

GLO 1644



**DEEPENING & COMPLETION REPORT**

**WELL 34-7B**

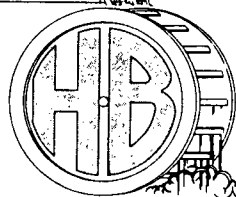
**LEASEHOLDER**

**MOTHER EARTH INDUSTRIES**

**CAREFREE, ARIZONA**

**PREPARED BY**

**HIGGINSON-BARNETT, CONSULTANTS**



**MAY, 1985**

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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 hundred feet to the northeast and on December 16, 1983 commenced drilling Well #34-7B (Lady Linda). This well was completed on January 8, 1984 to a depth of 1165'. The successful completion of Well #34-7B 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. After the completion of Well #34-7A, the rig was moved back to Well #34-7B on May 12, 1984 and the well was deepened and completed to 1,300 feet on May 14, 1984.

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 it's construction. ThermaSource, Inc. with Gerald Niimi supervising the tests, ran the well tests that are reported in this document. 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.

This brief report is to relate the activities associated only with the deepening of Well #34-7B from 1165' to 1300'. A completion report for the first 1165' has already been submitted to the Bureau of Land Management. Also tests were conducted to determine the relationship between Wells #34-7A and #34-7B after the deepening of Well #34-7B and these results are found within the completion report for Well #34-7A, which has also already been submitted to the Bureau of Land Management. Therefore, for additional information the reader is referred to well completion reports for Wells #34-7A and #34-7B to be found in duplicate in the well file within the offices of the Bureau of Land Management.

II. LOCATION

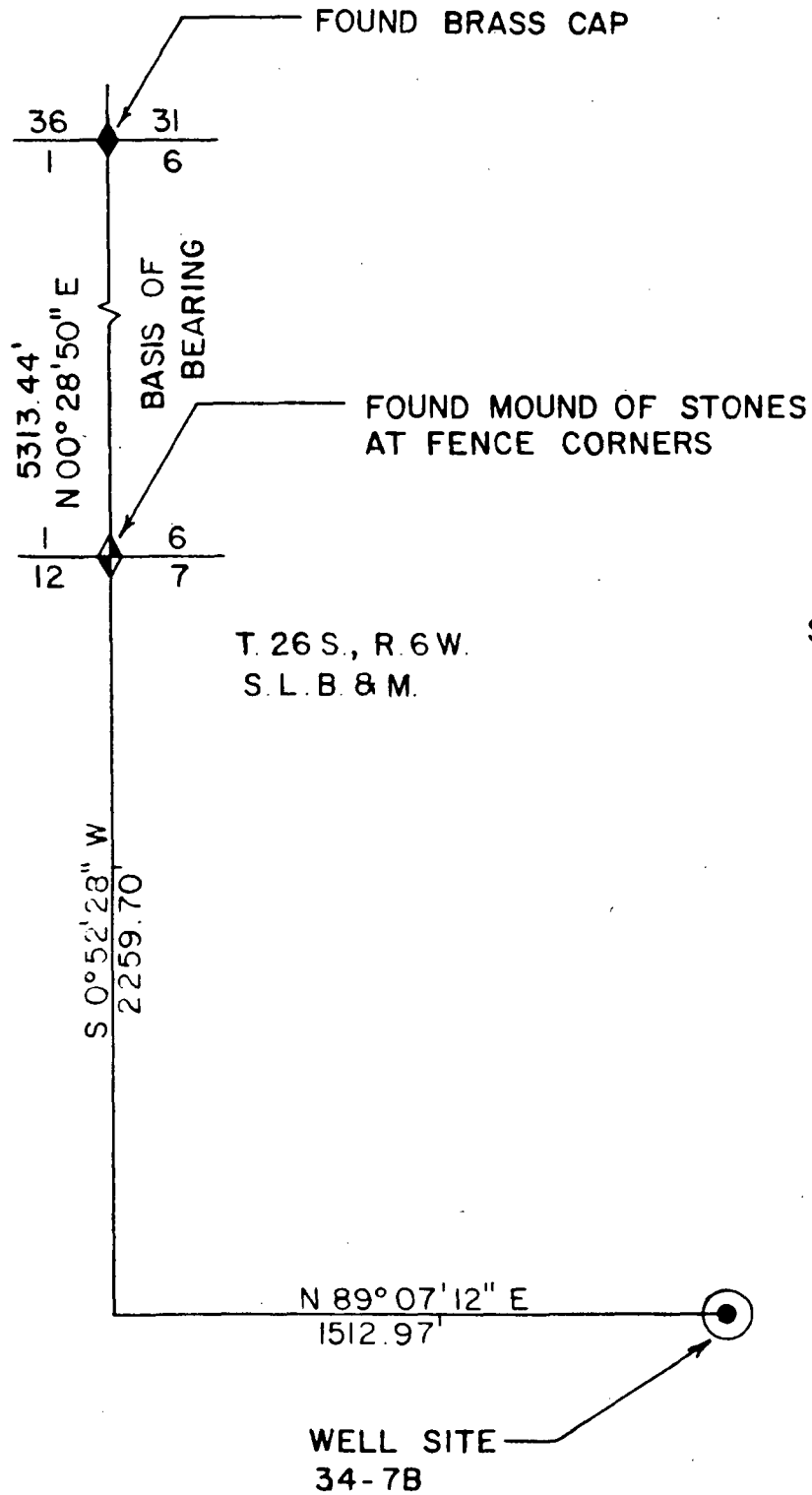


## II. LOCATION

This report covers the deepening and completion of Mother Earth Industries' Well #34-7B (Lady Linda). The well is located in Beaver County, Utah near Sulphurdale in the Cove Fort-Sulphurdale KGRA. More specifically the well is described as: Beginning at the Northwest Corner, Section 7, T26S, R6W, S.L.B.&M. Thence S  $0^{\circ}52'28''$ W, 2259.70 feet along West line Section 7, thence N  $89^{\circ}07'12''$  E, 1512.97 feet to centerline Well #34-7B.

Well #34-7B is located about 250 feet northeast of Mother Earth Industries' well #34-7A (Olga). Figure #1 shows the location of Well #34-7B.

FIGURE #1



SCALE: 1"=500'

T. 26 S., R. 6 W.  
S. L. B. & M.

# MOTHER EARTH

GEOHERMAL WELL SITE 34  
SULPHURDALE, UTAH

III. WELL DRILLING AND CONSTRUCTION HISTORY

### III. WELL DRILLING AND CONSTRUCTION HISTORY

Deepening of Well #34-7B began on May 12, 1984. Initially the hole was to be drilled with a 12-1/4" bit, but since this bit would not fit through customs 13-3/8" wellhead, the hole was drilled with a 10-5/8" bit. The open hole was drilled with air and no cuttings were collected. The well was completed to a depth of 1300' on May 14, 1984. Figure #2 is a record of the daily events which transpired during the deepening of Well #34-7B. Figure #3 shows a profile of the well after deepening. During the deepening the well was equipped with a blow-out preventer stack which is shown in figure #4. Records of drilling bits and air drilling are shown in figures #5 and #6 respectively. A directional survey was not run after the deepening of the well.

FIGURE #2

WELL NAME: 34-7B Deepening

LOCATION: Sulphurdale, Utah

OPERATOR: Cove Creek Geothermal

PREPARED BY: Louis E. Capuano, Jr.

DATE	DEPTH	OPERATIONS
5-8-84 to 5-11-84		Move rig from 34-7A to 34-7B and start rigging up. Drilled Mousehole and Rathole using power swivel and started nipling up blow out preventer stack as in drawing 002.
5-12-84	1167'	Nipple up blow out preventers. Rig on payroll at 8:00am, 5-12-84.
5-13-84	1167'	Finished nipling up blow out preventers and tested same to 500psi with BLM Representative present to witness test. Nippled up Blooie Line and leveled derreck. Picked up 12 $\frac{1}{4}$ " bit and attempted to run in hole. 12 $\frac{1}{4}$ " bit would not fit through customs 13-3/8" wellhead. Ordered smaller bit.
5-14-84	1300'	Measure and picked up Drill Pipe while waiting on 10-5/8" bit. Make up 10-5/8" bit and 8" Drill Collars ran in to 1159' and drilled 10-5/8" hole to 1300'. Pulled out of hole and installed 6' orifice plate in Blooie Line to test well. Tested well for 6 hours. Rigged up to lay down drill pipe and release rig.
5-15-84	1300'	Layed down all drilling tools. Nippled down blow out preventers and released rig at 6:00pm 5-14-84.

FIGURE #3

12" 400 ANSI  
WKM POW-R-SEAL  
MASTER VALVE

13-3/8" S.O.W. x 12" 400 ANSI  
CUSTOM WELLHEAD WITH  
2-3 OUTLETS & VALVES

GROUND LEVEL

30" CONDUCTOR SET AT  
40' IN A 36" HOLE AND  
CEMENTED FROM 0-40'  
WITH REDI-MIX CEMENT.

20" CASING SET IN A 26"  
HOLE AT 424'. 26" HOLE WAS  
DRILLED TO 440'. CEMENTED WITH  
GEOTHERMAL GRADE CEMENT.

13-3/8" CASING SET IN A 17 1/2"  
HOLE AT 799'. 17 1/2" HOLE WAS DRILLED  
TO 824'. CEMENTED WITH GEOTHERMAL  
GRADE CEMENT.

12 1/4" OPEN HOLE FROM 824'  
TO 1165'±

10-5/8" OPEN HOLE FROM  
1165' TO 1300'.

200'

400'

600'

800'

1000'

1200'

1400'

REVISED	DATE

**TSI**  
ThermaSource Inc.

100 E Street • P.O. Box 1236 • Santa Rosa, California 95402  
(707) 523-2960 • Telex 171743 • TWX 510 7446439

MOTHER EARTH INDUSTRIES  
COVE CREEK GEOTHERMAL  
WELL COMPLETION DIAGRAM  
34-7B

DRAWN
FOR: MEI/CCG
BY: L.E.C.
DATE: 5-23-84
SCALE: 1" = 200'
DRAWING No.
001

12" 900 API GRANT  
ROTATING HEAD

FIGURE #4

12" 900 API HYDRIL

12" 900 API DOUBLE  
RAM TYPE PREVENTER

1 RAM EQUIPPED WITH  
DRILL PIPE RAMS

1 RAM EQUIPPED WITH  
CSO RAMS

12" 400 ANSI  
MASTER GATE VALVE

12" 900 API BANJO BOX

DOUBLE STUDDED ADAPTOR  
12" 400 ANSI x 12" 900 API

12" 400 ANSI  
MASTER GATE  
VALVE

13-3/8" SOW x 12" 400  
ANSI WELLHEAD  
EQUIPPED WITH  
2-3" OUTLETS  
AND VALVES

GROUND LEVEL

13-3/8" CASING

REVISED	DATE

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BLOW OUT PREVENTER STACK  
ON 13-3/8" CASING  
34-7B DEEPENING

DRAWN
FOR: MEI
BY: LEC
DATE: 2-15-84
SCALE: N/A
DRAWING No. 002





COVE CREEK GEOTHERMAL

AIR CIRCULATING DATA

34-7B DEEPENING

DATE	DEPTH (FEET)	CIRCULATING MEDIA	COMP. PRESSURE (PSIG)	INPUT VOLUME OR (CFPM)	NO. OF COMP. OR RUNNING	TEMP OUT	EXIT PRESSURE (PSIG)	REMARKS
5/4/84	1300'	AIR	170	3000	3	-	-	Drilling 10-5/8" hole

Input pressure intially was 170psig no notable increases were encouted while drill from 1159' to 1300'.

**IV. WELL TEST**

#### IV. WELL TEST

As was previously stated a well test was conducted for both Wells #34-7A and #34-7B after the deepening of Well #34-7B. The results of this test have already been submitted in duplicate to the Bureau of Land Management as part of the well completion report for Well #34-7A. However, the following table prepared by ThermaSource Inc., might be of interest. This table shows the changes in the producing behavior of Well #34-7B from January to June, 1984.

	<u>1/21/84</u>	<u>4/2/84</u>	<u>6/6/84</u>
Gas Concentration (%)	60	44	20
Flowing Pressure (psig)	60	54	44
Gas Pressure (psia)	27.0	22.4	6.5
Steam Pressure (psia)	44.7	43.2	49.2
Total Flow (lbs/hr)	94,000	92,000	72,000
Gas Flow (lbs/hr)	56,400	40,000	15,000
Steam Flow (lbs/hr)	37,600	52,000	57,000

\*The above table only includes data during testing with a 6" orifice plate.

Figure #7 shows the daily flow test data which was used for the conclusions reached in the Well Test portion of the well completion report for Well #34-7A but which was not included in that report.

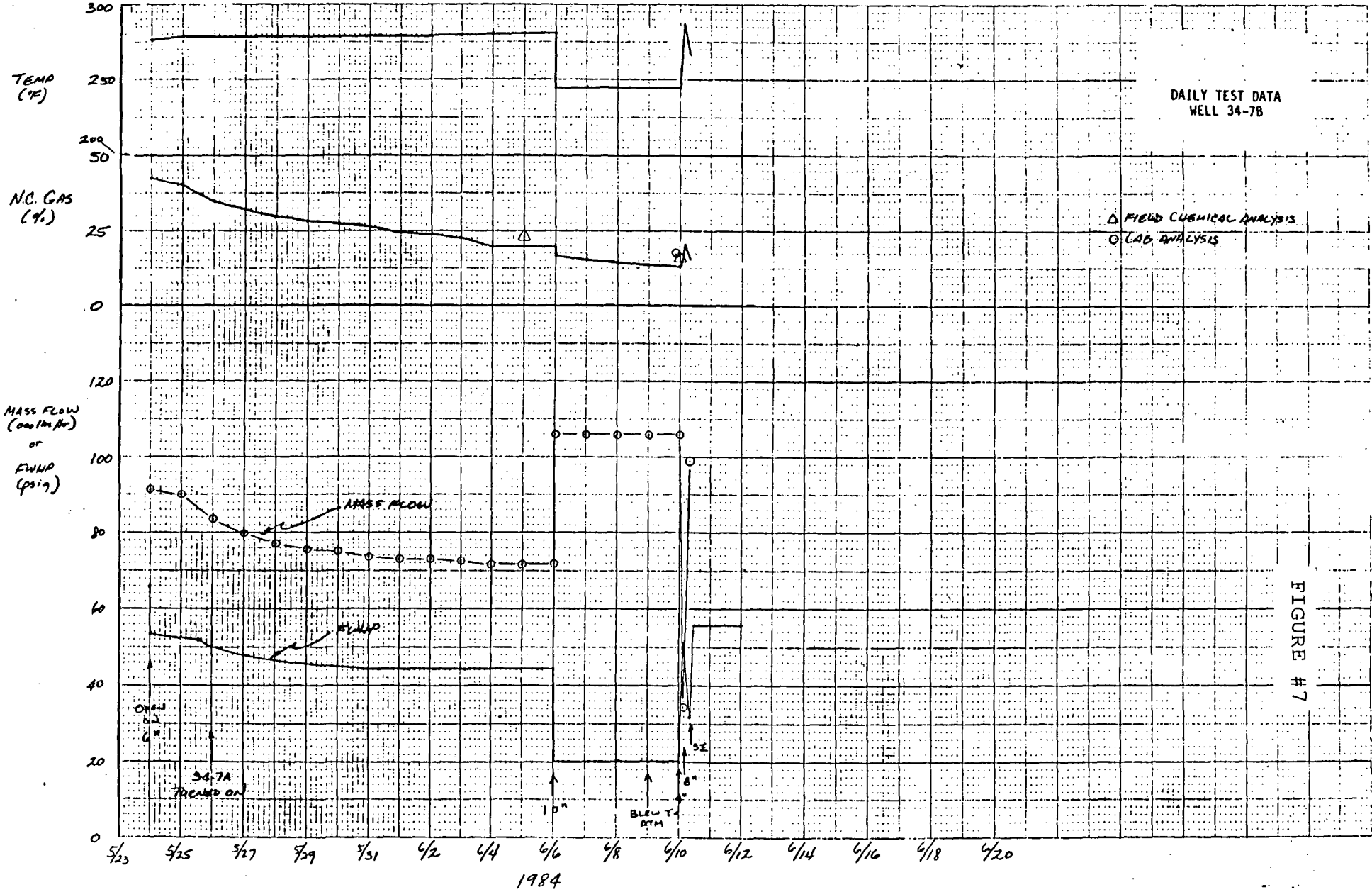


FIGURE # 7

V. GEOLOGY

## V. GEOLOGY

During the 135' deepening of Mother Earth Industries' Well #34-7B no cuttings were collected. Therefore, a new lithologic log of the well was not made. However, it is reasonably concluded that the well continued through the Three Creeks Tuff formation. For a more detailed report on the geology of the region and the lithology of Well #34-7B the reader is referred to the well completion reports for Wells #34-7A and #34-7B already on file with the Bureau of Land Management.