Encl. 4

GL03921

UNION GEOTHERMAL COMPANY OF NEW MEXICO

WELL COMPLETION RECORD

WELL NO.: Baca 12 Deepening AFE NO.: 413702 API NO. 30-043-90031

FIELD: Valles Caldera-Redondo Creek LEASE: BACA

OPERATOR: Union Geothermal Company of New Mexico

COUNTY: Sandoval STATE: New Mexico

LOCATION: New Mexico State Plane Co-ordinates:

1,773,160'N; 399,360'E
Projected Location: 4180'fnl, 2820'fel
Sec. 14, T19N, R3E

ELEVATION: 8427' G.L. 8451' K.B.

REASON FOR DRILLING: Exploratory: Deepen well to test Paleozoic limestone and pre-Cambrian granite

SPUD DATE: June 27, 1981 COMPLETION DATE: September 6, 1981

TOTAL DEPTH: 10,637'

BHL: 134'N; 214'E; 10,555'VD

DRILLING COMPANY: Brinkerhoff-Signal Rig 78

GEOLOGISTS: Denton, Bodell

ENGINEERS: Blackwell, Hamblin

RIG TESTS: Production test 9/5/81:
Unloaded hole @ 4000'. Hole produced 15 gpm H_2O while circulating with 150 psi air @ 4000'. Test lasted 2 hrs.
Injection Test 9/5/81:
Injected 570 bbl H_2O @ 306 gpm and 1000 psi standpipe pressure through 1 stand drillpipe @ surface with pipe rams closed.

DISPOSITION OF WELL: Shut in

DRILLING FLUID USED: Aerated water 9212' to 10,637'TD

UNION GEOTHERMAL COMPANY OF NEW MEXICO

WELL COMPLETION RECORD

LITHOLOGIC DATA (Deepening)

FORMATION	INTERVAL		
	This well (MD/VSS)	Baca 2 (VSS)	Baca 7 (VSS)
Abo Fm (red beds)	9212'-9220'/-750' to -758'	+5550' to +4360'	+4764' to +3884'
Magdalena Gp (L.S., Siltstone)	9220'-10220'/-758' to -1721'	+4360' to +3500'	+3884' to +3264'
Granite (Pre-Cambrian?)	10220'-10637'TD/-1721' to -2105'	+3500' to +2840'TD	+3264' to +3192'TD

CASING (Deepening)

SIZE	INTERVAL-KB
7" Blank	8895' - 3220', cemented

LOST CIRCULATION

DEPTH	REMARKS
3540'-9212'	Set 45 cement plugs to cure L.C. while conditioning hole for 7" casing.

STDOE

Form G-105
Adopted 10/1

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

GEOTHERMAL RESOURCES WELL LOG

Operator Union Geothermal Company of New Mexico

Address P. O. Box 15225, Rio Rancho, New Mexico 87174

Reservoir Redondo Creek Field

Lease Name Baca Location No. 1 Well No. Baca No. 12 Unit Letter O

Location: 4180 feet from the North line and 2820 feet from the East line Section 14

Township 19N Range 3E County Sandoval

FORMATIONS PENETRATED BY WELL

DEPTH TO Top of Formation	DEPTH TO Bottom of Formation	Thickness	Drilled or Cored	Recovery	DESCRIPTION
212'	9220'	8'	Drilled		Abo Fm. (red beds)
220'	10,220'	963'	"		Magdalena Gp. (L.S., Siltstone)
220'	10,637'	384'	"		Granite (Pre-Cambrian)

Attach Additional Sheets if Necessary

This form must be accompanied by copies of electric logs, directional surveys, physical or chemical logs, water analyses, tests, and temperature surveys (See Rule 205).

STDOE CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed R. O. Engebretsen Position Area Manager Date 9/29/81

R. O. Engebretsen

Form G-1
Adopted

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

GEOTHERMAL RESOURCES WELL SUMMARY REPORT

Operator Union Geothermal Co. of New Mexico Address Rio Rancho, NM 87174

Lease Name BACA location Well No. BACA-12 Remedial

Unit Letter O Sec. 14 Twp. 19N Rge 3E

Reservoir Redondo Creek County Sandoval

Commenced drilling 08-15-81

Completed drilling 09-04-81

Total depth 10,637 Plugged depth --

Junk None

Commenced producing Not produced (Date)

GEOLOGICAL MARKERS	DEPTH
Caldera Fill	Surf. - 160'
Bandelier Tuff	160' - 6460'
Paliza Cyn Form.	6460' - 7380
Redbeds	7575' - 10,2
Granite	10,220' - 10

Geologic age at total depth:

Date	Static test Shut-in well head		Production Test Data								
			Total Mass Flow Data					Separator Data			
	Temp. °F	Pres. Psig.	Lbs/Hr	Temp. °F	Pres. Psig.	Enthalpy	Orifice	Water cuft/Hr	Steam Lbs/Hr	Pres. Psig.	Tem
			NOT TESTED								

CASING RECORD (Present Hole)

Size of Hole	Size of Casing	Weight of Csg/ft.	Grade of Casing	New or Used	Seamless or Lapweld	Depth of Shoe	Top of Casing	Number of Sacks Cement	Top of Cement	Cement To Determined
26"	20"	94#	H-40	N	S	247'	Surf	1016 ft^3	Surf	Visual
17½"	13-3/8	68#	K-55	N	S	1453'	Surf	1709 ft^3	Surf	Visual
12¼"	9-5/8	36#	K-55	N	S	3540'	Surf	1625 ft^3	Surf	Visual
8-3/4	7	26#	K-55	N	S	8895'	3220'	2010 ft^3	NOT DETERMINED	

PERFORATED CASING

(Size, top, bottom, perforated intervals, size and spacing of perforation and method.)

NONE

Was analysis of effluent made? NO Electrical log depths NONE Temperature log depths NONE

STDOE

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed R O Engebretsen Position Area Manager Date 9/29/81

R.O. Engebretsen

06-27-81 Moved in and rigged up Brinkerhoff-Signal rig #78. Set in BOP stack.

06-28-81 Completed setting in BOP stack and flowline spool. Drilled and set rat hole. Nippled up BOPE and flow line. Function-tested BOPE. OK. Picked up BHA. Picked up 3-1/2" drill pipe.

06-29-81 Continued RIH, picking up 3-1/2" drill pipe and 4-1/2" drill pipe to fill at 7958'. Broke circulation with aerated water. Cleaned out fill from 7958' to 8853'.

06-30-81 Cleaned out fill from 8853' to 9206'. Circulated hole clean. POH to 3343'. RIH to 9206'. No fill. POH. Ran Sperry Sun Gyroscope. Surveyed hole at 200' intervals from 200' to 9160'.

07-01-81 RIH with 7" casing spear to 3343'. Engaged liner. Jarred liner free. Chained out of hole. Laid down fishing tools. Laid down 7" casing.

07-02-81 Continued to lay down 7" liner. Recovered a total of 140 joints 7" 26#. Laid down 3-1/2" drill pipe. Picked up 6" drill collars and 4-1/2" drill pipe.

07-03-81 Continued picking up 4-1/2" drill pipe to fill at 9068'. Pumped 70 bbls Gel - LCM pill. POH. RIH with OEDP to 8005'. Cooled hole. HOWCO mixed and pumped 83 cu. ft. class "H" cement with 1-1 Perlite, 3% Gel, 40% SSA-1 and 0.4% HR-7. displaced with 83 cu. ft. water. CIP at 2330 hours.

07-04-81 POH. Attempted without success to fill hole. RIH to top of cement at 9049'. POH. RIH with OEDP to 9,000'. Cooled hole. HOWCO mixed and pumped plug #2: 125 cu. ft. class "H" cement with 1-1 Perlite, 3% Gel, 40% SSA-1 and 0.4% HR-7. Displaced 112 cu. ft. water. CIP at 1500 hours. POH. RIH with slick BHA to top of cement at 9041'.

07-05-81 Spotted 100 bbl gel and LCM pill at 9,000'. POH. RIH with OEDP to 8,000'. Pumped 210 bbls Gel and LCM. RIH to 8998'. HOWCO mixed and pumped 499 cu. ft. water followed by 125 cu. ft. class "H" cement with 1-1 Perlite, 3% Gel, 40% SSA-1 and 0.4% HR-7. Displaced with 112 cu. ft. water. CIP at 0730 hours. POH to 3400'. Drill pipe partially plugged. POH. Found 16 joints drill pipe partially plugged with cement. Pumped mud through fill up line while POH. Attempted to fill hole with 670 bbls water. Pumped a total of 1170 bbls fluid. Unable to fill hole.

07-06-81 RIH. Cleaned out bridge from 5773' to 5790'. RIH to cement at 9049'. POH. RIH with OEDP to 8999'. Cooled hole. Stuck drill pipe. Worked pipe free. Pulled to 8937'. HOWCO mixed and pumped plug #4: 125 cu. ft. class "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel and 0.4% HR-7. Displaced with 252 cu. ft. water. CIP 1700 hours. POH to 6986'. Pumped to clear drill pipe. Driller did not notice that pump had popped off. WOC.

07-07-81 RIH to cement at 9049'. POH to 8000'. Attempted to pump through drill pipe. Had no pressure increase. Pump pop off bypass by open. Attempted to pump through drill pipe with HOWCO. Pressure increased to 3000 psi. Drill pipe plugged with cement. POH. Laid down 48 joints of cemented drill pipe. RIH to 8000' with rerun #2. Production ran pressure-temperature survey. Tool stopped at 6960'. POH. Temperature at 6960' = 351°F with top of fluid at 1700' $^{+}_{-}$. Pipe stuck after survey. Pulled free. POH to 2982'. Pumped water to flush hole. Staged into hole to 5967' and to 8012'. Picked up drill pipe. Running in hole.

07-08-81 RIH to 9049'. Pumped water. POH. RIH with OEDP to 8937'. HOWCO pumped 28 cu. ft. sand. Displaced with 711 cu. ft. water. POH to 7542'. RIH to sand at 8987'. Pumped 1100 bbls water to cool hole. Hole did not fill. POH to 8937'. Pumped 112 cu. ft. gel slurry, followed by 95 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112

07-08-81 cu. ft. mud and 560 cu. ft. water. CIP at 1530 hours. WOC. RIH to cement at 8590'. Unable to fill hole.

07-09-81 POH to 7542'. Pumped 260 bbls water. No fill. Pumped 112 cu. ft. gel slurry. Followed by 95 cu. ft. "H" cement, with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2, and 0.4% HR-7. Displaced with 112 cu. ft. mud and 448 cu. ft. water. CIP at 0145 hours. POH to 6149. WOC. RIH to cement at 7451'. Pumped 250 bbls water with no fill. POH to 6427'. Pumped 250 bbls water with no fill. Pumped 112 cu. ft. mud followed by 95 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 364 cu. ft. water. CIP at 1200 hours. POH to 3230'. WOC. Located cement at 6270'. Pumped 250 bbls water with no fill. POH to 5218'. Pumped 250 bbls water with no fill. POH to 5218'. Pumped 140 cu. ft. mud, followed by 100 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2, and 0.4% HR-7. Displaced with 112 cu. ft. mud and 280 cu. ft. water. CIP at 2210 hours. POH to 3231'. WOC.

07-10-81 WOC 7 hours total. Located cement at 5746'. Unable to fill hole. Hung OEDP at 5684'. HOWCO pumped 140 cu. ft. gel slurry, fo..owed by 100 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud, and 280 cu. ft. water. CIP at 0810. POh to 3231'. WOC 7 hours. RIH to cement at 5520'. Pumped 400 bbls water. Hole did not fill. POH to 4471'. Pumped 160 bbls water. Hole did not fill. Pumped 140 cu. ft. gel slurry, followed by 100 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 250 cu. ft. water. CIP at 1810. POH to 3231'. WOC at 2400 hours.

07-11-81 WOC 7 hours total. RIH to cement at 5032'. Filled hole with 312 bbls water. Circulated, losing 250 bbls/hr. POH to 4191'. Filled hole with 120 bbls water. Pumped 140 cu. ft. gel slurry and 112 cu. ft. "H" cement with 1-1 Perlite

07-11-81 Cont'd

40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 168 cu. ft. water. CIP at 0445 hours. POH to 3231'. WOC 7 hours. RIH to cement at 4522'. Filled hole with 200 bbls water. Circulated, losing 200 bbls/hr water. POH to 4006'. Cooled hole. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. "H" cement, with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 168 cu. ft. water. POH to 3231'. WOC 7 hours. RIH to cement at 4228'. Filled hole with 95 bbls water. Circulated, losing 180 bbls./hr. POH to 3822'. Cooled hole.

07-12-81 Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. "H" cement, with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7, displaced with 112 cu. ft. mud and 157 cu. ft. water CIP at 0030 hours. POH to 2892'. WOC 7 hours. RIH to cement at 4006'. Filled hole with 70 bbls water. Cooled hole, losing 100 bbls/hr. POH to 3822'. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 157 cu. ft. water. CIP at 1000 hours. WOC 7 hours. Laid down 90 joints drill pipe while WOC. RIH with OEDP to cement at 3774'. Filled hole with 40 bbls water. Circulated to cool hole, losing 35 bbls/hr. Hung OEDP at 3760'. Pumped 140 cu. ft. gel slurry, followed by by 112 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2, and 0.4% HR-7. Displaced with 112 cu. ft. mud and 140 cu. ft. water. CIP at 1945 hours. POH. WOC.

07-13-81 WOC 7 hours. RIH with 8-3/4" bit to cement at 3544'. Filled hole. Circulated with full returns. Cleaned out cement from 3544' to 4033'. Losing 42 bbls/hr at 3941 and 60 bbls/hr at 4033'. POH. RIH with OEDP. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2, and 0.4% HR-7. Displaced with 112 cu. ft. mud and 168 cu. ft. water. CIP at 2045 hours. POH. WOC 7 hours.

07-14-81 RIH with OEDP to cement at 3832'. Filled hole. Circulated with full returns. Tripped for drilling assembly. Cleaned out cement from 3832' to 4521', losing 25-35 bbls/hr from 3993' to 4521'.

07-15-81 Cleaned out cement from 4521' to 5146', losing 35 to 40 bbls/hr. Lost all returns at 5146'. Cleaned out cement with no returns from 5146' to 5156'. POH. RIH with 90' OEDP. Driller struck crown. Made repairs to bumper boards. RIH with OEDP to 5155'. Pumped 250 bbls water, 140 cu. ft. gel slurry and 106 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 269 cu. ft. water. CIP at 2000 hours. POH to 3259'. WOC.

07-16-81 WOC 7 hours. RIH to top of cement at 5139'. Pumped 250 bbls water. Hole filled, but broke down after 90 bbls. Circulated. Hung OEDP at 5124'. Pumped 140 cu. ft. gel slurry, 106 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 269 cu. ft. water. CIP at 0500 hours.POH to 3259. WOC 7 hours. RIH to cement at 5139'. No fill. Filled hole with 115 bbls water. Circulated, losing 250 bbls/hr. With OEDP at 5124', pumped 140 cu. ft. gel slurry, followed by 100 cu. ft. "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 269 cu. ft. water. CIP at 1410 hours. WOC 7 hours. RIH to cement at 4972'. Filled hole with 80 bbls water. Cooled hole. Losing 180 bbls/hr. Hung OEDP at 4968'. Pumped 140 cu. ft. gel slurry, followed by 100 cu. ft. "H" cement with 1-1 Perlite, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. CIP at 2300 hours. POH to 3259'. WOC.

07-17-81 WOC (7 hours total). RIH to cement at 4869'. Filled hole with 70 bbls water. Circulated, losing 200 bbls/hr. POH to 4284. Losing 120 bbls/hr. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. class "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 196 cu. ft. water. CIP 0940 hours. POH to 3259'. WOC

07-17-81 Cont'd

(7 hours total). RIH to cement at 4863'. Filled hole with 72 bbls water. Losing 250 bbls/hr. Hung OEDP at 4842'. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. class "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 252 cu. ft. water. CIP at 1830 hrs (plug #22). POH to 3259'. WOC at 2400 hours.

07-18-81 WOC (7 hours total). RIH to cement at 4711'. Filled hole with 83 bbls water. Circulated, losing 236 bbls/hr. Hung OEDP at 4685'. Pumped 140 cu. ft. gel slurry, followed by 112 cu. ft. class "H" cement with 40% SSA-1, 1-1 Perlite, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 224 cu. ft. water. CIP at 0400 hours (Plug #23). POH to 3259'. WOC (7 hours total). RIH to top of cement at 4531'. Circulated, losing 96 bbls/hr. Hung OEDP at 4501'. Pumped 140 cu. ft. gel slurry, followed by 95 cu. ft. class "H" cement with 1-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 224 cu. ft. water. CIP 1300 hours (Plug #24). POH to 3259'. WOC (7 hours total). RIH to cement at 4341'. POH to 3849'. Pumped 140 cu. ft. mud, 112 cu. ft. class "B" cement with 10 lbs/sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 168 cu. ft. water. CIP 2200 hours (Plug #25). POH to 3259'. WOC at 2400 hours.

07-19-81 WOC (7 hours total). RIH to cement at 3846'. Circulated with full returns. WOC. RIH with 8-3/4" bit and nine 8" drill collars. Cleaned out cement from 3846' to 4373'. Hole started taking fluid at 4313' to 4373' at 84 bbls/hr rate. POH. RIH with OEDP to 4373'. Circulated. With OEDP at 4371', HOWCO pumped 140 cu. ft. mud, followed by 125 cu. ft. "B" cement with 10 lbs/sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 202 cu. ft. water. CIP at 2400 hours, plug #26.

CSTDOE

07-20-81 POH to 3631'. Filled hole, standing full. Closed rams. Squeezed away 8 bbls fluid to formation at 100 psi. POH to 3259'. WOC 7 hours. RIH to cement at 4210'. Circulated, losing 32 bbls/hr. Hung OEDP at 4188'. HOWCO pumped plug #27, 125 cu. ft. class "B" cement with 10 lbs per sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 190 cu. ft. water. CIP at 1000 hours. POH to 3538'. Squeezed away 8 bbls water at 200 to 500 psi. POH to 3259'. WOC 7 hours. RIH to cement at 4083'. Circulated with full returns. POH. WOC. RIH with 8-3/4" bit.

07-21-81 Located cement at 4083'. Cleaned out cement to 4587' with good returns. Hole started taking fluid at 60 bbls/hr rate. POH. RIH with OEDP to 4587'. HOWCO pumped plug #28: 125 cu. ft. "B" cement with 10 lbs. per sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. displaced with 112 cu. ft. mud and 224 cu. ft. water. CIP at 2100 hours. POH. WOC.

07-22-81 WOC 7 hours. RIH with OEDP to cement at 4421'. Hole taking fluid at more than 60 bbls/hr. Hung OEDP at 4406'. Pumped 125 cu. ft. "B" cement with 10 lbs per sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. displaced with 112 cu. ft. mud and 202 cu. ft water. CIP at 0730 hours. (Plug #29). POH. WOC 7 hours. RIH. Located cement at 4156'. Circulated. Hole taking 60 bbls/hr. Hung OEDP at 4156'. Pumped 125 cu. ft. "B" cement with 10 lbs per sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 190 cu. ft. water. CIP at 1600 hours (Plug #30). POH to 3259'. Filled hole, fluid falling away. WOC 7 hours. Located cement at 3988'. Circulated. Hole taking 60 bbls an hour. Hung OEDP at 3988'. HOWCO pumped 125 cu. ft. "B" cement with 10 lbs per sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 291 cu. ft. water. CIP at 2400 hours (Plug #31).

07-23-81 POH to 3259'. WOC 5 hours. Filled hole. Hole taking 52 bbls/hr. Located top of cement at 3814'. Circulated, losing 30 bbls/hr. Hung OEDP at 3814', pumped 177 cu. ft. "B" cement with 0.5% CFR-2 and 0.4% HR-7. Displaced with 269 cu. ft. water. CIP t 0930 hours (Plug #32). POH to 2793'. Squeezed away 3 bbls water with 400 psi. WOC 7 hours. RIH. Located cement at 3548'. Circulated. Closed rams. WOC 12 hours. Drilled firm cement from 3548' to 3645'. No loss of fluid.

07-24-81 Drilled out cement from 3645' to 4703'. The hole was taking 84 bbls/hr in the interval from 3775' to 3867'.

07-25-81 Drilled out cement from 4703' to 4952'. POH. Changed bits. RIH. Drilled out cement from 4952' to 5200'. Hole taking 116 bbls/hr at 5170', lost total returns at 5200'. POH. RIH with OEDP to 5200'. Pumped water, fluid level to surface, but would not circulate. With OEDP at 4200', pumped plug #33: 177 cu. ft. class "B" cement, 0.5% CFR-2 and 0.4% HR-7, and displaced with 381 cu. ft. water. CIP at 1900 hours. POH to 4270'. Filled hole, fluid falling away. POH, laying down 4-1/2" working drill pipe.

07-26-81 WOC for a total of 5 hours. Filled hole. Hole taking 196 bbls/hr. RIH with OEDP and tagged cement at 5080'. Circulated. Hung with OEDP at 5080' and pumped in plug #34: 125 cu. ft. class "B" cement with 0.5% CFR-2, 0.4% HR-7 and 50# Flo-Seal. Displaced with 381 cu. ft. water. POH to 4150'. Filled hole with 34 bbls water. Fluid dropping away at 196 bbls/hr. POH, laying down working drill pipe. CIP 0315 hours. WOC. RIH witrh 8-3/4" bit #4 to cement at 4902'. Hole taking 114 bbls/hr fluid. Cleaned out cement from 4902' to 4917'. Lost returns completely and regained partial returns. POH. RIh with OEDP to 4917'. HOWCO mixed and pumped 125 cu. ft. "B" cement with 0.5% CFR-2 and 0.4% HR-7. Displaced with 308 cu. ft. water. CIP at 1600 hours. (Plug #35). POH. Kept hole full with 80 bbls/hr. Ran Schlumberger Spinner Survey; tool failed. RIH with 8-3/4" bit to cement at 4711'.

07-27-81 Cleaned out cement. Lost 100 bbls/hour from 4711' to 5810'. Lost all returns at 5810'. Had intermittent returns from 5810' to 5910'. POH. RIH with OEDP.

07-28-81 RIH with OEDP to 5859'. Pumped 400 bbls/hr water, filling hole to within 80' of surface. Pumped 112 cu. ft. class "B" cement with 0.5% CFR-2 and 0.4% HR-7. Displaced with 437 cu. ft. water. CIP at 0240. POH. WOC 6 hours. Laid down 54 joints drill pipe. RIH with OEDP to cement at 5870'. Filled hole with 156 bbls water. Circulated, losing 220 bbls/hr. Pumped plug #37: 112 cu. ft. gel slurry, 129 cu. ft. "B" cement with 10 lbs/sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 325 cu. ft. water. CIP at 1045 hours. POH to 3300'. WOC 6 hours. RIH to cement at 5680'. Circulated, losing 120 bbls/hr. POH. RIH with 8-3/4" bit to 5657'. Cleaned out cement stringers to 5680' and cement to 5685', losing 80 bbls/hr.

07-29-81 Cleaned out cement from 5685' to 6014'. Lost all returns. Cleaned out cement with no returns from 6014' to 6075'. RIH to 6270'. Cleaned out cement with no returns from 6270' to 6292'. POH. RIH with OEDP to 6119'. Circulated. Pumped 140 cu. ft. gel slurry, 123 cu. ft. "B" cement with 10 lbs/ sack Gilsonite, 2% Gel, 0.5% CFR-2 and 0.4% HR-7. Displaced with 112 cu. ft. mud and 336 cu. ft. water. CIP at 1900 hours. POH to 3255'. WOC.

07-30-81 WOC 6 hours. RIH to 6292'. No fill from plug #38. Hung OEDP at 6152'. Pumped plug #39: 140 cu. ft. Gel and LCM slurry, 123 cu. ft. "B" cement with 50# Flo-Seal, 0.5% CFR-2 and 0.2% HR-7. Displaced with 112 cu. ft. mud and 336 cu. ft. water. CIP at 0420 hours. POH to 3255'. WOC 7 hours. RIH to cement at 5991'. Hole filled momentarily with 100 bbls water and returns lost. Cooled hole. Pumped plug #40: 140 cu. ft. Gel and LCM slurry, 145 cu. ft. "B" cement with 0.5% CFR-2 and 0.2% HR-7. Displaced with 112 cu. ft. mud and 269 cu. ft. water. CIP at 1300 hours. POH to 3255'. WOC 7 hours. RIH to cement at 5811'. Circulated, losing 300

07-31-81 Cleaned out cement from 5811' to 6196'. RIH to top of cement plug at 6292'. Cleaned out cement from 6292' to 6308' without returns. POH. Rigged for aerated water drilling. RIH to 6139'. Attempting to break circulation at 2400 hours.

08-01-81 Unable to break circulation. POH 24 stands. Installed jet subs at 2232' and 1160'. RIH to 6139'. Broke circulation. Reamed from 6139' to 6308'. Cleaned out cement from 6308' to 6783'. RIH to 7170'. Cleaned out cement to 7260'. RIH to 7344'. Cleaned out cement to 7624' at 2400 hours.

08-02-81 Continued cleaning out cement plugs from 7624' to 7753'. RIH to 8590'. Cleaned out cement from 8590' to 8836'. RIH to 8900' (Bottom of cement plug #5 was not as deep as thought - 8937'.) Circulated. Measured out of hole with no correction. RIH with HOWCO plug catcher on 4-1/2" drill pipe to 8987'. POH to 8973'. Cooled hole with 500 bbls water. HOWCO pumped 56 cu. ft. "B" cement with 70 lbs per sack Gilsonite, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. Displaced with 655 cu. ft. water. Bumped plug. CIP at 1745 hours. POH. RIH with 8-3/4" bit to 8605'.

08-03-81 Production Department ran P/T survey. Survey indicated fluid level at 1400' and temperature at 8500' = 496°F - static 8-1/2 hours. RIH to cement at 8837'. Cleaned out cement at 8899' with water and no returns. Broke circulation with aerated water. Cleaned out cement from 8899' to 8930'. Circulated clean. Short trip to 3540'. RIH to top of sand at 8987'. No cement below 8930?? POH to 8242'. Slipped and cut badly damaged drilling line. Continued POH. RIH with HOWCO plug catcher to 8973'. Pumped 400 bbls water to cool hole at 2400 hours.

08-04-81 Pumped plug #42 through OEDP: 56 cu. ft. "B" cement with 20# per sack Gilsonite, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. Displaced with 672 cu. ft. water. CIP at 0045 hours. POH to 6146'. Cooled hole with 400 bbls water. HOWCO pumped plug #43 through OEDP at 6146': 112 cu. ft. "B" cement with 2-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. Displaced with 459 cu. ft. water. CIP at 0300 hours. POH. WOC 8 hours. RIH to cement at 6071'. Hole would not fill. Unable to start circulation with air/water. POH. Installed jet subs.

08-05-81 Cleaned out cement from 6068' to 6174'. RIH to 6299'. POH to retrieve jet sub and string float. RIH to bridge at 6434'. Cleaned out from 6034' to 6528' without returns. POH. Installed jet sub. RIH to 6528'. Cleaned out to 6700' RIH to bridge at 8992'. POH. RIH with plug catcher on bottom of drill pipe to 8900'. Pumped 25 cu. ft. sand. Displaced with 225 cu. ft. water. POH to 5737'. Waited two hours for sand to settle. RIH to top of sand at 8985'. 7' of fill. Pulled drill pipe to 8900'. Pumped water to cool hole. Hung OEDP at 8970' HOWCO pumped plug #44 consisting of 187 cu. ft. class "H" cement 1-1 Perlite, 40% Silica flour, 3% Gel, 0.5% CFR-2, and 0.4% HR-7. Bumped plug with 713 cu. ft. water. CIP 2200 hours. POH.

08-06-81 Continued POH. WOC total of 7 hours. RIH with saw tooth single to cement at 8575'. Circulated. Filled hole. Fluid at 175'. POH. RIH with 8-3/4" bit and stabilizer on top of first drill collar to 8575'. Circulated with air and water. Cleaned out cement from 8575' to 8816'.

08-07-81 Continued drilling out cement from 8816' to 8900'. Circulated hole clean with aerated water. POH to 3540'. RIH to 8900'. No fill. POH. Rigged and ran liner, consisting of 33 joints of 7" 26# L-80 LT&C casing plus 94 joints 7" 26# K-55 LT&C casing. RIH and hung on Midway 9-5/8" by 7" LT&C liner hanger at 3220'. Cooled hole for 2 hours. Cemented as follows: HOWCO mixed and pumped 337 cu. ft. Gel, 112 cu. ft. water, followed by 417 cu. ft. class "H" cement with 0.5% HR-7 and 1287 cu. ft. "H" cement with 0.4% HR-7 with 50# per sack Spherelite, 40% SSA-1, 4% Gel, 5% Lime and 0.4% CFR-2, plus 306 cu. ft. class "B" cement with 40% SSA-1, 0.5% CFR-2 and 0.4% HR-7.

08-08-81 Displaced cement with 505 cu. ft. water. Under displaced cement due to excessive pressure. CIP at 0130 hours. Left 879 cu. ft. cement in 7" casing. Estimated top of cement at 4100'. Fluid level at 20' below surface after CIP. POH to 2290'. Circulated with full returns. POH. Laid down Midway hanger tools. RIH with 8-3/4" bit to top of liner hanger. Circulated with full returns. Had no cement. POH. Picked up nine 4-3/4" drill collars. RIH with 6-1/8" bit to top of cement at 3230'. Cleaned out cement from 3230' to 3235'. RIH to 3473'. Circulated. POH. Laid down 4-1/2" drill pipe.

08-09-81 Continued to lay down 4-1/2" drill pipe. Laid down 6" drill collars. Replaced 4-1/2" drill pipe rams with 3-1/2" drill pipe rams. Picked 6-1/8" bit and 4-3/4" drill collars. RIH with 3-1/2" drill pipe to cement at 4461'. Drilled cement from 4461' to 4667'.

08-10-81 Drilled cement from 4667' to 4948'. Tested liner lap with 500 psi plus Hydrostatic. Lap OK. Drilled cement to 5185'. POH. Changed bit. Added 3 drill collars to assembly. RIH. Drilled cement with 6-1/8" bit rerun #7 from 5185' to 6081'.

08-11-81 Drilled cement with 6-1/8" rerun bit #7 from 6081' to 8254'.

08-12-81 Drilled cement from 8254' to 8885'. Drilled guide shoe - cleaned out cement and sand to 9225'. Hole standing full.

08-13-81 POH. RIH with 6" magnet and junk sub. Hole standing full of water. POH. Recovered large amounts of junk (1 large piece of Grant rotating drive bushing and miscellaneous small pieces). Made run no 2 with 6" magnet to 9225'. POH. Recovered large amount of miscellaneous broken pieces of liner hanger. Ran 6" globe junk basket. POH.

08-14-81 POH with 6-1/8" globe junk basket with no recovery. RIH with 6" magnet and junk sub. Worked over junk at 9225'. POH. Recovered 3 pounds junk with large piece of Grant Kelly rotating head drive bushing. RIH with 6" magnet and junk sub. Worked over junk at 9225'. Recovered 12 lb. hammer head and small pieces of junk. RIH with 6" magnet and junk sub.

08-15-81 Worked over junk at 9225'. POH with no recovery. RIH with 6-1/8" mill and junk sub to 9225'. Milled on junk and drilled with mill to 9231'. POH. RIH with magnet and junk sub to 9231'. Worked over junk. POH.

08-16-81 POH with magnet. Recovered 4" DIA x 1/2" piece of Grant rotating head drive bushing and miscellaneous small pieces of metal. RIH with rerun #8, 6-1/8" bit and junk sub to 9231'. Drilled 6-1/8" hole from 9231' to 9248'. POH. Made up 6-1/8" drilling assembly. RIH to 9225'. Reamed from 9225' to 9248'. Drilled 6-1/8" hole

08-17-81	Drilled 6-1/8" hole from 9332' to 9604'.
08-18-81	Drilled 6-1/8" hole from 9604' to 9850'.
08-19-81	Drilled 6-1/8" hole from 9850' to 10,054'.
08-20-81	Drilled 6-1/8" hole from 10,054' to 10,124'.
08-21-81	Drilled 6-1/8" hole from 10,124' to 10,263'.
08-22-81	Drilled 6-1/8" hole from 10,263' to 10,369'.
08-23-81	Drilled 6-1/8" hole from 10,369' to 10,435'.
08-24-81	POH. Changed bit. Reamed from 10,375' to 10,435'. Drilled 6-1/8" hole from 10,435' to 10,466'. POH. Changed bit. RIH. Reamed from 10,398' to 10,408'.
08-25-81	Drilled 6-1/8" hole from 10,466' to 10,537'. RIH with bit and junk sub to prepare hole for diamond bit. Reamed from 10,472' to 10,537'. Drilled 6-1/8" hole from 10,537' to 10,545'.
08-26-81	Made up Ace 6-1/8" diamond bit. Drilled 6-1/8" hole from 10,545' to 10,563'.
08-27-81	POH with Ace diamond bit. Found junk to be on bottom, indicated by "O" ring and flat spot in center. Drilled 6-1/8" hole from 10,563' to 10,619'.
08-28-81	Drilled 6-1/8" hole from 10,619' to 10,627'. POH. Left cones in hole. RIH with 5-1/2" junk sub to 10,482'. Worked and washed to bottom. Circulated with full returns. Worked over junk.

STDOE

08-29-81 POH. Recovered small pieces of cones and bearings (25% of total). RIH to 10,482'. Stuck pipe. Circulated with full returns while working stuck pipe. Freed pipe. POH. RIH with bit to 10,453'. Circulated and reamed from 10,453' to 10,616'. POH. RIH with 5-1/2" magnet.

08-30-81 Circulated and worked over junk. POH. Recovered small piece of cone and bearing. RIH with 5-1/2" magnet. Worked over junk at 10,627'. POH. Recivered pieces of cone and bearings. RIH with 6-1/8" junk mill. Reamed from 10,550' to 10,627'. Milled on junk at 10,627'. Swept hole with Gel.

08-31-81 POH. No junk in junk sub. RIH with 6" magnet to 10,627'. Worked on junk. POH to 10,604'. Set back Kelly. Stuck pipe. circulated with 100% returns. Unable to free pipe. Rigged up McCullough Wireline and Free Point. RIH to top of drill collars at 10,324'. Wireline shorted out in splice. Rigged down McCullough. Circulated.

09-01-81 Circulated while waiting on Wireline Services. RIH with Free Point Indicator. Wireline failed at 10,300'. POH. Burned 1200' of wireline. Ran temperature survey on production wireline. Temperature survey results:

8000'	15 minutes	300°F maximum
8500'	11 minutes	334°F maximum
9000'	11 minutes	355°F maximum
9500'	11 minutes	381°F maximum
10,000'	11 minutes	401°F maximum
10,300'	11 minutes	415°F maximum

POH. Circulated and waited on high temperature wireline.

09-02-81 Ran HOMCO Free Point Indicator to 10,170'. Free Point Indicator stopped at 10,170'. POH. RIH with sinker bar and collar locator to 10,568'. POH. Ran Free Point. Indicated pipe 65% free at top of drill collars at 10,355', 35% free at 10,386', and stuck at 10,417'. Ran back-off shots. Backed off on second attempt at 10,355'.

STDOE

09-03-81 RIH with screw-in sub, bumper sub and jars to fish at 10,355'. Screwed into fish. Circulated. Recovered entire fish. RIH.

09-04-81 Drilled 6-1/8" hole from 10,627' to 10,632'. Cored from 10,632' to 10,637' (5 feet).

09-05-81 Recovered 38" granite core. Laid down core bbl. RIH with bit #25 to 1423'. Unloaded hole with 150 psi air pressure. Circulated with air at 100 psi. RIH to 2353'. Unloaded hole with 310 psi air. Circulated with air at 100 psi. RIH to 3381'. Unloaded hole with 570 psi air. Circulated with 150 psi air. RIH to 4033'. Unloaded hole with 580 psi air pressure. Circulated with 150 psi air. Hole making 15 GPM while circulating. Circulated one hour. Water decreased to 5 GPM after 30 minutes. Continued to make 5 GPM. POH, laying down drill pipe. RIH with one stand of 3-1/2" drill pipe. Filled hole with water. Closed pipe rams. Injected 570 bbls water at 306 GPM at 1000 psi pressure. RIH with drill collars and drill pipe. POH, laying down drill pipe.

09-06-81 Continued laying down drill pipe and drill collars. Removed BOP's. Released rig for moved to BACA-20 at 1800 hours.

BACA-12

20" C @ 247'
13-3/8" C @ 1453'
9-5/8" Liner @ 1270'-3540'
9-5/8" Tie-Back @ 0'-1270'

7/31/81

(800,000)

34 Dys, 9211', 0' Drld

RIH with 8-3/4" bit to 5811'. Cleaned out cement from 5811' to 6196'. Lost returns after penetrating bottom of plug at 6196'. RIH to top of cement plug at 6293'. Cleaned out cement from 6292' to 6302' without returns. POH. Rigged for aerated water drilling. RIH to 6139'. Attempting to break circulation at 2400 hours.

8/01/81

(821,250)

35 Dys, ETD 8900', TD 9211', 0 Drld.

Unable to break circulation. POH 24 stands. Installed jet subs at 2232' and 1160'. RIH to 6139'. Broke circulation. Reamed from 6139' to 6308'. Cleaned out cement from 6308' to 6933'. RIH to 7170'. Cleaned out cement to 7260'. RIH to 7344'. Cleaned out cement to 7624' at 2400 hours.

8/02/81

(847,290)

36 Dys, ETD 8987', TD 9211', 0' Drld.

Continued cleaning out cement plugs from 7624' to 7753'. RIH to 8590'. Cleaned out cement from 8590' to 8836'. RIH to 8900' (Bottom of cement plug #% was not as deep (8937') as thought). Circulated. Measured out of hole with no correction. RIH with HOWCO plug catcher on 4-1/2" drill pipe to 8987'. POH to 8973'. Cooled hole with 500 bbls water. HOWCO pumped 56 cu. ft. "B" cement with 20 lbs/sack Gilsonite, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. Displaced with 655 cu. ft. water. Bumped plug. CIP at 1745 hours. POH. RIH with 8-3/4" bit to 8605'.

BACA 12 DEEPENING

8/03/81

(873,850)

37 Dys, 9211' TD, 0' Drld.

Production Department ran P/T survey. Survey indicated fluid level at 1400' and temperatures at 8500' = 496°F - static 8-1/2 hours. RIH to cement at 8837'. Cleaned out cement 8899' with water and no returns. Broke circulation with aerated water. Cleaned out cement from 8899' to 8930', circulated clean. Short trip to 3540'. RIH to top of sand at 8987'. No cement below 8930'?? POH to 8242'. Slipped and cut badly damaged drilling line. Continued POH. RIH with HOWCO plug catcher to 8973'. Pumped 400 bbls water to cool hole at 2400 hours.

BACA 12 DEEPENING

8/04/81

(897,490)

38 Dys, 9211' TD, 0' Drld.

HOWCO pumped plug #42 through OEDP at 8973', 56 cu. ft. "B" cement with 20#/sack Gilsonite, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. displaced with 672 cu. ft. water. CIP at 0045 hours. POH to 6146'. Cooled hole with 400 bbls water. HOWCO pumped plug #43 through OEDP at 6146', 112 cu. ft. "B" cement with 2-1 Perlite, 40% SSA-1, 3% Gel, 0.5% CFR-2 and 0.2% HR-7. Displaced with 459 cu. ft. water. CIP at 0300 hours. POH. WOC 8 hours. RIH to cement at 6071'. Hole would not fill. Unable to start circulation with air/water. POH. Installed jet subs.

BACA ϕ2 DEEPENING

8/05/80

(909,935)

39 Dys; 9200' TD, 0' Drld.

Cleaned out cement from 6068' to 6074'. RIH to 6299'. POH to retrieve jet sub and string float. RIH to bridge at 6434'. Cleaned out from 6034' to 6528' without returns. POH. Installed jet sub. RIH to 6528'. Cleaned out to 6700'. RIH to bridge at 8992'. POH. RIH with plug catcher on bottom of drill pipe to 8900'. Pumped 25 cu. ft. sand, displaced with 225 cu. ft. water. POH to 5737'. Waited 2 hours for sand to settle. RIH to top of sand at 8985' (7' fill). Pulled drill pipe to 8900'. Pumped water to cool hole. Hung OEDP at 8970'. HOWCO pumped plug #44 consisting of 087 cu. ft. class "H" cement 0-0 Perlite, 40% Silica flour, 3% Gel, 0.5% CFR-2 and 0.4% HR-7. Bumped plug with 703 cu. ft. water. CIP 2200 hours. POH at 2400 hours.

BACA 12 DEEPENING

8/06/81

(942,050)

40 Dys, 9211' TD-8900' ETD, 0' Drld.

Continued POH. WOC total of 7 hours. RIH with saw tooth single to cement at 8575'. POH. RIH with 8-3/4" bit and stabilizer on top of first drill collar to 8575'. Circulated with air and water. Cleaned out cement from 8575' to 8816'.

BACA-12 DEEPENING

rec'd 8/17/81
KR

20" C. @ 247'
13-3/8" C. @ 1452'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
7-5/8" tie-back @ 0' - 1270'

8/07/81

(968,512)

41 Dys, 9211' TD, 8900' ETD, 0' Drld.

Continued drilling out cement from 8816' to 8900'. Circulated hole clean with aerated water. POH to 3540'. RIH to 8900' No fill. POH. Rigged and ran liner, consisting of 33 joints of 7" 26# L-80 LT&C casing plus 94 joints 7" 26# K-55 LT&C casing. RIH and hung on Midway 9-5/8" x 7' LT&C liner hanger at 3220'. Cooled well for 2 hours. Cemented as follows: HOWCO mixed and pumped 337 cu. ft. Gel, 112 cu.ft. water, 196 cu. ft. Flo-Chek and 112 cu. ft. water, followed by 417 cu. ft. with 0.5% HR-7 and 1287 with 0.4% HR-7 of class "H" cement with 50#/sack Sphearlite, 40% SSA-1, 4% Gel, 5% Lime and 0.4% CFR-2 plus 306 cu. ft. class "B" cement with 40% SSA-1, 0.5% CFR-2 and 0.4% HR-7. Displaced at 2400 hours.

8/08/81

(1,054,902)

42 Dys, 9211' TD, 8900' ETD, 0' Drld.

Displaced cement with 505 cu. ft. water under displaced cement due to excessive pressure. CIP at 0130 hours. Left 879 cu. ft. cement in 7" casing. Estimated top of cement at 4100'. Fluid level at 20' below surface after CIP. POH to 2290'. Circulated with full returns. POH. Laid down Midway hanger tools. RIH with 8-3/4" bit to top of liner hanger. Circulated with full returns. Had no cement. POH. Picked up 9 4-3/4" drill collars. RIH with 6-1/8" bit to top of cement at 3230'. Cleaned out cement from 3230' to 3235'. RIH to 3473'. Circulated. POH. Laid down 4-1/2" drill pipe.

BACA 12 DEEPENING Cont'd

8/09/81

(1,068,687)

43 Dys, 9211', 0' Drld.

Continued to lay down 4-1/2" drill pipe. Laid down 6" drill collars. Replaced 4-1/2" drill pipe rams with 3-1/2" drill pipe rams. Picked 6-1/8" bit and 4-3/4" drill collars. RIH with 3-1/2" drill pipe to cement at 4461'. Drilled cement from 4461' to 4667'.

8/10/81

(1,091,762)

44 Dys, 9211' TD, 0' Drld., Form Cement.

Drilled cement from 4667' to 4948'. Tested liner lap with 500 psi plus Hydrostatic. Lap OK. Drilled cement to 5185'. POH. Changed bit. Added 3 drill collars to assembly. RIH. Drilled cement with 6-1/8" rerun bit #7 from 5185' to 6081'.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/11/81

(1,104,941)

45 Dys, 9211' TD, 0' Drld., Form Cement.

Drilled cement with 6-1/8" rerun bit #7 from 6081' to 8160'. POH. Replaced union on standpipe. RIH with rerun bit #8. Drilled cement from 8160' to 8254'.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/12/81

(1,127,986)

46 Dys, 9225', 0' Drld.

Drilled cement from 8254' to 8885'. Circulated with 40 bbl Gel sweeps. POH to install circulating subs. Cleaned flow line. RIH with circulating subs at 952' above bit, 1964' above bit. RIH to 8885'. Drilled guide shoe. Cleaned out cement and sand to 9225'. Found junk on bottom. Circulated hole clean. POH. Hole standing full. (Junk believed to be slips from liner hanger previously recovered. Marks on 6-1/8" bit indicate possibility of large pieces.)

BACK-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/13/81

(1,142,458)

47 Dys, 9225', 0' Drld.

POH. RIH with 6" magnet and junk sub. Hole standing full of water. POH. Recovered large amounts of junk (1 large piece of Grant rotary drive bushing and miscellaneous small pieces.) Made run #2 with 6" magnet to 9225'. POH. Recovered large amount of miscellaneous broken pieces of liner hanger. Ran 6" globe junk basket. POH.

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/21/81

(1,299,808)

55 Dys, 10,263', 139' Drld., Form Siltstone, Sandstone

RIH with bit #14 to 10,054'. Reamed to 10,124'. Drilled 6-1/8" hole from 10,124' to 10,214'. POH. Changed bit and tools. RIH with bit #15 to 10,154'. Reamed to 10,214'. Drilled 6-1/8" hole from 10,214' to 10,263'.

Surveys 10,278' 22° N 40 E

8/22/81

(1,324,228)

56 Dys, 10,369', 106' Drld., Form SS.

Drilled 6-1/8" hole from 10,263' to 10,291'. Surveyed. POH. Changed bit and tools. RIH to 10,231'. Reamed to 10,291'. Drilled 6-1/8" hole from 10,291' to 10,369'. POH. Left bearings and pieces of cone in the hole. RIH with bit and junk sub.

8/23/81

(1,345,238)

57 Dys, 10,435', 66' Drld., Form Sandstone

RIH. Staged into hole with cooling stops at 5000' and 7,500'. RIH to 10,309'. Reamed to 10,369'. Worked over junk at 10,369'. Drilled 6-1/8" hole from 10,376' to 10,435'. POH.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/24/81

(1,372,674)

58 Dys, 10,466', 31' Drld., Form Sandstone, Granite Wash

POH. Changed bit. RIH with bit #19. Reamed from 10,375' to 10,435'. Drilled 6-1/8" hole from 10,435' to 10,466'. POH. Changed bit. RIH. Reamed from 10,398' to 10,408'.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/25/81

(1,391,154)

59 Dys, 10,545', 79' Drld., Form Granite

Reamed 6-1/8" hole from 10,408' to 10,466'. Drilled 6-1/8" hole from 10,466' to 10,537'. POH. Changed bit. RIH with bit and junk sub to prepare hole for diamond bit on next run. Reamed from 10,472' to 10,537'. Drilled 6-1/8" hole from 10,537' to 10,545'. POH.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/26/81

(1,416,427)

60 Dys, 10,563', 18' Drld., Form Granite

POH. No junk recovered in junk sub. Made up Ace 6-1/8" diamond bit. RIH to 10,430'. Reamed from 10,430' to 10,545'. Circulated hole. Drilled 6-1/8" hole from 10,545' to 10,563'. POH. Top of granite 10,200'.

BACA-12 DEEPENING

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/27/81

(1,440,317)

61 Dys, 10,619', 56' Drld., Form Granite

POH with Ace diamond bit. Found junk to be on bottom, indicated by "O" ring and flat spot in center. RIH with bit #23 to 10,408'. Reamed 6-1/8" hole from 10,408' to 10,563'. Drilled 6-1/8" hole from 10,563' to 10,619'. Circulated. Surveyed. Stuck pipe. Worked free. POH. Magna-Glo'd tools. AMF equipment failed. Changed bit. RIH at 2400 hours.

Surveys 10,589' 24° 30' S 58° W

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/28/81

(1,455,571)

62 Dys, 10,627'(corrected), 8' Drld., Form Granite

Reamed from 10529' to 10619'. Drilled 6-1/8" hole from 10619' to 10627'. POH. Left cones in hole. AMF inspected drill collars. Laid down 7" drill collar. RIH with 5-1/2" magnet and 5-1/2" junk sub to 10482'. Worked and washed to bottom. Circulated with full returns (rig pump only, no air). Worked over junk and POH at 2400 hours.

8/29/81

(1,473,001)

63 Dys, 10627', 0' Drld.

Continued to POH. Recovered small pieces of cones and bearings (25% of total). RIH to 10,482' with 5-1/2" magnet and 5-1/2" junk sub. Stuck pipe. Circulated with full returns while working stuck pipe. Freed pipe. POH. RIH with bit #25 and 3 point reamer to 10,453'. Circulated and reamed from 10,453' to 10,616'. POH to 10,453'. RIH to 10,616'. POH. RIH with 5-1/2" magnet and 5-1/2" junk sub at 2400 hours.

8/30/81

(1,487,406)

64 Dys, 10,627', 0' Drld.

RIH to 10,627', Circulated and worked over junk. POH. Recovered small piece of cone and bearings. (Approximately 50% of junk remaining in hole). RIH with 5-1/2" magnet and junk sub. Worked over junk at 10,627'. POH. Recovered pieces of cone and bearings. RIH with 6-1/8" junk mill and junk sub. Repaired Hydromatic. Reamed from 10,550' to 10,627'. Milled on junk at 10,627'. Swept hole with gel. POH at 2400 hours.

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

8/31/81

(1,503,240)

65 Dys, 10627', 0' Drld.

Continued POH. No junk in junk sub. RIH with 6" magnet and 5-1/2" junk sub. Circulated at 10,600'. RIH to 10,627'. Worked on junk. POH to 10,604'. Set back Kelly. Stuck pipe. Circulated with 100% returns. Unable to free pipe. Waited on fishing tools. Rigged up McCullough Wireline and Free Point. RIH to top of drill collars at 10,324'. Wireline shorted out in splice at 7000'. Rigged down McCullough. Circulated while waiting on HOMCO wireline truck. Bottom of fish at 10,604'. Top of drill collars at 10,324'.

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

9/01/81

(1,521,101)

66 Dys, 10627', 0' Drld.

Circulated while waiting on HOMCO wireline services. Rigged up HOMCO and circulating sub. RIH with Free Point Indicator. Wireline failed at 10,300'. POH. Burned 1200' of wireline. Ran temperature survey on production wireline. Discontinued circulation at 8,000'. After 1/4 hour, temperature = 300°F. Temperature survey results:

8000'	15 minutes	300°F maximum
8500'	11 minutes	334°F maximum
9000'	11 minutes	355°F maximum
9500'	11 minutes	381°F maximum
10,000'	11 minutes	401°F maximum
10,300'	11 minutes	415°F maximum

POH. Circulated and waited on high temperature wireline.

rec'd SEP 10 19

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

9/02/81

(1,538,622)

67 Dys, 10627', 0' Drld.

Circulated and waited on high temperature wireline. Line arrived at 0100 hours. Spliced line. Ran HOMCO Free-Point Indicator to 10,170'. Free-Point Indicator stopped at 10,170'. POH. RIH with sinker bar and collar locator to 10,568'. POH. Ran Free-Point. Indicated pipe free at top of drill collars at 10,355', 35% free at 10,386', and stuck at 10,417'. POH. Ran back-off shots. Backed off on second attempt at 10,355'. POH. Fish left in hole: Bottom at 10,604', top at 10,355'. Fish consists of 6" HOMCO magnet, 5-1/2" junk sub, float sub, and eight 4-3/4" drill collars. Chained out of hole at 2400 hours.

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

rec'd SEP 10 198

9/03/81

(1,557,452)

68 Dys, 10627', 0' Drld.

Chained out of hole. Recovered drill pipe and one 4-3/4" drill collar. RIH with screw-in sub, bumper sub and jars to fish at 10,355'. Screwed into fish. Circulated. Jarred fish free. POH. Recovered entire fish. RIH with rerun bit #5.

BACA-12 DEEPENING

Rec'd 9/23/81

Encl. 1

20" C. @ 247
13-3/8" C. @ 1453'
9-5/8" L. @ 1270' - 3540'
7" L. @ 3220' - 8895'
9-5/8" Tie-back @ 0' - 1270'

9/04/81

(1,574,782)

69 Dys, 10637', 10' Drld.

RIH to 10,497'. Reamed to 10,627'. Drilled 6-1/8" hole from 10,627' to 10,632'. No indication of junk in hole. POH. RIH with 5-7/8 x 2-3/8" core assembly. Cooled hole at 6086' and 8500'. RIH to 10,632'. Cooled hole. Circulated high-vis Gel pill. Cored from 10,632' to 10,637' (5 feet). Losing 95 bbls water/hour while coring.

9/05/81

70 Dyus, 10,637' T.D., 0' Drld.

POH. Recovered 38" granite core. Laid down core bbl. RIH with bit #25 to 1423'. Unloaded hole with 150 psi air pressure. Circulated with air at 100 psi. RIH to 2353'. Unloaded hole with 310 psi air. Circulated with air at 100 psi. RIH to 3381'. Unloaded hole with 570 psi air. Circulated with 150 psi air. RIH to 4033'. Unloaded hole with 580 psi air pressure. Circulated with 150 psi air. Hole making 15 GPM while circulating. Circulated one hour. Water decreased to 5 GPM after 30 minutes. Continued to make 5 GPM. POH, laying down drill pipe. Filled hole with water. Closed pipe rams. Injected 570 bbls water at 306 GPM at 1000 psi stand pipe pressure. RIH with drill collars and drill pipe. POH, laying down drill pipe at 2400 hours.

9/06/81

(1,653,542)

71 Dys, 10637' T.D., 0' Drld.

Continued laying down drill pipe and drill collars. Re-strung from 10 lines to 8 lines. Removed BOP's. Released rig for move to BACA #20 at 1800 hours.

Injection Well Status — Month MAY 5-8

PAGE #1 — BACA #12 INJECTIVITY TEST — Well No. BACA #12

Date	Time	WHP Press.	WELL HEAD TEMP OF	G.P.M.	Remarks
					INJECTION Meter = 0-150" WC
	B-12 SURVEY 39 P/T IN				INJECTION LINE = 6.0"
	place AT 3500' FROM 0938 TO				ORIFICE = 3.75"
	1458 HRS				ORIFICE COEFFICIENT = 53.32
5-5-80	1008	VACUUM	58 °f	—	BEGIN INJECTION
"	1020	62 PSIG	56	373	WELL PRESSURED UP
"	1043	62	58	371	
"	1045	64	58	± 500 GPM	FROM 1105 HRS TO 1120 HRS
"	1130	65	58	[53] 388 gpm	INJECTION RATE INCREASED TO
"	1142	65	58	[53] 388 gpm	± 500 GPM
"	1200	66	58	[52.5] 386 gpm	
"	1215	68	57	[50] 377.	
"	1230	70	57	373	
"	1245	70	57	373	
"	1300	69	57	373	
"	1312	67	56	377	
"	1320	66	55	392	BEGAN TO STABALIZE INJECTION
"	1330	64	54	392	RATE @ 1330 HRS.
"	1340	62	54	399	
"	1350	60	54	404	
"	1400	57	54	410	
"	1410	45	54	402	
"	1420	43	53	410	
"	1424	30	53	399	
"	1430	25	52	400	
"	1440	21	52	410	
"	1445	10	52	399	
"	1500	5	52	[51] 403	
"	1511	VACUUM	52	406	WELL WENT ON VACUUM
"	1520	"	52	395	
"	1533	"	52	[575] 404	
"	1550	"	52	400	
"	1700	"	54	[56] 406	
"	1820	"	54	[50] 400	
Total					

R.S. ENGEBRETSEN
MAY 13 1980

1008 - 5/1 ≈ 24 Hrs.
1008 - 5/1
1008 - 5/6 = 1 Hr.
1008 - 5/6.3
1455 - 5/6

ction Well Status

Month MAY 5 198

PAGE #2 BACA #12 INJECTIVITY TEST Well No. BACA #12

Date	Time	WHP Press.	WELL HEAD TEMP of	G.P.M.	Remarks
5-5-80	1900	VACUUM	55	56 [25] 399 GPM	
"	1930	"	55	55 [5] 398	
"	1950	"	55	57 [1] 402	AT 1958 HRS Picked up
"	2100	"	54	402	B-12 Survey 39 P/T from 3500'
"	2115	"	54	56 [5] 400	
"	2130	"	54	399	Opened B-6 upper pond 1/2 WA
"	2215	"	54	56 [5] 399	
"	2310	"	58	58 406	Opened B-6 upper pond All the w
Total					

R.E. ENGINEER-OFFICE
MAY 13 1980

DICK

76

UNION GEOTHERMAL DIVISION

SUBSURFACE SURVEY
Field Work Sheet

B-12-5-38-P/T

OWNER Union Geo. of N.M. FIELD Redondo Canyon WELL NAME BACA #1

CASING 20" @ 247' 13 3/8" @ 453' ELEV. 8430' DATE: 5/5/80

LINER DESCRIPTION: 9 5/8" @ 3540' ZERO POINT: G.L. + 8'

7" @ 3345' DEPTH 8400'

TUBING DETAIL:

PURPOSE

REMARKS:

Element: P-4650 9222 12 hr 15 turn

ELEMENT T- 93°- 618' SERIAL NO. 10222 CLOCK 12 hr. 15 TURN STABILIZATION PERIOD

ENGAGE STYLUS: P-0650 - 0645 DISENGAGE STYLUS: P-0945 - T0945

WELL HEAD .5 PSI

PICKUP @ 6500' TIME ON BOTTOM 0803 - 0813 MAX. °F 476°

WELL STATUS: Shut in

SHUT IN: 12/15/76 ON PRODUCTION:

RATE

Pressure

TIME	DEPTH	DEFL.	P-T	GRAD.	COR #0
0726	3000	.342	831	—	+.001
0738	4000	.500	1199	.368	+.004
0750	5000	.617	1470	.271	+.006
0802	6000	.779	1851	.381	+.007
0813	6500	.886	2102	.502	+.007

Temperature

TIME	DEPTH	DEFL.	P-T	GRAD.	#0
0726	3000	1.243	467		
0738	4000	1.276	475		
0750	5000	1.278	476		
0802	6000	1.257	470		
0813	6500	1.27	476		

TIME	DEPTH	DEFL.	P-T	GRAD.	/D

R.O. ENGEBRETSEN

MAY 13 1980

COMMENTS: Suspect Pressure Readings

X

7/6

GEOTHERMAL DIVISION

SUBSURFACE TEMPERATURE SURVEY

BH12-S-38-P/T

OWNER Union Geo. of N. Mex. FIELD Redondo CANYON WELL NAME BACA #12

CASING 20" @ 247' 13⅜" @ 1453' ELEV. 8430' DATE: 5/5/80

LINER DESCRIPTION: 9⅝" @ 3540' ZERO POINT GL +8'

7" @ 3345' DEPTH 8400'

HOLE DESCRIPTION:

INSTRUMENT 93° #0618°

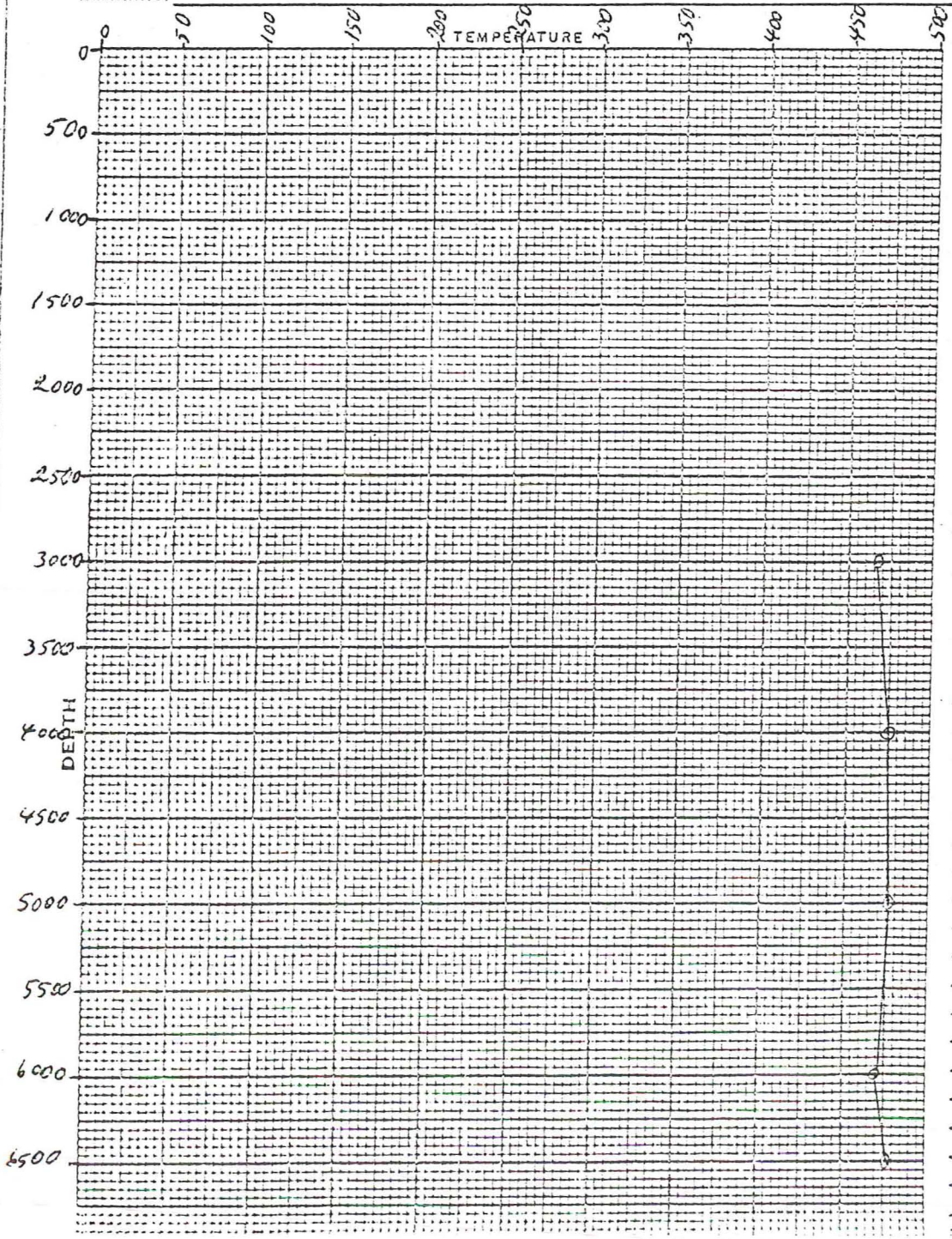
SERIAL NO 10222

PURPOSE

MAX TEMP. 476 °F @ 6

REMARKS:

STABLIZATION PERIOD



PRESSURED, CASING, PSI	GAUGE	
	.5	

DEPTH	TEMP.	DEPTH
3000	467	
4000	475	
5000	476	
6000	470	
6500	476	

R.O. ENGEBRETSEN

MAY 13 1980

76

GEOTHERMAL DIVISION

SUBSURFACE PRESSURE SURVEY

B#12-S-38-P/I

OWNER Union Geo. of N. Mex. FIELD Redondo Area WELL NAME BACA #12

CASING 20" C 247' 13⅜" C 1453' ELEV. 6430' DATE: 5/5/80

LINER DESCRIPTION: 9⅝" C 3540' ZERO POINT GL +8'

7" C 3345' DEPTH 8400'

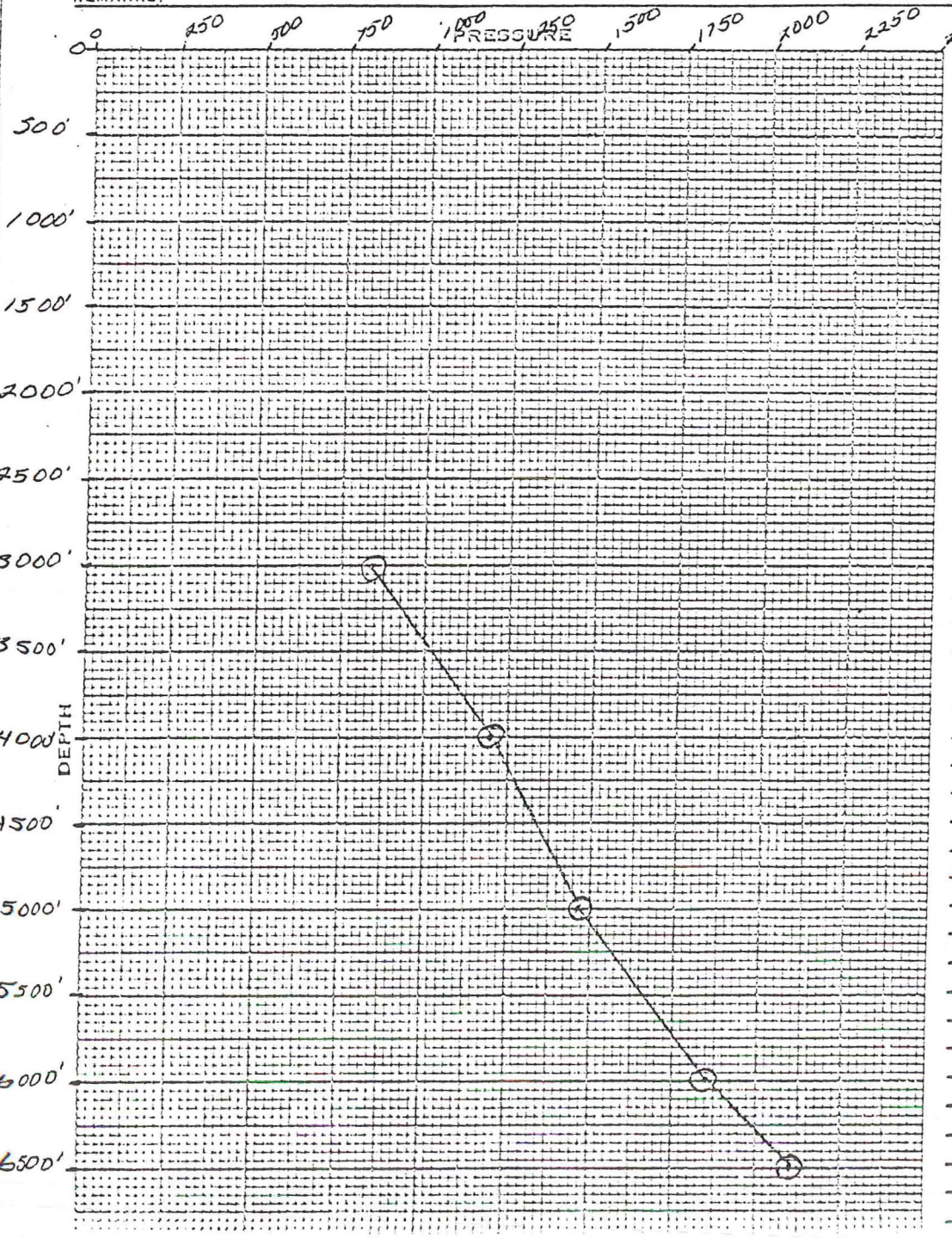
HOLE DESCRIPTION:

INSTRUMENT 4650

SERIAL NO. 9222

PURPOSE MAX. TEMP 476 °F @ 65

REMARKS:



PRESSURES	GAUGE	
CASING, PSI	# 5	

DEPTH	PRESSURE	GRA
3500	831	
4000	1199	
5000	1470	
6000	1851	
6500	2102	

R.O. ENGEBRETSEN

MAY 13 1980

76

R.O. ENGEBRETSEN

MAY 13 1980

UNION GEOTHERMAL DIVISION

DICK

SUBSURFACE SURVEY

Field Work Sheet

B-12 5-39

OWNER UNION GEOTHERMAL CO N.M FIELD Redondo Canyon WELL NAME BACA #13

CASING 20" AT 247' ; 13 3/8 AT 1453 ELEV. 8430 DATE: 5-5-80

LINER DESCRIPTION: 9 5/8 at 3590' ; Tie back 1270' ZERO POINT GL + 8'

7" AT 3343' to 9211 DEPTH 8400'

TUBING DETAIL:

PURPOSE Injectivity Test

REMARKS:

Element 0-4650 PSI 9222 Clock 12hr 15 Turn

ELEMENT 93°-618°F SERIAL NO. 10222 CLOCK 12 hr 15 TURN STABILIZATION PERIOD

ENGAGE STYLUS P. 0925; T. 0921 DISENGAGE STYLUS P. 2016; T. 2016

WELL HEAD See wellhead Chart

PICKUP @ 3500 TIME ON BOTTOM 1008 - 1958 MAX. °F 474 °F

WELL STATUS ON INJECTIVITY TEST

SHUT IN: ON PRODUCTION:

RATE ± 400 GPM INJECTION

	PRESSURE						PRESSURE						TEMPERATURE					
TIME	DEPTH	DEFL.	P-T	GRAD.	COR/ID		TIME	DEPTH	DEFL.	P-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D
1008	3500	.413	498		+.002		1728	3500	.609	1451			1008	3500	1.217	459		
1013	"	.516	1236		+.004		1753	"	.606	1444			1013	"	1.272	474		
1018	"	.576	1375		+.006		1828	"	.602	1435			1018	"	1.250	468		
1023	"	.618	1472		+.007		1858	"	.600	1431			1023	"	1.187	451		
1028	"	.643	1531		+.008		1928	"	.595	1414			1028	"	1.100	428		
1033	"	.654	1557		+.009		1958	"	.593	1414			1033	"	.963	390		
1038	"	.660	1571		+.008								1038	"	.730	323		
1043	"	.659	1568		+.004								1043	"	.469	245		
1048	"	.658	1566		0								1048	"	.311	196		
1053	"	.660	1571		0								1053	"	.223	167		
1058	"	.661	1573		0								1058	"	.168	149		
1103	"	.662	1575		0								1103	"	.132	138		
1108	"	.691	1644		0		INCREASED INJECTION RATE						1108	"	.108	130		
1113	"	.689	1639		0		TO ± 500 GPM FROM						1113	"	.075	119		
1118	"	.688	1637		0		1105 HRS TO 1120 HRS						1118	"	.056	113		
1123	"	.663	1578		-.001								1123	"	.038	106		
1128	"	.661	1580		-.001								1128	"	.027	102		
1158	"	.663	1578		-.001								1158	"	.018	99		
1228	"	.664	1580		-.001								1228	"	.015	98		
1258	"	.663	1578		-.001								1258	"	.004	94		
1328	"	.666	1585										* 1328	"	NR	NR		
1358	"	.665	1559															
1428	"	.646	1538															
1458	"	.637	1517										1958		NR	NR		
1528	"	.629	1498															
1558	"	.621	1479										* FROM 1328 HRS TO 1958 H.					
1628	"	.614	1463										WELL BORE WAS below					
1658	"	.610	1454										93 °F AT 3500'					

COMMENTS:

L

BY:

Baca No. 12
Injectivity and
Pressure Fall off.

Injection Well Status

Month 5-6-80

BACA #12 INJECTIVITY TEST

Well No. BACA #12

Date	Time	WELL HEAD Press.	WELL HEAD TEMP	G.P.M.	Remarks
5-6-80	MIDNIGHT 0000	VACUUM	60 °f	406 gpm	
"	0015	"	60	406	
"	0040	"	60	406	
"	0420	"	56	394	OPENED B-11 POND to B-12
"	0435	"	56	394	
"	0450	"	56	385	OPENED B-18 POND to B-12
"	0515	"	55	390	
"	0535	"	54	406	
"	0626	"	53	404	
"	0654	"	53	404	
"	0725	"	53	404	0700 - 0930 RAN P/P
"	0816	"	54	404	0-4700 PSI ; 0-4650 PSI tandem
"	0833	"	54	404	Pressure B-12 S-40 P/P
"	0901	"	55	406	
"	0923	"	55	406	
"	0950	"	56	406	
"	1030	"	57	402	
"	1100	"	57	402	B-12 S-41 SPINNER SPINNER SURVEY 1100 - 1210h
"	1130	"	57	402	
"	1200	"	57	401	
"	1230	"	57	401	
"	1300	"	56	400	
"	1330	"	56	400	
"	1340	"	58	400	
"	1430	"	59	400	
"	1545	"	59	394	
"	1600	"	59	400	
"	1700	"	60	402	
"	1730	"	60	402	
"	1850	"	60	400	
"	1900	"	55	400	1926 - 1956 HRS RAN B-12 S-
"	1915	"	55	400	P/T at 1956 shut off
"	1955	"	55	400	Injection
"					
Total					

R.O. ENGEBRETSEN

MAY 13 1980

76

UNION GEOTHERMAL DIVISION

SUBSURFACE SURVEY
Field Work Sheet

B-12 S 40 P

OWNER Union Geo of N.M. FIELD Redondo Canyon WELL NAME BACA #12
CASING 20" at 247'; 13⅜ at 453 ELEV. 8430' DATE: 5/6/80
LINER DESCRIPTION: 9⅝ at 3540'; Tie back 1270' ZERO POINT GL + 8'
7" at 3343' to 9211 DEPTH 8400'
TUBING DETAIL:

PURPOSE Injectivity test
REMARKS:
Element 0-4650 PSI - 9222 12hr 15
ELEMENT 0-4700 PSI SERIAL NO. 14191 CLOCK 12hr 15 TURN STABILIZATION PERIOD
ENGAGE STYLUS 0654 5/6/80 DISENGAGE STYLUS 1002 5/6/80
WELL HEAD See chart
PICKUP @ 6500' TIME ON BOTTOM 0842 - 0852 MAX. °F
WELL STATUS ON Injection 400 GPM
SHUT IN: ON PRODUCTION:
RATE ± 400 gpm injection

Pressure 0-4650 PSI

TIME	DEPTH	DEFL.	P-T	GRAD.	ID
0724	3000	.510	1222		
0735	3500	.604	1440		
0746	3750	.649	1545		
0757	4000	.693	1649		
0808	4500	.783	1861		
0819	5000	.874	2074		
0830	5500	.965	2286		
0841	6000	1.056	2498		
0852	6500	1.149	2714		
0930	3500	.605	1442		

Pressure 0-4700 PSI

TIME	DEPTH	DEFL.	P-T	GRAD.	ID
0724	3000	.508	1235		
0735	3500	.598	1448		
0746	3750	.642	1551		
0757	4000	.687	1657		
0808	4500	.777	1867		
0819	5000	.868	2079		
0830	5500	.959	2292		
0841	6000	1.050	2505		
0852	6500	1.141	2717		
0930	3500	.599	1450		

TIME	DEPTH	DEFL.	P-T	GRAD.

R.O. ENGEBRETSEN
MAY 13 1980

COMMENTS:

BY:

76

GEOTHERMAL DIVISION

SUBSURFACE PRESSURE SURVEY

B-12 540 P

OWNER Union Geo of N.M. FIELD Redondo WELL NAME BACA #12

CASING 20" At 241'; 13 3/8" At 1453' ELEV. 8430 DATE: 5/6/80

LINER DESCRIPTION: 9 5/8 At 3540; tie back 1270' ZERO POINT GL + 8

7" At 3343 to 9211 DEPTH 8400'

HOLE DESCRIPTION:

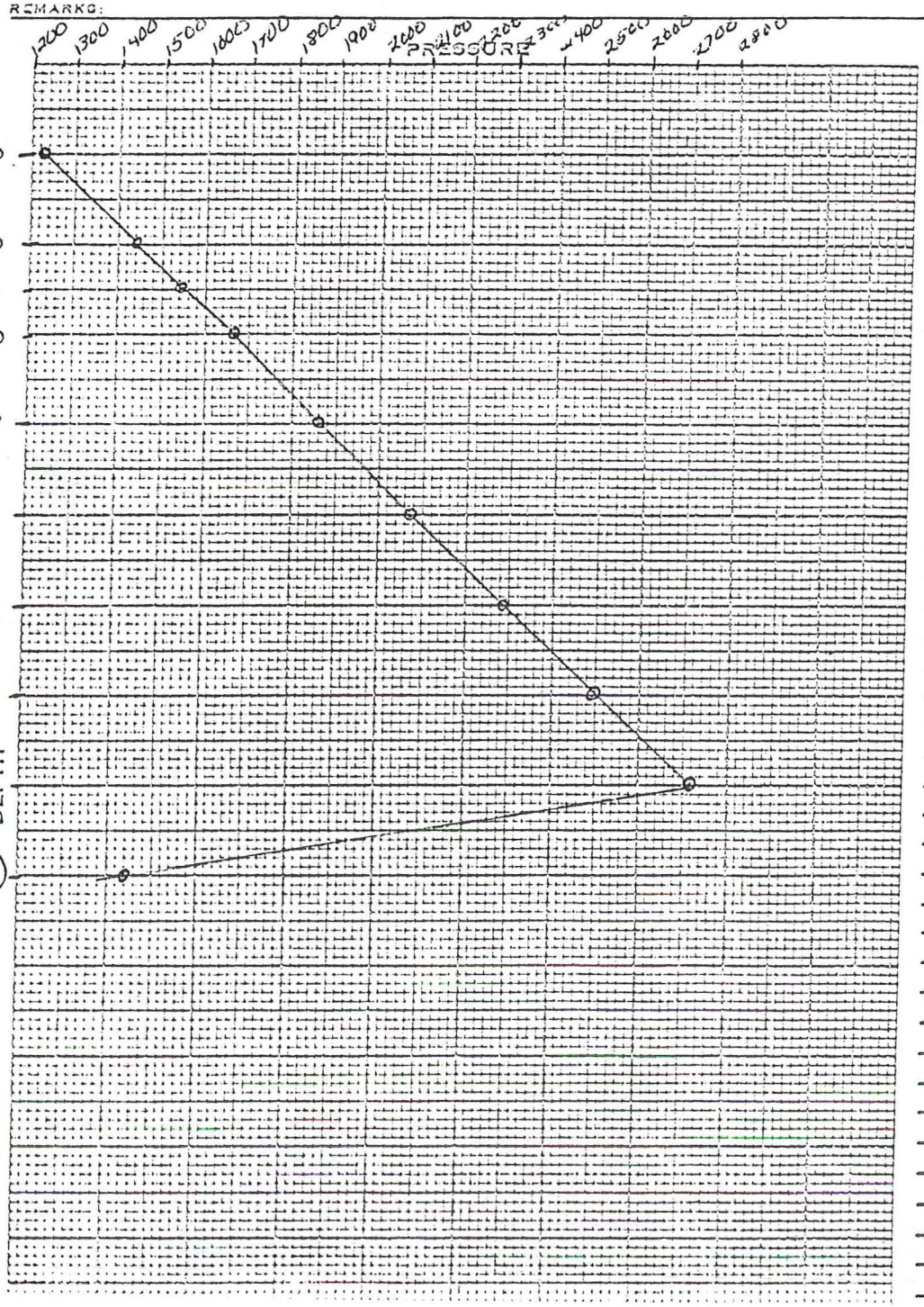
INSTRUMENT 0-4650

SERIAL NO. 9222

PURPOSE MAX. TEMP °F @

REMARKS:

STABLIZATION PERIOD



PRESSURE, CASING, PSI	GAUGE VAC	DO VAC

DEPTH	PRESSURE	GRADI
3000	1222	0
3500	1440	.436
3750	1545	.420
4000	1649	.416
4500	1861	.424
5000	2074	.426
5500	2286	.416
6000	2498	.424
6500	2714	.432
3500	1442	—

R.O. ENGEBRETSEN

MAY 13 1980

76

GEOTHERMAL DIVISION

SUBSURFACE PRESSURE SURVEY

B12-540-P1

OWNER UNION GEO CO. OF N.M. FIELD REDONDO WELL NAME BACA 17

CASING 20" @ 247'; 13 3/8" @ 1453' ELEV. 8430' DATE: 5-6-80

LINER DESCRIPTION: 9 5/8" @ 3540' TIEBACK @ 1270 ZERO POINT GL + 8'

7" @ 3343 TD 9311' DEPTH 8400'

HOLE DESCRIPTION:

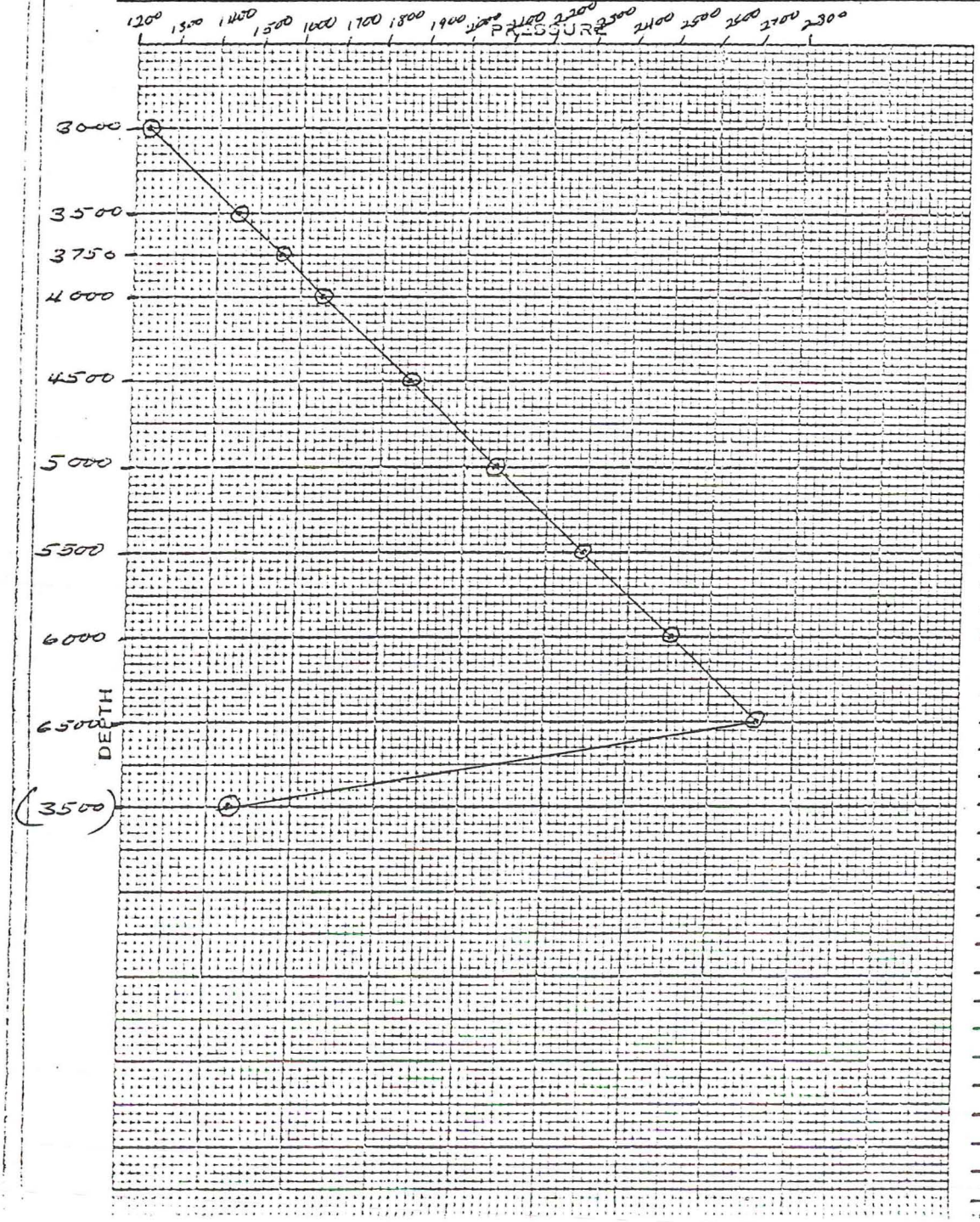
INSTRUMENT 0-4700

SERIAL NO 14191

PURPOSE MAX. TEMP — °F @ —

REMARKS:

STABLIZATION PERIOD



PRESSURES	GAUGE	
CASING, PSI	VAC	VAC

DEPTH	PRESSURE	GR
3000	1235	
3500	1448	
3750	1551	
4000	1657	
4500	1867	
5000	2079	
5500	2292	
6000	2505	
6500	2717	
3500	1450	

R.O. ENGEBRETSEN

MAY 13 19

76

UNION

GEOTHERMAL DIVISION

SUBSURFACE SURVEY

Field Work Sheet

B-12 S42 PIT

OWNER UNION Geothermal Co N Mex FIELD Redondo Canyon WELL NAME BACA #12

CASING 20" AT 247'; 13 3/8 AT 1453' ELEV. 8430' DATE: 5-6 + 5-7 -8

LINER DESCRIPTION: 9 5/8" AT 3540' Tieback 1270' ZERO POINT GL +8'

7" AT 3343' TO 9211' DEPTH 8400'

TUBING DETAIL:

PURPOSE

REMARKS:

ELEMENT 0-4700 SN 14191 CLOCK 12 hr 15 TURN

ELEMENT 93°-618°F SERIAL NO. 10222 CLOCK 12 .15 TURN STABILIZATION PERIOD

ENGAGE STYLUS P-1910 ; T-1912 DISENGAGE STYLUS P0615 ; T-0615

WELL HEAD 0

PICKUP @ 3500 TIME ON BOTTOM 1926 – 0556 MAX. °F 259°F

WELL STATUS Shut 5-7-80 ; open to atmosphere 1950 hrs

SHUT IN: ON PRODUCTION:

RATE

	PRESSURE					TEMPERATURE										
TIME	DEPTH	DEFL.	P-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.
1941	3500	.592	1434		NC	1941	3500	NR	NR							
1956	"	.592	1434		"	1956	"	"	"							
2001	"	.549	1332		"	2001	"	"	"							
2006	"	.531	1289		"	2006	"	"	"							
2011	"	.525	1275		"	2011	"	"	"							
2016	"	.514	1254		"	2016	"	"	"							
2021	"	.511	1242		"	2021	"	"	"							
2026	"	.507	1232		"	2026	"	"	"							
2056	"	.487	1185		-003	2056	"	.024	101							
2126	"	.477	1161		"	2126	"	.080	121							
2156	"	.469	1142		"	2156	"	.122	135							
2226	"	.462	1126		"	2226	"	.162	148							
2256	"	.456	1111		"	2256	"	.192	157							
2326	"	.451	1100		"	2326	"	.230	170							
2356	"	.447	1090		"	2356	"	.260	179							
0026	"	.443	1081		"	0026	"	.287	188							
0056	"	.439	1071		"	0056	"	.314	197							
0126	"	.436	1064		"	0126	"	.339	205							
0156	"	.434	1059		"	0156	"	.362	212							
0226	"	.433	1057		-002	0226	"	.383	219							
0256	"	.431	1052		-002	0256	"	.405	226							
0326	"	.430	1050		-001	0326	"	.425	232							
0356	"	.428	1045		"	0356	"	.444	238							
0426	"	.426	1040		"	0426	"	.463	243							
0456	"	.426	1040		0	0456	"	.480	249							
0526	"	.425	1038		0	0526	"	.492	252							
0556	"	.425	1038		+001	0556	"	.516	259							

R.O. ENGEBRETSEN

MAY 13 1980

COMMENTS:

BY: Jim Brown; Jim Thomson; Theldon Pallett

76

UNION GEOTHERMAL DIVISION

SUBSURFACE SURVEY

Field Work Sheet

B-12 S42 PIT

OWNER UNION Geothermal Co N Mex FIELD Redondo Canyon WELL NAME BACA #12

CASING 20" AT 247'; 13 3/8 AT 1453' ELEV. 8430' DATE: 5-6 + 5-7 -8

LINER DESCRIPTION: 9 5/8" AT 3540' Tieback 1270' ZERO POINT GL +8'

7" AT 3343' TO 9211' DEPTH 8400'

TUBING DETAIL:

PURPOSE

REMARKS:

ELEMENT 0-4700 SN 14191 CLOCK 12 HR 15 TURN

ELEMENT 93°-618°F SERIAL NO. 10222 CLOCK 12 15 TURN STABILIZATION PERIOD

ENGAGE STYLUS P-1910 ; T-1912 DISENGAGE STYLUS P0615 ; T-0615

WELL HEAD O

PICKUP @ 3500 TIME ON BOTTOM 1926 – 0556 MAX. °F 259°F

WELL STATUS Shut 5-7-80 ; open to atmosphere 1956 hrs

SHUT IN: ON PRODUCTION:

RATE

	PRESSURE					TEMPERATURE										
TIME	DEPTH	DEFL.	P-T	GRAD.	ID	TIME	DEPTH	DEFL.	P-T	GRAD.	ID	TIME	DEPTH	DEFL.	P-T	GRAD.
1941	3500	.542	1434		NC	1941	3500	NR	NR							
1956	"	.542	1434		"	1956	"	"	"							
2001	"	.549	1332		"	2001	"	"	"							
2006	"	.531	1289		"	2006	"	"	"							
2011	"	.525	1275		"	2011	"	"	"							
2016	"	.514	1254		"	2016	"	"	"							
2021	"	.511	1242		"	2021	"	"	"							
2026	"	.507	1232		"	2026	"	"	"							
2056	"	.487	1185		-003	2056	"	.024	101							
2126	"	.477	1161		"	2126	"	.080	121							
2156	"	.469	1142		"	2156	"	.122	135							
2226	"	.462	1126		"	2226	"	.162	148							
2256	"	.456	1111		"	2256	"	.192	157							
2326	"	.451	1100		"	2326	"	.230	170							
2356	"	.447	1090		"	2356	"	.260	179							
0026	"	.443	1081		"	0026	"	.287	188							
0056	"	.439	1071		"	0056	"	.314	197							
0126	"	.436	1064		"	0126	"	.339	205							
0156	"	.434	1059		"	0156	"	.362	212							
0226	"	.433	1057		-002	0226	"	.383	219							
0256	"	.431	1052		-002	0256	"	.405	226							
0326	"	.430	1050		-001	0326	"	.425	232							
0356	"	.428	1045		"	0356	"	.444	238							
0426	"	.426	1040		"	0426	"	.463	243							
0456	"	.426	1040		0	0456	"	.480	249							
0526	"	.425	1038		0	0526	"	.492	252							
0556	"	.425	1038		+001	0556	"	.516	259							

R O ENGEBRETSEN

MAY 13 1980

COMMENTS:

76

UNION GEOTHERMAL DIVISION

SUBSURFACE SURVEY
Field Work Sheet B-12 S-43 P/T

OWNER Union Geothermal-N.M. FIELD Redondo Canyon WELL NAME Baca #12
CASING 20"@ 247'; 13 3/8"@ 1453 ELEV. 8430 DATE: 5/8/80
LINER DESCRIPTION: 9 5/8" @ 3540'; Tie back 1270' ZERO POINT G.L. + 8'
7" - 3343 - 9211 DEPTH 8400'

TUBING DETAIL:

PURPOSE Gradient Survey

REMARKS:
Element - 0-4700 psi. S/N - 14191 Cl - 12 hr. 15 T
ELEMENT 93°-618°F SERIAL NO. 10222 CLOCK 12 hr. 15 TURN STABILIZATION PERIOD
ENGAGE STYLUS T-0947 P-0950 DISENGAGE STYLUS T-1358 P-1359
WELL HEAD O
PICKUP @ TIME ON BOTTOM MAX. °F 368°@ 3500'
WELL STATUS Shut in
SHUT IN: 5/7/80 ON PRODUCTION:
RATE

TIME	DEPTH	DEFL.	P-T	GRAD.	corr./D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D
1029	3500	.392	960	—	-.006	1029	3500	.871	364								
1114	"	.392	960	—	-.006	1114	"	.876	365								
1125	4000	.473	1152	.384	-.007	1125	4000	783	339								
1136	4500	.556	1348	.392	-.006	1136	4500	.792	341								
1147	5000	.640	1547	.398	-.005	1147	5000	.805	345								
1158	5500	.723	1741	.388	-.004	1154	5500	.798	343								
1209	6000	.804	1939	.396	-.002	1209	6000	.777	337								
1220	6500	.891	2133	.388	-.001	1220	6500	.807	345								
1244	3500	.392	960	—	-.006	1244	3500	.880	366								
1337	3500	.392	"	—	"	1337	"	.846	368								

R.O. ENGEBRETSEN
MAY 13 1980

COMMENTS:

2

16

GEOTHERMAL DIVISION

SUBSURFACE PRESSURE SURVEY B-12 S-43

OWNER UNION OIL CO. OF NEW MEXICO
FIELD REDONDO CANYON
WELL NAME BACA #12

CASING 20" AT 247' 13 3/8" AT 1453'
ELEV. 8430'
DATE: 5-8-80

LINER DESCRIPTION: 9 5/8" AT 3540'
7" AT 3345'
ZERO POINT GL + 8'
DEPTH 8400'

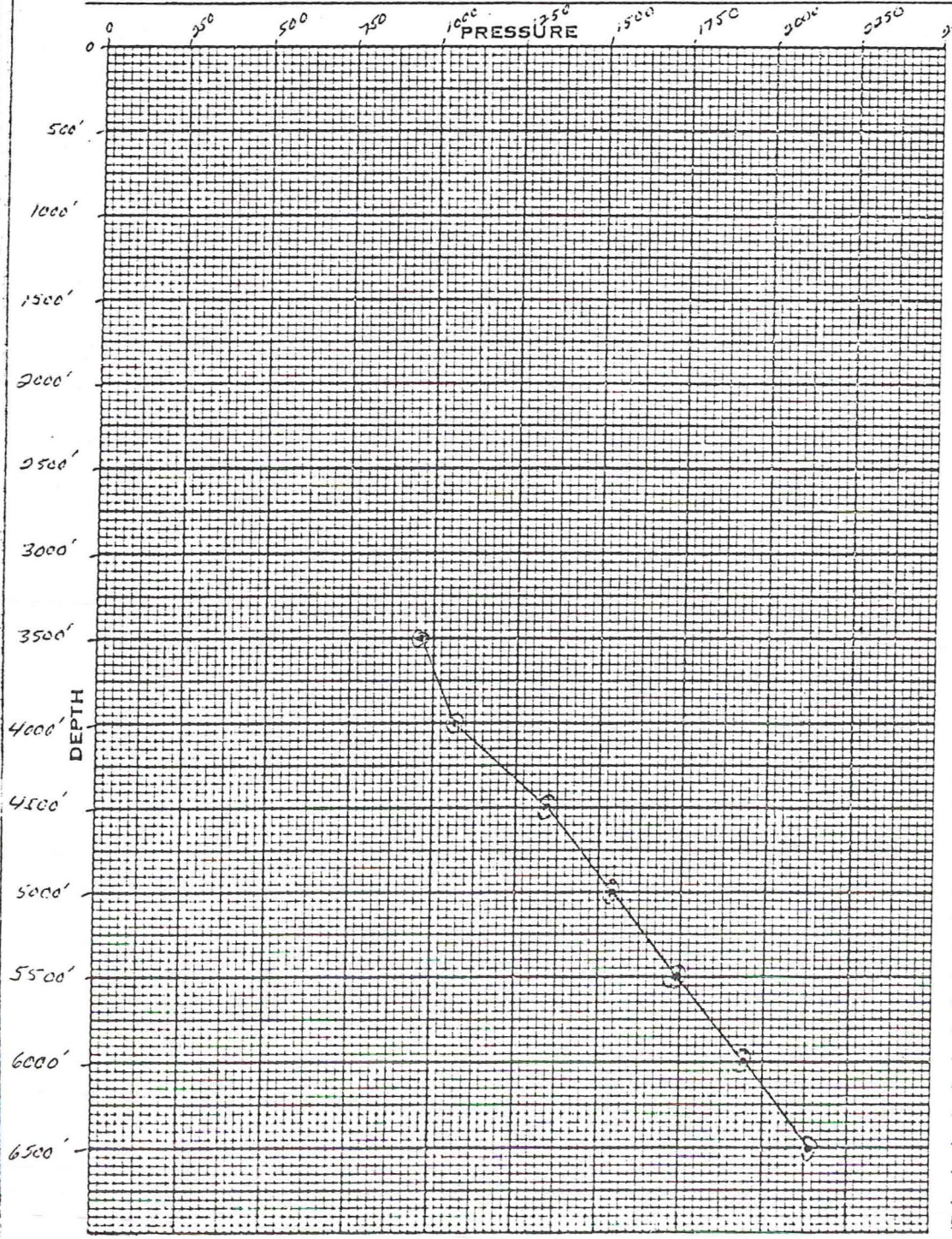
HOLE DESCRIPTION:

INSTRUMENT O-4700
SERIAL NO 9222

PURPOSE
MAX TEMP 368 °F @ 35

REMARKS:

STABLIZATION PERIOD



PRESSURES.	GAUGE	
CASING. PSI		

DEPTH	PRESSURE	GR.
3500	960	
4000	1152	
4500	1348	
5000	1547	
5500	1741	
6000	1939	
6500	2133	

R.O. ENGEBRETSEN

MAY 13 1980

1/2

BY: C. TESE / T. THC

76

GEOTHERMAL DIVISION

SUBSURFACE TEMPERATURE SURVEY

OWNER Union Geothermal - N.M. FIELD Redondo Canyon WELL NAME Baca #12

CASING 20" @ 247', 13 3/8 @ 1453 ELEV. 8430' DATE: 5/8/80

LINER DESCRIPTION: 9 5/8" @ 3540' Tie back 1270' ZERO POINT GL + 8'

7" @ 3343-9211 DEPTH

HOLE DESCRIPTION:

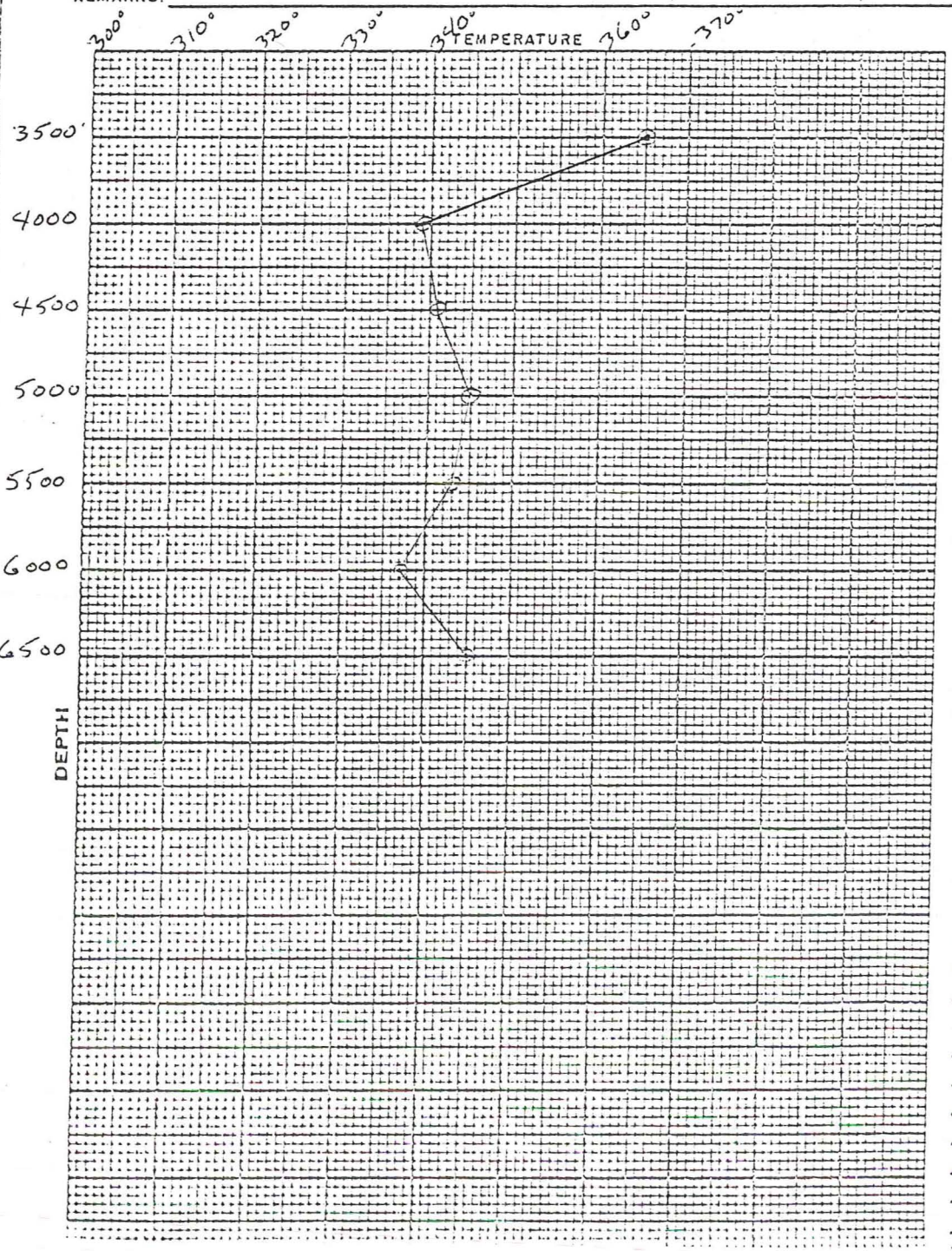
INSTRUMENT 93° - 618°

SERIAL NO 10222

PURPOSE Gradient Survey MAX. TEMP 368 °F @ 35

REMARKS:

STADLIZATION PERIOD



PRESSURES.	GAUGE	DO
CASING, PSI	0	C

DEPTH	TEMP.	DEPTH
3500	365°	
4000	339°	
4500	341°	
5000	345°	
5500	343°	
6000	337°	
6500	345°	

R.O. ENGEBRETSEN

MAY 13 1980

76

UNION GEOTHERMAL DIVISION

SUBSURFACE SURVEY
Field Work Sheet

B-12 S-44 P/T

OWNER UNION GEO. OF NEW MEXICO FIELD REDONDO CANYON WELL NAME BACA #12
CASING 20" AT 447' 13 3/8" AT 1453' ELEV. 8430' DATE: 5-9-80
LINER DESCRIPTION: 9 5/8" AT 3540' ZERO POINT GL + 8'
7" AT 3345' DEPTH 8400'
TUBING DETAIL:

PURPOSE GRADIENT SURVEY
REMARKS:
ELEMENT-P 0-4700 PSI SN - 14191 CLOCK-12 HR 15-JULN
ELEMENT-T-93°-618°F SERIAL NO.-10222 CLOCK-12 HR. 15-TURN STABILIZATION PERIOD
ENGAGE STYLUS P-0850 T-0848 DISENGAGE STYLUS P-1205 T-1207
WELL HEAD 0 PSI.
PICKUP @ 3500' TIME ON BOTTOM MAX. °F 391°F AT 3500'
WELL STATUS SHUT IN
SHUT IN: 5/7/80 ON PRODUCTION:
RATE

PRESSURE						TEMPERATURE											
TIME	DEPTH	DEFL.	P-Ø	GRAD.	CORR/D	TIME	DEPTH	DEFL.	Ø-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D
0926	3500	.395	96.7		-.004	0926	3500	.963	390								
0956	3500	.395	96.7		-.004	0956	3500	.965	391								
1026	3500	.395	96.7		-.004	1026	3500	.967	391								
1041	3500	.395	96.7		-.004	1041	3500	.968	391								

R.G. ENGEBRETSEN
MAY 13 1980

COMMENTS:

2

BY:

R.O. ENGEBRETSEN

MAY 13 1980

UNION GEOTHERMAL DIVISION

11-621
B-12 injectivity

SUBSURFACE SURVEY
Field Work Sheet

B-12 S-45 P/T

OWNER UNION GEOTHERMAL CO FIELD REDONDO CANYON WELL NAME BACA #12

CASING 20" AT 247'; 13 3/8" AT 1453' ELEV. 8430' DATE: 5-12-80

LINER DESCRIPTION: 9 5/8" AT 3540' ZERO POINT GL+8'

7" AT 3345 DEPTH 8400'

TUBING DETAIL:

PURPOSE GRADIENT SURVEY

REMARKS:

ELEMENT 0-4700 PSI SN 14191 CLOCK 12 hr 15 TURN

ELEMENT 95°-618°F SERIAL NO. 10222 CLOCK 12 hr 15 TURN STABILIZATION PERIOD

ENGAGE STYLUS P. 0834 T. 0836 DISENGAGE STYLUS P. 1145 T. 1145

WELL HEAD 0 PSIG.

PICKUP @ 1050 TIME ON BOTTOM 1055-1105 MAX. °F

WELL STATUS SHUTIN

SHUT IN: 5/7/80 ON PRODUCTION:

RATE

	PRESSURE					TEMPERATURE										
TIME	DEPTH	DEFL.	P-[illegible]	GRAD.	CORR/D	TIME	DEPTH	DEFL.	[illegible]-T	GRAD.	/D	TIME	DEPTH	DEFL.	P-T	GRAD.	/D
0924	1000	.005	13	—	NC	0924	1000	.416	229								
0936	2000	.167	420	.407	NC.	0936	2000	.924	379								
0948	3000	.320	788	.368	-.003	0948	3000	1.099	427								
1000	3500	.397	971	.366	-.003	1000	3500	1.078	422								
1019	3500	.397	971	—	-.003	1019	3500	1.078	422								
1030	4000	.474	1154	.366	-.004	1032	4000	1.047	413								
1042	5000	.634	1533	.379	-.002	1042	5000	1.053	415								
1054	6000	.795	1909	.376	0	1054	6000	.967	391								
1105	6500	.878	2103	.388	+.002	1105	6500	1.064	418								

COMMENTS: NOTE: 30 MINUTE STOP AT 3500'

X

7/6

R.O. ENGEBRETSEN
MAY 13 1980

GEOTHERMAL DIVISION
SUBSURFACE TEMPERATURE SURVEY

B-12 545

OWNER UNION GEOTHERMAL CO FIELD Redondo Canyon WELL NAME B-12
CASING 20" AT 247', 13 3/8 AT 1453' ELEV. 8430' DATE: 5-12-80
LINER DESCRIPTION: 9 5/8" AT 3540' ZERO POINT GL+8
7" AT 3345' DEPTH 8480'

HOLE DESCRIPTION:

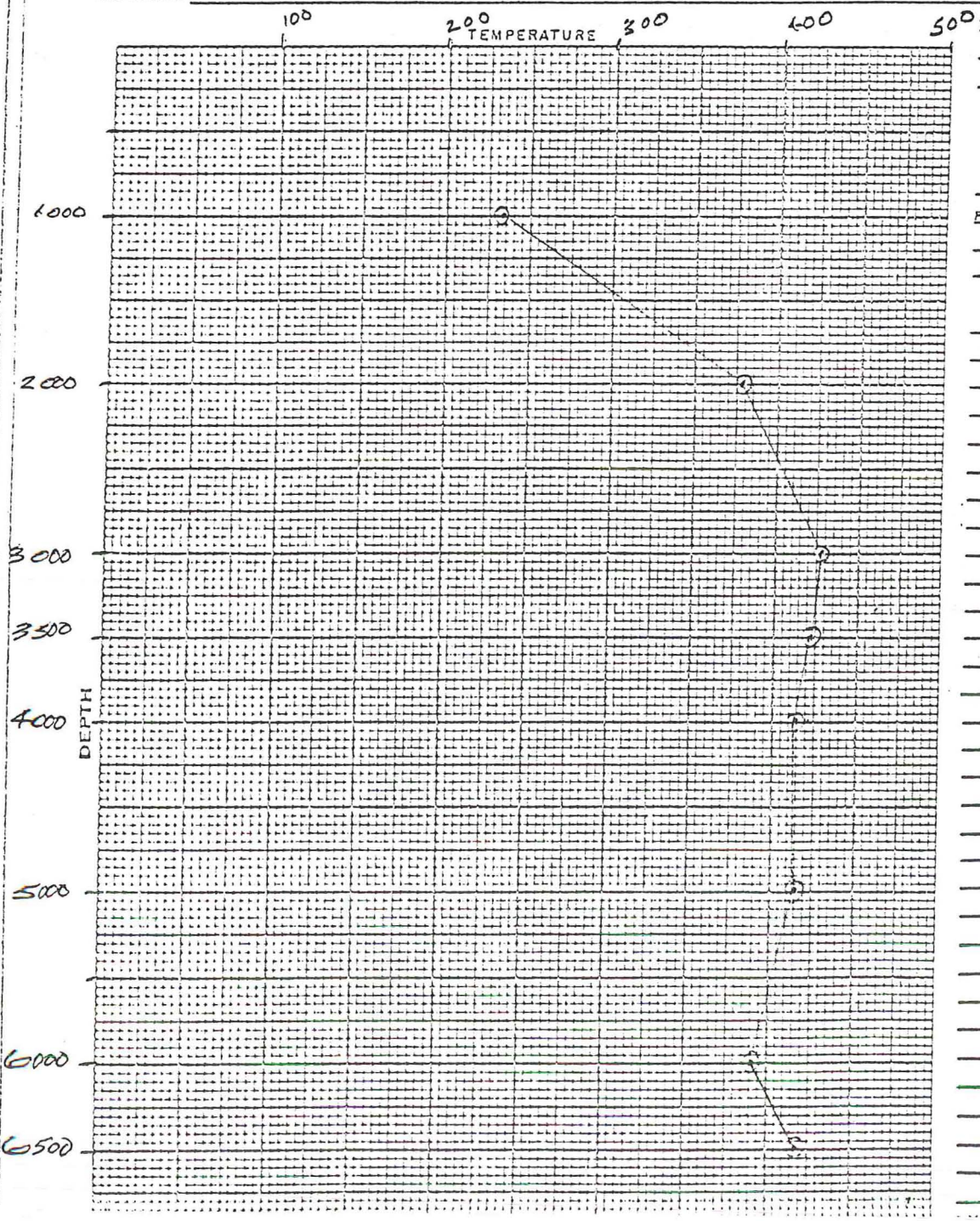
INSTRUMENT 93°-648°
SERIAL NO 10222

PURPOSE

MAX TEMP. 427 °F @ 300

REMARKS:

STABLIZATION PERIOD



PRESSURES.	GAUGE	
CASING. PSI		

DEPTH	TEMP.	DEPTH
1000	229	
2000	379	
3000	427	
3500	422	
3500	422	
4000	413	
5000	415	
6000	391	
6500	418	

76

GEOTHERMAL DIVISION

R.O. ENGEBRETSEN

MAY 13 1980

SUBSURFACE PRESSURE SURVEY

B-12 S 45

OWNER UNION GEOTHERMAL CO NM FIELD Redondo Canyon WELL NAME BACA #12

CASING 20" AT 247', 13 3/8 AT 1453', ELEV. 8430' DATE: 5-12-80

LINER DESCRIPTION: 9 5/8 AT 3540', ZERO POINT GL+8

7" AT 3345' DEPTH 8400

HOLE DESCRIPTION:

INSTRUMENT 0-4700

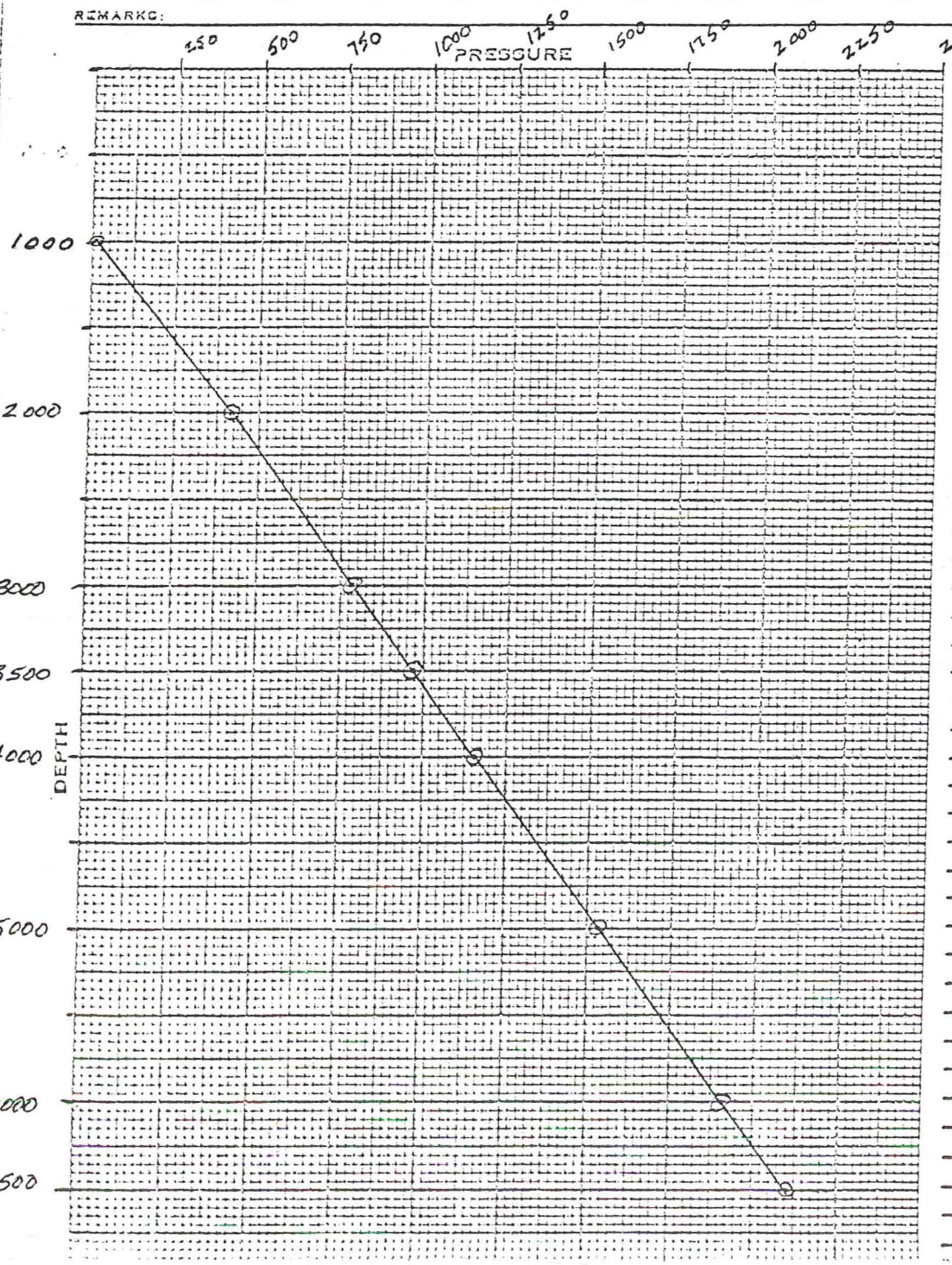
SERIAL NO 14191

PURPOSE

MAX. TEMP 427 °F @ 30

REMARKS:

STABLIZATION PERIOD



PRESSURED.	GAUGE	
CASING. PSI	—	—

DEPTH	PRESSURE	GRA
1000	13	
2000	420	.4
3000	746	.3
3500	971	.3
3500	971	
4000	1154	.3
5000	1533	.3
6000	1909	.3
6500	2103	.3

R.O. ENG - TSEN
MAY 20 1980

Union Geothermal Co. of New Mexico B-12 S-~~46~~ P/T

SURVEY DATE: MAY 19, 1980

TITLE BACA #12 S-46 P/T

TEMP. EL. S/N	: 10222	PRESS. EL. S/N	: 14191
RANGE	: 93°-618° F	RANGE	: 0-4700 P.S.I.
CALIBRATED	: 11-10-76	CALIBRATED	: 1-24-80
CLOCK: 12 HRS.	: S/N: 14089	CLOCK: 12 HRS.	: S/N: 14090

WHP AT START OF SURVEY : 0 PSIG
WHP AT END OF SURVEY : 0 PSIG
OPENED WELL TO ELEMENT : 0732 HRS.
POH : 0931 HRS.
TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY
0 MOS., 11 DAYS, 21 HRS., 32 MINS.
DATE AND TIME OF LATEST S. I. (FT. NO.) 0900 HRS. 5/07 1980

			TEMPERATURE		PRESSURE			
Station	Depth	Time at Sta.	Defl.	°F	Defl.	Corr. Defl.	PSIG	REMARKS
1	1000	0735-0750	.522	261	.013	.013	33	
2	2000	0752-0802	.980	395	.173	.173	485	
3	3000	0804-0814	1.171	447	.327	.324	798	
4	3500	0815-0830	1.143	439	.404	.401	981	
4	3500	0830-0845	1.143	439	.404	.401	981	
5	4000	0846-0856	1.150	441	.480	.477	1161	
6	5000	0858-0908	1.151	441	.634	.632	1528	
7	6000	0910-0920	1.060	417	.790	.790	1897	
8	6500	0921-0931	1.152	442	.870	.872	2089	
								J. THOMSON
								G. DIESEL

R.O. ENGEBRETSEN

MAY 20 1980

Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

B-12 S-46 P/T

OWNER Union Geothermal - N.M. FIELD Redondo Canyon WELL NAME Baca #12

CASING 20"@247'; 13⅜@1453 ELEV. 8430 DATE: 5/19/80

LINER DESCRIPTION: 9⅝"@3540' ZERO POINT G.L. + 8'

7"@3345 DEPTH 8400'

HOLE DESCRIPTION:

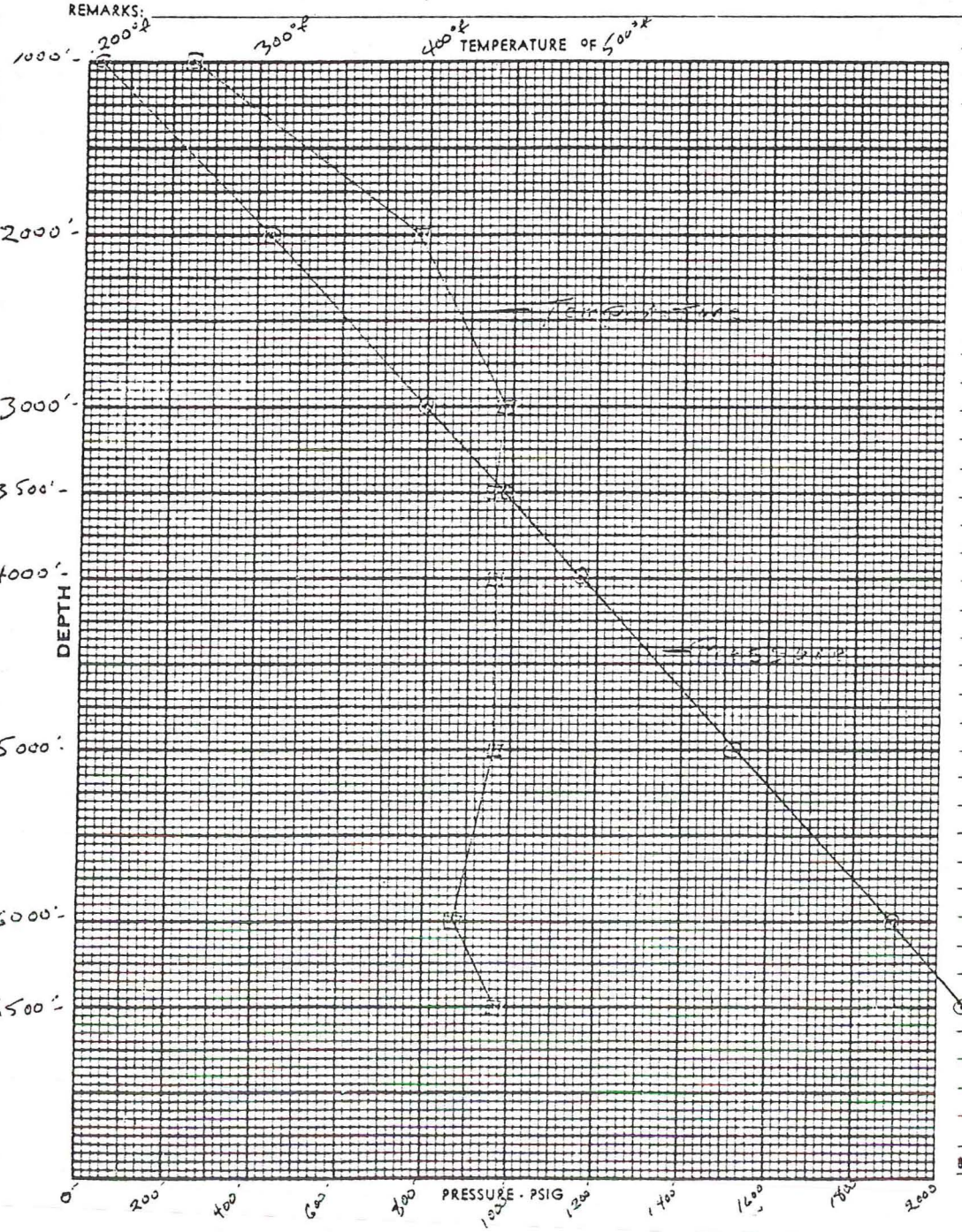
0-4700 psi INSTRUMENT 93°-618°

S/N 14191 SERIAL NO. 10222

PURPOSE Gradient Survey MAX. TEMP. 447 °F @ 3000

REMARKS:

STABLIZATION PERIOD



PRESSURES	GAUGE	BOMB
CASING, PSI	0	0

DEPTH	TEMP.	PRESS.	G
1000	261	33	-
2000	395	435	.4
3000	447	798	.3
3500	439	981	.3
4000	441	1161	.3
5000	441	1528	.3
6000	417	1897	.3
6500	442	2089	.3

□ - Temp.

○ - Press.

BY: J. Thomson T. Pierce

R.O. ENGEBRETSEN
JUN 17 1980

Union Geothermal Co. of New Mexico B-19 S-47 P/T

SURVEY DATE: 6-9-80

TITLE BACA #12 SURVEY #47 GRADIENT SURVEY

TEMP. EL. S/N	: 10222	PRESS. EL. S/N	: 14191
RANGE	: 93°-618° F.	RANGE	: 0-4700 P.S.I.
CALIBRATED	: 11-10-76	CALIBRATED	: 1-24-77
CLOCK: 12 HRS.	: S/N: 14089	CLOCK: 12 HRS.	: S/N: 14090

WHP AT START OF SURVEY : 0 PSIG
WHP AT END OF SURVEY : 0 PSIG
OPENED WELL TO ELEMENT : 1155 HRS.
POH : 1334 HRS.
TIME ELAPSED FROM LATEST S. I. TO START OF THIS SURVEY
1 MOS., 3 DAYS, ____ HRS., ____ MINS.
DATE AND TIME OF LATEST S. I. (FT. NO. NA) 0900 HRS. 5-7 1980

			TEMPERATURE		PRESSURE			
Station	Depth	Time at Sta.	Defl.	°F	Defl.	Corr. Defl.	PSIG	REMARKS
1	1000'	1159-1209	.554	271	.017	.017	43	
2	2000'	1211-1221	1.009	403	.176	.176	442	
3	3000'	1223-1233	1.211	458	.330	.327	805	
4	3500'	1234-1244	1.181	450	.405	.402	983	
5	4000'	1245-1255	1.218	460	.481	.479	1166	
6	5000'	1258-1308	1.213	458	.632	.631	1526	
7	6000'	1312-1322	1.152	442	.786	.787	1890	
8	6500'	1324-1334	1.211	458	.866	.863	2075	

X

J. THOMSON, G. OI

R.O. ENGEBRETSEN

JUN 17 1980

Union Geothermal Co. of New Mexico

B-12 5-47 P/T

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF NEW MEXICO FIELD REDONDO CANYON WELL NAME BACA #12

CASING 20" AT 247' ; 13 3/8" AT 1453' ELEV. 8430' DATE: 6-9-80

LINER DESCRIPTION: 9 5/8" AT 3540' ; TIE BACK 1270' ZERO POINT GL + 12'

7" - 3343'-9211' DEPTH 8400'

HOLE DESCRIPTION:

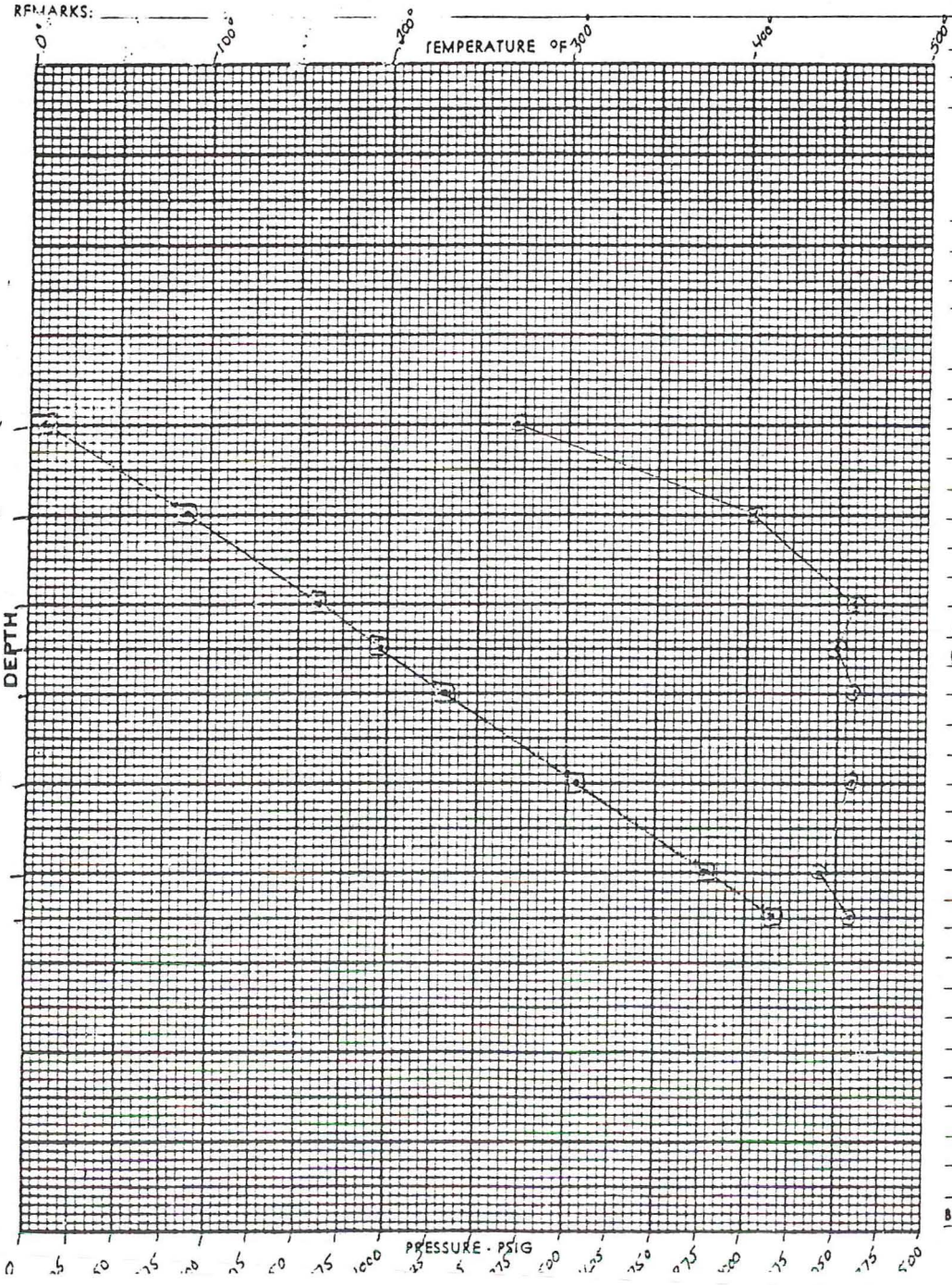
0-4700 PSI INSTRUMENT 93°-618°

14191 SERIAL NO. 10222

PURPOSE GRADIENT SURVEY MAX. TEMP. 460 °F @ 4000'

REMARKS:

STABLIZATION PERIOD



PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH	TEMP.	PRESS.	G
1000'	271	43	
2000'	403	442	.3
3000'	458	805	.3
3500'	450	983	.
4000'	460	1166	.
5000'	458	1526	.
6000'	442	1890	.
6500'	458	2075	.

⊙ - TEMP.

□ - PRESS.

BY: J. THOMSON, G. DIESEL

B12-S48

R.O. ENGEBRETSEN

JUL 10 1981

Union Geothermal Co. of New Mexico

SURVEY DATE: 7-7-81

TITLE B12 - S 48 P/T

TEMP. EL. S/N	: KTB 100098	PRESS. EL. S/N	: KPG 14191
RANGE	: 100 - 702 °F	RANGE	: 4575 PSI
CALIBRATED	: 1-7-75	CALIBRATED	: 4-17-81
CLOCK: 12 HRS.	: S/N: 23778	CLOCK: 12 HRS.	: S/N: 14080

WHP AT START OF SURVEY : 0 PSIG

WHP AT END OF SURVEY : 0 PSIG

OPENED WELL TO ELEMENT : 1353 HRS.

POH : 1533 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___

			TEMPERATURE		PRESSURE			
Station	Depth	Time at Sta.	Defl.	°F	Defl.	Corr. Defl.	PSIG	REMARKS
1	1000	1401-1411	N.R.	—	N.R.	—	—	
2	2000	1415-1425	0.371	246	0.128	—	209	
3	3000	1428-1438	0.551	311	0.300	0.305	712	
4	4000	1441-1451	0.529	304	0.470	0.477	1113	
5	5000	1454-1504	0.583	324	0.637	0.650	1511	
6	6000	1507-1517	0.593	327	0.806	0.824	1910	
7	6960	1520-1533	0.660	351	0.982	1.004	2323	
	NOTE:	REQUEST BY THE RIG						

CSTDOE

B 12 - 48 P/

R.O. ENGEBRETSEN

JUL 10 1981

Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CANYON WELL NAME BACA 12

CASING 20" @ 247' ; 13⅜" @ 1453' ELEV. 8430' DATE: 7-7-81

LINER DESCRIPTION: 9⅝" @ 3540' ; TIE BACK @ 1270' ZERO POINT KB

7" @ 3343' – 9211' DEPTH 8400'

HOLE DESCRIPTION:

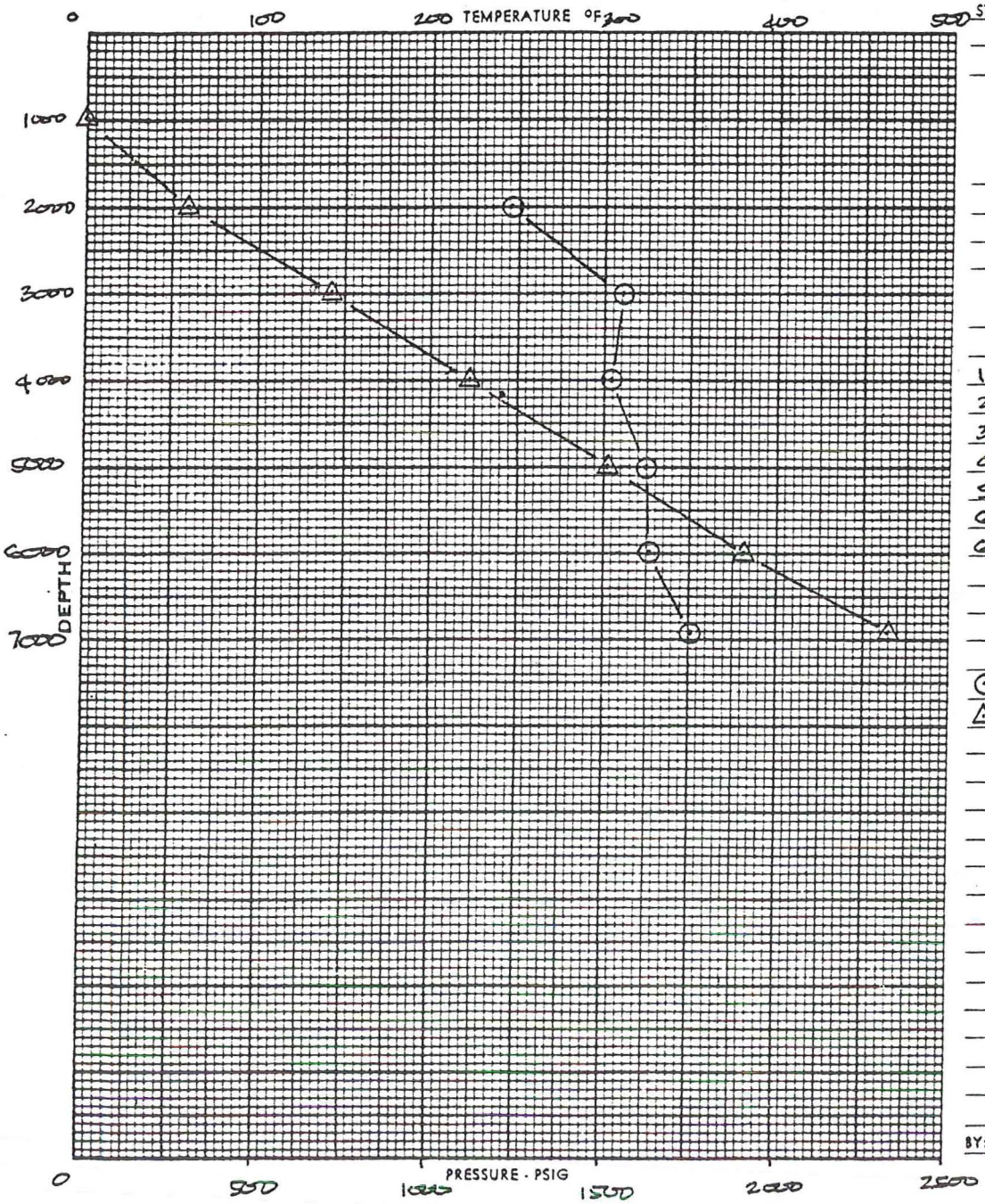
4575 PSI INSTRUMENT 100 - 792

KPG 14191 SERIAL NO. KTB 10092

PURPOSE TEMP/PRESS GRADIENT SURVEYS TO 6060' MAX. TEMP. 351 °F @ 606

REMARKS:

STABLIZATION PERIOD



PRESSURES	GAUGE	BOM
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG
1000	—	0
2000	246	209
3000	311	712
4000	304	1113
5000	324	1511
6000	327	1910
6060	351	2323

⊙ TEMPERATURE

△ PRESSURE

BY:

B12-S49 P/T

6

Union Geothermal Co. of New Mexico

SURVEY DATE: 8-03-81

TITLE B12-S49 P/T (OPEN HOLE)

TEMP. EL. S/N	: KTB 10222	PRESS. EL. S/N	: KPC 14101
RANGE	: 93 - 618 °F	RANGE	: 4575 PSI
CALIBRATED	: 11 - 10 - 76	CALIBRATED	: 4 - 17 - 81
CLOCK: 12 HRS.	: S/N: 23778	CLOCK: 12 HRS.	: S/N: 14087

WHP AT START OF SURVEY : 0 PSIG

WHP AT END OF SURVEY : 0 PSIG

OPENED WELL TO ELEMENT : 0100 HRS.

POH : 0216 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___

			TEMPERATURE		PRESSURE			
Station	Depth	Time at Sta.	Defl.	°F	Defl.	Corr. Defl.	PSIG	REMARKS
1	5000'	0119-0120	0.462	243	0.645	0.661	1537	
2	6000	0131-0141	0.520	261	0.822	0.841	1950	
3	7000	0143-0153	0.780	338	0.990	1.014	2346	
4	8000	0155-0205	1.205	456	1.161	1.183	2732	
5	8500	0206-0216	1.358	496	1.248	1.265	2918	
CSTDOE								

R.O. ENGEBRETSEN

AUG 0 6 1981

B 12 - 3 40 P/T

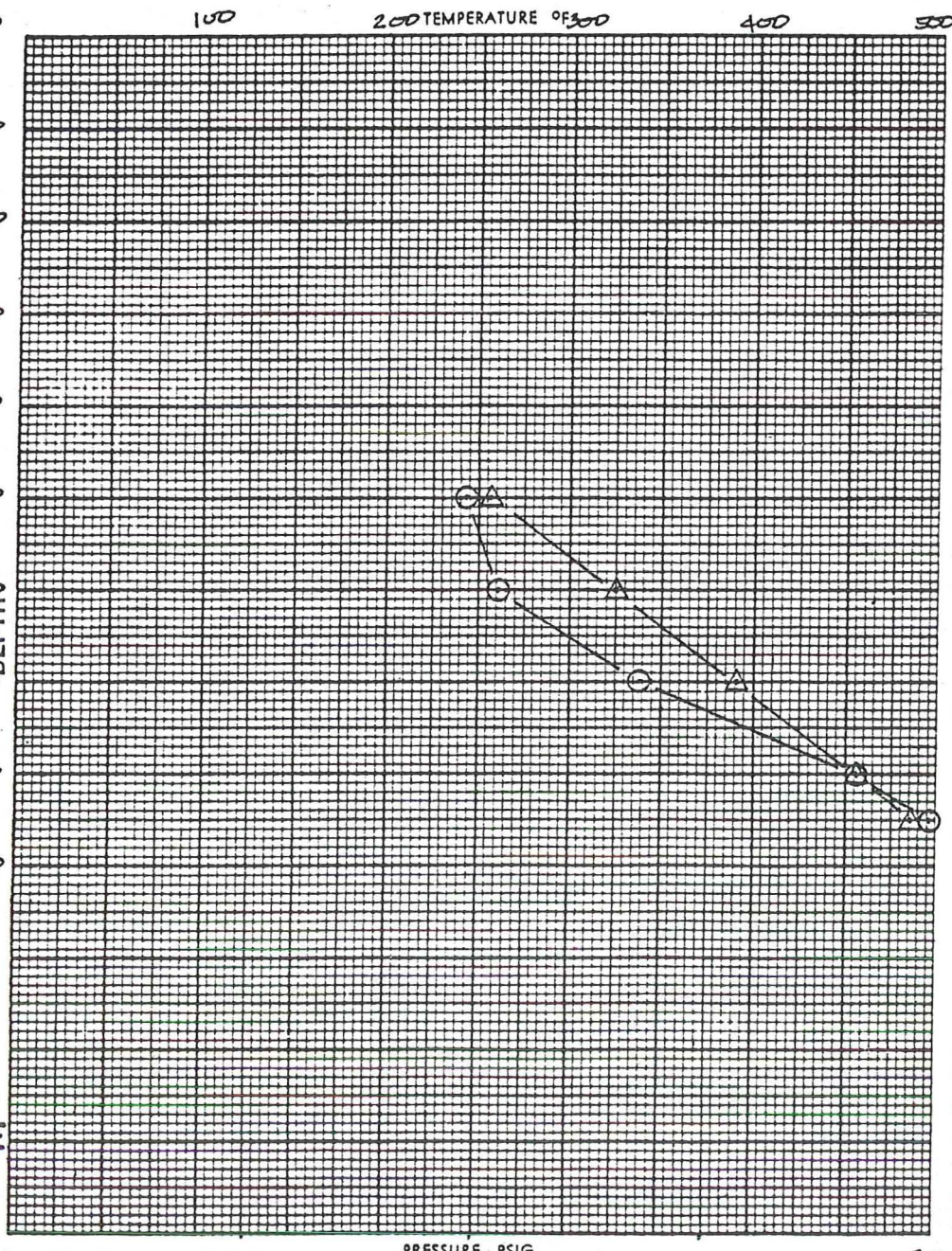
Union Geothermal Co. of New Mexico

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CANYON WELL NAME BACA No 12
CASING ELEV. 8430' DATE: 8-03-81
LINER DESCRIPTION: ZERO POINT KB
DEPTH 8400'

HOLE DESCRIPTION:
4575 PSI INSTRUMENT 93-618 FA
KPG 14191 SERIAL NO. KTD 10222

PURPOSE TEMP/PRESS GRADIENT SURVEY TO 8500' MAX. TEMP. 496 °F @ 8500
REMARKS:



STABLIZATION PERIOD

PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS. PSIG	GRA
5000	243	1537	-
6000	261	1950	0.4
7000	338	2346	0.3
8000	456	2732	0.3
8500	496	2918	0.3

⊙ TEMPERATURE
△ PRESSURE

R.O. ENGEBRETSEN
AUG 0 6 1981

BY:

STDOE

B12-S50T

R.O. ENGEBRETSE

SEP 0 1 1981

Union Geothermal Co. of New Mexico

SURVEY DATE: 9-1-81

TITLE B12-S50 TEMPERATURE (RIG ON)

TEMP. EL. S/N	: KTB 10222	PRESS. EL. S/N	:
RANGE	: 93-618°F	RANGE	:
CALIBRATED	: 11-10-76	CALIBRATED	:
CLOCK: 12 HRS.	: S/N: 23781	CLOCK: HRS.	: S/N:

WHP AT START OF SURVEY : 0 PSIG

WHP AT END OF SURVEY : VAC. PSIG

OPENED WELL TO ELEMENT : — HRS.

POH : 1431 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__

			TEMPERATURE		PRESSURE			
Station	Depth	Time at Sta.	Defl.	°F	Defl.	Corr. Defl.	PSIG	REMARKS
1	8000'	1316-1331	0.683	310				
2	8500	1332-1343	0.766	334				
3	9000	1344-1355	0.842	355				
4	9500	1356-1407	0.930	381				
5	10000	1408-1410	1.001	401				
6	10300	1420-1431	1.054	415				
	NOTE:	WHEN RUNNING IN HOLE RIG STILL						
		CIRCULATING WITH WATER. STOP PUMPING						
		WATER IN HOLE WHEN TOOL REACHED						
		8000' @ 1316 HRS.						

Wireline te... survey run to check BH... prior to run... Backoff tools whi... fishing stuck pipe during deepening o...

CSTDOE

B12 - S 50 T

Union Geothermal Co. of New Mexico

R. O. ENGEBRETSEN

SEP 01 1981

SUBSURFACE TEMPERATURE AND PRESSURE SURVEY

OWNER UNION GEOTHERMAL CO. OF N.M. FIELD REDONDO CANYON WELL NAME BACA No. 12

CASING ELEV. 5430' DATE: 9-1-81

LINER DESCRIPTION: ZERO POINT KB

DEPTH

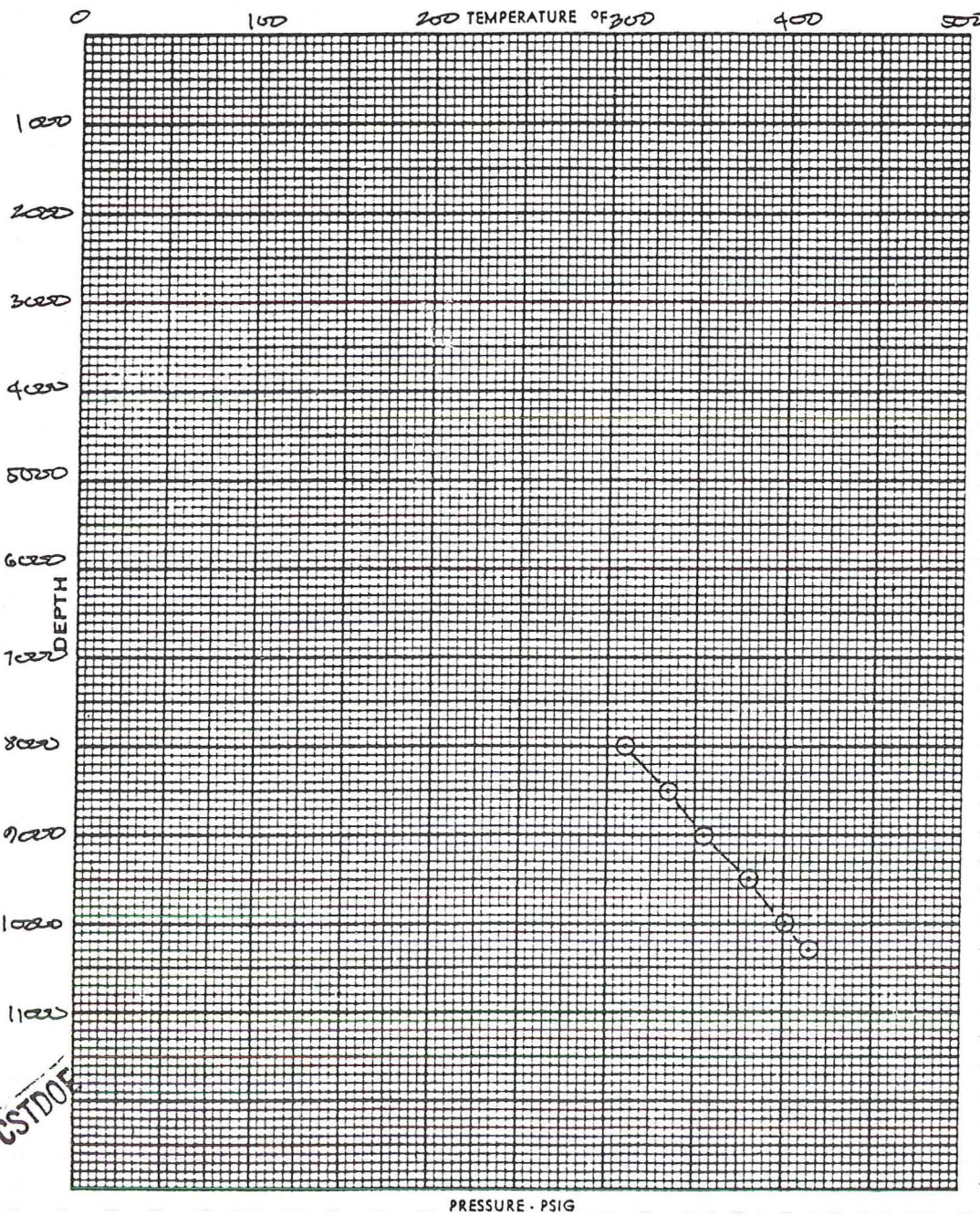
HOLE DESCRIPTION: (OPEN HOLE) INSTRUMENT 93-618

SERIAL NO. KTB 10222

PURPOSE TEMPERATURE GRADIENT SURVEY FROM MAX. TEMP. 415 °F @ 1030

REMARKS: 8000' - 10300'

STABLIZATION PERIOD



PRESSURES	GAUGE	BOMB
CASING, PSI		

DEPTH FT.	TEMP. °F	PRESS.	GR
8000	310		
8500	334		
9000	355		
9500	381		
10000	401		
10300	415		

BY:

CSTDOE