

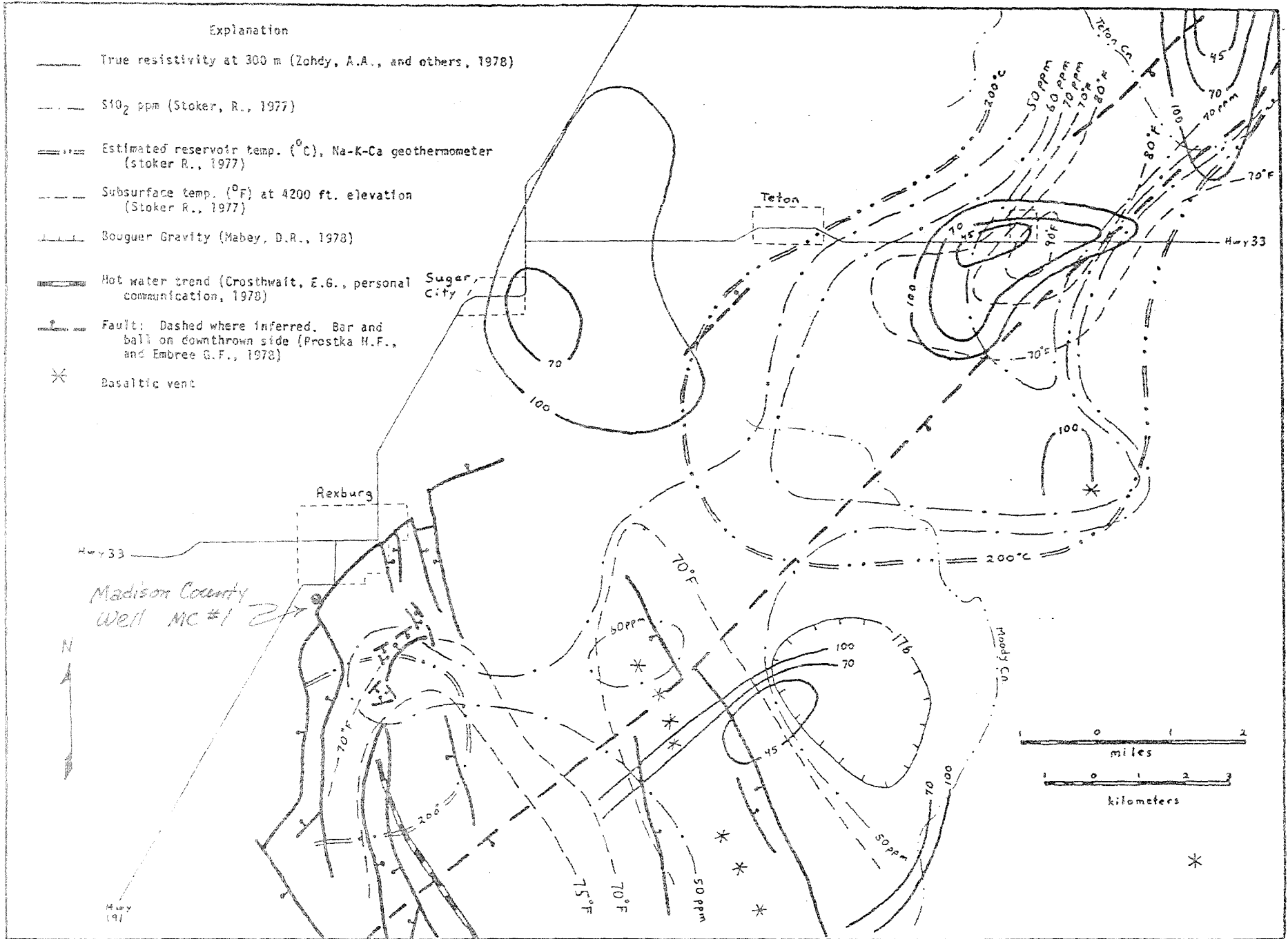
GL04430

PELIMINARY REPORT
ON
MADISON COUNTRY GEOTHERMAL WELL

Submitted By
Energy Services Inc.
1084 N. Skyline Dr.
Plaza #2
Idaho Falls Ida.

July 23, 1980

Compiled by G. F. Embree, U.S. Geological Survey





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June 15, 1980

BRIEF SUMMARY TO-DATE OF DRILLING ON

MADISON COUNTY GEOTHERMAL #1

- June 2 - Rig move-in began (CRC Colorado Well Co.)
- June 5 - Began drilling mouse and rat holes. Severe lost circulation problems. Water supply system breakdown.
- June 6 - 10 PM, completed mouse and rat holes
- June 7 - 2 AM began drilling out of 20-inch conductor pipe with 17 $\frac{1}{2}$ " bit at 125 ft level (kelly bushing, 110 ft ground level)
(All future depth references are from Kelly bushing)
- June 8 - 4 AM reached 245 ft, no returns, and difficulty getting out of hole. Cemented entire hole at 4 PM to 8 PM.
- June 9 - Began drilling out cement at 1 AM, still soft. Delayed until 6 AM to continue drilling
- June 10 - Pea gravel encountered in 300 ft depth range. Removed 17 $\frac{1}{2}$ inch reamer from behind 17 $\frac{1}{2}$ inch bit
- June 11 - Considerable difficulty cleaning pea gravel out of hole. No returns. Very fractured in other formation, presumed to be basalt.
- June 12 - Reached 600 ft.
- June 13 - Considerable trouble at 730 ft, stuck in hole. Ran quick mud sweep and freed bit.
- June 14 - Reached 1006 ft with 17 $\frac{1}{2}$ inch bit at 0845. Spotty returns. Ran mud sweep to condition hole and lost returns. Began tripping out to case at 1000. Began casing at 1215 hrs. Casing hit obstruction at about 730 ft at 1400 hrs. Washed casing into the 750 ft level by 1700 hrs. Could get it no further, and decided to cement at that point. Began cementing at 2045, with 1750 cu ft total; first 700 cu. ft. a 50/50 Pos mix, ten followed by 1050 ft³ class G. All cement in pipe at 2200 hours. But plug wouldn't drop and couldn't displace remaining cement out of pipe. Abandoned operation at midnight. There were 813 cu. ft. inside 13-3/8" casing, and presumably 585 cu. ft. in the drilled space outside of casing. The remaining 350 cu. ft. is excess for voids. Obtained no returns at the surface.



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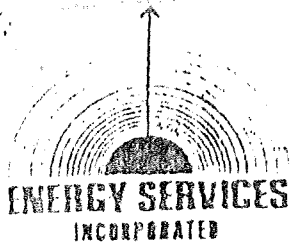
MADISON COUNTY GEOTHERMAL #1
WEEKLY ACTIVITY DRILLING REPORT
(June 15 - 22, 1980)

- June 15 - Waited on cement. Nipped up and started in hole at 7:00 p.m., Drilling started at 143 feet.
- June 16 - 9:30 a.m., drilled to 423 feet. At 11:40 a.m. the penetration rate was approximately 30 feet/hr., drilled to 613 feet, tripped out D.P. and put collars back in. This was completed at 6 p.m. At 10:00 p.m. the bit plugged, tripped 5 double strands and cleared the bit. Drilling was then continued.
- June 17 - At 8:15 a.m. the bit plugged on the connection. Tripped out to clear cross-over sub and 6.25 inch washed out collar. The sub was replaced and the collar layed down. Both mud pumps were causing trouble. At 7:30 the pumps were repaired and drilling was started at 8:30 at a depth of 1132 feet. Tripped to install float and sub to eliminate bit plugging.
- June 18 - Continuous drilling with shutdowns to service the rig and pumps. Tripped out at 1616 feet. The bit was then changed, float was plugged with vis/funnel. After the formation changed and the penetration rate was very slow.
- June 19 - Continued drilling from 1700 to 1889 feet. Formation consisted of rhyolite and quartz, penetration rate was very slow because #2 mud pump was being welded and the hole could not be cleaned. Mixed 10-bag-pill (10 bags Magogett bentonite and 1 bag lime) to run sweep and clean the hole.
- June 20 - Continued drilling from 2010 to 2165 feet with a 12.25 inch bit. Drilling rate was very slow, due to #2 mud pump being out of service (welded again). Continued drilling with 1 pump but can't clean hole. 10:00 p.m. penetration rate zero, bit sticking in hole. Mixing 10-bags pill to run sweep and see if penetration rate changes. No Change, tripped and changed 2 jets to #12.
- June 21 - Trip. in complete at 2:30 a.m. with 180 feet of fill. Drilling with 90 RPM and 10,000 bls. More weight doesn't help penetration rate even at low speed. New pump delivered at 3:00 p.m., and installed at 8:30 p.m. Tried various drilling rates, decided best rate to be 12,000 lb and 40 RPM which is 12 feet per hour.

MADISON COUNTY GEOTHERMAL #1
WEEKLY ACTIVITY DRILLING REPORT
(June 15 - 22, 1980)
(Continued)

June 22 - Reached 2,486 feet at 1:00 p.m. Began trip out of hole. Out of hole at 4:30 p.m. and began to temperatuer log. Could not get through bridge at 1,210 feet. Began to trip in at 7:00 p.m. Broke through bridge with 35,000 lb. (1,210 feet). Encountered 400 feet of fill at bottom of hole. #1 mud pump bull wheel has all spokes broken. Pump is unusable. Shut drilling operation down at 10:00 p.m. awaiting arrival of replacement mud pump. Pulled tools up inside 13 foot-3/8 inch casing.

John K...



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BRIEF SUMMARY TO DATE OF DRILLING ON
MADISON COUNTY GEOTHERMAL #1
June 30, 1980

- June 23 - No Activity while waiting for mud pump.
- June 24 - No Activity mud pump arrived at 3:00 p.m.
- June 25 - The mud pump was installed and drilling started again at 3:20 a.m. 50 bags of gel were order to condition the hole in preparation for running casing. At 4:11 p.m. the first sweep was pumped in the hole. Three 10 bag sweeps were made to prepare the hole. At 6:00 p.m started tripping out of the hole for temperature logging and to run casing. At 9:00 p.m. logging tool hit a bridge at 1210 feet. The casing was in the hole at 1:30 to a depth of 2304 feet.
- June 26 - Began waiting on cement at 2:00 a.m. The cement trucks arrived at 4:30 a.m. and started pumping cement at 5:10 a.m. 238 barrels of cement were used during the cementing operation. Water was obtained in the returns but no cement. The cement was tagged between the 13 3/8 inch and 20 inch casing at 225 feet GL. The cement between 9 5/8 and 13 3/8 inch was tagged at 350 feet KB. The water level in the annulus between 13 3/8 inch and 20 inch is 23 feet. Cement was pump through the a 1 1/4 inch pipe in between the 13 3/8 inch and 20 inch casing until the cement was at GL. This was completed at 8:30 p.m. The 20 inch, 13 3/8, and 9 5/8 inch casing was cut off to nipple up and install the BOP (Blow out preventer).
- June 27 - Frank Sherman from the state witnessed the BOP pressure test. There was 810 psi on the blind rams for 1 hour and 850 psi on pipe rams for 30 minutes. The test was terminated at 10:00 a.m. Drilled out float and shoes at 1:00 p.m. Only 35 feet to 40 feet of cement was encountered at the bottom of the casing. There was not much fill when the cement was drilled through. Drilled to 2805 feet.
- June 28 - Continued drilling and lost circulation at 3148 feet with no returns. 5 feet fault zone encountered. Reached 3209 feet, but bridged immediately between 3150 and 3100 feet. Lost one trash pump on the canal and the 2nd pump couldn't keep up with lost circulation. Began tripping out of the hole at 7:35. Tripping was completed two hours later. Ran a temperature log until 11:30 p.m. Temperature probe hit a bridge at 3150 feet. Tripped back in hole at 11:30 p.m.

BRIEF SUMMARY TO DATE OF DRILLING ON
MADISON COUNTY GEOTHERMAL #1
June 30, 1980
(Continued)

June 29 - On the way back in nit light bridge about 3150 feet.
Still no returns, 20 feet of light fill was encountered
at the bottom of the hole. At 8:50 drilled to 3369 feet.
At 8:00 the total depth drilled was 3350 feet. Problems
with the trash pump and bit sticking in the hole. Pulled
up four double stands, (240 feet) for trash pump repairs.
Back on bottom at 11:50 with only bridge at 3155 encountered.
Continued drilling with no returns. Some fill encountered
in bottom on each connection.

J. H. G.



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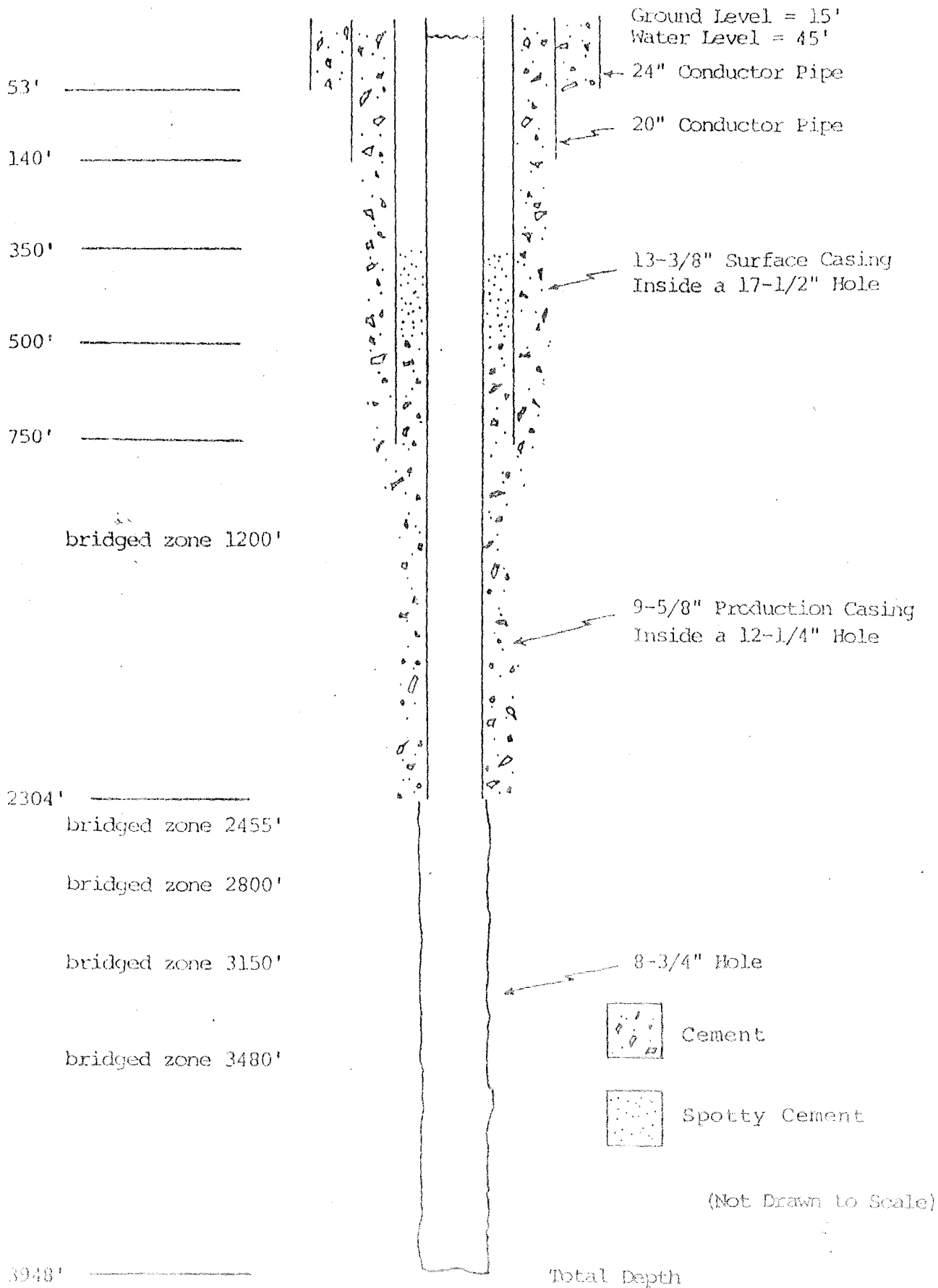
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- June 30- Continued drilling with no returns and at 10:30 tripped out to check bit and run temperature log. At 3:30 tripped back in and continued drilling with no returns. At 7:00 p.m. started to stick in the hole at 3948 feet. Tripped out 300 feet of pipe and the hole was cleaned out.
- July 1- Tripped out of the hole due to sticking in the hole. A bailer was run to 3,700 feet to retrieve cuttings and then a deviation survey was run. The deviation was 1 degree. An airlift was started at 13:20 hours at a flow rate of 700 gpm.
- July 2- The airlift continued until noon at about 600 gpm. The drill pipe was tripped out to log the well. After the log was run tripped in to clean out possible bridges.
- July 3- Started airlift again at 0240 and continued airlift all day.
- July 4- Continued airlift until 8:00 a.m. then tripped out to run temperature log. Tripped back in to clean hole and found 150 feet of fill. The rig was released.

GEOHERMAL WELL #1

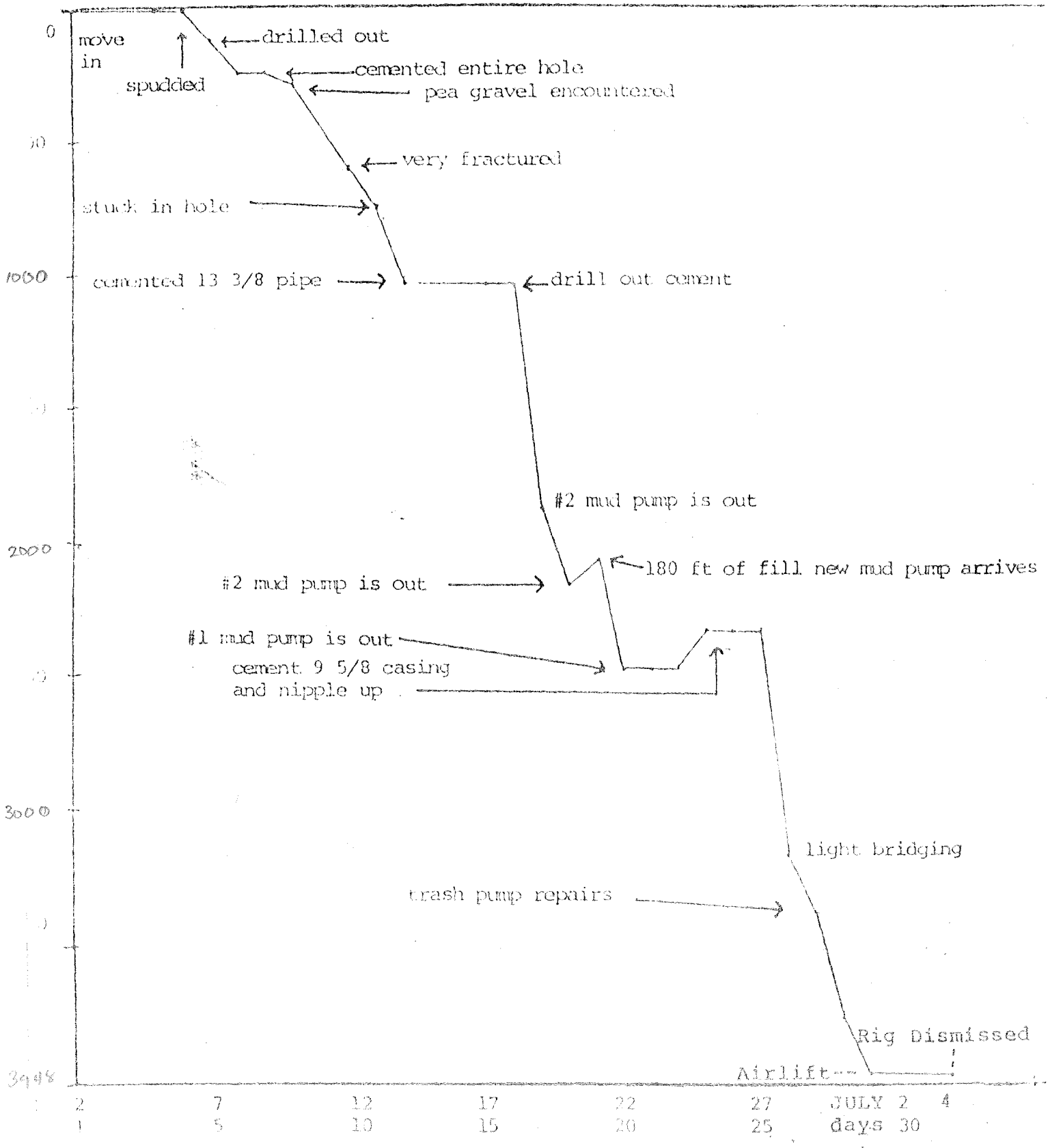
(Everything Referenced to the Kelly Bushing " KB ")

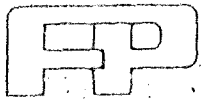
KB = 0'



7/23/80

MADISON COUNTY GEOTHERMAL WELL #1

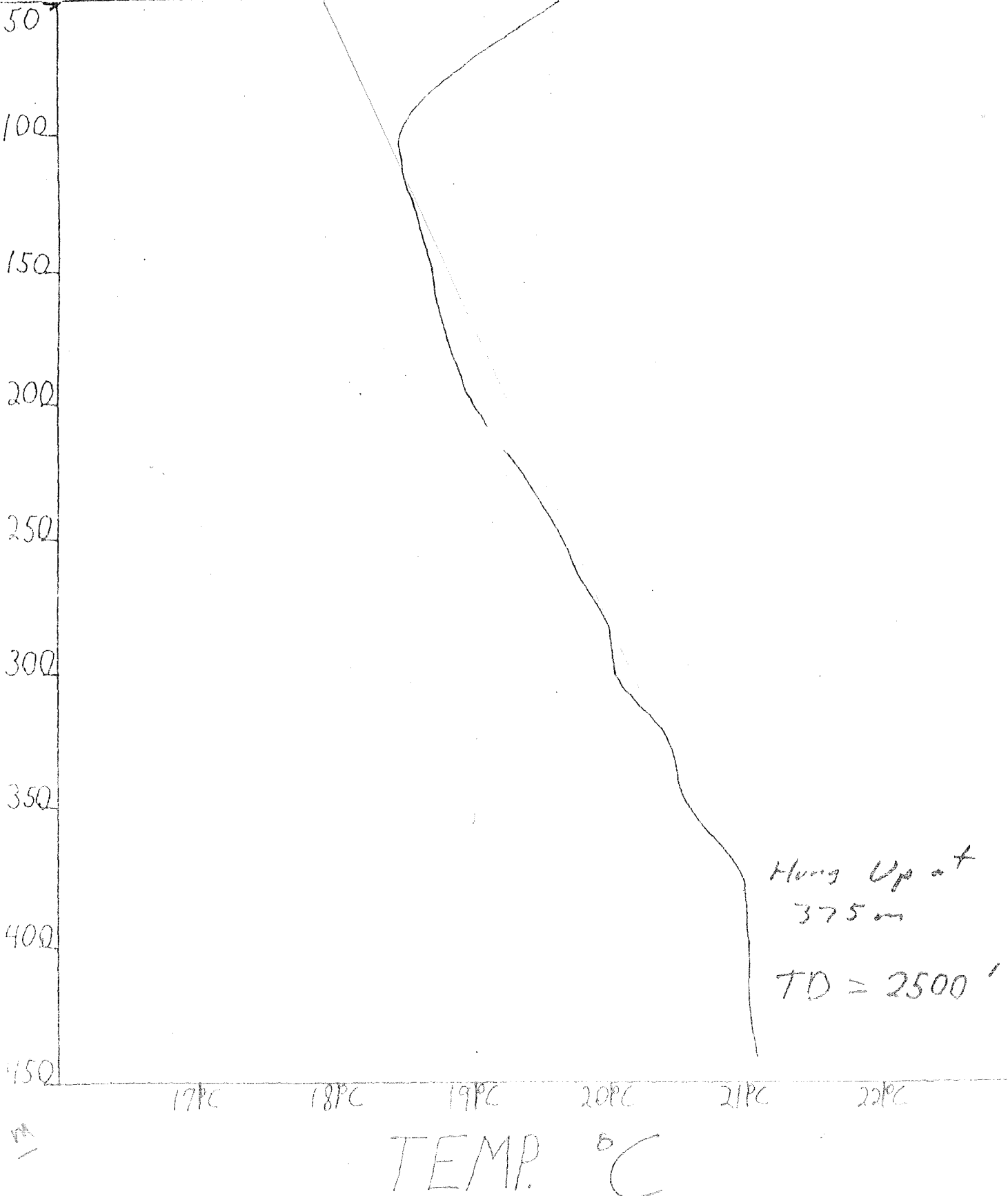


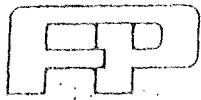


Madison County Geothermal

Ryne

2/22/89



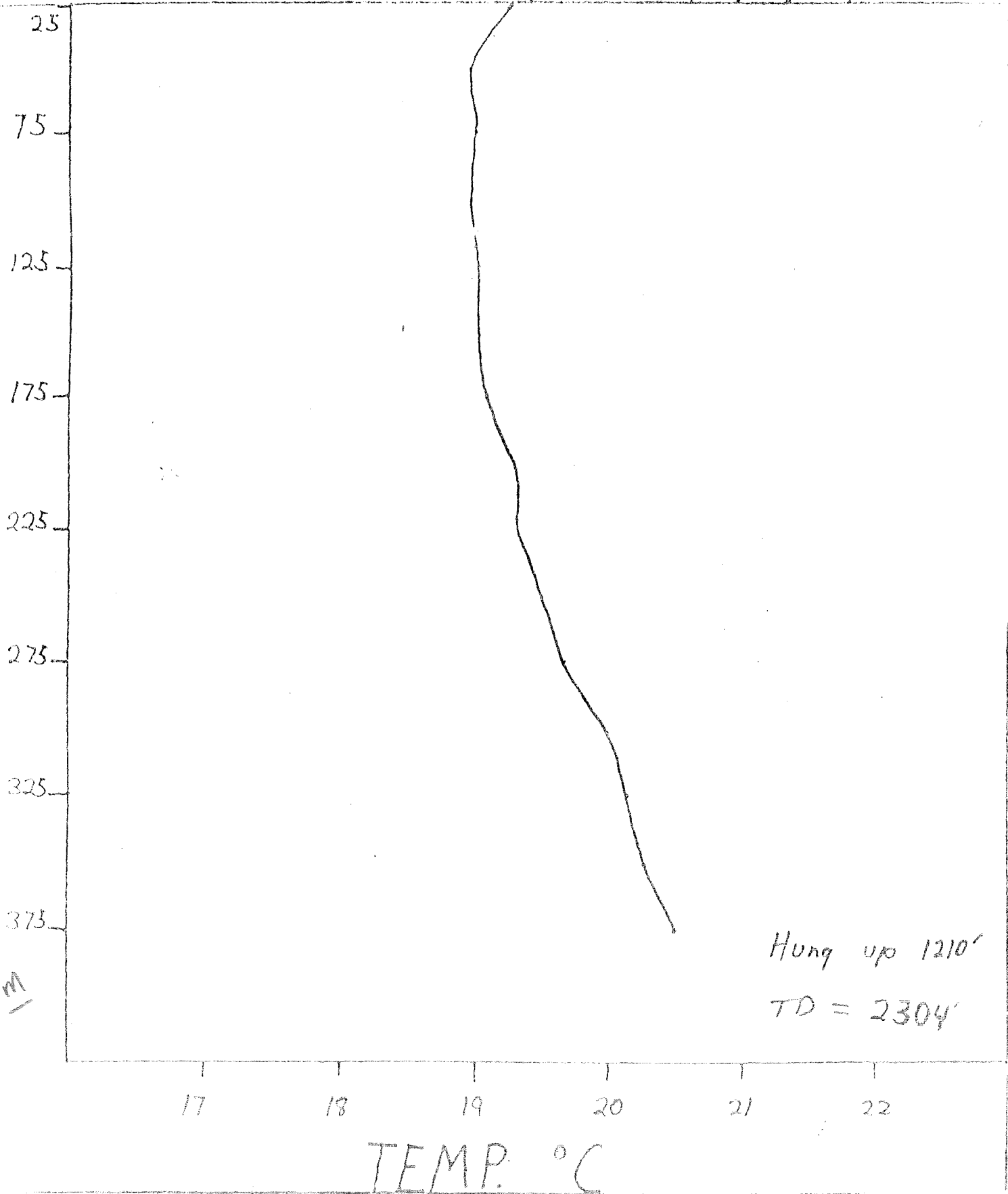


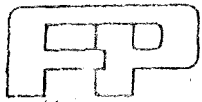
Madison County Geothermal

Ryne

~~6/25/80~~

6/25/80



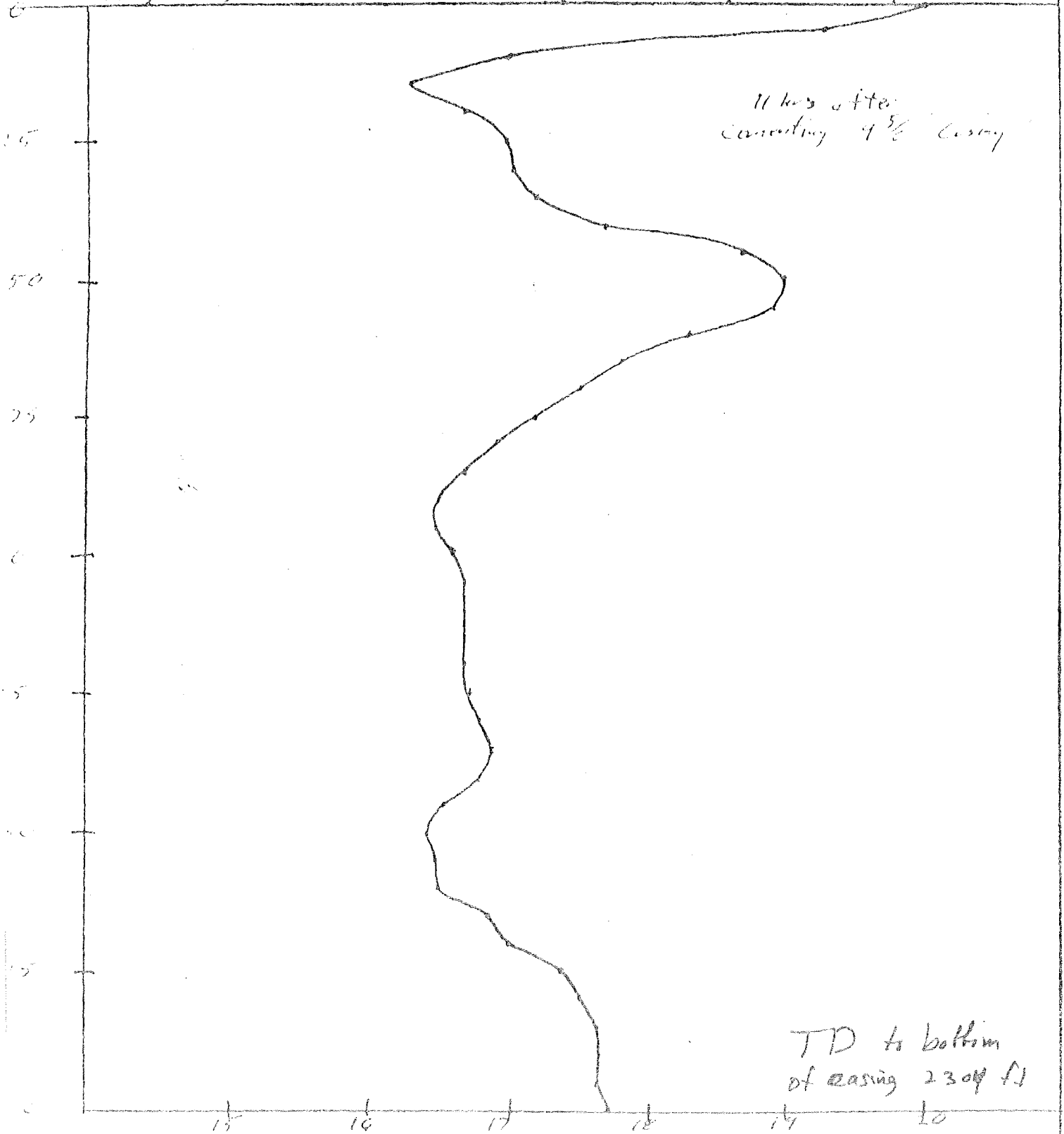


FORSGREN PERKINS ENGINEERING

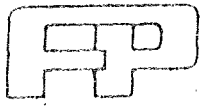
Madison County

6/26/80

Temp. Log (200m detail / ^{First})

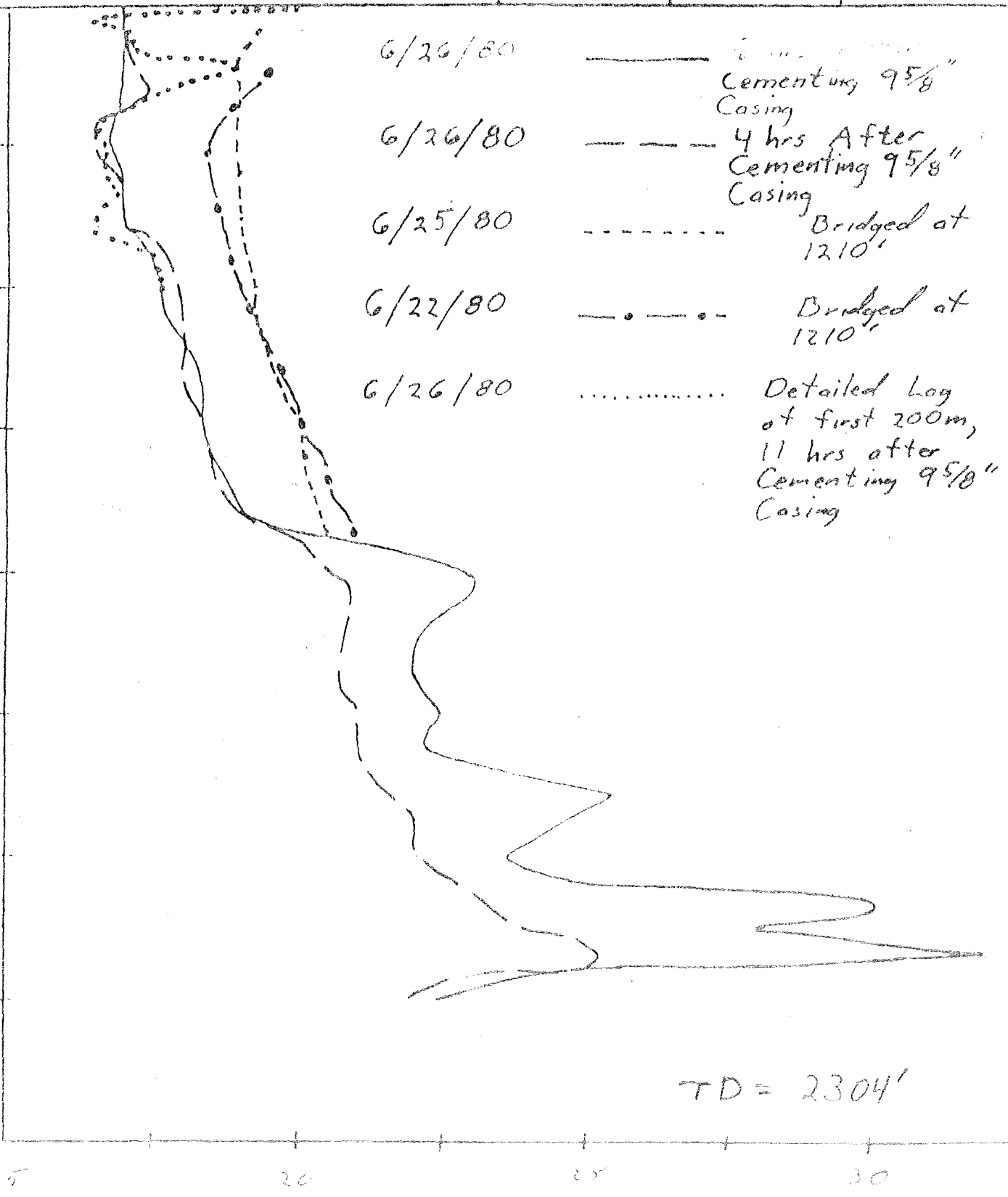


Temp in °C



Madison County

Temperature Logs



TD = 2304'

15

20

25

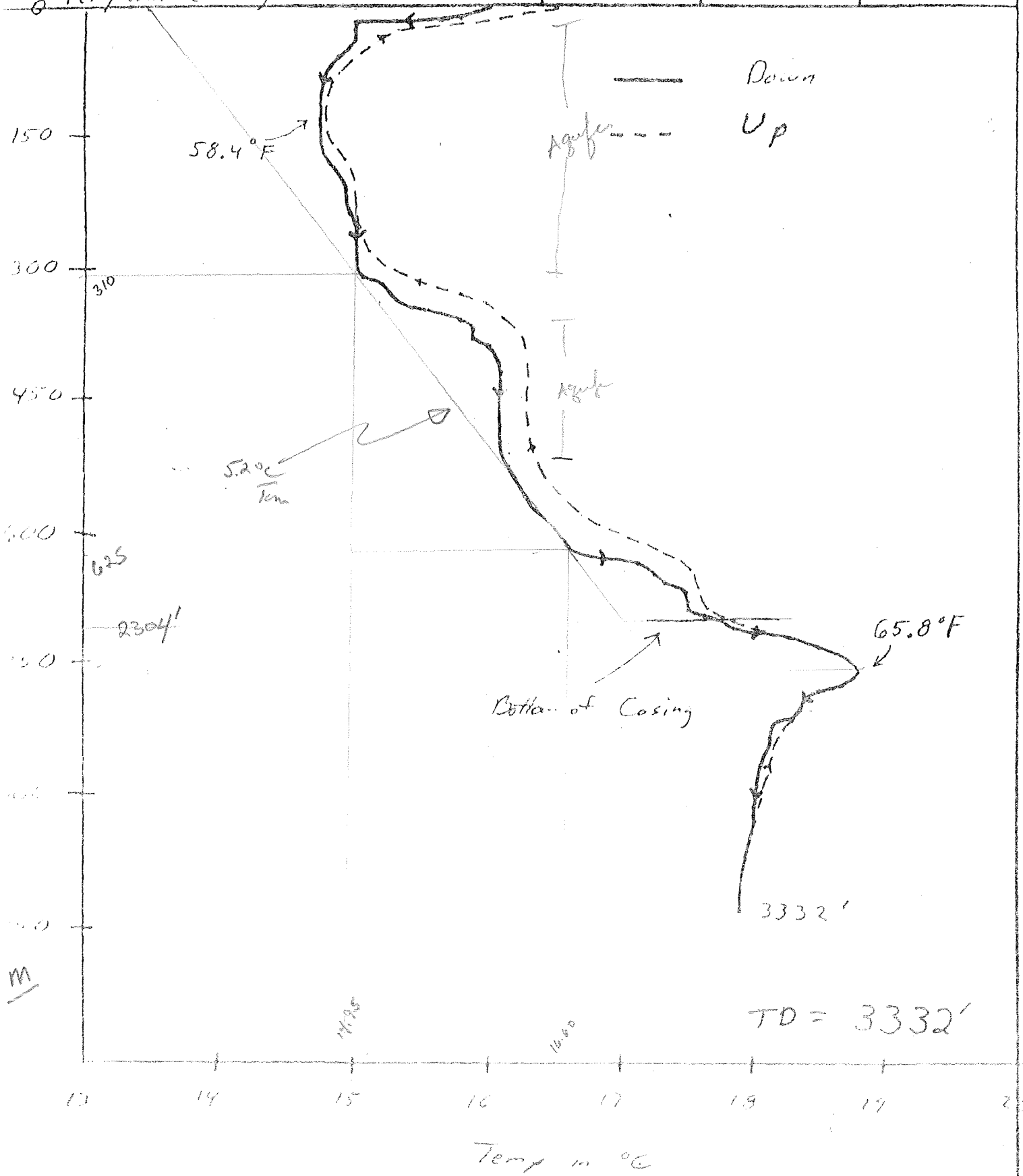
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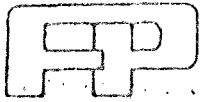
Temp in °C



FORSGREN PERKINS ENGINEERING

PROJECT	Madison County	DATE	6/30/80
Temperature Log		DATE	

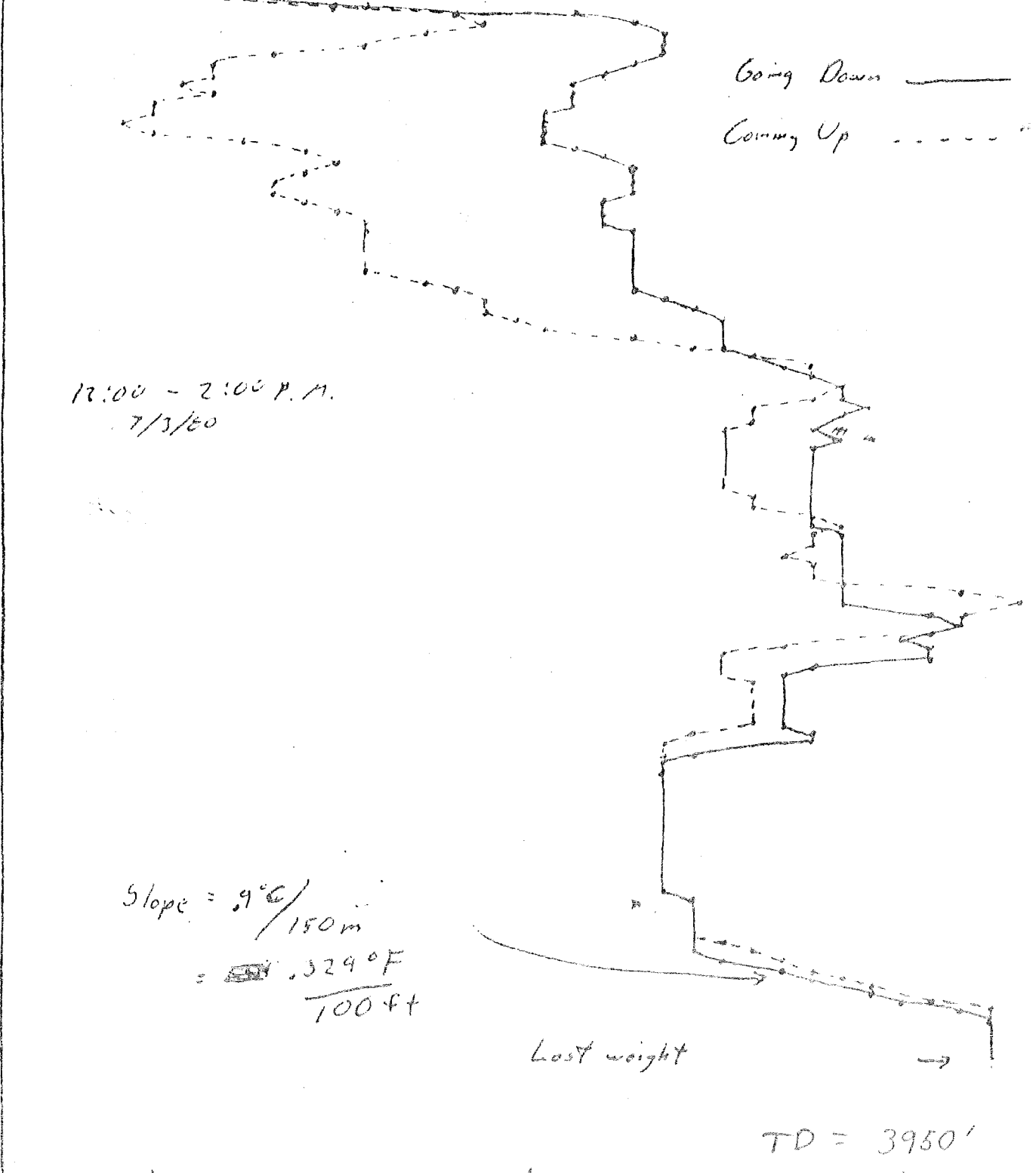




FORSGREN PERKINS ENGINEERING

Date & Location

6.75	6.40	6.85	6.80	6.75	6.70	6.65
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12:00 - 2:00 P.M.
7/3/80

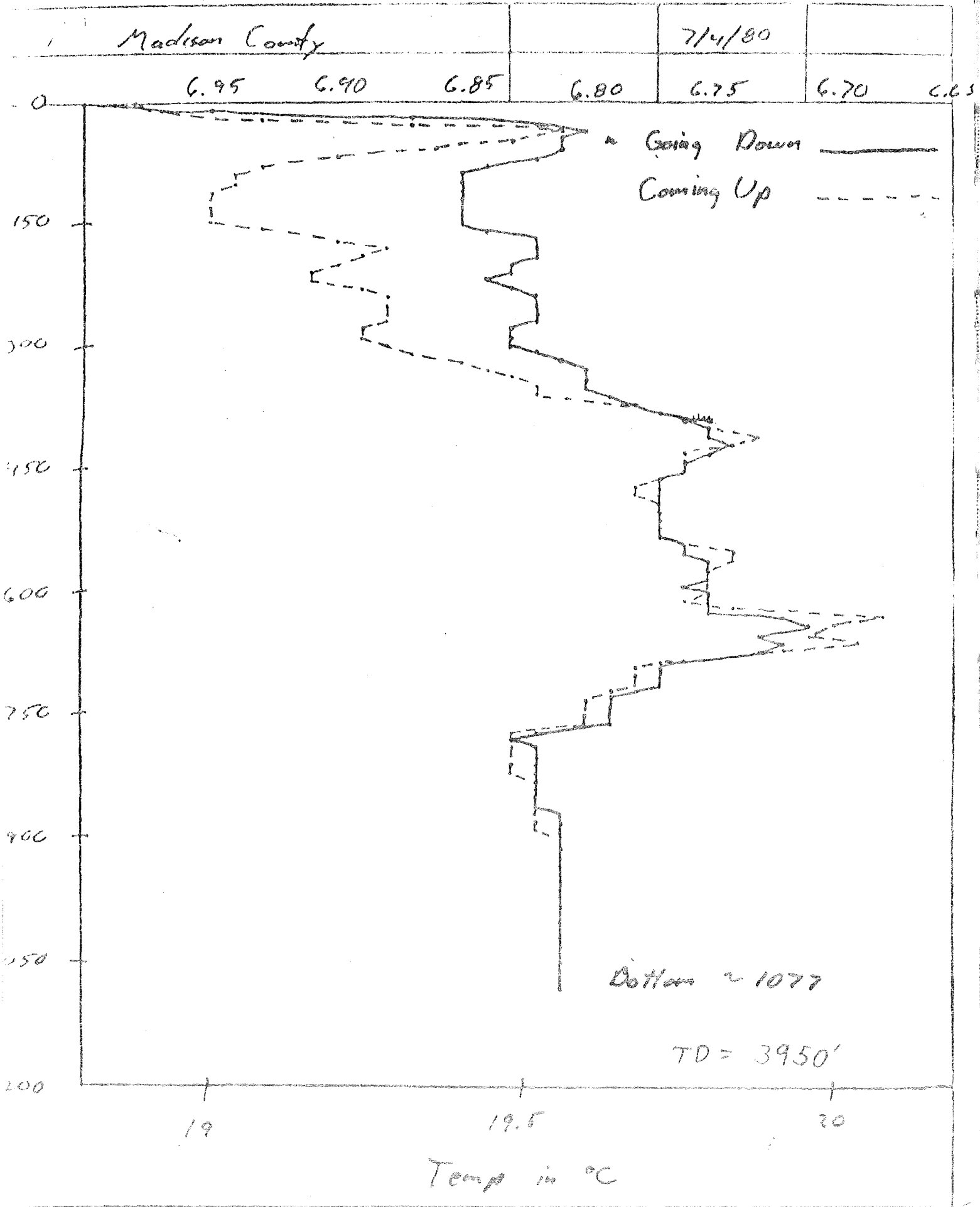
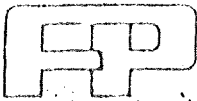
$$\text{Slope} = \frac{9^{\circ}\text{C}}{150\text{m}}$$

$$= \frac{0.0529^{\circ}\text{F}}{100\text{ft}}$$

Last weight →

TD = 3950'

Temp °C	19	19.5	20
After	6.45		6.70





FORSGREN•PERKINS ENGINEERING

PROJECT	Madison County	BY		DATE	7/5/80	PROJECT NO.	
Temp. Log?	C.9	C.E	C.7	DATE	6.6	C.5	SHEET OF

