

6101645



COMPLETION REPORT

WELL 66-28

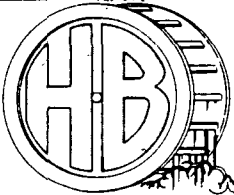
LEASEHOLDER

MOTHER EARTH INDUSTRIES

CAREFREE, ARIZONA

PREPARED BY

HIGGINSON-BARNETT, CONSULTANTS



AUGUST, 1985

WELL COMPLETION REPORT

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TABLE OF CONTENTS

	<u>PAGE</u>
I. ABSTRACT.....	1
II. LOCATION.....	3
III. WELL DRILLING AND CONSTRUCTION HISTORY.....	5
IV. WELL TESTS.....	16
V. GEOLOGY.....	21

TABLE OF FIGURES

<u>FIGURE NUMBER</u>	<u>PAGE</u>
1 LOCATION MAP.....	4
2 DAILY DRILLING ACTIVITIES.....	6-8
3 CHART OF DAYS SPENT ON WELL.....	9
4 WELL PROFILE.....	10
5 MUD DATA.....	11
6 AIR CIRCULATING DATA.....	12
7 DRILLING BIT RECORD.....	13
8 DIRECTIONAL SURVEY DATA.....	14
9 SPECIFICATIONS OF DRILLING RIG.....	15
10 TEMPERATURE SURVEY DATA.....	17-18
11 PRESSURE SURVEY DATA.....	19-20
12 LITHOLOGIC LOG OF WELL #66-28.....	23-24

I. ABSTRACT

I. ABSTRACT

Mother Earth Industries of Carefree, Arizona acquired the majority of the federal leases in the Cove Fort-Sulphurdale Known Geothermal Resource Area (KGRA), from Union Oil Company. Union Oil Company had drilled four wells and concluded that they were no longer interested in proceeding with development of the property. Mother Earth Industries, succeeding Union Oil, determined they would proceed to explore for geothermal resources beyond the exploration that had been accomplished by Union Oil.

In the fall of 1983, an MEI affiliate, Cove Creek Geothermal, drilled Well #34-7. At a depth of about 1,100 feet the well bore encountered dry steam, which was not anticipated, and Well #34-7 became an uncontrolled blow-out well. After considerable effort Cove Creek Geothermal successfully closed the discovery well and proceeded to move a few 100 feet to the northeast and drill Well #34-7B. #34-7B was successfully completed and it verified the existence of quality steam on the property. With that verification MEI moved back to the well pad constructed for the drilling of Well #34-7 and at a location slightly to the south of the initial location, drilled Well #34-7A.

In May of 1985 Mother Earth Industries moved away from the discovery wells and drilled exploratory Wells #34-30, #66-28, #47-6. Each of these wells was drilled to test a bona fide geothermal objective and to preserve the federal leases on which they were situated as provided in Bureau of Land Management Instruction Memorandum 85-63, October 23, 1984. Drilling, in each instance, was commenced before the termination of the primary term of the affected lease and continued over the end of the primary term. These wells were completed in June and July of 1985. This report is specific to the drilling of Well #66-28 which was commenced on May 22, 1985 and completed to a total depth of 1864' on June 30, 1985.

This report is prepared as required by federal regulations as a well completion report and is submitted to the Bureau of Land Management. The material in the report was obtained from a number of sources and was correlated and summarized by Higginson-Barnett, Consultants, a consulting firm in Bountiful, Utah. Higginson-Barnett participated in the activities associated with the drilling of the well, particularly as they related to geology and permitting. ThermaSource Inc. of Santa Rosa, California, particularly Mr. Louis Capuano, designed the well and supervised its construction. The well location was determined by Forsgren-Perkins, a consulting engineering firm in Salt Lake City, Utah. The information provided herein, is by the approval of Wayne A. Portanova, President of Mother Earth Industries.

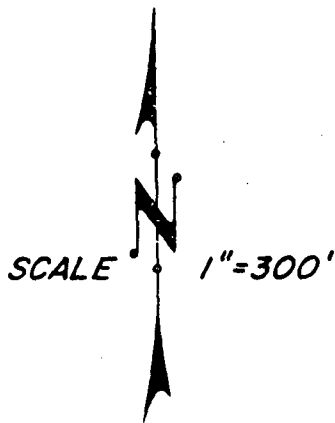
7

II. LOCATION

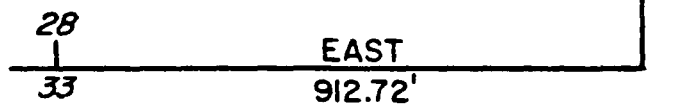
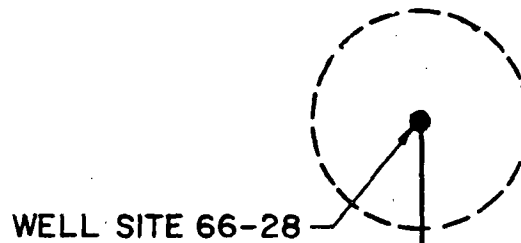
II. LOCATION

This report covers the completion of Mother Earth Industries' Well #66-28. The well is located in Millard County, Utah just east of Cove Fort along I-70 in the Cove Fort-Sulphurdale KGRA. More specifically the well is described as: Beginning from the South Quarter corner of Section 28, T25S, R6W, SLB&M, E. 912.72' and N. 1405.61' to Well #66-28.

Figure #1 shows the location of Well #66-28.



SECTION 28
T 25 S, R 6 W
SALT LAKE BASE
& MERIDIAN



REVISED	DATE


FORSGREN-PERKINS ENGINEERING, p.a.

MOTHER EARTH INDUSTRIES
WELL SITE 66-28

DRAWN
FOR:
BY: <i>FP</i>
DATE: <i>MAY, 1985</i>
SCALE: <i>AS NOTED</i>
DRAWING NO.

III. WELL DRILLING AND CONSTRUCTION HISTORY

III. WELL DRILLING AND CONSTRUCTION HISTORY

Drilling of Mother Earth Industries' Well #66-28 began on May 22, 1985 with the drilling of a 26" hole to 20' and the setting of 20" casing and cementing it in to that depth. This drilling was done with an Earth Drill Model #52. With the conductor in place the Earth Drill was then changed out and replaced with a Wilson Truck Mounted Rotary Rig which spudded in on June 19, 1985. The well was then drilled with mud to 125' where 13-3/8" casing was set in a 17-1/2" hole. Here blow-out prevention equipment was installed and tested.

Drilling then continued with mud and a 12-1/4" bit to a depth of 610' where 9-5/8" casing was cemented in. During the interval from 277' to 303' about 31 barrels of drilling mud was lost. Wood chips were therefore added and about 15 barrels an hour were lost for two hours before the hole healed itself. Again blow-out prevention equipment was installed and tested.

The 8-3/4" hole was then drilled with air to a total depth of 1864'. The hole was making water in the last 200'. Sump stability problems forced the cessation of drilling on June 30, 1985.

Figure #2 is a daily journal of drilling activities. Figure #3 is a profile of the well after completion. Figure #4 shows a graph of time spent in drilling the well. Figures #5, #6, and #7 show a history of mud, air, and bits used while drilling. While drilling the well the driller occasionally took a directional survey. The results of these are shown in Figure #8. Figure #9 gives the specifications of the Wilson Rotary Rig which was used during the majority of the drilling.

*Each Day from 7:00 AM to 7:00 AM

FIGURE #2

WELL NAME: Cove Fort #66-28

LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries

PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
6/20/85	40'	Rig on day rate at 12:00 Noon, 6/19/85. Pick up dyna drill and 12-1/4" bit. Drill from 30' to 40'. Pull out of hole and drill rathole with dyna drill.
6/21/85	125'	Dyna drill 12-1/4" hole to 125'. Circulate and pull out of hole. Lay down dyna drill. Pick up 17-1/2" bottom hole assembly. Run in hole and open hole to 17-1/2" from 30' to 75'. Pull out of hole. Change bits.
6/22/85	125'	Open hole to 125'. Circulate. Wipe hole. Pull out of hole. Lay down 17-1/2" tools. Rig up power tongs. Ran 3 joints (120') of 13-3/8", 54.5#, K-55, S.T.&C. casing with stab-in float shoe and centralizer on each joint. Run in hole with 4-1/2" drill pipe and stab into shoe. Pump 30 barrels water followed by 166 cu.ft. (102 sacks) Class "G" cement blended with 40% silica flour and 3% CaCl ₂ , displaced with 1.5 barrels water. Good returns to surface. Cement in place at 8:30 PM, 6/21/85. Pull out of hole with stab-in tool. Wait on cement eight hours. Land casing and weld on 13-3/8" wellhead.
6/23/85	183'	Install and nipple up 12" 900 blow out preventer equipment. Test complete shut off at 250 psi for 15 minutes. Okay. Pick up 12-1/4" bit and run in hole to top of cement at 108'. Test pipe rams to 200 psi for 15 minutes. Okay. Drill out cement from 108'-120'. Drilled shoe at 120' and cement to 125'. Drill 12-1/4" hole to 141'. Pull out of hole. Lay down 2- 8" drill collars. Change bits. Pick up rear bit stabilizer, 2-drill collars, 12-1/4" stab. Run in hole. Drill to 145'. Survey at 125'. Drill to 183'.
6/24/85	575'	Drill 12-1/4" hole from 183' to 406'. Survey at 369'. Drill to 575'. Hole lost 31 barrels mud at 277'. 15 barrels per hour from 277'-307'. Cured with sawdust.
6/25/85	610'	Drill to 590'. Measure out of hole. Change bits and run in hole. Drill to 610'. Circulate and pull out of hole. Break 12-1/4" tools. Rig up power tongs for 9-5/8"

WELL NAME: Cove Fort #66-28

LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries

PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
		<p>casing. Change rams from 4-1/2" to 9-5/8". Ran 15 joints (604') of 9-5/8", 40#, K-55, Buttress casing with guide shoe at 604'. Stab-in float at 561'. Ran centralizers in middle of bottom joint then one every other collar to surface (total of 8). Rig down power tongs. Make up stab in tool and run in hole with drill pipe. Stab in and pump 20 barrels water followed by 200 ft³ (94 sacks) Class "H" cement blended with 1:1 perlite and 40% silica flour and 3% gel and 0.5% CFR-2, tailed with 176 cu.ft. (109 sacks) Class "H" cement blended with 40% silica flour and 0.5% CFR-2 and 2% CaCl₂. Displaced with 8.2 barrels water. Good returns to surface. Cement in place at 8:55 AM. Pull out of hole with stab in tools. No top job required after 1 hour. Wait on cement 8 hours. Top of cement dropped 15'. Mix fresh cement and fill to surface.</p>
6/26/85	734'	<p>Weld on 9-5/8" casinghead. Install 10" 600 valve and 12" 900 blow out preventer and rotating head. Lay down 4- 8" drill collars and 12" tools. Rig up blooie line and blow out preventers. Change pipe rams. Test complete shut off for 15 minutes at 900 psi with State/BLM representative witnesses. Pick up 8-3/4" bottom hole assembly and run in hole. Close pipe rams and test to 900 psi for 15 minutes with State & BLM witnesses. Run in hole to cement at 555' and drill out to float collar at 561'. Then to shoe at 604'. Change over to air blowing hole dry. Drill 8-3/4" hole with air to 642'. Survey at 642'. Drill to 734'.</p>
6/27/85	1004'	<p>Drill to 765'. Air pressure increase from 245# to 700#. Broke air line and stuck pipe at 725'. Fix line. Slug hole and free pipe. Pull out of hole. Lay down stabs. Run in hole with new bit and ream from 734' to 765'. Blow hole to dry out but hole continues to make minor water at 1-2 barrels per hour. Begin mist with air. Drill 8-3/4" hole to 911'. Survey and drill to 1004'.</p>
6/28/85	1314'	<p>Blow hole clean. Pull out of hole. Change</p>

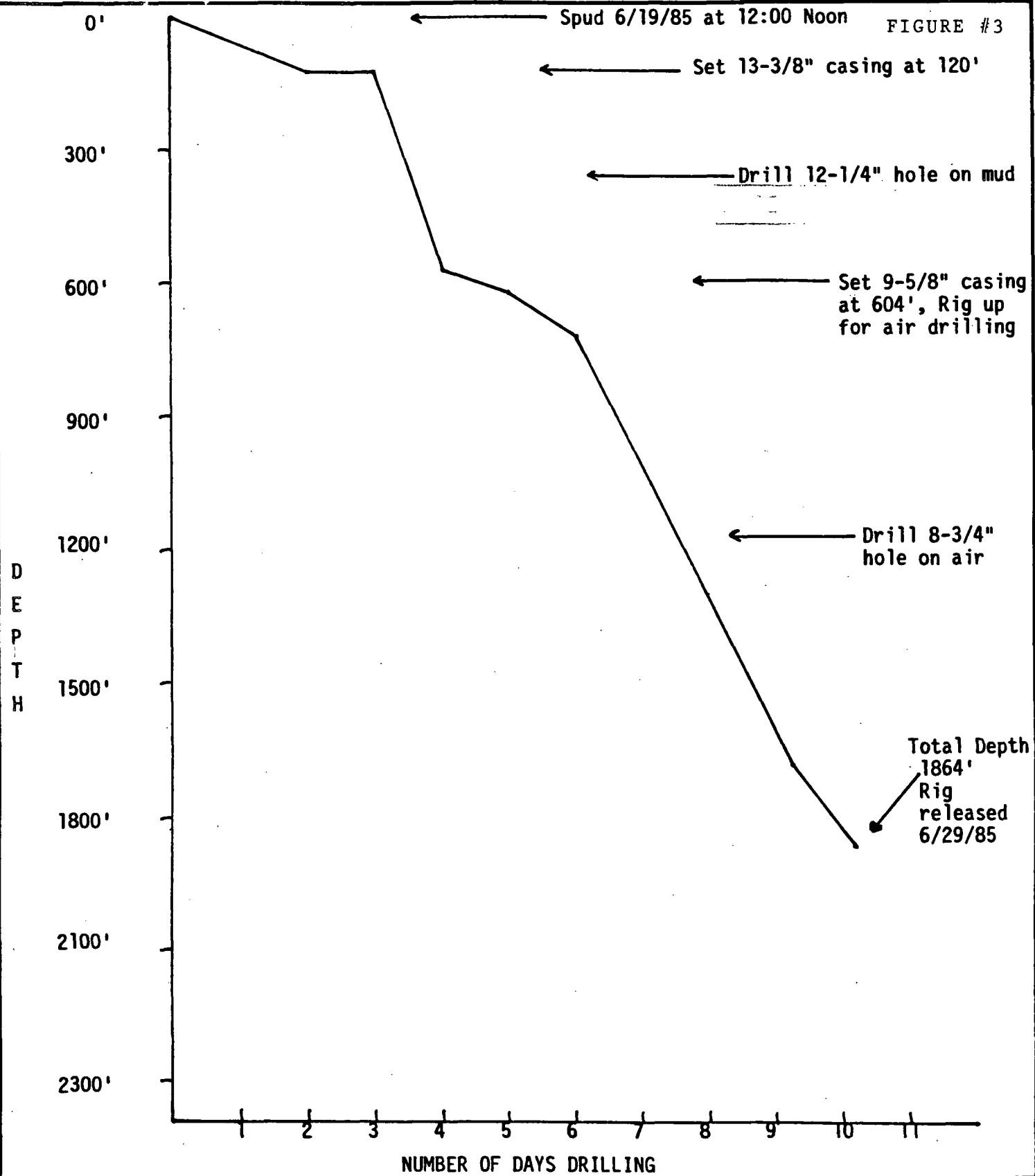
WELL NAME: Cove Fort #66-28

LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries

PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
		bits. Run in hole and ream from 974'-1004'. Drill to 1065'. Slug hole with rig people with 25 barrels water. Air pressure dropped from 320 psi to 240 psi. Drill to 1314' and survey. At 1065' air pressure went up to 320 psi. At 1283' pressure rose from 280 to 340 psi then dropped to 280 psi.
6/29/85	1683'	Pull out of hole. Change bits. Run in hole and blow hole clean. Drill to 1683'. Survey at 1652'. Pull out of hole. Change bits. Run in hole, blow hole and ream from 1653'-1683'.
6/30/85	1864'	Drill to 1864'. Pull out of hole. Run in hole with dirll collar and drill pipe to shoe. Pull out of hole laying down same. Release rig at 3:30 AM, 6/30/85 for move to next site.




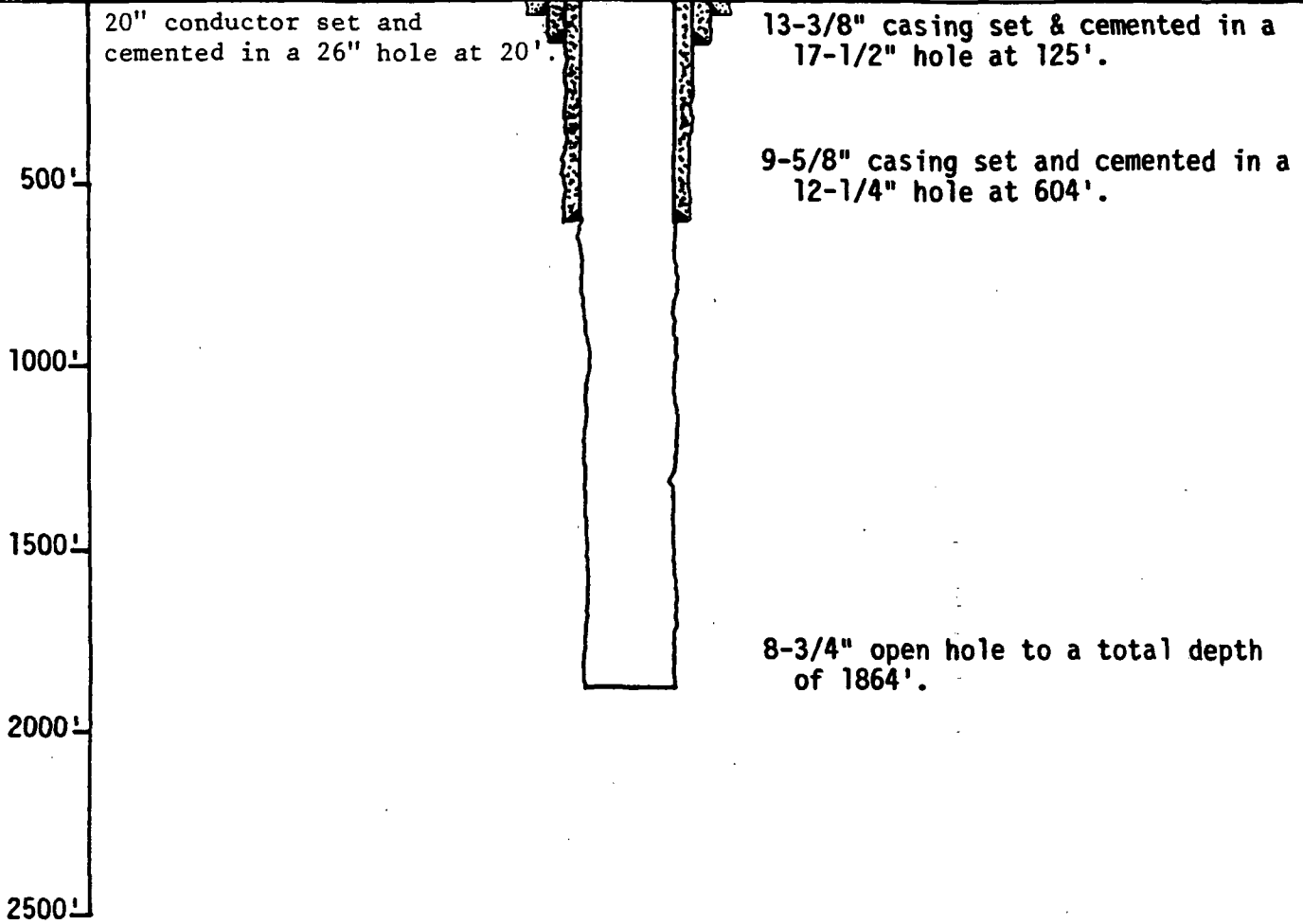

REVISED	DATE	 • P.O. Box 1236 • Santa Rosa, California 95402 (707) 523-2960 • Telex 171743 • TWX 510 7446439 ThermaSource Inc.	DRAWN
			FOR: MEI
			BY: LEC
			DATE: 8-1-85
			SCALE:
			DRAWING No.
		DRILLING CURVE COVE FORT #66-28 MOTHER EARTH INDUSTRIES	

FIGURE #4

GROUND LEVEL



REVISED	DATE	 • P.O. Box 1236 • Santa Rosa, California 95402 (707) 523-2960 • Telex 171743 • TWX 510 7446439 ThermaSource Inc.	DRAWN
			FOR: MEI
			BY: LEC
			DATE:
			SCALE:
			DRAWING No.
		WELL SCHEMATIC COVE FORT #66-28 MOTHER EARTH INDUSTRIES	

MUD DATA

WELL NAME: Cove Fort 66-28

DATE	DEPTH (meters) Ft	MUD WEIGHT (lbs/ft ³)	MUD VISCOSITY (sec)	STAND PIPE PRESSURE (psig)	TEMPERATURE OUT (°F)	REMARKS
6/20/85	40'	Spud Mud				
6/21/85	125'	Spud Mud				
6/22/85	125'	72	60	600	86°	Run 13-3/8" casing at 125'.
6/23/85	183'	69	43	500	92°	
6/24/85	575'	71	61	500	115°	
6/25/85	610'	70	59	500	150°	Ran 9-5/8" casing at 604'.
6/26/85	DRILL TO 642' ON MUD - SWITCH TO AIR WITH 8-3/4" HOLE.					

AIR CIRCULATING DATA

FIGURE #6

DATE	DEPTH (FEET)	CIRCULATING MEDIA	COMP. PRESSURE (PSIG)	INPUT VOLUME OR (CFPH)	NO. OF COMP. OR RUNNING	TEMP OUT °F	EXIT PRESSURE (PSIG)	REMARKS
6-26	734	"	120	1140	1	116	----	Drill 8-3/4" hole w/air
6-27	1004	"	245	1140	1	65		
6-28	1314	"	260	1159	1	74		
6-29	1683	"	265	1140	1	107		
6-30	1864	"	285	1140	1	186		

LEASE AND WELL NUMBER **MEI Cove Fort Well #66-28** DATE SPUDDED **6-20-85**

DIVISION **Geothermal** COMPANY DRILLING FOREMEN DRILLING CONTRACTOR AND RIG NO. **H & W Rig #7**

BIT NO.	SIZE	MAKE	TYPE	NOZZLES 32 NOS		DEPTH OUT	FEET	HOURS	FEET PER HOUR	BIT WT. MLB.	ROT. RPM.	DULL COND. 8TH			STAND PIPE PRESS.	DEPTH IN	CIRC. MEDIA	DATE IN	DATE OUT	SERIAL No.	
												T	B	G & REM							
RR 1	12 1/4	Smith	J4	-	-	40	10	1	10	5	D.D.	4	4	I	600	30	Mud	6-20	6-20	CBS 1420	
2	12 1/4	Smith	4JS	-	-	125	85	4	21.2	6	D.D.	3	4	I	600	40	Mud	6-21	6-21	CF-985	
3	17 1/2	Smith	3JS	-	-	75	45	16	2.8	6	80	2	6	I	600	30	Mud	6-21	6-21	BH-8033	
RR 4	17 1/2	Smith	DS	-	-	125	50	8	6.25	10	80	4	4	I	600	75	Mud	6-22	6-22	BF-7490	
RR 5	12 1/4	Sec	S-88	-	-	141	16	3	5.3	10 1/15	65	3	6	1/8	Ø	125	Mud	6-23	6-23	CBS-1420	
RR 6	12 1/4	HTC	X-44	10	16	16	590	449	30 1/4	14.9	10 1/15	80	4	6	1/8	500	141	Mud	6-24	6-25	TF-209
RR 7	12 1/4	Smith	F-3	-	-	610	20	1	20	16	75	1	1	I	500	590	Mud	6-25	6-25	CBS-1400	
8	8 3/4	Sec	M4NJ	-	-	765	155	6.75	23	18/20	60	3	3	I	320	610	Air	6-27	6-27	766125	
9	8 3/4	HTC	HH44	-	-	1004	239	16.25	14.7	18/20	60	4	5	1/16	245	765	Air	6-27	6-27	CBS-8260	
10	8 3/4	HTC	HH44	-	-	1314	310	19 1/2	15.9	18/22	55	4	6	1/16	135/320	1004	Air	6-28	6-28	CK-130	
11	8 3/4	STC	4GA	-	-	1683	369	16 3/4	22	18/22	55	3	5	I	265	1314	Air	6-29	6-29	CBS-1480	
12	8 3/4	STC	4GA	-	-	1864	181	9.5	19	20	70	4	6	1/16	285	1683	Air	6-30	6-30	CBS-1475	

-13-

FIGURE #7

DIRECTIONAL INFORMATION

MOTHER EARTH INDUSTRIES

MEI #66-28

<u>DEPTH</u>	<u>DEVIATION</u>
125'	1°
369'	1°30'
642'	2°
911'	1°45'
1284'	1°
1652'	0°15'



HAW Drilling Inc. P.O. Box 1851, El Centro, California 92244 (619) 353-5440

RIG 7DESCRIPTION

WILSON Mogul 42 Double Drum Drawworks, S/N 10034, 450 HP, LEBUS Grooved for 1" Line, 9/16" Sand Line Drum, Water Circulating Brake, Texas Western 56S Makeup S/N 112 and Spinning Catheads, Hydraulic Breakout Cylinder, Air Drillers Control, Mounting Bracket for Halliburton Measuring Device

WILSON Single Engine Compound

CATERPILLAR 3412 600 HP Diesel Engine, S/N 38S1658 w/Air Starter, Radiator, Gauges, Allison TC955 Torque Converter S/N 63016

QUINCY 325-15 Air Compressor S/N 183914S, Compound Driven

WILSON 102-250 102' Hydraulically Raised and Scoped Mast, 250,000 lb. Static Hook Load, Crown Block w/5 Sheaves, 1" Line, 3 1/2" Standpipe, Crown Safety Platform, Racking Board, Tong Counterweights, Catline Sheave, Ladder, Derrick Climber, Mast Stand (Mounted on Carrier), Fluorescent Lights, 5/8" and 3/4" Guy Lines

SUBSTRUCTURE 10'H x 13'W x 21'6"L w/Rotary Beams, 4' Folding Side Mounted Wings, V-Door Ramp, (1) 14' Stair Floor to Ground Parallel w/Ramp on Off Drillers Side, (2) 8'6" Stairs Floor to Unit each side, Safety Rails, Boxes Plated Top and Bottom, Sub Carrier in Base, (Rotary Table Mount Flush w/Floor), Opening for Rat Hole and Mouse Hole

MUD TANK - 3'H x 6'W x 28'L 100 Bble w/2-3' x 4' Single Shale Shakers
3 Cone Desilter

PUMP - Emsco D-500 7 1/2" x 16" Driven by Caterpillar 3412 Engine

WATER TANK - 1500 Gal

GENERATOR - 25 KW Powered by Detroit 371 Diesel Engine

BLOCKS & HOOK - Combination 150 Ton Sowa

SWIVEL - Gray 150 Ton

KELLY - 4 1/2 Square

ROTARY TABLE - Hacker 17 1/2" Opening

TONGS - Woolley Type C

WATER TRUCK - 1977 Chevy 2000 Gal Tank

IV. WELL TEST

IV. WELL TEST

At this time no flow testing of Well #66-28 has been performed. However, if in the future such tests as are anticipated are made, the results will be submitted. However, temperature and pressure surveys were taken of the well. Such surveys indicate that the well reaches its highest temperature of 314° F at the bottom of the hole. Pressure increases at a fairly consistent rate after it reaches the water table at around 1640'. The data for these two surveys are shown in Figures #10 and #11.

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

FIGURE #11

SUB-SURFACE TEMPERATURE SURVEY

CO. MOTHER EARTH IND.	RUN 01 FIELD COVE FORT	WELL 66-28
EFF DEPTH 1864'	WELL STAT STATIC	TOOL HUNG
CASING 95/8" @ -604'	CASING PRESS	ON BOTTOM 10:16
LINER -	TUBING PRESS	OFF BOTTOM 10:19
DATE 071785	ELEMENT RANGE 57 - 490	ZERO POINT 12'
ELEVATION	ZONE	SHUT-IN
MAX TEMP	PICK-UP 1857'	ON-PROD
PERF -	CAL SER NO. 31	MPP
TUBING -		
UNITS ENGLISH	PURPOSE	TEMPERATURE GRADIENT 7/17/85

SURVEY DATA

CO. MOTHER EARTH IND.				RUN 01 FIELD COVE FORT				WELL 66-28			
TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	0	71.4	0.000	1:00	1050	196.4	.124				
1:00	100	71.6	.002	1:00	1100	202.8	.128				
1:00	200	74.7	.031	1:00	1150	211.3	.171				
1:00	250	79.0	.086	1:00	1200	218.0	.133				
1:00	300	83.8	.096	1:00	1250	223.8	.116				
1:00	350	88.7	.098	1:00	1300	230.2	.128				
1:00	400	95.4	.135	1:00	1350	238.9	.175				
1:00	450	101.4	.121	1:00	1400	245.5	.131				
1:00	500	108.4	.138	1:00	1450	252.8	.147				
1:00	550	117.0	.172	1:00	1500	261.6	.175				
1:00	600	126.8	.196	1:00	1550	269.2	.152				
1:00	650	134.1	.147	1:00	1600	275.3	.122				
1:00	700	142.6	.169	1:00	1650	284.6	.186				
1:00	750	149.6	.139	1:00	1700	291.0	.128				
1:00	800	161.3	.235	1:00	1750	298.2	.143				
1:00	850	167.3	.119	1:00	1800	303.7	.110				
1:00	900	174.1	.137	1:00	1850	312.9	.184				
1:00	950	182.1	.160	1:00	1857	314.4	.223				
1:00	1000	190.2	.161	0:00	0	0.0	0.000				

BY S. WILSON/B. DAILY.

dt/dz
 1600-1857 F 0.1521 °F/ft
 152.1°F/1000'

TEMPERATURE GRADIENT

MOTHER EARTH IND

COVE FORT

WELL #66-28

7/17/85

file # 010066-2

< 1857'

320.0

280.0

240.0

200.0

160.0

120.0

80.0

TEMPERATURE (F)

DEPTH (FT)

600.0

800.0

1000.0

1200.0

1400.0

1600.0

1800.0

2000.0

ELD CA
9-2788
10 x 10 1/2 INCH
10 x 14 INCHES

40.0

PRUETT INDUSTRIES INC
 8915 ROSEDALE HWY., BAKERSFIELD, CA. 93308
 (805) 563-2768

PAGE 1
 FIGURE #10

SUB-SURFACE PRESSURE SURVEY

CO. MOTHER EARTH IND. RUN 1A FIELD COVE FORT WELL 66-28
 EFF DEPTH 1864' CASING PRESS WELLS STAT STATIC TOOL HUNG
 CASING 95/8" @ -604' TUBING PRESS ON BOTTOM 10:16
 LINER - ELEMENT RANGE 0 - 1056 OFF BOTTOM 10:19
 DATE 071785 ZONE ZERO POINT 12'
 ELEVATION PICK-UP 1857' SHUT-IN
 MAX TEMP CAL SER NO. 15128 ON-PROD
 PERF - MPP
 TUBING -
 UNITS ENGLISH PURPOSE PRESSURE GRADIENT 7/17/85

SURVEY DATA

CO. MOTHER EARTH IND.			RUN 1A FIELD COVE FORT			WELL 66-28		
TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD	
1:00	0	55.8	0.000	1:00	1050	55.8	0.000	
1:00	100	55.8	0.000	1:00	1100	55.8	0.000	
1:00	200	55.8	0.000	1:00	1150	55.8	0.000	
1:00	250	55.8	0.000	1:00	1200	55.8	0.000	
1:00	300	55.8	0.000	1:00	1250	55.8	0.000	
1:00	350	55.8	0.000	1:00	1300	55.8	0.000	
1:00	400	55.8	0.000	1:00	1350	55.8	0.000	
1:00	450	55.8	0.000	1:00	1400	55.8	0.000	
1:00	500	55.8	0.000	1:00	1450	55.8	0.000	
1:00	550	55.8	0.000	1:00	1500	55.8	0.000	
1:00	600	55.8	0.000	1:00	1550	55.8	0.000	
1:00	650	55.8	0.000	1:00	1600	55.8	0.000	
1:00	700	55.8	0.000	1:00	1650	60.1	0.085	
1:00	750	55.8	0.000	1:00	1700	60.2	.404	
1:00	800	55.8	0.000	1:00	1750	100.1	.398	
1:00	850	55.8	0.000	1:00	1800	119.4	.388	
1:00	900	55.8	0.000	1:00	1850	138.9	.385	
1:00	950	55.8	0.000	1:00	1857	142.1	.465	
1:00	1000	55.8	0.000	0:00	0	0.0	0.000	

BY S.WILSON/R.DAILY

PRESSURE GRADIENT

MOTHER EARTH IND.

COVE FORT

WELL #66-28

7/17/85

file # 010066-2

160.0
140.0
120.0
100.0
80.0
60.0
40.0

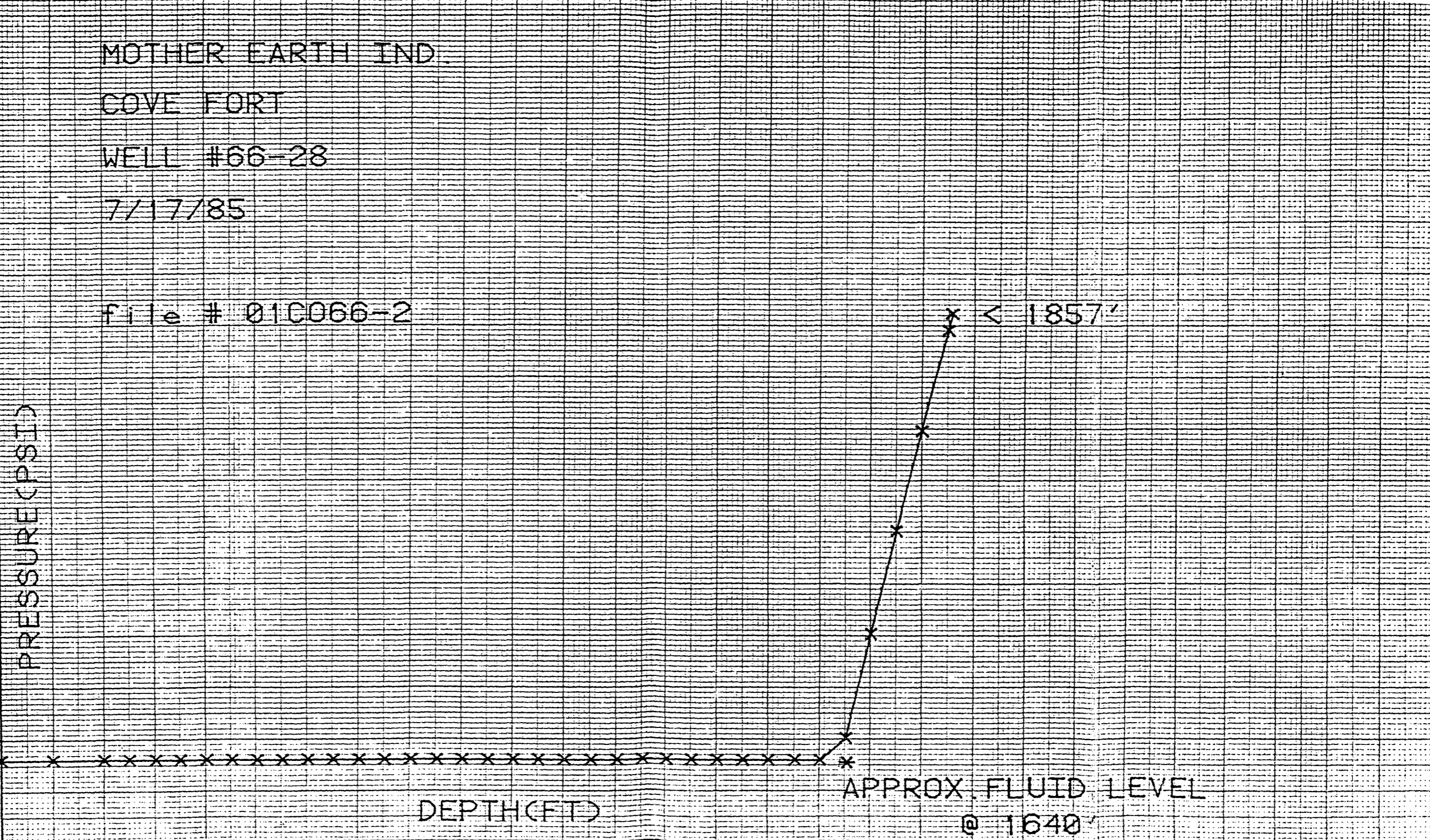
PRESSURE (PSI)

DEPTH (FT)

200.0 400.0 600.0 800.0 1000.0 1200.0 1400.0 1600.0 1800.0 2000.0

APPROX. FLUID LEVEL
@ 1640'

< 1857'



LD, CA
2788
10 x 10 to 1/2 INCH
10 x 14 INCHES

V. GEOLOGY

V. GEOLOGY

The lithology of Well #66-28 was determined primarily by examining the drill cuttings under a binocular microscope with added input coming from the study of geologic reports and maps of the area as well as direct input from geologists Dr. Myron Best and Tom Steven.

Well #66-28 was drilled in a region which has been identified as a Known Geothermal Resource Area. Three different hydrothermal episodes have been identified by Moore and Samberg (1979)¹ with the last being related to the active deposition of sulphur in the area. These episodes of hydrothermal activity are tied to relatively recent volcanic and seismic activity in the area.

Well #66-28 is located on the structural block just north of the Cove Creek fault. Steven (1983)² has mapped many small step faults of minor displacement in the area of Well #66-28. These nearly vertical faults are identified by the alteration in the rock as they have historically provided conduits for geothermal fluids. Zones of alteration can be seen in road cuts above the site as well as in the rock on the well pad.

Volcanic activity began in the region about 30 m.y. ago and continued up until 0.5 m.y. ago (Steven and Morris, 1983)². These volcanics consist of predominately intermediate composition lava flows, tuff breccias, and ash-flow tuffs which were deposited upon deformed Paleozoic and Mesozoic sedimentary rocks. These volcanics have since been faulted and altered.

1) GEOLOGY OF THE COVE FORT-SULPHURDALE KGRA, by J. N. Moore and S. M. Samberg, 1979.

2) GEOLOGIC MAP OF THE COVE FORT QUADRANGLE, WEST-CENTRAL UTAH, by Thomas A. Steven and Hal T. Morris, 1983.

Well #66-28 begins right from the surface in what has been mapped by Steven as Tertiary Dog Valley volcanics. This formation consists of a heterogeneous sequence of intermediate composition lava flows, tuff breccias, and ash-flow tuffs of local origin. This sequence continues to a depth of 1580' with the exception of a granitic intrusion between 1160' and 1320'. The cuttings also indicate a minor fault zone in the area of 770'.

Following the Dog Valley volcanics at 1580' and continuing to the bottom of the hole the well passes through a Paleozoic sedimentary rock sequence. These undifferentiated Paleozoic rocks consist predominately of dolomites with some zones of quartzite. Much of the hole shows speckling of pyrite and pyrite veining.

Figure #12 is a lithologic log of the Well #66-28.

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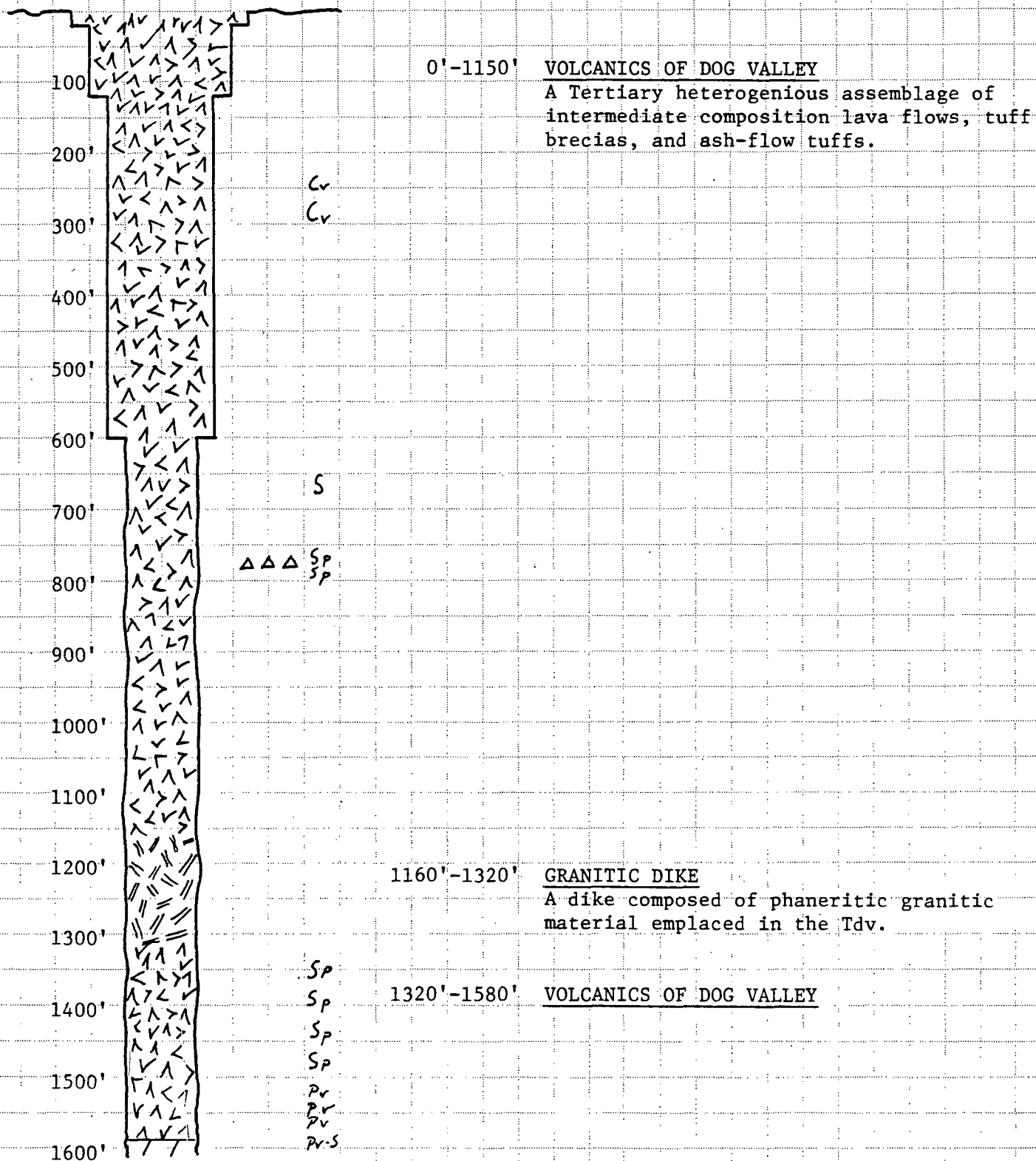
106 West 500 South Suite 101
 BOUNTIFUL, UTAH 84010
 (801) 292-4662

SHEET NO. 1 OF 2
 CALCULATED BY DAB DATE 8/26/85
 CHECKED BY JAB DATE 9/26/85
 SCALE 1"=400' (vertical)

LITHOLOGY

MINERALIZATION

FIGURE #12



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SHEET NO. 2 OF 2

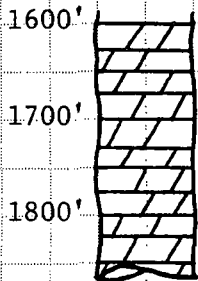
CALCULATED BY DAB DATE 8/26/85

CHECKED BY JAB DATE 9/26/85

SCALE 1"=400' (vertical)

LITHOLOGY

MINERALIZATION



Pv

Sp
 Sp
 Sp
 Sp
 Sp
 Sp

1580'-1864'

UNDIFFERENTIATED PALEOZOIC ROCKS
 Undifferentiated Paleozoic sedimentary rocks consisting predominately of dolomites with some quartzite. Rocks are often speckled with pyrite, or show quartz or pyrite veining.

TD= 1864'

MINERALIZATION KEY

- Sp - Speckled with pyrite.
- Cv - Calcite veining
- Pv - Pyrite veining.
- S - Silicified.
- △△△ - Fault zone.