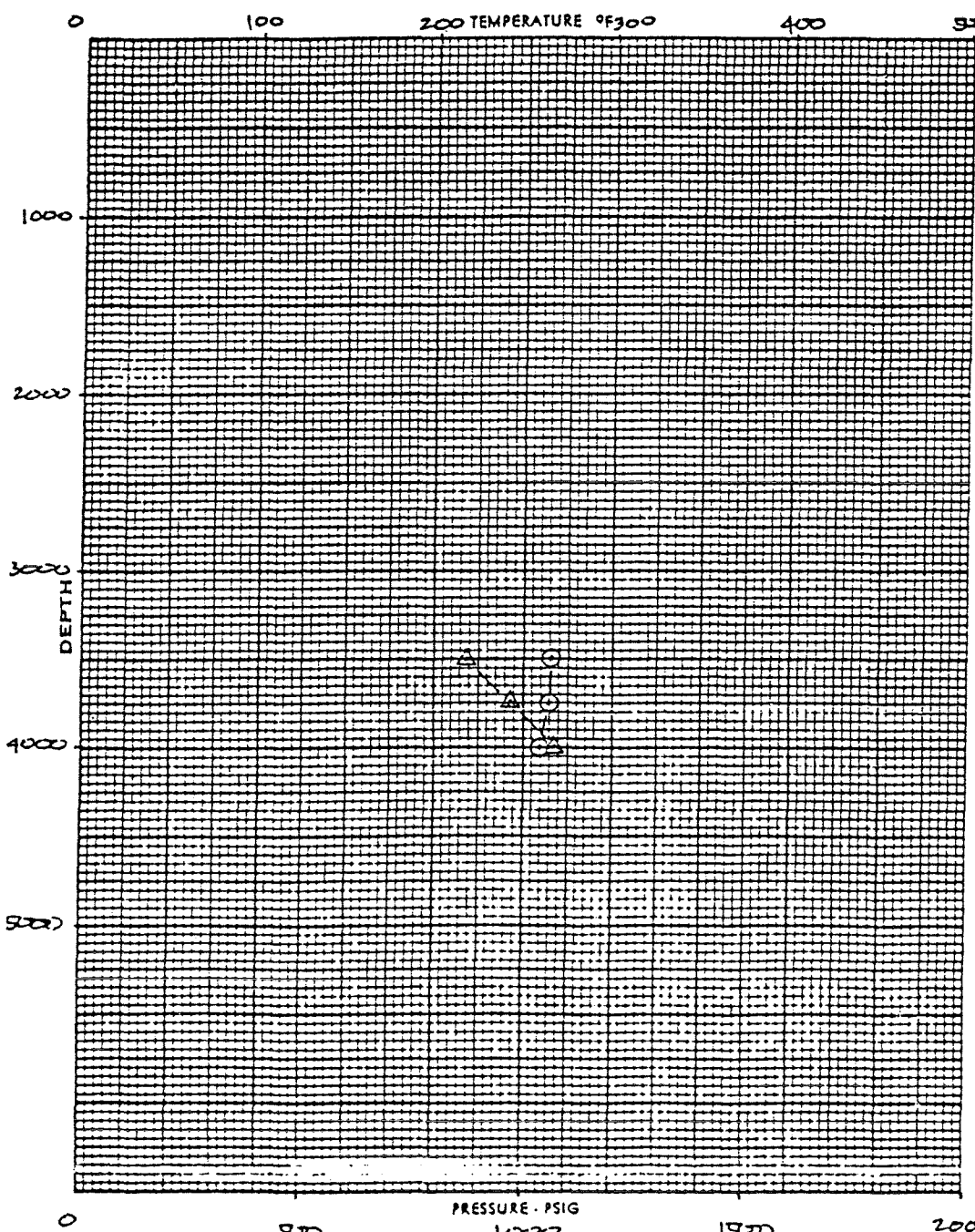
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-526 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA # 18
 CASING 13 $\frac{3}{8}$ " @ 660' ; 9 $\frac{5}{8}$ " SURF. - 2013' ELEV. 8734.5' DATE: 4-16-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 4000' MAX. TEMP. 266 °F @ 3500'
 REMARKS: _____



PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
3500	266	873	-
3750	265	971	0.392
4000	260	1069	0.392

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

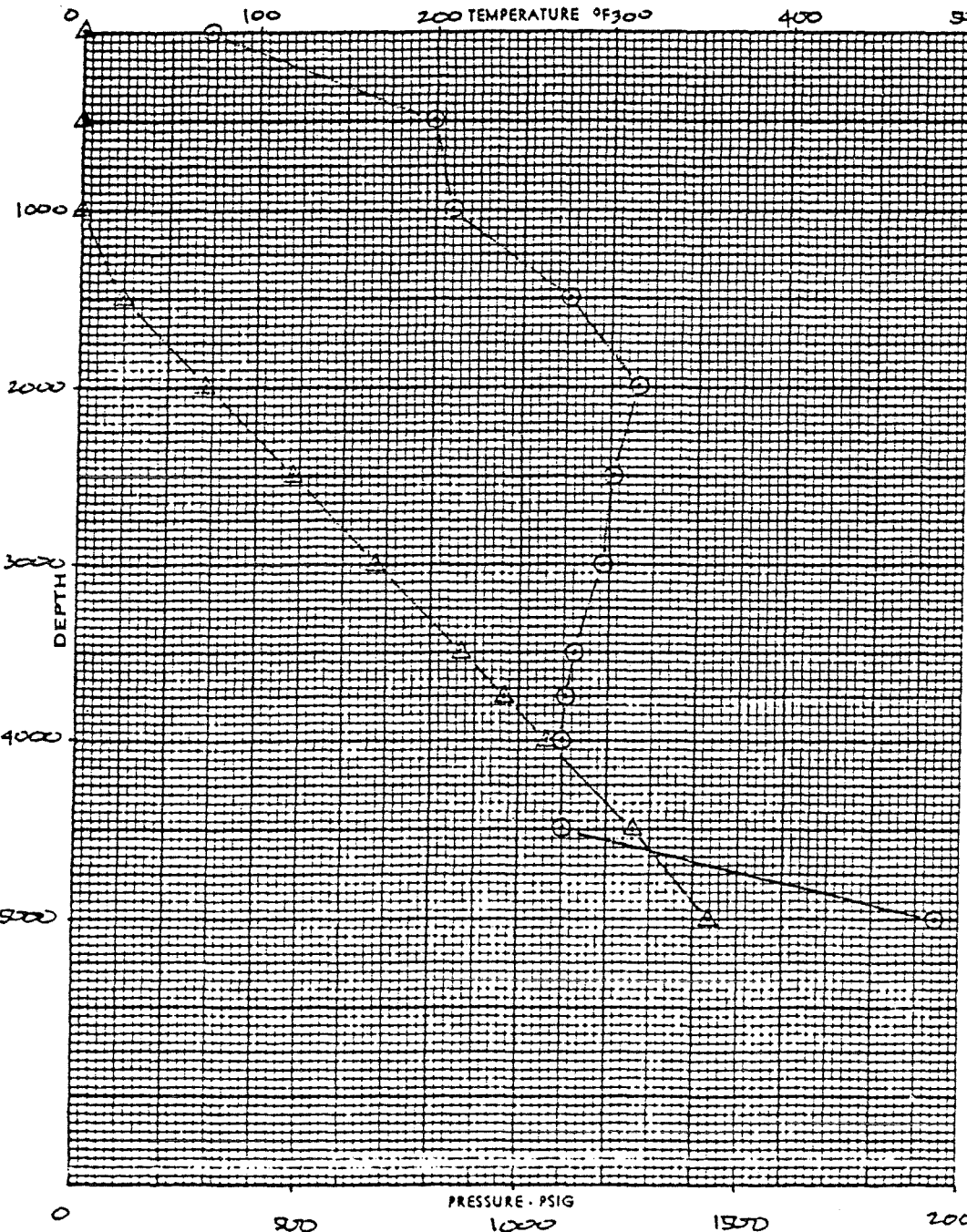
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-527 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA No 18
 CASING 13 3/8" @ 660' ; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 4-19-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 487 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD			
PRESSURES	GAUGE	BOMB	
CASING, PSI			
DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	72	-	-
500	109	-	-
1000	209	-	-
1500	277	95	-
2000	316	285	0.380
2500	302	484	0.398
3000	297	675	0.382
3500	281	871	0.392
3750	276	968	0.388
4000	274	1064	0.3840
4500	275	1263	0.398
5000	487	1434	0.342

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

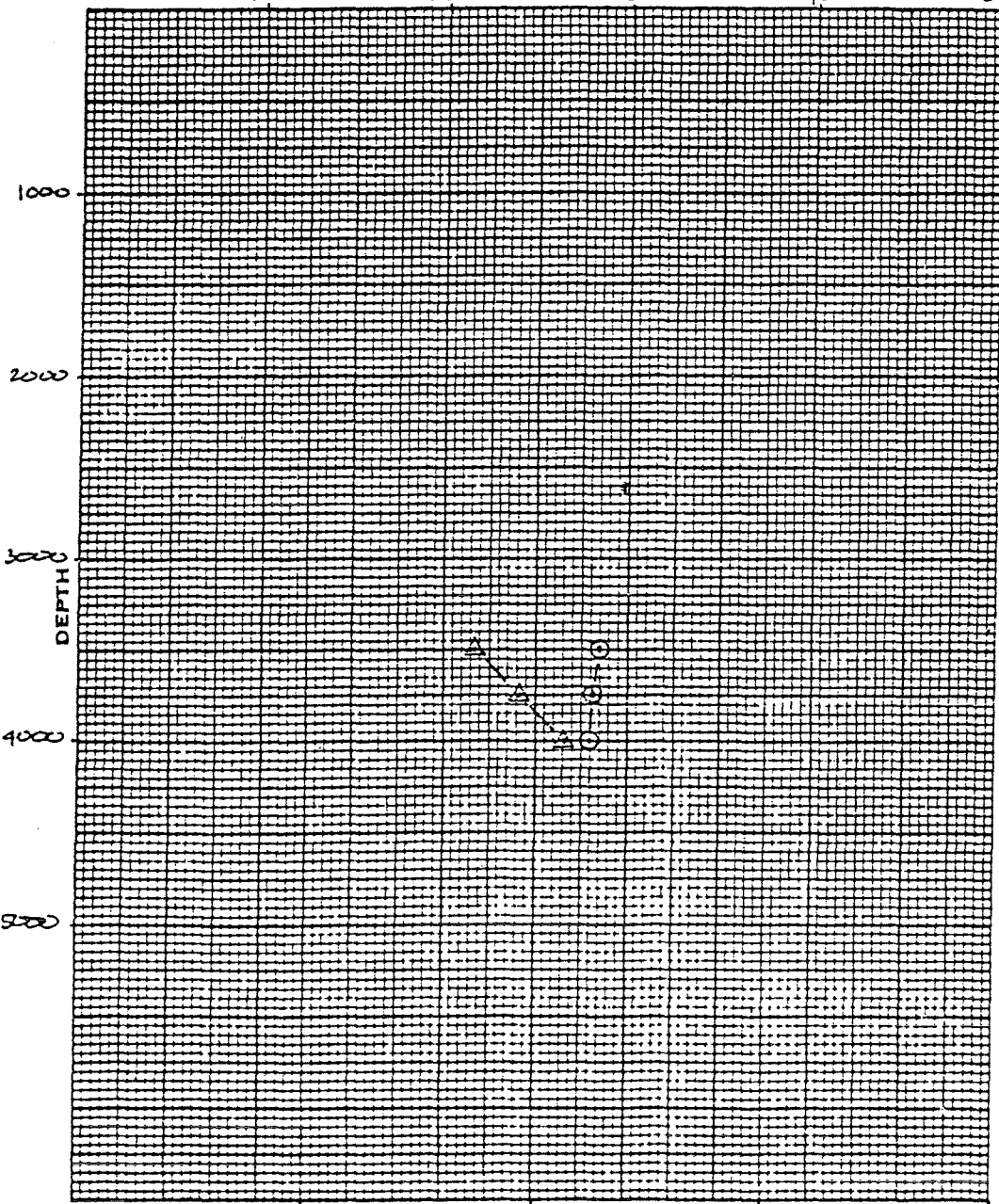
B18-528 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA No 18
 CASING 13 3/4" @ 660' ; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 4-21-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 4000' MAX. TEMP. 285 °F @ 3500'
 REMARKS: _____

0 100 200 TEMPERATURE °F 300 400 500 STABILIZATION PERIOD



PRESSURES	GAUGE	BOMB	
CASING, PSI			
DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
3250	285	870	-
3750	282	966	0.384
4000	279	1064	0.392

○ TEMPERATURE
 △ PRESSURE

\$Y: _____

0 200 1000 1500 2000



Union Geothermal Co. of New Mexico

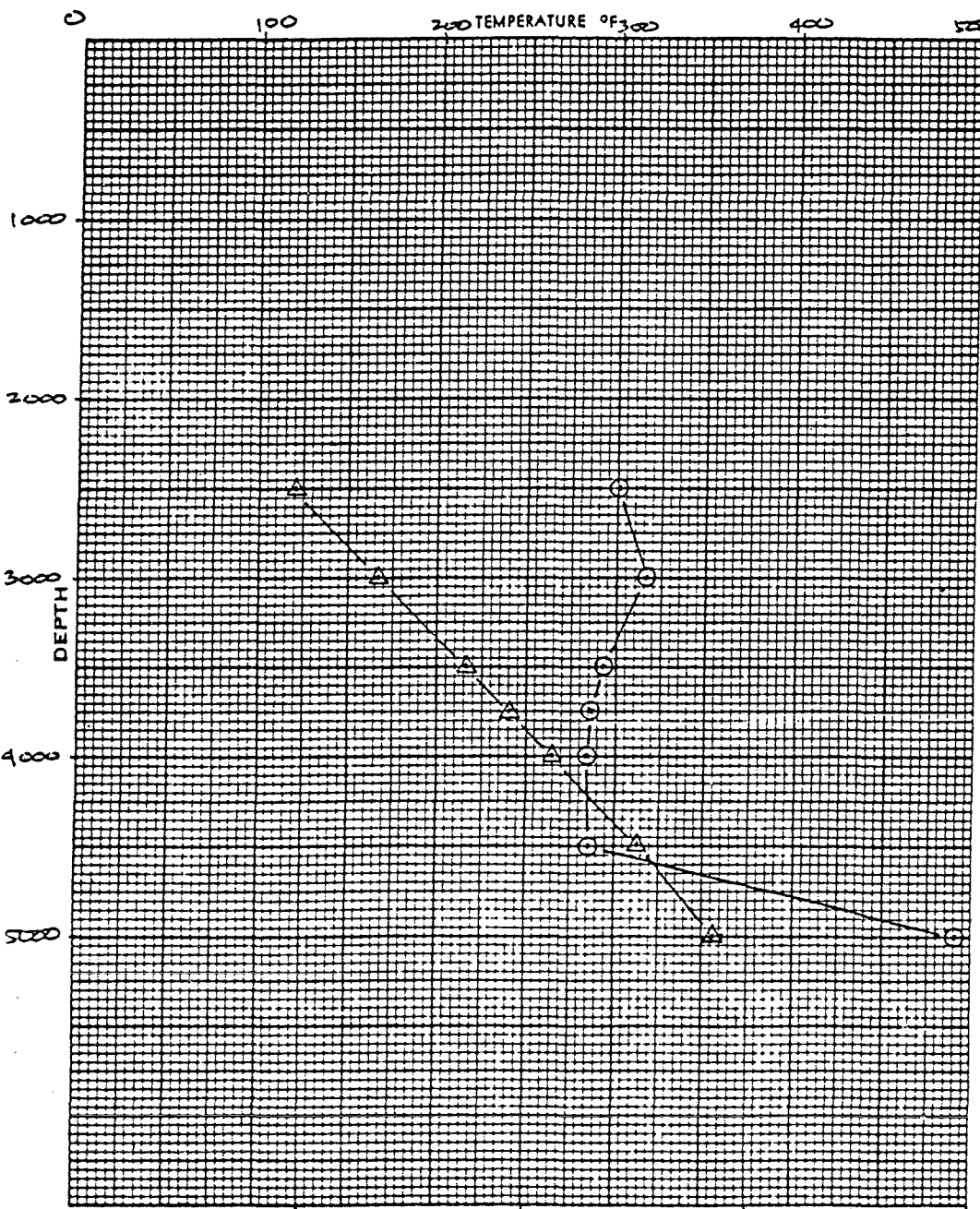
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S29 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA No 18
 CASING 13 3/8" @ 660'; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 4-23-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 490 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB	
CASING, PSI			
DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.

2750	301	482	-
3000	313	670	0.376
3500	293	863	0.386
3750	287	961.4	0.3936
4000	283	1059	0.3904
4500	286	1255	0.392
5000	490	1426	0.342

○ TEMPERATURE
 △ PRESSURE

BY: _____



Union Geothermal Co. of New Mexico

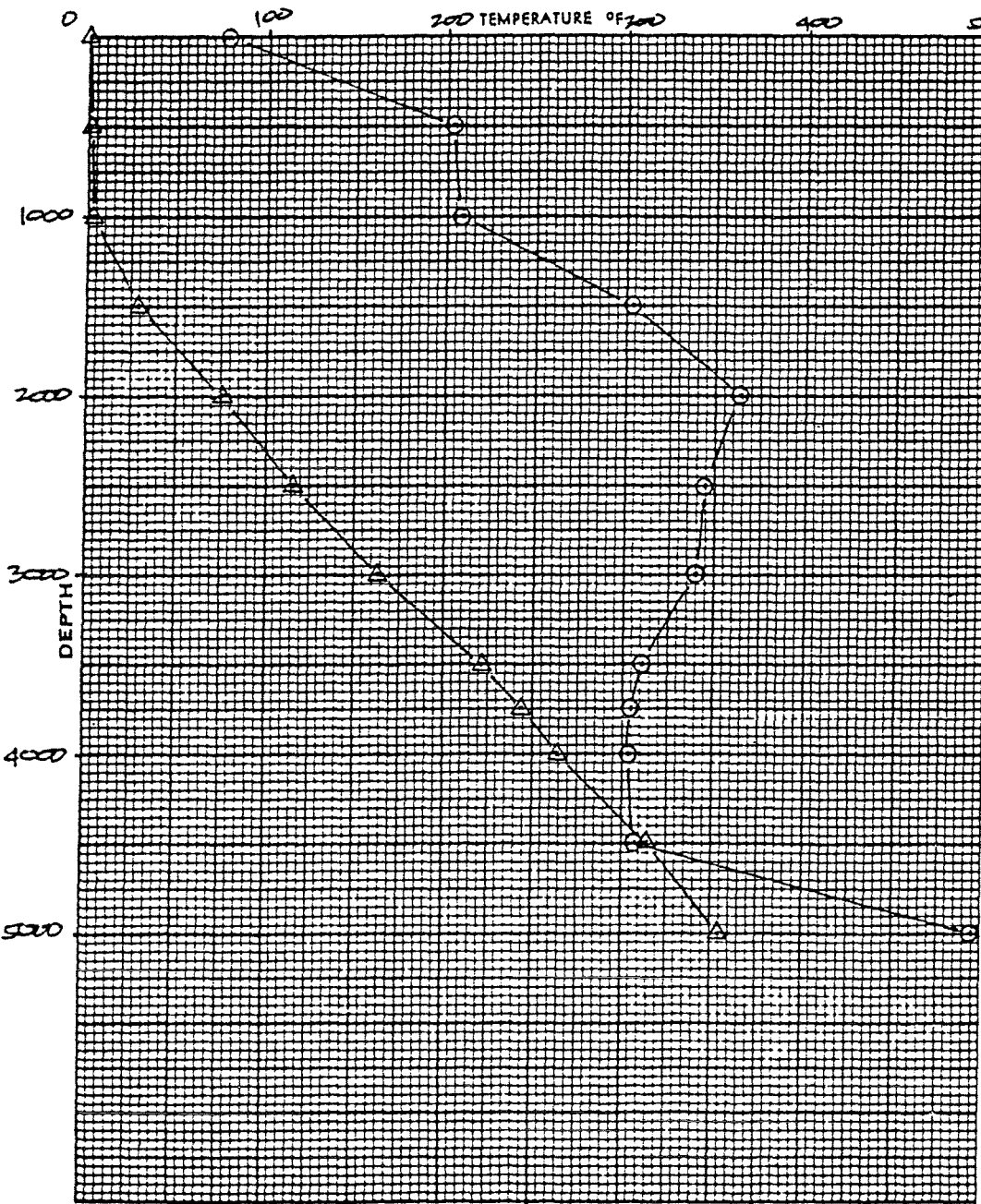
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S30 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA NO 18
 CASING 13 3/8" @ 660'; 9 5/8" @ SURF. - 2013' ELEV. 8734.5' DATE: 5-3-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 32SD PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 22390 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 494 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI	4	3

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	78	3	-
500	203	7	-
1000	208	13	-
1500	203	119	0.212
2000	363	303	0.368
2500	345	464	0.322
3000	340	656	0.384
3500	311	878	0.444
3750	205	974	0.384
4000	203	1054	0.320
4500	308	1257	0.406
5000	494	1419	0.324

○ TEMPERATURE
 △ PRESSURE

BY: _____



RUN NO. B18-S31 P/P

Union Geothermal Co. of New Mexico

SURVEY DATE: 5-4-82

TITLE BACA No 18 P/P GRADIENT SURVEY TO 5000 FT.

PRESS. EL. S/N : KPG 22390 PRESS. EL. S/N : KPG 9222
 RANGE : 3250 PSI RANGE : 4600 PSI
 CALIBRATED : 7-1-81 CALIBRATED : 7-7-80
 CLOCK: 12 HRS.: S/N: 18356 CLOCK: 12 HRS.: S/N: 23778

WHP AT START OF SURVEY : 2 PSIG
 WHP AT END OF SURVEY : 2 PSIG
 OPENED WELL TO ELEMENT: 1305 HRS.
 POH : 1421 HRS.

TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY
0 MOS., 21 DAYS, 4 HRS., 2 MINS.

DATE AND TIME OF LATEST S. I. (FT. NO.) 0856 HRS. 4-13-1982
 WATER INJ.

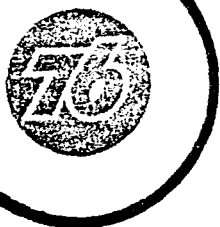
Station	Depth	Time at Sta.	P R E S S U R E			P R E S S U R E			REMARKS
			Defl.	Corr. Defl.	PSIG	Defl.	Corr. Defl.	PSIG	
1	3000'	1311-1326	0.392	0.398	646				
2	3500	1327-1337	0.518	0.528	855				
3	3750	1338-1348	0.580	0.592	958				
4	4000	1349-1359	0.639	0.652	1056				
5	4500	1400-1410	0.753	0.767	1245				
6	5000	1411-1421	0.880	0.886	1441				

*MISSED RUN
KPG 9222*

Union Geothermal Co. of New Mexico

B18-531 P/P

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY



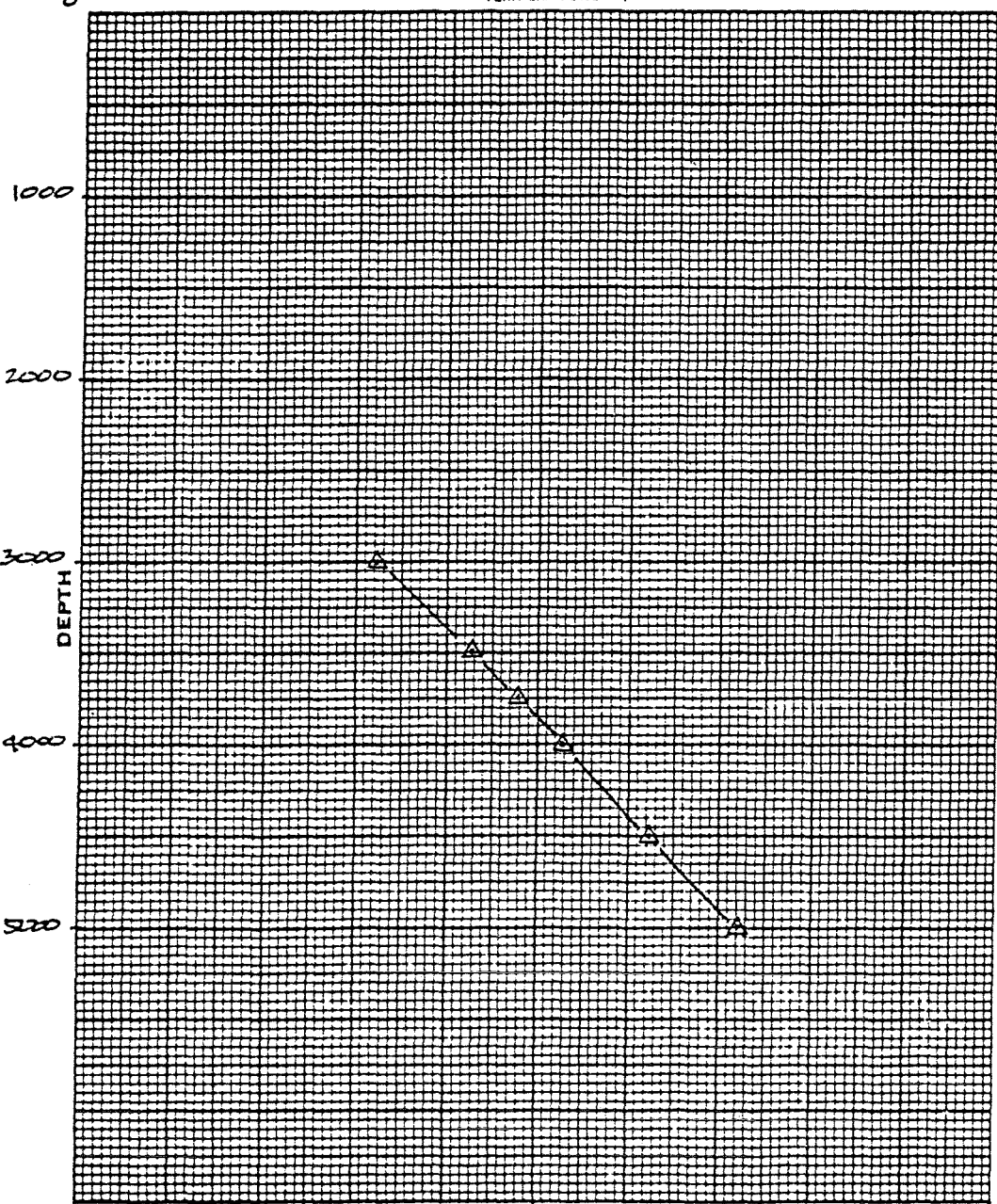
OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA # 18
 CASING 13 3/8" @ 600' ; 9 5/8" @ SURF. - 2013' ELEV. 8734.5' DATE: 5-4-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 3250 PSI INSTRUMENT 4600 PSI FAHR.
 _____ KPG 22390 SERIAL NO. KPG 9222

PURPOSE P/P GRADIENT SURVEY TO 5000 FT. MAX. TEMP. _____ °F @ _____
 REMARKS: COL. CHECK ON KPG 22390

TEMPERATURE OF

STABILIZATION PERIOD

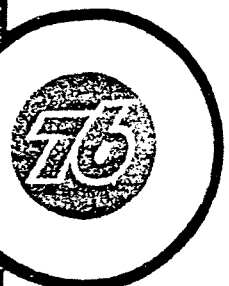


PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP.	PRESS.	GRAD.
3000		646	-
3500		855	0.418
3750		958	0.412
4000		1056	0.392
4500		1245	0.378
5000		1441	0.392

Δ KPG 22390

BY: _____



Union Geothermal Co. of New Mexico

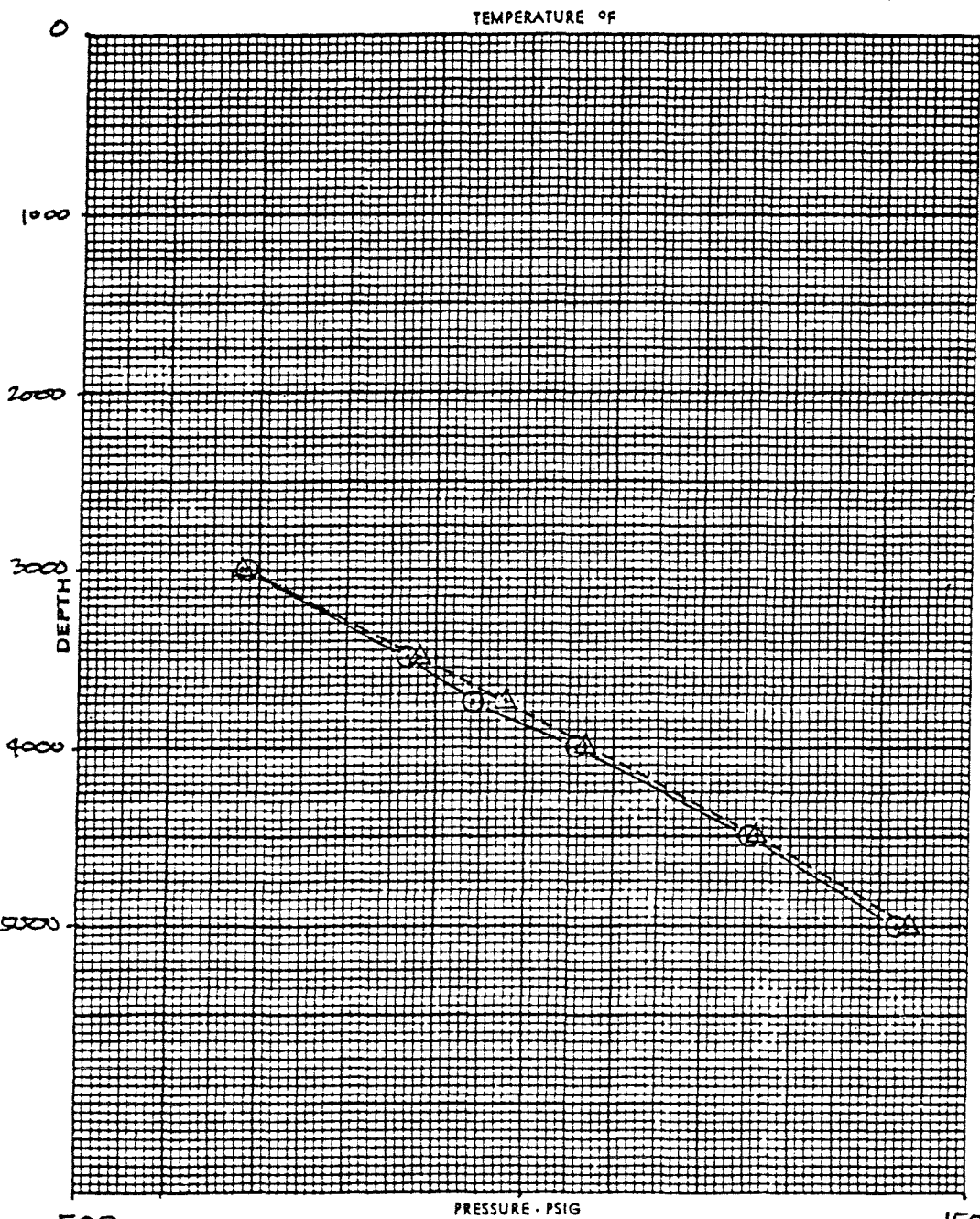
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S32 P/P

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD PERNODO CREEK WELL NAME BACA D^o 18
 CASING 13 3/8" @ 660' ; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 5-6-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____ INSTRUMENT _____ FAHR.
 SERIAL NO. _____

PURPOSE PRESS/PRESS GRADIENT SURVEYS TO 5000' MAX. TEMP. _____ °F @ _____
 REMARKS: CALIBRATION CHECK OF KPG 22390



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		
DEPTH FT.	PRESS. KPG 22390	GRAD. KPG 9222

3000	687	-	682	-
3500	868	.362	883	.402
3750	942	.376	980	.388
4000	1058	.464	1067	.348
4500	1255	.374	1262	.370
5000	1417	.328	1431	.338

○ KPG 22390
 △ KPG 9222

BY: _____



Union Geothermal Co. of New Mexico

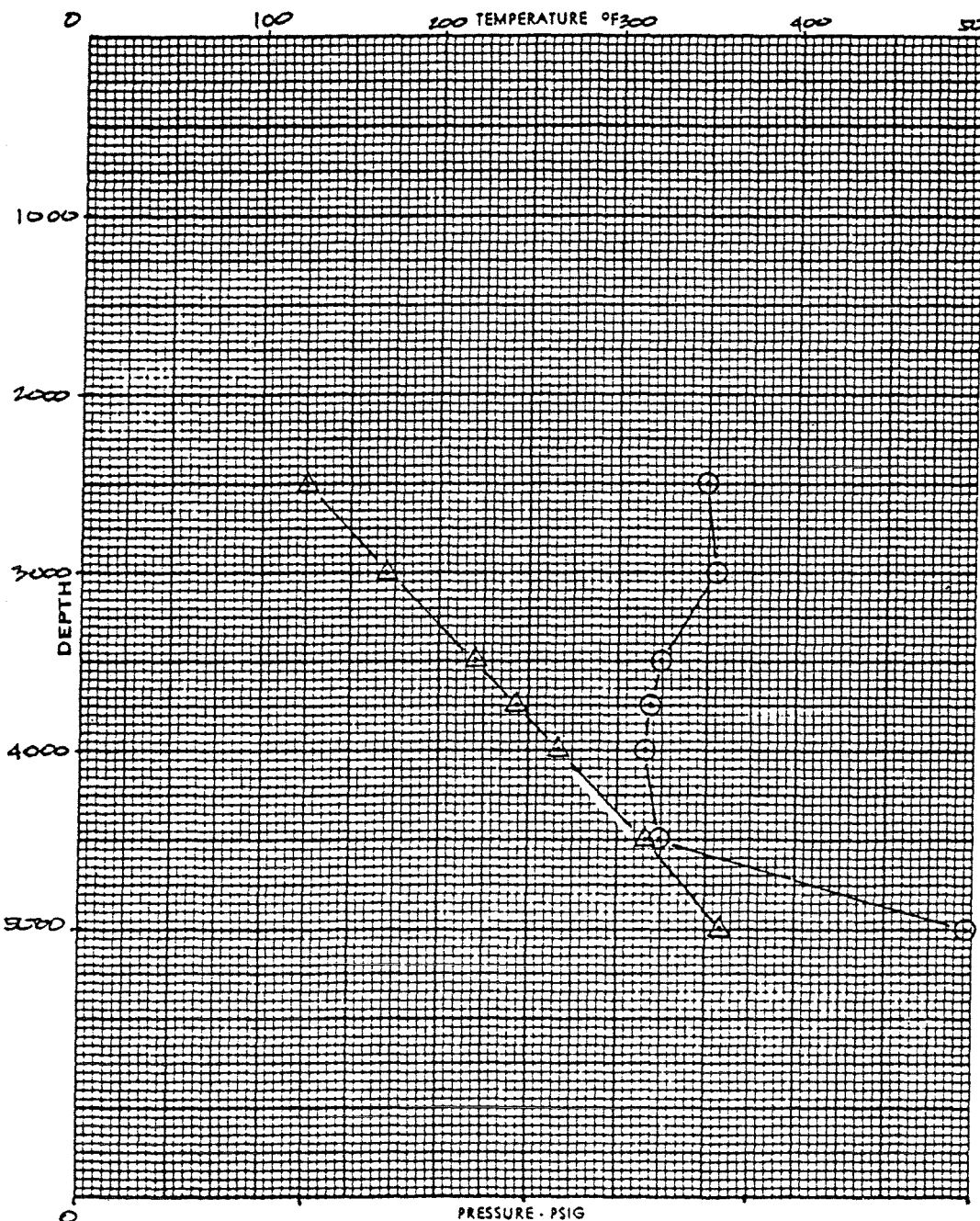
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S 33 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CREEK WELL NAME BACA N# 18
 CASING 13 3/8" @ 600'; 9 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 5-12-82
 LINER DESCRIPTION: 7" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 9600 PSI INSTRUMENT 1-680 FAHR.
 _____ KPC 9222 SERIAL NO. KTB 23338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 496 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GUAGE	BOMB	
CASING, PSI			
DEPTH	TEMP.	PRESS.	GRAD.
FT.	°F	PSIG	

1250	349	522	-
3000	355	694	0.384
3500	324	883	0.378
3750	318	977	0.376
4000	316	1069	0.368
4500	323	1262	0.386
5000	496	1434	0.340

○ TEMP
 △ PRESS

BY: _____



Union Geothermal Co. of New Mexico

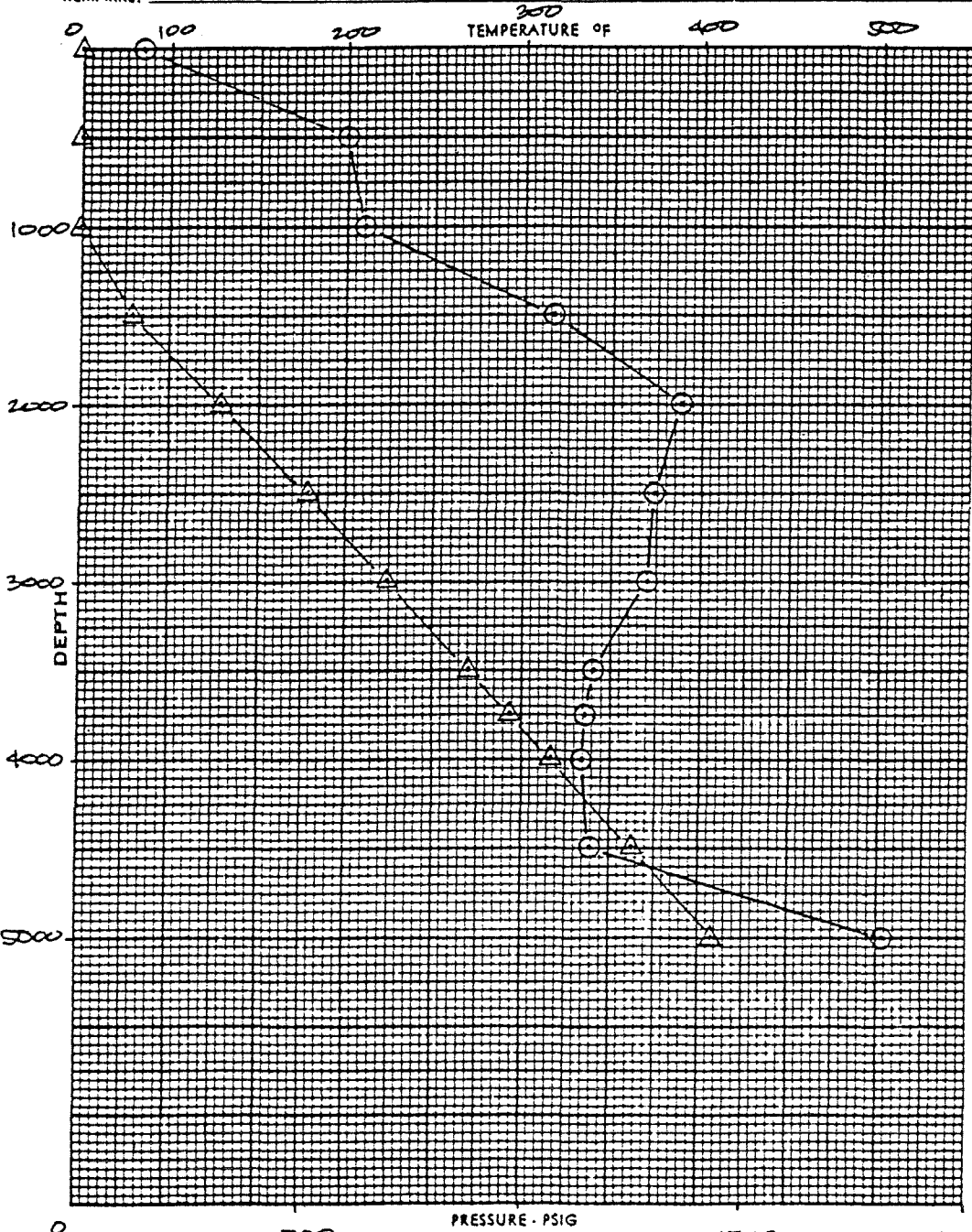
SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B18-S34 P/T

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REYNOLDO CREEK WELL NAME BACA #18
 CASING 13 3/8" @ 660' ; 10 5/8" SURF. - 2013' ELEV. 8734.5' DATE: 5-25-82
 LINER DESCRIPTION: 1" @ 1853' - 5240' ZERO POINT KB
 DEPTH 5240'

HOLE DESCRIPTION: _____
 _____ 4600 PSI INSTRUMENT 1-680 FAHR.
 _____ KPG 9222 SERIAL NO. KTB 73338

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 5000' MAX. TEMP. 503 °F @ 5000'
 REMARKS: _____



STABILIZATION PERIOD _____

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRAD.
0	70	-	-
500	200	-	-
1000	211	-	-
1500	317	118	-
2000	388	317	0.398
2500	373	516	0.398
3000	370	606	0.360
3500	341	883	0.374
3750	336	975	0.368
4000	334	1060	0.376
4500	337	1252	0.366
5000	503	1431	0.358

○ TEMP.
 Δ PRESS.

BY: _____

UNION

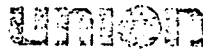
FEB 22 1982

Prepared by: JPA
Checked by: _____
Date: / / 1982
Sheet: 1 of 4

BACA No 18 WATER INJECTION

W.D. A.P.E. no.

DATE	EXACT TIME HRS.	A H "W.C.	RATE GPM	DAILY TOTAL GALS.	CUMULATIVE GALS	REMARKS
2-16-82	1500					START INJECTION
	1500 - 2255	252	500		237,500	
	2255 - 2400	133	363	261,114	261,114	PRODUCED WATER
2-17-82	0000 - 0935	131	361		468,515	FROM BACA No 13
	0935 - 1045	252	500		503,515	flow test # 7
	1045 - 2400	40	391	553,519	814,633	CHANGED ORIFICE
2-18-82	0000 - 1030	22.9	296		1,001,129	FROM 3" TO 4"
	1030 - 2400	20.85	282	415,189	1,229,822	
2-19-82	0000 - 0910	20.2	277.8		1,382,648	
	0910 - 2400	18.24	264.8	388,505	1,618,327	
2-20-82	0000 - 1035	19.8	276		1,793,497	
	1035 - 2400	20	277.5	398,572	2,016,899	
2-21-82	0000 - 0920	19.5	274		2,170,365	
	0920 - 2400	19.1	270.8	391,776	2,408,675	
2-22-82	0000 - 0920	17.7	260.7		2,554,686	
	0920 - 2400	17.86	262.1	376,648	2,785,323	
2-23-82	0000 - 0905	17.4	258.6		2,926,292	
	0905 - 2400	65.8	255.5	369,645	3,154,968	CHANGED ORIFICE
2-24-82	0000 - 0830	66	256		3,285,513	FROM 4" TO 3"
	0830 - 2400	66.4	256.7	369,246	3,524,214	
2-25-82	0000 - 0845	67.5	258.8		3,660,165	
	0845 - 2400	62.3	248.6	363,342	3,887,556	
2-26-82	0000 - 0850	64.1	252.2		4,021,219	
	0850 - 2400	65.8	255.6	366,238	4,253,794	
2-27-82	0000 - 1025	64.5	253.1		4,411,962	
	1025 - 2400	64.1	252.2	363,676	4,617,470	
2-28-82	0000 - 0845	63.7	251.4		4,749,463	
	0845 - 2400	63.3	250.6	361,337	4,978,807	
3-1-82	0000 - 0920	63	250		5,118,820	
	0920 - 2400	63.17	250.4	360,335	5,339,142	
3-2-82	0000 - 0903	62.5	249		5,474,365	
	0903 - 2400	62.6	249.2	358,775	5,697,917	
3-3-82	0000 - 0910	63.66	251.3		5,836,148	
	0910 - 2400	62.76	249.6	360,335	6,058,252	OFF-DISE



Prepared by JPR	Checked by	Date / /	Sheet 2 of 4
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BACA No 18 WATER INJECTION

W.O. U.P.E. No.

DATE	EXACT TIME #RS.	A H "W.C.	RATE GPM	DAILY TOTAL GALS.	CUMULATIVE GALS	REMARKS
3-4-82	0000-0910	60.22	244.4		6,192,695	PRODUCED WATER
	0910-2400	60.95	246	353,317	6,411,569	FROM BACA # 13
3-5-82	0000-1045	59.7	243.3		6,568,512	FLOWTEST # 7
	1045-2400	62.96	250.98	356,476	6,768,045	
3-6-82	0000-1000	60.24	245.5		6,915,346	INJECTION LINE = 6"
	1000-2400	59.8	244.6	352,762	7,120,807	ORIFICE BORE = 3"
3-7-82	0000-0935	60.42	245.86		7,262,181	COEFFICIENT = 3.65
	0935-2400	59.76	244.5	352,814	7,473,681	
3-8-82	0000-0910	59.82	244.6		7,608,232	
	0910-2400	58.62	242.2	350,078	7,823,759	
3-9-82	0000-0905	59.8	244.6		7,957,080	
	0905-2400	60.15	245.3	352,875	8,176,634	
3-10-82	0000-0930	59.37	243.71		8,315,546	
	0930-2400	59.38	243.75	350,973	8,527,606	
3-11-82	0000-0930	58.03	240.96		8,664,953	
	0930-2400	72.36	269	371,404	8,899,010	
3-12-82	0000-0925	71.38	267.2		9,049,978	
	0925-2400	65.6	256.12	375,072	9,274,082	
3-13-82	0000-0930	65.04	255.05		9,419,452	
	0930-2400	69.1	262.9	374,066	9,648,147	
3-14-82	0000-0950	65.1	255.12		9,793,668	
	0950-2400	65.94	256.8	368,810	10,016,957	
3-15-82	0000-0920	63.3	251.6		10,157,861	
	0920-2400	61.15	247.3	358,522	10,375,479	
3-16-82	0000-0920	58.4	241.63		10,510,791	
	0920-2400	59.52	243.99	350,022	10,725,501	
3-17-82	0000-0920	57.7	240.23		10,860,031	
	0920-2400	59.21	243.4	348,681	11,074,182	
3-18-82	0000-0910	58.04	240.94		11,206,698	
	0910-2400	57.16	239.11	345,325	11,419,507	
3-19-82	0000-0915	57.48	239.8		11,552,583	
	0915-2400	56.43	237.6	343,313	11,762,820	
3-20-82	0000-1045	56.41	237.53		11,916,025	
	1045-2400	56.3	237.3	341,859	12,104,679	



Prepared by JPR	Checked by	Date / /	Sheet 3 of 4
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BACA No 18 WATER INJECTION

W.O. I.A.F.E. No.

DATE	EXACT TIME HRS.	Δ H "W.C.	RATE GPM	DAILY TOTAL GALS.	CUMULATIVE GALS	REMARKS
3-21-82	0000-1020	56.25	237.18		12,251,733	PRODUCED WATER
	1020-2400	54.92	234.16	339,063	12,443,743	FROM BACA No 13
3-22-82	0000-0950	57.3	239.4		12,584,982	FLOWTEST # 7
	0950-2400	56.2	237.08	342,757	12,786,500	
3-23-82	0000-0925	55.6	235.81		12,919,734	INJECTION LINE = 6"
	0925-2400	57.1	238.77	342,333	13,125,833	ORIFICE BORG = 3"
3-24-82	0000-0915	55.0	234.54		13,259,003	COEFFICIENT = 51.65
	0915-2400	57.63	240.27	342,812	13,471,645	
3-25-82	0000-0920	55.52	235.8		13,603,706	
	0920-2400	58.97	242.02	345,039	13,816,684	
3-26-82	0000-0915	55.57	235.93		13,947,627	
	0915-2400	60.08	245.33	348,061	14,164,745	
3-27-82	0000-0930	56.35	237.58		14,300,164	
	0930-2400	56.23	237.34	341,906	14,506,600	
3-28-82	0000-1011	55.3	235.37		14,650,463	
	1011-2400	56.74	238.4	341,458	14,848,108	
3-29-82	0000-0900	54.75	234.2		14,974,574	
	0900-2400	55.49	235.77	338,660	15,186,768	
3-30-82	0000-0939	54.16	232.92		15,321,628	
	0939-2400	55.26	235.27	337,429	15,524,197	
3-31-82	0000-0850	53.86	232.28		15,647,305	
	0850-2400	56.65	238.22	339,891	15,864,088	
4-1-82	0000-0937	55.9	236.63		16,000,626	
	0937-2400	60.61	246.4	349,180	16,213,268	
4-2-82	0000-0950	56.4	237.68		16,353,499	
	0950-2400	70.13	265.05	365,520	16,578,788	
4-3-82	0000-0930	74.79	273.7		16,734,799	
	0930-2400	75.87	275.67	395,849	16,974,637	
4-4-82	0000-1125	61.00	247.2		17,143,967	
	1125-2400	62.06	249.33	357,574	17,332,211	
4-5-82	0000-0930	55.05	234.83		17,466,063	
	0930-2400	54.5	233.65	337,128	17,669,339	
4-6-82	0000-0938	54.2	233.01		17,804,018	
	0938-2400	53.75	232.04	334,698	18,004,037	

UNION GEOTHERMAL CO. OF NEW MEXICO PRESSURE INTERFERENCE DATA

WELL NAME : BACA NO 18
 TRANSDUCER : PAROSCIENTIFIC
 MODEL# : 2000-A-002
 SERIAL# : 7312 900 PSIA

CHAMBER SETTING : 3650' KB

DATE	TIME <small>HRS.</small>	AMBIENT TEMP. °F	TRANSR. RDGS.		WHP PSIG	WHT	INITIALS	REMARKS
			PRESS.	FREQ.				
7-22-81	1315							INSTALLED SPERRY SW CHAMBER/TUBING @ 3650' KB
7-23-81	1450	88	856.865	27.85699	376			
24	1410	88	857.615	27.86005	379			
27	1530	78	856.562	27.85676	376			
28	1510	74	854.666	27.84994	377			
29	1046	78	856.700	27.85753	379			

CSTDOE

BACA 18 INTERFERENCE PRESSURE DATA

DATE TIME PRESSURE

07/23/81 1450 856.565

07/24/81 1410 857.615

07/27/81 1530 856.562

07/28/81 1510 854.666

07/29/81 1040 856.700

07/30/81 1555 857.049

07/31/81 1353 854.155

08/04/81 1045 857.017

08/05/81 1520 855.690

08/06/81 1505 854.467

08/11/81 1423 859.048

08/12/81 1445 861.980

08/13/81 1415 863.290

08/14/81 1125 863.467

08/17/81 1251 863.768

08/18/81 1340 863.969

08/19/81 1440 864.139

08/20/81 1455 864.107

08/21/81 1450 864.118

Interference Pressure Data - 18 (p 1 of 2)

DATE TIME PRESSURE

07/23/81	1450	856.565	
07/24/81	1410	857.615	
07/27/81	1530	856.562	
07/28/81	1510	854.666	
07/29/81	1040	856.700	
07/30/81	1555	857.049	
07/31/81	1353	854.155	
08/04/81	1045	857.017	
08/05/81	1520	855.690	
08/06/81	1505	854.467	
08/11/81	1423	859.048	
08/12/81	1445	861.980	
08/13/81	1415	863.290	
08/14/81	1125	863.467	
08/17/81	1251	863.768	
08/18/81	1340	863.969	
08/19/81	1440	864.139	
08/20/81	1455	864.107	
08/21/81	1450	864.118	
08/26/81	1340	863.806	
08/27/81	1440	862.032	
08/28/81	1435	863.208	PURGED @1440
08/31/81	1450	859.521	
09/02/81	1130	859.500	
09/03/81	1405	840.280	
09/04/81	1415	861.857	PURGED TUBING W/NITROGEN @1350
09/08/81	1400	816.820	SUSPECT LEAKS ON TUBING & FITTINGS
09/09/81	0900		PURGED W/NITROGEN

Interference Pressure Data
Baca 18

R. O. ENGBRETSSEN

SEP 29 1981

09/09/81 1550 857.461

09/10/81 1320 855.913

09/11/81 1310 855.455

09/14/81 1415 854.177

09/15/81 1520 855.306

09/16/81 1345 855.350

09/17/81 1506 861.627 PURGED TUBING W/NITROGEN @1425

09/18/81 1310 860.930

09/21/81 1425 862.225

09/22/81 1525 862.310

09/24/81 1005 862.541

09/25/81 1105 862.576



Interference Pressure Data - 18 (1 of 1)

DATE TIME PRESSURE

09/28/81 1450 862.624

09/29/81 1335 862.608

09/30/81 1515 862.702

10/01/81 1340 863.424

Bar
In.

Interference Pressure Data 18
DATE TIME PRESSURE

10/05/81	1500	863.091
10/06/81	1300	863.316
10/07/81	1335	863.401
10/08/81	1620	863.500
10/09/81	1450	863.526

Interference Pressure Data Baca 18 (p 1 of 1)

DATE TIME PRESSURE

10/12/81 1250 864.303
10/13/81 1320 864.303
10/14/81 1330 864.877
10/15/81 1455 865.131
10/16/81 1505 864.718



DATE TIME PRESSURE

10/19/81 1100 865.227

10/20/81 1415 865.599

10/22/81 1420 865.577

10/23/81 1130 865.635

10/27/81 1030 864.949

10/28/81 1350 865.013

10/29/81 1425 865.061

10/30/81 1455 865.348

BACA 18

DATE TIME PRESSURE

11/02/81 1420 865.301

11/03/81 1445 865.753

11/04/81 1435 865.801

11/05/81 1500 866.291

11/06/81 1450 866.145

INTERFERENCE PRESSURE DATA
BACA 18

DATE TIME PRESSURE

11/09/81 1100 866.345

11/10/81 1625 853.566

11/11/81 1440 866.446 PURGED NITRO @1355

11/12/81 1355 866.184

11/13/81 1335 866.227

R.O. ENGBRETSSEN
NOV 17 1981

INTERFERENCE PRESSURE DATA
BACA 18



DATE TIME PRESSURE

11/16/81 1420 866.638

11/17/81 1030 866.918

11/18/81 1350 866.853

11/19/81 1430 866.612

11/20/81 1410 866.951

R.O. ENGBREISEN

NOV 24 1981

INTERFERENCE PRESSURE DATA
BACA 18



DATE TIME PRESSURE

11/16/81 1420 866.638

11/17/81 1030 866.918

11/18/81 1350 866.853

11/19/81 1430 866.612

11/20/81 1410 866.951

R.O. ENGBRETSSEN

NOV 24 1981

DATE TIME PRESSURE

11/23/81 1325 867.130

11/24/81 1420 866.762

11/25/81 1355 867.094

R.O. ENGBRETSSEN

DEC 01 1981

INTERFERENCE PRESSURE DATA
BACA 18

DATE	TIME	PRESSURE
11/30/81	1420	867.501
12/01/81	1455	867.381
12/02/81	1510	867.068
12/03/81	1435	867.465
12/04/81	1125	867.650

END OF DATA

INTERFERENCE PRESSURE DATA

BACA 18

DATE TIME PRESSURE

12/07/81 1420 867.495

12/08/81 1415 867.367

12/09/81 1430 867.420

12/10/81 1505 867.699

12/11/81 1435 867.758

R.O. ENGBRETSSEN
DEC 15 1981

BACA 18

DATE TIME PRESSURE

	DATE	TIME	PRESSURE	
1				
2	12/14/81	1450	867.774	
3				
4	12/15/81	1405	867.379	
5				
6	12/16/81	1440	867.601	
7				
8	12/17/81	1355	867.833	
9				
10	12/18/81	1330	867.868	SHUT IN 813 @ 0930
11				
12	12/21/81	1455	867.450	
13				
14	12/22/81	1100	867.284	
15				
16	12/23/81	1410	867.373	
17				
18	12/24/81	1515	867.510	
19				
20	12/29/81	1510	866.159	
21				
22	12/30/81	1440	866.205	
23				
24	12/31/81	1405	866.030	
25				
26	01/06/82	1015	866.331	
27				
28	01/07/82	1405	866.330	
29				
30	01/08/82	1500	865.051	
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R.O. ENGBRETSSEN

JAN 11 1982

