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THERMAL DATA FROM HEAT-FLOW TEST WELLS
NEAR LONG VALLEY, CALIFORNIA

By

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Open-File Report

1974

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Introduction

As part of the Geological Survey's study of the Long Valley area, an attempt was made to define the regional thermal setting of the caldera. The first phase of this study involved the drilling of four holes in granitic rocks outside of the caldera and two holes within it (Figure 1). LV was drilled as a hydrologic test well. In Figure 1, the light areas are areas of crystalline rocks and the stippled area, volcanic and sedimentary rocks. (For an explanation of the symbols, see Plate 1 of Bateman and others (1963).) Preliminary temperature measurements and thermal conductivity determinations have been completed and are presented in this report. Also presented herein are data obtained in November 1973 from the shallow holes drilled by Lewis (1974) and some thermal conductivity values from these short holes. These preliminary data are being released now because of intense public interest. The study is continuing, and an interpretive report will be written later this year. The temperature measurements are presented in both graphs and tables. Thermal conductivity data are tabulated as a function of depth for each hole. For locations of the shallow test wells, reference should be made to the quadrangle maps shown in Figures 3 through 13 of Lewis (1974). Symbols and units for the various quantities are:

Z, Depth both feet and meters are used in tables

Temperature, °C

K, Thermal conductivity $\text{mcal cm}^{-1} \text{sec}^{-1} \text{°C}^{-1}$

RHO, Density, gm cm^{-3}

PHI, Porosity (%)

Deep Holes

For each deep hole, two sets of temperatures and a list of thermal conductivities are given. For all holes except LV, casing was grouted into the hole upon completion of drilling. In Figures 3 through 6 the temperature profile exhibiting the higher temperatures was made a day or so after the grouting operation. The profile exhibiting lower temperatures is the most recent one in each case. The temperatures were measured at intervals of one or two feet; however, the tabulations only show temperatures every 20 or 25 feet. In the temperature tabulations depth columns are headed Z in both meters and feet. The resistance column gives the resistance in ohms of the particular thermistor used. For LV (also labeled LVCH) casing has not yet been cemented into the hole and the two profiles represent temperatures measured one and five days after completion of drilling, respectively. In this case, the higher temperatures are the more recent ones and are closer to equilibrium.

In the conductivity tables, depths are shown only in feet. The column headed K WET refers to the conductivity of a water-saturated sample. RHO WET, in turn, refers to the density of a saturated sample. PHI refers to the percent apparent porosity determined from the difference between dry and water-saturated specimens. Where the abbreviation N.P. appears in the PHI column, measurements were made using the needle-probe apparatus described by Lachenbruch and Marshall (1966). All other thermal conductivities were measured with the Birch-type apparatus described by Sass and others (1971).

Shallow Hydrologic Test Wells

Temperatures not reported by Lewis (1974) for these wells are included in Tables 18 through 30. We also measured thermal conductivities on a number of samples from these wells, and these are listed in Table 31. The lithology of the individual samples has not yet been determined, but they may be described generally as Pleistocene lake sediments. A few of the measured conductivities are lower than that of water ($\sim 1.5 \text{ mcal cm}^{-1} \text{ sec}^{-1} \text{ }^{\circ}\text{C}^{-1}$). The only reasonable explanation for these anomalously low values is that the samples were not completely saturated. Evidently some of the "waterproof" sample containers had leaked prior to our measurements.

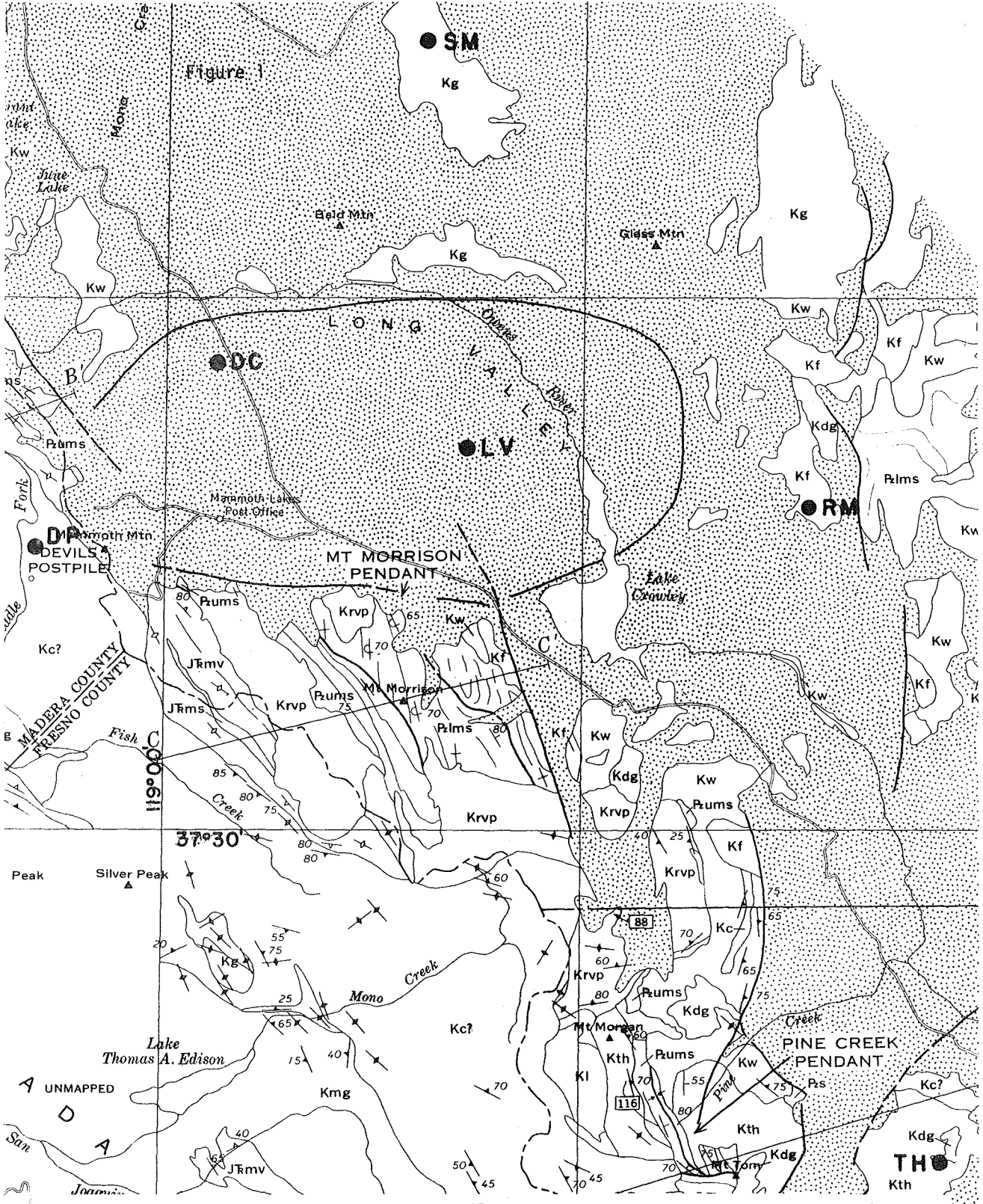
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THO
Kth

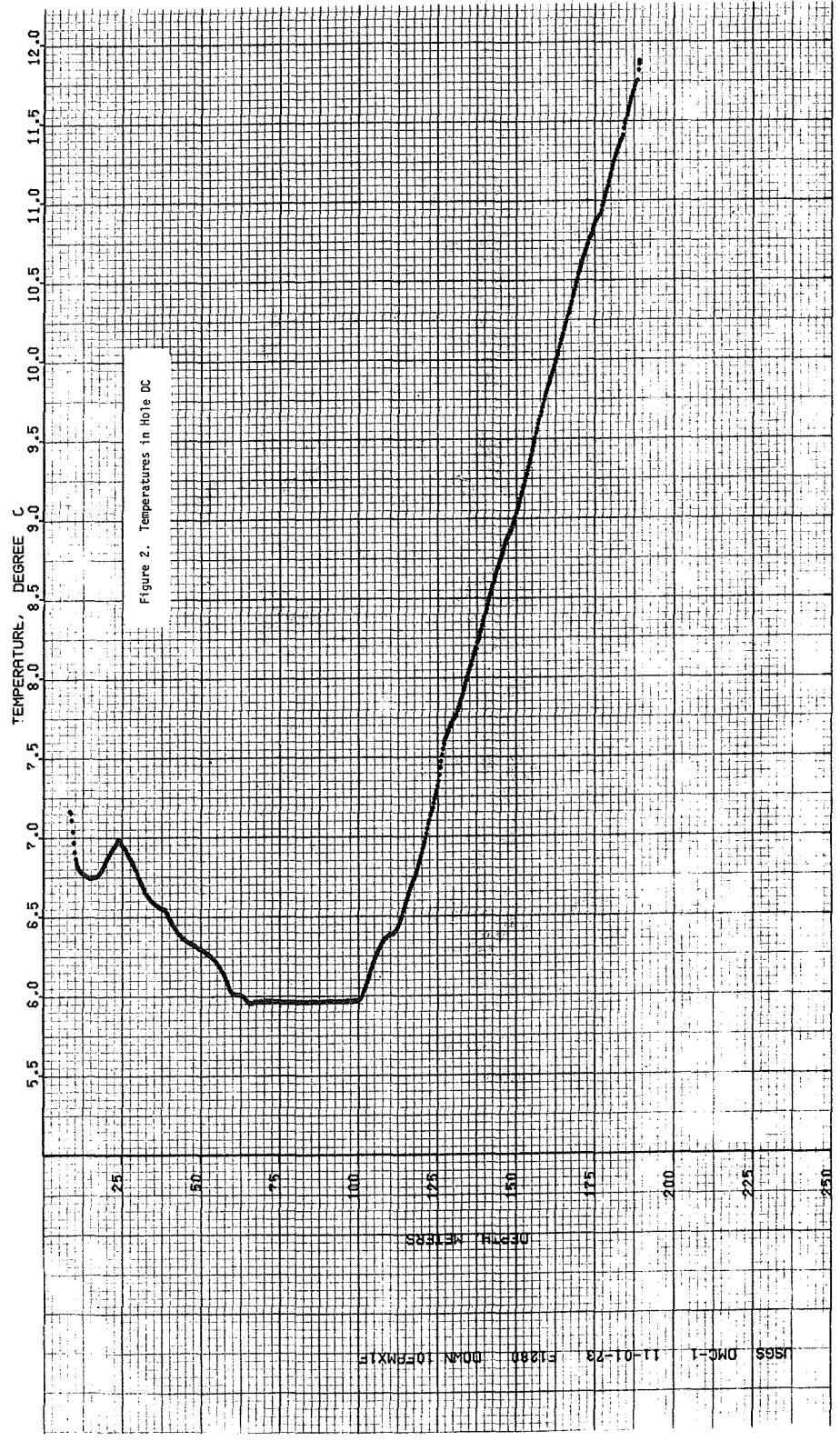


Table 1. Temperatures in DC

USGS DC-1 11-01-73 F1280

INPUT		ZCORR		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
12.19	40.00	12.19	40.00	19128.0	6.775
15.24	50.00	15.24	50.00	19151.0	6.747
18.29	60.00	18.29	60.00	19123.0	6.761
21.34	70.00	21.34	70.00	19023.0	6.901
24.38	80.00	24.38	80.00	18958.0	6.980
27.43	90.00	27.43	90.00	19045.0	6.875
30.48	100.00	30.48	100.00	19161.0	6.735
33.53	110.00	33.53	110.00	19260.0	6.617
36.58	120.00	36.58	120.00	19306.0	6.562
39.62	130.00	39.62	130.00	19352.0	6.508
42.67	140.00	42.67	140.00	19443.0	6.400
45.72	150.00	45.72	150.00	19493.0	6.342
48.77	160.00	48.77	160.00	19523.0	6.306
51.82	170.00	51.82	170.00	19555.0	6.269
54.86	180.00	54.86	180.00	19603.0	6.213
57.91	190.00	57.91	190.00	19697.0	6.103
60.96	200.00	60.96	200.00	19778.0	6.010
64.01	210.00	64.01	210.00	19805.0	5.979
67.06	220.00	67.06	220.00	19822.0	5.959
70.10	230.00	70.10	230.00	19815.0	5.967
73.15	240.00	73.15	240.00	19816.0	5.966
76.20	250.00	76.20	250.00	19821.0	5.960
79.25	260.00	79.25	260.00	19822.0	5.959
82.30	270.00	82.30	270.00	19822.0	5.959
85.34	280.00	85.34	280.00	19821.0	5.960
88.39	290.00	88.39	290.00	19821.0	5.960
91.44	300.00	91.44	300.00	19817.0	5.965
97.54	320.00	97.54	310.00	19819.0	5.962
97.54	320.00	97.54	320.00	19815.0	5.967
100.58	330.00	100.58	330.00	19806.0	5.977
103.63	340.00	103.63	340.00	19671.0	6.134
106.68	350.00	106.68	350.00	19533.0	6.295
109.73	360.00	109.73	360.00	19461.0	6.379
112.78	370.00	112.78	370.00	19407.0	6.443
115.82	380.00	115.82	380.00	19244.0	6.636
118.87	390.00	118.87	390.00	19094.0	6.816
121.92	400.00	121.92	400.00	18902.0	7.048
124.97	410.00	124.97	410.00	18684.0	7.315
128.02	420.00	128.02	420.00	18427.0	7.634
131.06	430.00	131.06	430.00	18322.0	7.766
134.11	440.00	134.11	440.00	18152.0	7.981
137.16	450.00	137.16	450.00	17995.0	8.162
140.21	460.00	140.21	460.00	17824.0	8.403
143.26	470.00	143.26	470.00	17650.0	8.631
146.30	480.00	146.30	480.00	17504.0	8.824
149.35	490.00	149.35	490.00	17385.0	8.982
152.40	500.00	152.40	500.00	17217.0	9.208
155.45	510.00	155.45	510.00	17037.0	9.453
158.50	520.00	158.50	520.00	16845.0	9.718
161.54	530.00	161.54	530.00	16703.0	9.916
164.59	540.00	164.59	540.00	16548.0	10.134
167.64	550.00	167.64	550.00	16387.0	10.363
170.69	560.00	170.69	560.00	16225.0	10.596
173.74	570.00	173.74	570.00	16103.0	10.774
176.78	580.00	176.78	580.00	16009.0	10.912
179.83	590.00	179.83	590.00	15852.0	11.144
182.88	600.00	182.88	600.00	15714.0	11.350
185.93	610.00	185.93	610.00	15558.0	11.566
188.98	620.00	188.98	620.00	15404.0	11.821

Table 2. Conductivities from DC-1

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
DMC-1	142.	F	TRACHYANDESITE	3.99	2.80	5.0	
DMC-1	167.	F	TRACHYANDESITE	4.08	2.82	4.1	
DMC-1	191.5	F	TRACHYANDESITE	4.09	2.80	4.7	
DMC-1	207.	F	TRACHYANDESITE	4.19	2.77	4.7	
DMC-1	253.5	F	TRACHYANDESITE	4.11	2.78	6.2	
DMC-1	265.5	F	TRACHYANDESITE	3.98	2.80	5.6	
DMC-1	272.	F	TRACHYANDESITE	4.24	2.79	5.6	
DMC-1	283.3	F	TRACHYANDESITE	4.00	2.81	5.3	
DMC-1	293.	F	TRACHYANDESITE	4.40	2.80	5.5	
DMC-1	326.	F	TRACHYANDESITE	3.57	2.60	6.4	
DMC-1	333.	F	TRACHYANDESITE	4.16	2.64	4.7	
DMC-1	537.	F	CLAY	2.37		N.P.	
DMC-1	540.	F	SAND	1.89		N.P.	
DMC-1	577.	F	SAND	2.26		N.P.	
DMC-1	594.	F	SAND	2.02		N.P.	
DMC-1	594.	F	SAND	1.84		N.P.	
DMC-1	603.	F	SAND	1.40		N.P.	
DMC-1	606.	F	PUM. SED.	1.47		N.P.	
DMC-1	607.	F	PUM. SED.	1.30		N.P.	
DMC-1	617.	F	PUM. SED.	2.04		N.P.	
DMC-1	618.	F	SAND	1.53		N.P.	
DMC-1	625.	F	SAND	1.73		N.P.	
DMC-1	627.	F	PUMICE TUFF	1.11		N.P.	
DMC-1	629.	F	PUMICE TUFF	1.67		N.P.	
DMC-1	631.	F	PUMICE TUFF	1.55		N.P.	
DMC-1	634.	F	PUMICE TUFF	1.47		N.P.	
DMC-1	637.	F	PUMICE TUFF	0.95		N.P.	

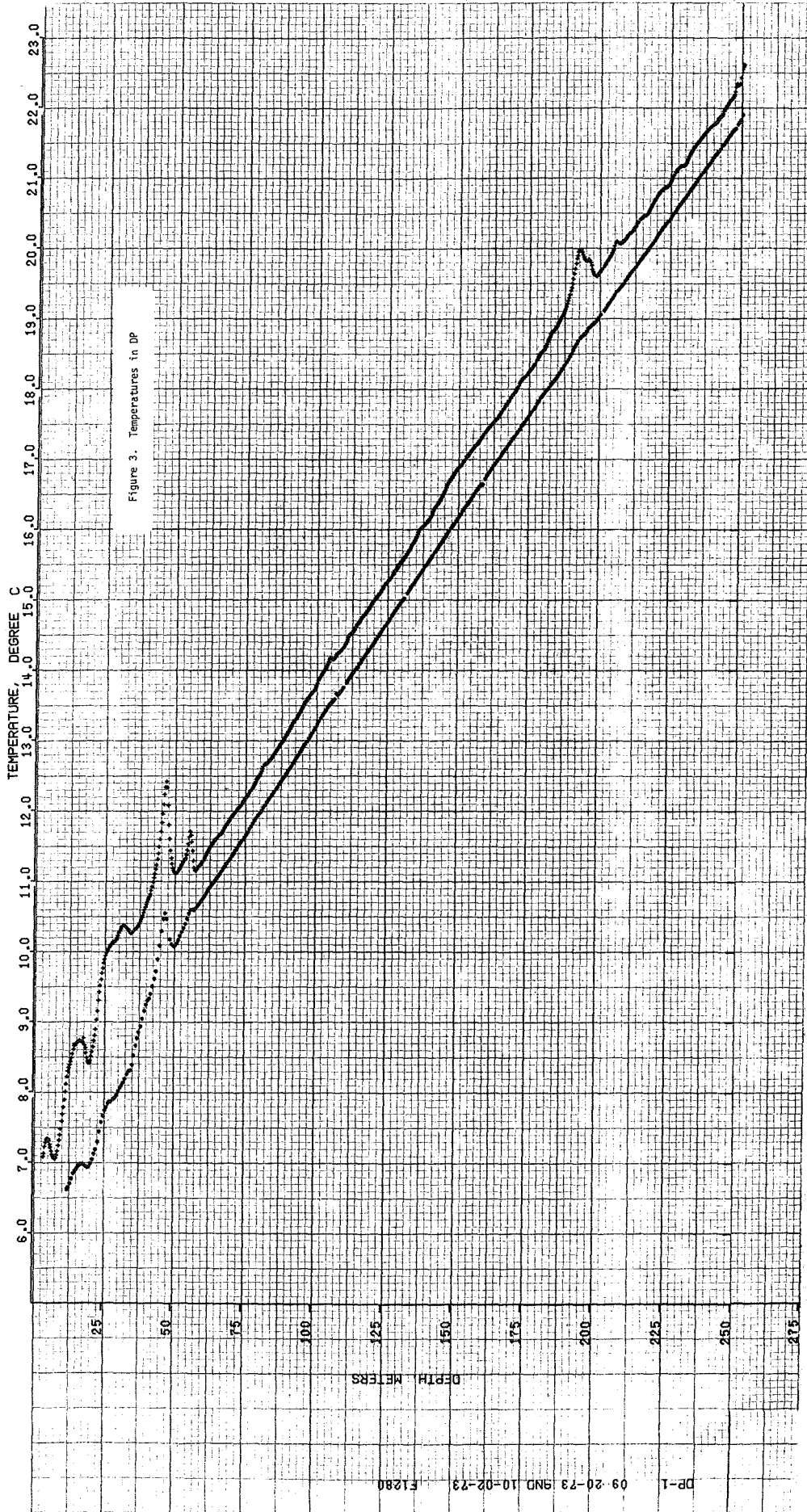


Table 3. Temperatures in DP

DP-1 09-20-73 F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
6.10	20.00	6.10	20.00	18731.0	7.257
12.19	40.00	12.19	40.00	17970.0	8.214
18.29	60.00	18.29	60.00	17620.0	8.670
24.38	80.00	24.38	80.00	16863.0	9.693
30.48	100.00	30.48	100.00	16453.0	10.269
36.58	120.00	36.58	120.00	16408.0	10.333
42.67	140.00	42.67	140.00	15956.0	10.990
48.77	160.00	48.77	160.00	15654.0	11.440
54.86	180.00	54.86	180.00	15654.0	11.440
60.96	200.00	60.96	200.00	15732.0	11.323
67.06	220.00	67.06	220.00	15499.0	11.675
73.15	240.00	73.15	240.00	15256.0	12.050
79.25	260.00	79.25	260.00	15007.0	12.440
85.34	280.00	85.34	280.00	14781.0	12.801
91.44	300.00	91.44	300.00	14534.0	13.203
97.54	320.00	97.54	320.00	14287.0	13.612
103.63	340.00	103.63	340.00	14037.0	14.035
109.73	360.00	109.73	360.00	13868.0	14.326
115.82	380.00	115.82	380.00	13634.0	14.735
121.92	400.00	121.92	400.00	13444.0	15.074
128.02	420.00	128.02	420.00	13251.0	15.423
134.11	440.00	134.11	440.00	13046.0	15.801
140.21	460.00	140.21	460.00	12853.0	16.163
146.30	480.00	146.30	480.00	12612.0	16.623
152.40	500.00	152.40	500.00	12427.0	16.984
158.50	520.00	158.50	520.00	12264.0	17.306
164.59	540.00	164.59	540.00	12115.0	17.606
170.69	560.00	170.69	560.00	11935.8	17.971
176.78	580.00	176.78	580.00	11766.3	18.323
182.88	600.00	182.88	600.00	11551.2	18.778
188.98	620.00	188.98	620.00	11331.0	19.253
195.07	640.00	195.07	640.00	11067.8	19.836
201.17	660.00	201.17	660.00	11121.8	19.715
207.26	680.00	207.26	680.00	10961.0	20.077
213.36	700.00	213.36	700.00	10839.9	20.354
219.46	720.00	219.46	720.00	10698.3	20.682
225.55	740.00	225.55	740.00	10571.3	20.980
231.65	760.00	231.65	760.00	10433.7	21.308
237.74	780.00	237.74	780.00	10287.2	21.663
243.84	800.00	243.84	800.00	10166.5	21.959
249.94	820.00	249.94	820.00	9975.5	22.437
251.16	824.00	251.16	824.00	9910.1	22.603

Table 4. Temperatures in DP

USGS DP-1		10-02-73		F1280			
----- INPUT -----		----- ZCORR -----					
Z METERS	Z FEET	Z METERS	Z FEET	RESISTANCE	TEMPERATURE		
12.19	40.00	12.19	40.00	19255.0	6.623		
15.24	50.00	15.24	50.00	19037.0	6.884		
18.29	60.00	18.29	60.00	18960.0	6.977		
24.38	80.00	24.38	80.00	18480.0	7.568		
27.43	90.00	27.43	90.00	18298.0	7.796		
30.48	100.00	30.48	100.00	18121.0	8.021		
33.53	110.00	33.53	110.00	17943.0	8.249		
39.62	130.00	39.62	130.00	17260.0	9.150		
42.67	140.00	42.67	140.00	17002.0	9.501		
48.77	160.00	48.77	160.00	16527.0	10.164		
51.82	170.00	51.82	170.00	16523.0	10.169		
54.86	180.00	54.86	180.00	16318.0	10.462		
57.91	190.00	57.91	190.00	16205.0	10.625		
60.96	200.00	60.96	200.00	16096.0	10.784		
64.01	210.00	64.01	210.00	15967.0	10.973		
67.06	220.00	67.06	220.00	15853.0	11.142		
70.10	230.00	70.10	230.00	15735.0	11.318		
73.15	240.00	73.15	240.00	15611.0	11.505		
76.20	250.00	76.20	250.00	15488.0	11.692		
79.25	260.00	79.25	260.00	15357.0	11.893		
82.30	270.00	82.30	270.00	15234.0	12.084		
85.34	280.00	85.34	280.00	15121.0	12.260		
88.39	290.00	88.39	290.00	15005.0	12.443		
91.44	300.00	91.44	300.00	14885.0	12.634		
94.49	310.00	94.49	310.00	14769.0	12.820		
97.54	320.00	97.54	320.00	14644.0	13.023		
100.58	330.00	100.58	330.00	14516.0	13.232		
103.63	340.00	103.63	340.00	14398.0	13.427		
106.68	350.00	106.68	350.00	14300.0	13.590		
109.73	360.00	109.73	360.00	14205.0	13.750		
112.78	370.00	112.78	370.00	14098.0	13.931		
115.82	380.00	115.82	380.00	13991.0	14.114		
118.87	390.00	118.87	390.00	13883.0	14.300		
121.92	400.00	121.92	400.00	13779.0	14.481		
124.97	410.00	124.97	410.00	13675.0	14.663		
128.02	420.00	128.02	420.00	13571.0	14.847		
131.06	430.00	131.06	430.00	13469.0	15.029		
134.11	440.00	134.11	440.00	13368.0	15.211		
137.16	450.00	137.16	450.00	13267.0	15.394		
140.21	460.00	140.21	460.00	13172.0	15.568		
143.26	470.00	143.26	470.00	13074.0	15.749		
146.30	480.00	146.30	480.00	12973.0	15.937		
149.35	490.00	149.35	490.00	12874.0	16.123		
152.40	500.00	152.40	500.00	12781.0	16.299		
155.45	510.00	155.45	510.00	12690.0	16.473		
158.50	520.00	158.50	520.00	12598.0	16.650		
161.54	530.00	161.54	530.00	12505.0	16.831		
164.59	540.00	164.59	540.00	12416.0	17.005		
167.64	550.00	167.64	550.00	12326.0	17.183		
170.69	560.00	170.69	560.00	12241.0	17.352		
173.74	570.00	173.74	570.00	12152.0	17.531		
176.78	580.00	176.78	580.00	12066.0	17.705		
179.83	590.00	179.83	590.00	11972.0	17.897		
182.88	600.00	182.88	600.00	11887.0	18.072		
185.93	610.00	185.93	610.00	11814.0	18.223		
188.98	620.00	188.98	620.00	11723.0	18.414		
192.02	630.00	192.02	630.00	11613.0	18.646		

Table 4. Temperatures in DP (continued)

Z METERS	Z FEET	Z METERS	Z FEET	RESISTANCE	TEMPERATURE
195.07	640.00	195.07	640.00	11546.0	18.789
198.12	650.00	198.12	650.00	11482.0	18.926
201.17	660.00	201.17	660.00	11406.0	19.090
204.22	670.00	204.22	670.00	11326.0	19.264
207.26	680.00	207.26	680.00	11249.0	19.433
210.31	690.00	210.31	690.00	11172.0	19.603
213.36	700.00	213.36	700.00	11095.0	19.775
216.41	710.00	216.41	710.00	11019.0	19.946
219.46	720.00	219.46	720.00	10946.0	20.111
222.50	730.00	222.50	730.00	10867.0	20.291
225.55	740.00	225.55	740.00	10794.0	20.459
228.60	750.00	228.60	750.00	10718.0	20.636
231.65	760.00	231.65	760.00	10647.0	20.802
234.70	770.00	234.70	770.00	10573.0	20.976
237.74	780.00	237.74	780.00	10500.0	21.149
240.79	790.00	240.79	790.00	10432.0	21.312
243.84	800.00	243.84	800.00	10360.0	21.486
246.89	810.00	246.89	810.00	10290.0	21.656
249.94	820.00	249.94	820.00	10220.0	21.827

Table 5. Conductivities from DP

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
DP-1	209.	F	GRANITE	7.41	2.61	0.8	
DP-1	232.	F	GRANITE	7.34	2.62	1.0	
DP-1	255.	F	GRANITE	6.84	2.61	1.2	
DP-1	277.	F	GRANITE	7.28	2.62	0.8	
DP-1	298.	F	GRANITE	7.38	2.61	1.1	
DP-1	323.	F	GRANITE	6.94	2.61	1.0	
DP-1	336.	F	GRANITE	7.16	2.62	1.0	
DP-1	359.	F	GRANITE	8.00	2.62	0.9	
DP-1	382.	F	GRANITE	7.14	2.62	0.9	
DP-1	406.	F	GRANITE	7.12	2.62	0.8	
DP-1	420.	F	GRANITE	7.74	2.62	1.1	
DP-1	439.	F	GRANITE	7.46	2.62	0.9	
DP-1	460.	F	GRANITE	7.37	2.61	1.1	
DP-1	480.	F	GRANITE	7.58	2.60	1.2	
DP-1	501.	F	GRANITE	6.66	2.59	1.5	
DP-1	521.	F	GRANITE	8.26	2.62	1.2	
DP-1	540.	F	GRANITE	6.01	2.60	1.2	
DP-1	560.	F	GRANITE	7.04	2.60	1.1	
DP-1	580.	F	GRANITE	7.01	2.61	1.2	
DP-1	600.	F	GRANITE	8.14	2.60	1.1	
DP-1	620.	F	GRANITE	7.66	2.59	1.3	
DP-1	639.	F	GRANITE	7.58	2.59	1.1	
DP-1	660.	F	GRANITE	7.13	2.61	1.1	
DP-1	682.	F	GRANITE	8.43	2.59	1.4	
DP-1	700.	F	GRANITE	7.29	2.62	0.9	
DP-1	720.	F	GRANITE	6.95	2.61	1.0	
DP-1	740.	F	GRANITE	7.63	2.60	1.0	
DP-1	760.	F	GRANITE	7.08	2.60	1.0	
DP-1	780.	F	GRANITE	7.00	2.61	1.0	
DP-1	800.	F	GRANITE	7.24	2.61	1.0	
DP-1	830.	F	GRANITE	7.39	2.61	1.1	

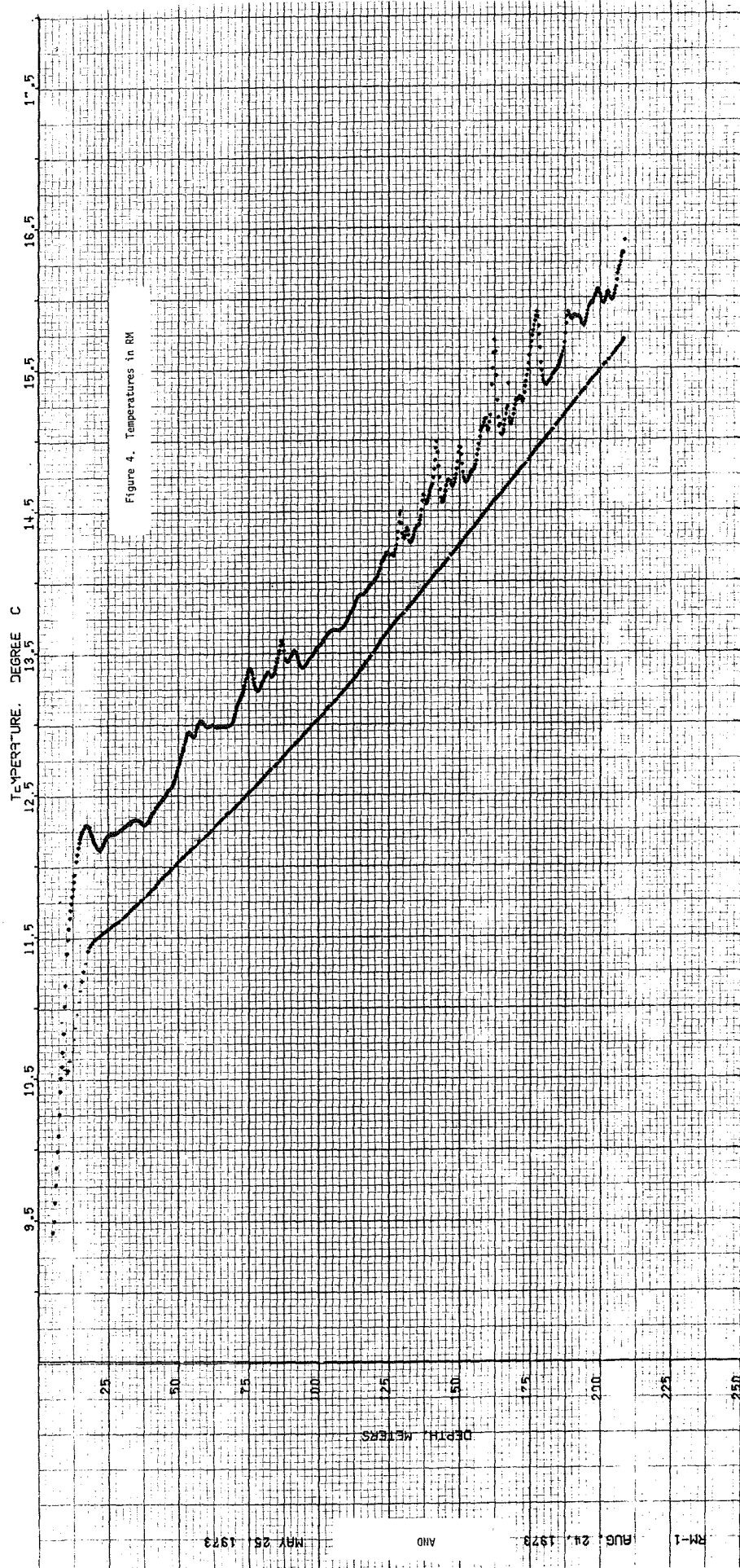


Table 6. Temperatures in RM

JSGS RM-1

05-25-73 80 F1247

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
18.29	60.00	18.29	60.00	16280.0	13.018
24.38	80.00	24.38	80.00	16845.0	12.201
30.48	100.00	30.48	100.00	16795.0	12.272
36.58	120.00	36.58	120.00	16777.0	12.298
42.67	140.00	42.67	140.00	16684.0	12.431
48.77	160.00	48.77	160.00	16549.0	12.625
54.86	180.00	54.86	180.00	16355.0	12.908
60.96	200.00	60.96	200.00	16304.0	12.983
67.06	220.00	67.06	220.00	16305.0	12.981
73.15	240.00	73.15	240.00	16113.0	13.266
79.25	260.00	79.25	260.00	16106.0	13.276
85.34	280.00	85.34	280.00	15961.0	13.494
91.44	300.00	91.44	300.00	15960.0	13.496
97.54	320.00	97.54	320.00	15960.0	13.496
103.63	340.00	103.63	340.00	15865.0	13.639
109.73	360.00	109.73	360.00	15819.0	13.709
115.82	380.00	115.82	380.00	15689.0	13.908
121.92	400.00	121.92	400.00	15553.0	14.119
128.02	420.00	128.02	420.00	15407.0	14.347
134.11	440.00	134.11	440.00	15389.0	14.375
140.21	460.00	140.21	460.00	15190.0	14.690
146.30	480.00	146.30	480.00	15180.0	14.706
152.40	500.00	152.40	500.00	15179.0	14.708
158.50	520.00	158.50	520.00	14925.0	15.118
164.59	540.00	164.59	540.00	14978.0	15.031
170.69	560.00	170.69	560.00	14817.0	15.294
176.78	580.00	176.78	580.00	14470.0	15.872
182.88	600.00	182.88	600.00	14717.0	15.459
188.98	620.00	188.98	620.00	14470.0	15.872
195.07	640.00	195.07	640.00	14460.0	15.889
201.17	660.00	201.17	660.00	14415.0	15.965
207.26	680.00	207.26	680.00	14226.0	16.288
208.18	683.00	208.18	683.00	14073.0	16.552

Table 7. Temperatures in RM

JSGS RM-1

08-24-73

80 F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
12.19	40.00	12.19	40.00	16104.0	10.772
18.29	60.00	18.29	60.00	15670.0	11.416
24.38	80.00	24.38	80.00	15593.0	11.532
30.48	100.00	30.48	100.00	15530.0	11.628
36.58	120.00	36.58	120.00	15452.0	11.747
42.67	140.00	42.67	140.00	15375.0	11.865
48.77	160.00	48.77	160.00	15293.0	11.992
54.86	180.00	54.86	180.00	15218.0	12.109
60.96	200.00	60.96	200.00	15147.0	12.220
67.06	220.00	67.06	220.00	15068.0	12.344
73.15	240.00	73.15	240.00	14995.0	12.459
79.25	260.00	79.25	260.00	14904.0	12.604
85.34	280.00	85.34	280.00	14810.0	12.754
91.44	300.00	91.44	300.00	14747.0	12.856
103.63	340.00	103.63	340.00	14586.0	13.117
109.73	360.00	109.73	360.00	14506.0	13.249
115.82	380.00	115.82	380.00	14417.0	13.396
121.92	400.00	121.92	400.00	14312.0	13.570
128.02	420.00	128.02	420.00	14226.0	13.715
140.21	460.00	140.21	460.00	14056.0	14.003
146.30	480.00	146.30	480.00	13966.0	14.157
152.40	500.00	152.40	500.00	13883.0	14.300
167.64	550.00	167.64	550.00	13707.0	14.607
164.59	540.00	164.59	540.00	13620.0	14.760
176.78	580.00	176.78	580.00	13537.0	14.908
182.88	600.00	182.88	600.00	13656.0	14.697
188.98	620.00	188.98	620.00	13370.0	15.207
195.07	640.00	195.07	640.00	13285.0	15.361
201.17	660.00	201.17	660.00	13206.0	15.506
207.26	680.00	207.26	680.00	13123.0	15.658

Table 8. Conductivities from RM

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
RM-1	213.	F	GRANITE	7.85	2.62	1.3	
RM-1	213.	F	GRANITE	8.08	2.62	0.8	
RM-1	302.	F	GRANITE	8.01	2.65	0.6	
RM-1	302.	F	GRANITE	8.16	2.65	0.4	
RM-1	334.	F	GRANITE	6.71	2.60	2.2	
RM-1	334.	F	GRANITE	7.08	2.60	1.6	
RM-1	365.	F	GRANITE	8.14	2.58	2.6	
RM-1	365.	F	GRANITE	7.69	2.58	1.9	
RM-1	384.	F	DIKE	5.53	2.87	0.8	
RM-1	384.	F	DIKE	5.53	2.87	0.4	
RM-1	417.	F	GRANITE	8.20	2.64	1.1	
RM-1	417.	F	GRANITE	7.90	2.65	0.6	
RM-1	440.	F	GRANITE	6.87	2.56	3.5	
RM-1	440.	F	GRANITE	6.91	2.56	2.0	
RM-1	471.	F	GRANITE	7.93	2.63	1.7	
RM-1	471.	F	GRANITE	7.72	2.63	0.9	
RM-1	496.	F	GRANITE	8.06	2.65	0.4	
RM-1	506.	F	GRANITE	7.87	2.65	0.4	
RM-1	512.	F	GRANITE	8.26	2.64	0.4	
RM-1	525.	F	GRANITE	8.21	2.65	0.3	
RM-1	536.	F	GRANITE	8.04	2.64	0.2	
RM-1	546.	F	GRANITE	7.90	2.64	0.2	
RM-1	556.	F	GRANITE	8.06	2.64	0.3	
RM-1	565.	F	GRANITE	7.73	2.63	0.5	
RM-1	576.	F	GRANITE	7.94	2.64	0.6	
RM-1	590.	F	GRANITE	8.22	2.64	0.2	
RM-1	600.	F	GRANITE	8.02	2.66	0.2	
RM-1	610.	F	GRANITE	8.14	2.71	0.2	
RM-1	623.	F	GRANITE	5.42	2.75	0.4	
RM-1	632.	F	GRANITE	7.85	2.65	0.3	
RM-1	643.	F	GRANITE	8.26	2.62	0.4	
RM-1	652.5	F	GRANITE	9.50	2.33	0.2	
RM-1	660.	F	GRANITE	8.27	2.63	0.2	
RM-1	670.	F	GRANITE	8.36	2.63	0.2	
RM-1	680.	F	GRANITE	7.76	2.62	0.6	
RM-1	687.	F	GRANITE	8.46	2.63	0.3	

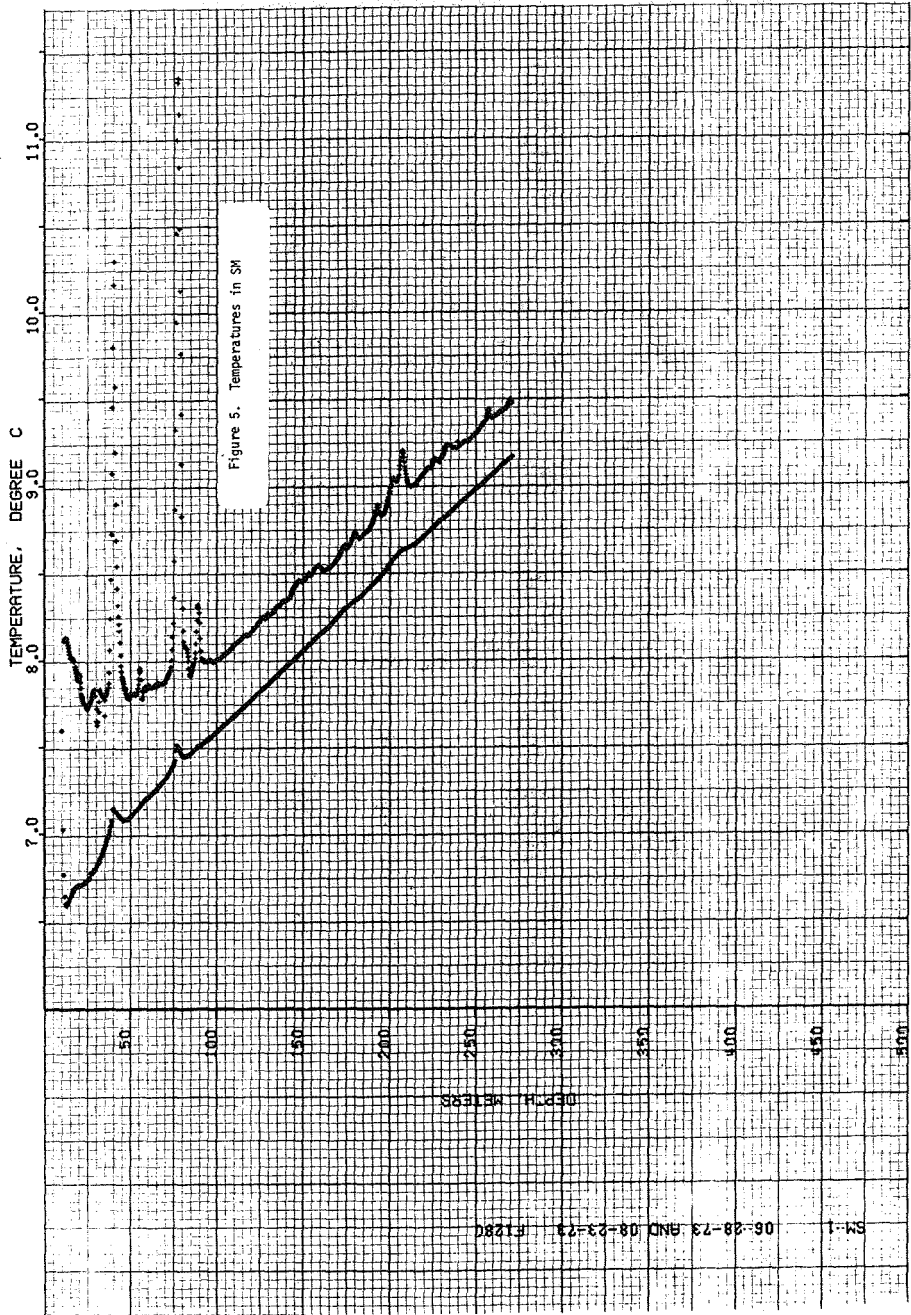


Table 9. Temperatures in SM

USGS SAGEHEN-1 06-28-73 80 F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
30.48	100.00	30.48	100.00	18415.0	7.649
36.58	120.00	36.58	120.00	18273.0	7.828
42.67	140.00	42.67	140.00	17888.0	8.320
48.77	160.00	48.77	160.00	18312.0	7.778
54.86	180.00	54.86	180.00	18221.0	7.893
60.96	200.00	60.96	200.00	18250.0	7.857
67.06	220.00	67.06	220.00	18245.0	7.863
73.15	240.00	73.15	240.00	18182.0	7.943
79.25	260.00	79.25	260.00	17148.0	9.302
85.34	280.00	85.34	280.00	18198.0	7.923
91.44	300.00	91.44	300.00	18127.0	8.013
97.54	320.00	97.54	320.00	18142.0	7.994
103.63	340.00	103.63	340.00	18116.0	8.027
109.73	360.00	109.73	360.00	18071.0	8.084
115.82	380.00	115.82	380.00	18026.0	8.142
121.92	400.00	121.92	400.00	17994.0	8.183
128.02	420.00	128.02	420.00	17951.0	8.239
134.11	440.00	134.11	440.00	17907.0	8.295
140.21	460.00	140.21	460.00	17871.0	8.342
146.30	480.00	146.30	480.00	17797.0	8.438
152.40	500.00	152.40	500.00	17765.0	8.480
158.50	520.00	158.50	520.00	17722.0	8.536
164.59	540.00	164.59	540.00	17734.0	8.521
170.69	560.00	170.69	560.00	17681.0	8.590
176.78	580.00	176.78	580.00	17633.0	8.653
182.88	600.00	182.88	600.00	17600.0	8.697
188.98	620.00	188.98	620.00	17555.0	8.756
195.07	640.00	195.07	640.00	17502.0	8.826
201.17	660.00	201.17	660.00	17357.0	9.020
207.26	680.00	207.26	680.00	17228.0	9.193
213.36	700.00	213.36	700.00	17377.0	8.993
219.46	720.00	219.46	720.00	17327.0	9.060
225.55	740.00	225.55	740.00	17270.0	9.137
231.65	760.00	231.65	760.00	17226.0	9.196
237.74	780.00	237.74	780.00	17214.0	9.212
243.84	800.00	243.84	800.00	17186.0	9.250
249.94	820.00	249.94	820.00	17159.0	9.287
256.03	840.00	256.03	840.00	17091.0	9.379
262.13	860.00	262.13	860.00	17076.0	9.400
268.22	880.00	268.22	880.00	17040.0	9.449

Table 10. Temperatures in SM

USGS SM-1

08-23-73

F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
12.19	40.00	12.19	40.00	19270.0	6.605
15.24	50.00	15.24	50.00	19237.0	6.644
18.29	60.00	18.29	60.00	19195.0	6.695
21.34	70.00	21.34	70.00	19184.0	6.708
24.38	80.00	24.38	80.00	19168.0	6.727
27.43	90.00	27.43	90.00	19136.0	6.765
30.48	100.00	30.48	100.00	19097.0	6.812
33.53	110.00	33.53	110.00	18960.0	6.977
42.67	140.00	42.67	140.00	18850.0	7.111
48.77	160.00	48.77	160.00	18870.0	7.087
60.96	200.00	60.96	200.00	18766.0	7.214
67.06	220.00	67.06	220.00	18716.0	7.275
73.15	240.00	73.15	240.00	18650.0	7.357
79.25	260.00	79.25	260.00	18570.0	7.456
85.34	280.00	85.34	280.00	18568.0	7.458
91.44	300.00	91.44	300.00	18525.0	7.511
97.54	320.00	97.54	320.00	18487.0	7.559
103.63	340.00	103.63	340.00	18430.0	7.630
109.73	360.00	109.73	360.00	18398.0	7.670
115.82	380.00	115.82	380.00	18348.0	7.733
121.92	400.00	121.92	400.00	18307.0	7.785
128.02	420.00	128.02	420.00	18261.0	7.843
134.11	440.00	134.11	440.00	18215.0	7.901
140.21	460.00	140.21	460.00	18170.0	7.958
146.30	480.00	146.30	480.00	18124.0	8.017
152.40	500.00	152.40	500.00	18079.0	8.074
158.50	520.00	158.50	520.00	18033.0	8.133
164.59	540.00	164.59	540.00	17990.0	8.188
170.69	560.00	170.69	560.00	17916.0	8.284
176.78	580.00	176.78	580.00	17893.0	8.314
182.88	600.00	182.88	600.00	17855.0	8.363
188.98	620.00	188.98	620.00	17815.0	8.415
195.07	640.00	195.07	640.00	17763.0	8.483
201.17	660.00	201.17	660.00	17701.0	8.564
207.26	680.00	207.26	680.00	17657.0	8.621
213.36	700.00	213.36	700.00	17633.0	8.653
219.46	720.00	219.46	720.00	17596.0	8.702
225.55	740.00	225.55	740.00	17554.0	8.757
231.65	760.00	231.65	760.00	17512.0	8.813
237.74	780.00	237.74	780.00	17470.0	8.869
243.84	800.00	243.84	800.00	17432.0	8.919
249.94	820.00	249.94	820.00	17390.0	8.976
256.03	840.00	256.03	840.00	17349.0	9.030
262.13	860.00	262.13	860.00	17309.0	9.084
268.22	880.00	268.22	880.00	17268.0	9.139
270.72	888.20	270.72	888.20	17252.0	9.161

Table 11. Conductivities from SM.

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
SM-1	284.	F	GRANITE	8.34	2.65	0.6	
SM-1	328.	F	GRANITE	7.76	2.67	1.2	
SM-1	378.	F	GRANITE	8.21	2.66	0.5	
SM-1	416.	F	GRANITE	7.84	2.68	0.4	
SM-1	453.	F	GRANITE	7.5H	2.68	0.5	
SM-1	504.	F	GRANITE	7.45	2.64	0.4	
SM-1	570.	F	GRANITE	7.06	2.67	0.4	
SM-1	649.	F	GRANITE	7.90	2.68	0.4	
SM-1	727.	F	GRANITE	7.76	2.67	0.4	
SM-1	795.	F	GRANITE	7.66	2.67	0.5	
SM-1	851.	F	GRANITE	7.80	2.68	0.3	
SM-1	893.	F	GRANITE	7.48	2.67	0.3	

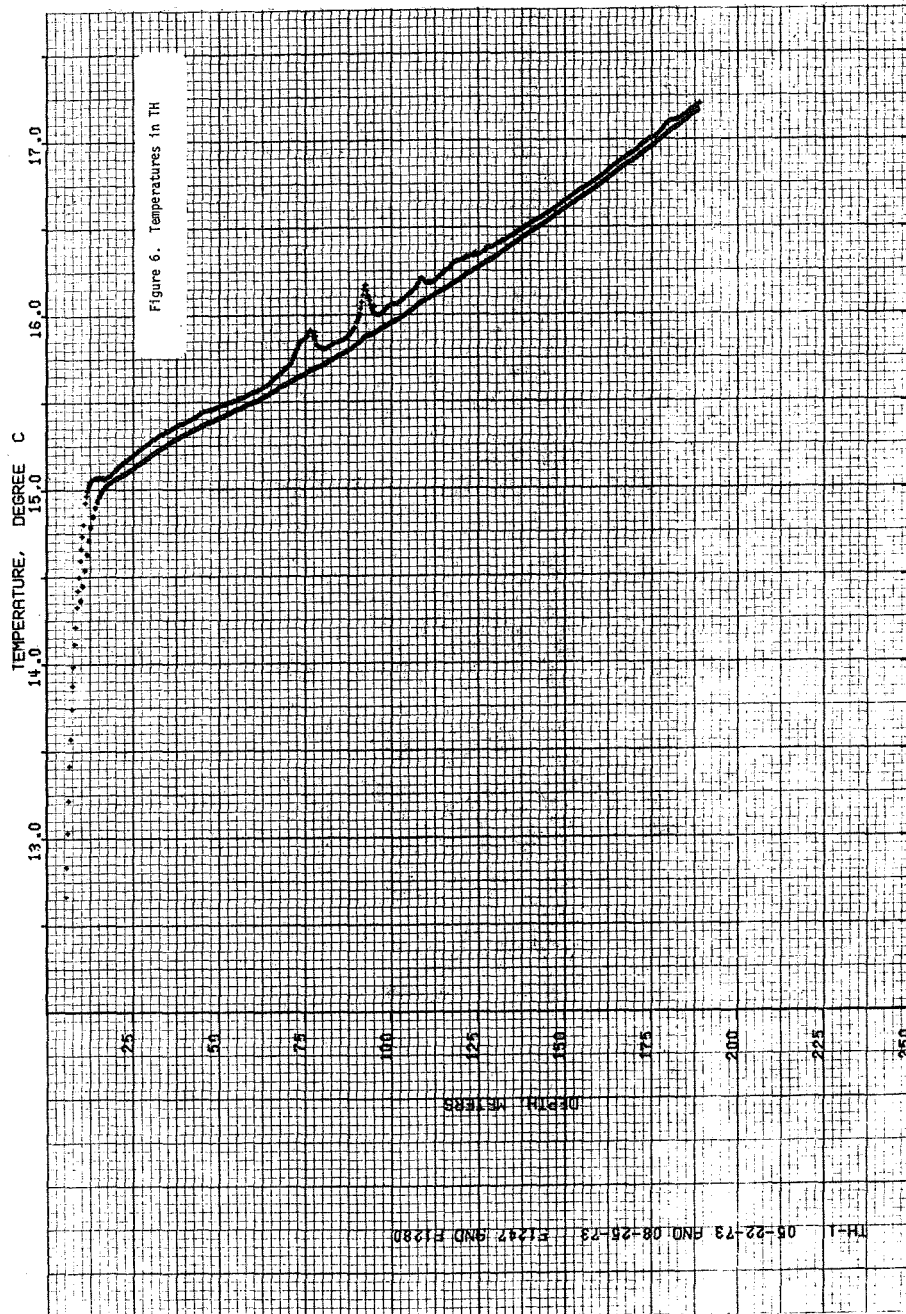


Table 12. Temperatures in TH

USGS TH-1

05-22-73 80 F1247

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
30.48	100.00	30.48	100.00	14824.0	15.283
36.58	120.00	36.58	120.00	14779.0	15.357
42.67	140.00	42.67	140.00	14745.0	15.413
48.77	160.00	48.77	160.00	14710.0	15.471
54.86	180.00	54.86	180.00	14684.0	15.514
60.96	200.00	60.96	200.00	14650.0	15.570
67.06	220.00	67.06	220.00	14600.0	15.654
73.15	240.00	73.15	240.00	14499.0	15.823
79.25	260.00	79.25	260.00	14505.0	15.813
85.34	280.00	85.34	280.00	14482.0	15.852
91.44	300.00	91.44	300.00	14350.0	16.075
97.54	320.00	97.54	320.00	14388.0	16.011
103.63	340.00	103.63	340.00	14340.0	16.092
109.73	360.00	109.73	360.00	14284.0	16.188
115.82	380.00	115.82	380.00	14244.0	16.257
121.92	400.00	121.92	400.00	14202.0	16.329
128.02	420.00	128.02	420.00	14167.0	16.389
134.11	440.00	134.11	440.00	14134.0	16.446
140.21	460.00	140.21	460.00	14090.0	16.523
146.30	480.00	146.30	480.00	14045.0	16.601
152.40	500.00	152.40	500.00	13997.0	16.685
158.50	520.00	158.50	520.00	13948.0	16.771
164.59	540.00	164.59	540.00	13898.0	16.859
167.64	550.00	167.64	550.00	13872.0	16.905
170.69	560.00	170.69	560.00	13849.0	16.946
173.74	570.00	173.74	570.00	13820.0	16.998
176.78	580.00	176.78	580.00	13795.0	17.042
179.83	590.00	179.83	590.00	13767.0	17.092
182.88	600.00	182.88	600.00	13745.0	17.132
185.93	610.00	185.93	610.00	13728.0	17.162
188.70	619.10	188.70	619.10	13698.0	17.216

Table 13. Temperatures in TH

USGS TH-1 08-25-73 80 F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
12.19	40.00	12.19	40.00	13621.0	14.758
18.29	60.00	18.29	60.00	13463.0	15.040
24.38	80.00	24.38	80.00	13421.0	15.115
30.48	100.00	30.48	100.00	13373.0	15.202
36.58	120.00	36.58	120.00	13329.0	15.281
42.67	140.00	42.67	140.00	13294.0	15.345
48.77	160.00	48.77	160.00	13263.0	15.401
54.86	180.00	54.86	180.00	13234.0	15.454
60.96	200.00	60.96	200.00	13204.0	15.509
67.06	220.00	67.06	220.00	13167.0	15.577
73.15	240.00	73.15	240.00	13127.0	15.651
79.25	260.00	79.25	260.00	13097.0	15.706
91.44	300.00	91.44	300.00	13016.0	15.857
97.54	320.00	97.54	320.00	12982.0	15.920
103.63	340.00	103.63	340.00	12941.0	15.997
109.73	360.00	109.73	360.00	12897.0	16.080
115.82	380.00	115.82	380.00	12856.0	16.157
121.92	400.00	121.92	400.00	12815.0	16.235
128.02	420.00	128.02	420.00	12776.0	16.309
134.11	440.00	134.11	440.00	12732.0	16.393
140.21	460.00	140.21	460.00	12689.0	16.475
152.40	500.00	152.40	500.00	12602.0	16.642
158.50	520.00	158.50	520.00	12558.0	16.728
164.59	540.00	164.59	540.00	12514.0	16.813
170.69	560.00	170.69	560.00	12469.0	16.901
176.78	580.00	176.78	580.00	12423.0	16.991

Table 14. Conductivities from TH

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
TH-1	431.	F	QUARTZ DIORITE	5.81	2.76	0.9	
TH-1	443.	F	QUARTZ DIORITE	5.76	2.74	1.0	
TH-1	452.	F	QUARTZ DIORITE	6.35	2.77	0.2	
TH-1	460.	F	QUARTZ DIORITE	6.19	2.79	0.4	
TH-1	470.	F	QUARTZ DIORITE	6.20	2.78	0.2	
TH-1	480.	F	QUARTZ DIORITE	6.31	2.77	0.2	
TH-1	490.	F	QUARTZ DIORITE	6.54	2.79	0.1	
TH-1	500.	F	QUARTZ DIORITE	6.27	2.75	0.3	
TH-1	510.	F	QUARTZ DIORITE	6.46	2.77	0.2	
TH-1	520.	F	QUARTZ DIORITE	6.51	2.77	0.1	
TH-1	530.	F	QUARTZ DIORITE	6.09	2.74	0.2	
TH-1	557.	F	QUARTZ DIORITE	6.15	2.77	0.2	
TH-1	567.	F	QUARTZ DIORITE	6.12	2.77	0.2	
TH-1	576.	F	QUARTZ DIORITE	6.66	2.76	0.2	
TH-1	587.	F	QUARTZ DIORITE	6.36	2.76	0.2	
TH-1	597.	F	QUARTZ DIORITE	6.48	2.74	0.6	
TH-1	606.	F	QUARTZ DIORITE	6.28	2.74	0.7	
TH-1	619.	F	QUARTZ DIORITE	6.68	2.76	0.1	

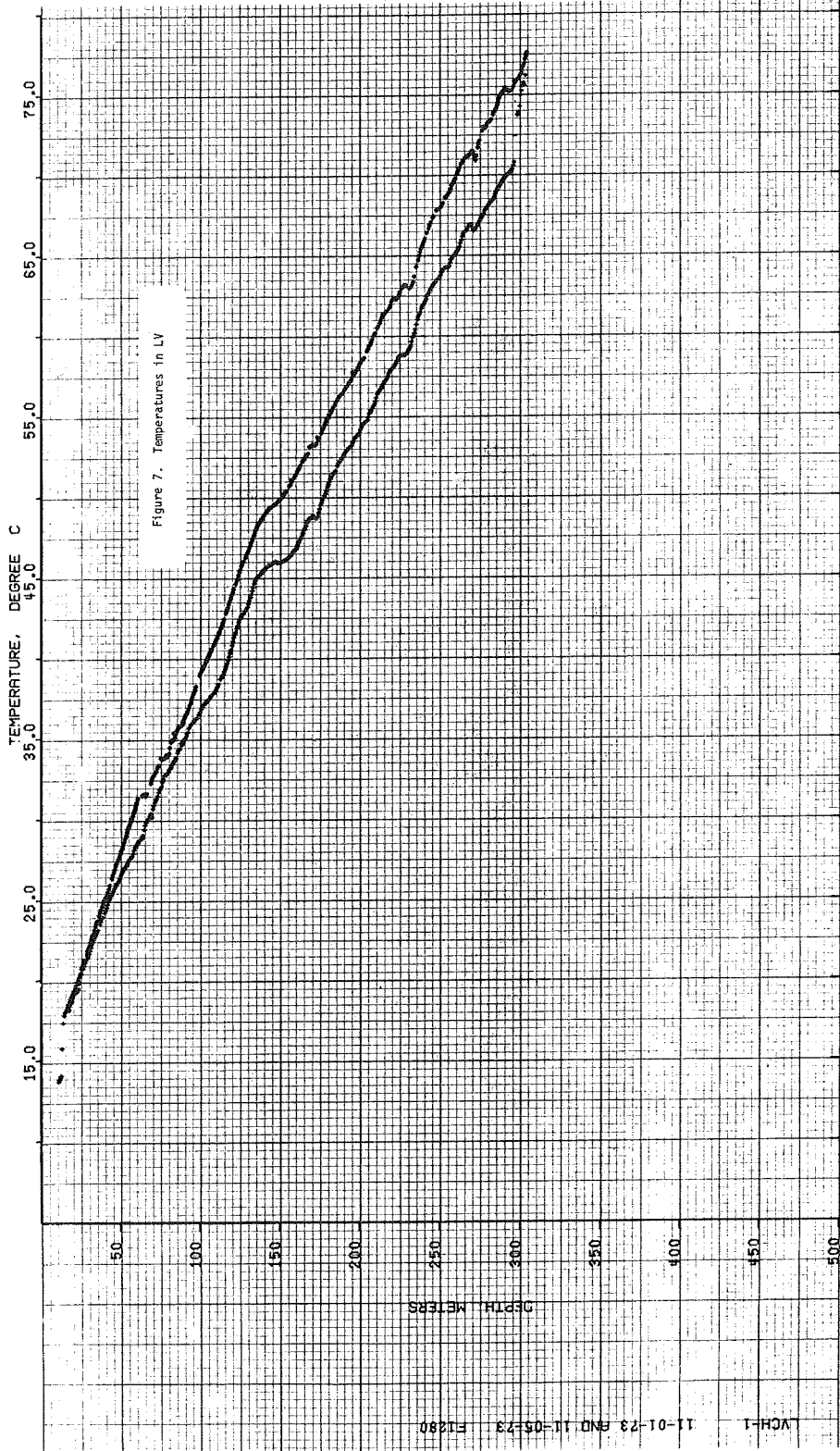


Table 15. Temperatures in LV

LVCH-1 11-01-73

F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
18.29	60.00	18.29	60.00	11541.0	18.799
24.38	80.00	24.38	80.00	10862.0	20.303
30.48	100.00	30.48	100.00	10244.0	21.768
36.58	120.00	36.58	120.00	9587.0	23.442
42.67	140.00	42.67	140.00	9013.0	25.016
54.86	180.00	54.86	180.00	8229.0	27.363
60.96	200.00	60.96	200.00	7864.0	28.545
73.15	240.00	73.15	240.00	7050.0	31.425
79.25	260.00	79.25	260.00	6687.0	32.836
85.34	280.00	85.34	280.00	6381.0	34.096
91.44	300.00	91.44	300.00	6117.0	35.240
97.54	320.00	97.54	320.00	5906.0	36.197
109.73	360.00	109.73	360.00	5541.0	37.948
115.82	380.00	115.82	380.00	5287.0	39.247
121.92	400.00	121.92	400.00	4902.0	41.359
128.02	420.00	128.02	420.00	4656.0	42.811
134.11	440.00	134.11	440.00	4383.0	44.529
140.21	460.00	140.21	460.00	4245.0	45.445
146.30	480.00	146.30	480.00	4175.0	45.923
152.40	500.00	152.40	500.00	4158.0	46.040
158.50	520.00	158.50	520.00	4080.0	46.586
164.59	540.00	164.59	540.00	3928.0	47.686
170.69	560.00	170.69	560.00	3776.0	48.836
176.78	580.00	176.78	580.00	3660.0	49.750
182.88	600.00	182.88	600.00	3471.0	51.315
188.98	620.00	188.98	620.00	3349.0	52.379
195.07	640.00	195.07	640.00	3263.0	53.156
201.17	660.00	201.17	660.00	3150.0	54.214
207.26	680.00	207.26	680.00	3040.0	55.287
213.36	700.00	213.36	700.00	2904.0	56.679
219.46	720.00	219.46	720.00	2798.0	57.817
225.55	740.00	225.55	740.00	2715.0	58.743
231.65	760.00	231.65	760.00	2675.0	59.202
237.74	780.00	237.74	780.00	2494.0	61.381
243.84	800.00	243.84	800.00	2388.0	62.745
249.94	820.00	249.94	820.00	2326.0	63.575
256.03	840.00	256.03	840.00	2276.0	64.264
262.13	860.00	262.13	860.00	2196.0	65.404
268.22	880.00	268.22	880.00	2103.0	66.791
274.32	900.00	274.32	900.00	2095.0	66.914
280.42	920.00	280.42	920.00	2023.0	68.044
286.51	940.00	286.51	940.00	1958.0	69.104
292.61	960.00	292.61	960.00	1903.0	70.034
298.70	980.00	298.70	980.00	1703.0	73.702
304.07	997.60	304.07	997.60	1550.0	76.865

Table 16. Temperatures in LV

LVCH-1

11-05-73

F1280

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
18.29	60.00	18.29	60.00	11672.0	18.521
24.38	80.00	24.38	80.00	10920.0	20.170
30.48	100.00	30.48	100.00	10707.0	20.661
36.58	120.00	36.58	120.00	9360.0	24.051
42.67	140.00	42.67	140.00	8760.0	25.747
48.77	160.00	48.77	160.00	8165.0	27.566
54.86	180.00	54.86	180.00	7620.0	29.371
60.96	200.00	60.96	200.00	7090.0	31.275
67.06	220.00	67.06	220.00	6955.0	31.786
73.15	240.00	73.15	240.00	6660.0	32.945
79.25	260.00	79.25	260.00	6432.0	33.881
85.34	280.00	85.34	280.00	6061.0	35.490
91.44	300.00	91.44	300.00	5825.0	36.574
97.54	320.00	97.54	320.00	5486.0	38.223
103.63	340.00	103.63	340.00	5192.0	39.752
109.73	360.00	109.73	360.00	4963.0	41.012
115.82	380.00	115.82	380.00	4690.0	42.605
121.92	400.00	121.92	400.00	4392.0	44.470
128.02	420.00	128.02	420.00	4148.0	46.110
134.11	440.00	134.11	440.00	3935.0	47.634
140.21	460.00	140.21	460.00	3773.0	48.859
146.30	480.00	146.30	480.00	3692.0	49.495
152.40	500.00	152.40	500.00	3614.0	50.122
158.50	520.00	158.50	520.00	3500.0	51.068
164.59	540.00	164.59	540.00	3666.0	49.702
170.69	560.00	170.69	560.00	3254.0	53.239
176.78	580.00	176.78	580.00	3159.0	54.128
182.88	600.00	182.88	600.00	3025.0	55.437
188.98	620.00	188.98	620.00	2934.0	56.365
195.07	640.00	195.07	640.00	2850.0	57.252
201.17	660.00	201.17	660.00	2746.0	58.394
207.26	680.00	207.26	680.00	2643.0	59.574
213.36	700.00	213.36	700.00	2528.0	60.958
219.46	720.00	219.46	720.00	2455.0	61.875
225.55	740.00	225.55	740.00	2390.0	62.718
231.65	760.00	231.65	760.00	2369.0	62.996
237.74	780.00	237.74	780.00	2209.0	65.215
243.84	800.00	243.84	800.00	2090.0	66.991
249.94	820.00	249.94	820.00	2032.0	67.900
256.03	840.00	256.03	840.00	1971.0	68.889
262.13	860.00	262.13	860.00	1883.0	70.380
268.22	880.00	268.22	880.00	1836.0	71.211
274.32	900.00	274.32	900.00	1795.0	71.955
280.42	920.00	280.42	920.00	1726.0	73.255
286.51	940.00	286.51	940.00	1665.0	74.455
292.61	960.00	292.61	960.00	1629.0	75.188
298.70	980.00	298.70	980.00	1594.0	75.919
304.80	1000.00	304.80	1000.00	1515.0	77.640

Table 17. Conductivities from LV

HOLE ID	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
LVCH-1	475.7	F	} Tuffaceous sand and clay	1.79		N.P.	
LVCH-1	492.	F		2.13		N.P.	
LVCH-1	522.	F		1.91		N.P.	
LVCH-1	545.5	F		2.04		N.P.	
LVCH-1	553.5	F		1.62		N.P.	
LVCH-1	572.	F		1.10		N.P.	
LVCH-1	576.	F		1.78		N.P.	
LVCH-1	587.	F		2.46		N.P.	
LVCH-1	606.5	F		2.81		N.P.	
LVCH-1	612.	F		1.87		N.P.	
LVCH-1	625.	F		1.85		N.P.	
LVCH-1	817.5	F		1.69		N.P.	
LVCH-1	822.5	F		2.37		N.P.	
LVCH-1	984.8	F		1.69		N.P.	

NB

ERRATA

All depths in columns 3 and 4, pages 30-42, are incorrect. Correct depths are listed in columns 1 and 2.

Table 18. Temperatures in hydrologic test well LV-3

LV-3 NOV 15, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	18383.0	9.180
0.61	2.00	2.00	6.56	17420.0	10.429
0.91	3.00	3.00	9.84	17050.0	10.931
1.22	4.00	4.00	13.12	16050.0	12.351
1.52	5.00	5.00	16.40	15072.0	13.841
1.83	6.00	6.00	19.68	14915.0	14.091
2.13	7.00	7.00	22.97	14626.0	14.558
2.44	8.00	8.00	26.25	14100.0	15.436
2.74	9.00	9.00	29.53	13677.0	16.170
3.05	10.00	10.00	32.81	13200.0	17.029
3.66	12.00	12.00	39.37	12650.0	18.064
4.27	14.00	14.00	45.93	12280.0	18.791
4.88	16.00	16.00	52.49	11700.0	19.981
5.49	18.00	18.00	59.05	11300.0	20.842
6.10	20.00	20.00	65.62	10750.0	22.085
7.62	25.00	25.00	82.02	9590.0	24.963
9.14	30.00	30.00	98.42	8548.0	27.911
10.67	35.00	35.00	114.83	7594.0	30.998
12.19	40.00	40.00	131.23	6984.0	33.215
13.72	45.00	45.00	147.64	6078.0	36.957
15.24	50.00	50.00	164.04	5772.0	38.369
16.76	55.00	55.00	180.45	5664.0	38.888
18.29	60.00	60.00	196.85	5576.0	39.319
19.81	65.00	65.00	213.25	5378.0	40.319
21.34	70.00	70.00	229.66	5019.0	42.246
22.86	75.00	75.00	246.06	4720.0	43.976
24.38	80.00	80.00	262.47	4427.0	45.739
25.91	85.00	85.00	278.87	4242.0	47.024
27.43	90.00	90.00	295.27	4126.0	47.824
28.96	95.00	95.00	311.68	4048.0	48.377
29.41	96.50	96.50	316.60	4044.0	48.405

Table 19. Temperatures in hydrologic test well LV-4

LV-4 NOV 15, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	20593.0	6.573
0.61	2.00	2.00	6.56	20060.0	7.172
0.91	3.00	3.00	9.84	20040.0	7.194
1.22	4.00	4.00	13.12	19630.0	7.668
1.52	5.00	5.00	16.40	19200.0	8.176
1.83	6.00	6.00	19.68	18740.0	8.735
2.13	7.00	7.00	22.97	18400.0	9.158
2.44	8.00	8.00	26.25	18150.0	9.475
2.74	9.00	9.00	29.53	18000.0	9.667
3.05	10.00	10.00	32.81	17965.0	9.713
3.66	12.00	12.00	39.37	17794.0	9.935
4.27	14.00	14.00	45.93	17603.0	10.186
4.88	16.00	16.00	52.49	17544.0	10.264
5.49	18.00	18.00	59.05	17503.0	10.319
6.10	20.00	20.00	65.62	17478.0	10.352
7.62	25.00	25.00	82.02	17610.0	10.177
9.14	30.00	30.00	98.42	17865.0	9.842
10.67	35.00	35.00	114.83	18045.0	9.610
12.19	40.00	40.00	131.23	18045.0	9.610
13.72	45.00	45.00	147.64	17954.0	9.727
15.24	50.00	50.00	164.04	17860.0	9.849
16.76	55.00	55.00	180.45	17650.0	10.124
17.89	58.70	58.70	192.58	17472.0	10.360

Table 20. Temperatures in hydrologic test well LV-6

LV-6 NOV 13, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.61	2.00	2.00	6.56	12878.0	17.629
0.91	3.00	3.00	9.84	12840.0	17.701
1.22	4.00	4.00	13.12	12657.0	18.051
1.52	5.00	5.00	16.40	12326.0	18.699
1.83	6.00	6.00	19.68	12020.0	19.316
2.13	7.00	7.00	22.97	11728.0	19.922
2.44	8.00	8.00	26.25	11256.0	20.939
2.74	9.00	9.00	29.53	10987.0	21.540
3.05	10.00	10.00	32.81	10725.0	22.143
3.66	12.00	12.00	39.37	10015.0	23.864
4.27	14.00	14.00	45.93	9486.0	25.240
4.88	16.00	16.00	52.49	8854.0	27.004
5.49	18.00	18.00	59.05	8338.0	28.556
6.10	20.00	20.00	65.62	7780.0	30.362
7.62	25.00	25.00	82.02	6579.0	34.814
9.14	30.00	30.00	98.42	5600.0	39.201
10.67	35.00	35.00	114.83	4885.0	43.006
12.19	40.00	40.00	131.23	4419.0	45.851
13.72	45.00	45.00	147.64	4123.0	47.845
15.24	50.00	50.00	164.04	3981.0	48.861
16.76	55.00	55.00	180.45	3911.0	49.378
16.98	55.70	55.70	182.74	3904.0	49.430

Table 21. Temperatures in hydrologic test well LV-7

USGS LV-7

11-13-73 114 F1284

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	19328.0	8.024
0.61	2.00	2.00	6.56	19240.0	8.129
0.91	3.00	3.00	9.84	19170.0	8.212
1.22	4.00	4.00	13.12	19098.0	8.299
1.52	5.00	5.00	16.40	18960.0	8.466
1.83	6.00	6.00	19.68	18708.0	8.775
2.13	7.00	7.00	22.97	18683.0	8.806
2.44	8.00	8.00	26.25	18578.0	8.936
2.74	9.00	9.00	29.53	18490.0	9.045
3.05	10.00	10.00	32.81	18462.0	9.080
3.66	12.00	12.00	39.37	18446.0	9.100
4.27	14.00	14.00	45.93	18643.0	8.855
4.88	16.00	16.00	52.49	18955.0	8.472
5.49	18.00	18.00	59.05	19173.0	8.209
6.10	20.00	20.00	65.62	19216.0	8.157
7.62	25.00	25.00	82.02	19125.0	8.267
9.14	30.00	30.00	98.42	19033.0	8.378
10.67	35.00	35.00	114.83	18935.0	8.496
12.19	40.00	40.00	131.23	18847.0	8.604
13.72	45.00	45.00	147.64	18797.0	8.665
15.24	50.00	50.00	164.04	18777.0	8.690
16.76	55.00	55.00	180.45	18763.0	8.707
18.29	60.00	60.00	196.85	18753.0	8.719
19.81	65.00	65.00	213.25	18743.0	8.731
21.34	70.00	70.00	229.66	18732.0	8.745
22.86	75.00	75.00	246.06	18721.0	8.759
24.38	80.00	80.00	262.47	18710.0	8.772
25.91	85.00	85.00	278.87	18698.0	8.787
27.43	90.00	90.00	295.27	18081.0	9.563

Table 22. Temperatures in hydrologic test well LV-11

LV-11 NOV. 14, 1973 F1284

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.61	2.00	2.00	6.56	18332.0	9.244
0.91	3.00	3.00	9.84	17964.0	9.714
1.22	4.00	4.00	13.12	17610.0	10.177
1.52	5.00	5.00	16.40	17039.0	10.946
1.83	6.00	6.00	19.68	16794.0	11.285
2.13	7.00	7.00	22.97	16565.0	11.608
2.44	8.00	8.00	26.25	16404.0	11.837
2.74	9.00	9.00	29.53	16252.0	12.056
3.05	10.00	10.00	32.81	16050.0	12.351
3.66	12.00	12.00	39.37	15705.0	12.865
4.27	14.00	14.00	45.93	15444.0	13.262
4.88	16.00	16.00	52.49	15452.0	13.250
5.49	18.00	18.00	59.05	15539.0	13.116
6.10	20.00	20.00	65.62	15609.0	13.010
7.62	25.00	25.00	82.02	15628.0	12.981
9.14	30.00	30.00	98.42	15449.0	13.254
10.67	35.00	35.00	114.83	15171.0	13.686
12.19	40.00	40.00	131.23	14874.0	14.156
13.72	45.00	45.00	147.64	14614.0	14.578
15.24	50.00	50.00	164.04	14298.0	15.101
16.76	55.00	55.00	180.45	14146.0	15.358
17.47	57.30	57.30	187.99	14002.0	15.604

Table 23. Temperatures in hydrologic test well LV-18

USGS LV-18

11-14-73

114 F1284

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	15914.0	12.552
0.61	2.00	2.00	6.56	15914.0	12.552
0.91	3.00	3.00	9.84	15250.0	13.562
1.22	4.00	4.00	13.12	14621.0	14.566
1.52	5.00	5.00	16.40	14160.0	15.334
1.83	6.00	6.00	19.68	13660.0	16.200
2.13	7.00	7.00	22.97	12844.0	17.693
3.05	10.00	10.00	32.81	11959.0	19.441
6.10	20.00	20.00	65.62	9560.0	25.042
7.62	25.00	25.00	82.02	8890.0	26.900
9.14	30.00	30.00	98.42	8470.0	28.148
10.67	35.00	35.00	114.83	8183.0	29.043
12.19	40.00	40.00	131.23	8000.0	29.633
13.72	45.00	45.00	147.64	7855.0	30.111
15.24	50.00	50.00	164.04	7724.0	30.552
16.76	55.00	55.00	180.45	7610.0	30.942
18.29	60.00	60.00	196.85	7502.0	31.319
19.81	65.00	65.00	213.25	7388.0	31.723
21.06	69.10	69.10	226.71	7285.0	32.094

Table 24. Temperatures in hydrologic test well LV-28

USGS LV-28 11-14-73

114 F1284

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	18799.0	8.663
0.61	2.00	2.00	6.56	18439.0	9.109
0.91	3.00	3.00	9.84	18446.0	9.100
1.22	4.00	4.00	13.12	17826.0	9.893
1.52	5.00	5.00	16.40	17777.0	9.957
1.83	6.00	6.00	19.68	17427.0	10.420
2.13	7.00	7.00	22.97	17230.0	10.685
2.44	8.00	8.00	26.25	17050.0	10.931
2.74	9.00	9.00	29.53	16910.0	11.124
3.05	10.00	10.00	32.81	16827.0	11.239
3.66	12.00	12.00	39.37	16770.0	11.319
4.27	14.00	14.00	45.93	16844.0	11.216
4.88	16.00	16.00	52.49	16975.0	11.034
5.49	18.00	18.00	59.05	17133.0	10.817
6.10	20.00	20.00	65.62	17353.0	10.519
7.62	25.00	25.00	82.02	17640.0	10.137
9.14	30.00	30.00	98.42	17739.0	10.007
10.67	35.00	35.00	114.83	17745.0	9.999
12.19	40.00	40.00	131.23	17698.0	10.060
13.72	45.00	45.00	147.64	17666.0	10.103
15.24	50.00	50.00	164.04	17648.0	10.126
16.76	55.00	55.00	180.45	17632.0	10.147
18.29	60.00	60.00	196.85	17617.0	10.167
19.81	65.00	65.00	213.25	17608.0	10.179
21.34	70.00	70.00	229.66	17599.0	10.191
21.95	72.00	72.00	236.22	17590.0	10.203

Table 25. Temperatures in hydrologic test well LV-41

USGS LV-41 11-14-73

114 F1284

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	18700.0	8.784
0.61	2.00	2.00	6.56	18385.0	9.177
0.91	3.00	3.00	9.84	17973.0	9.702
1.22	4.00	4.00	13.12	17350.0	10.523
1.52	5.00	5.00	16.40	17070.0	10.903
1.83	6.00	6.00	19.68	16850.0	11.207
2.13	7.00	7.00	22.97	16690.0	11.431
2.44	8.00	8.00	26.25	16680.0	11.445
2.74	9.00	9.00	29.53	16684.0	11.439
3.05	10.00	10.00	32.81	16525.0	11.664
3.66	12.00	12.00	39.37	16377.0	11.876
4.27	14.00	14.00	45.93	16213.0	12.113
4.88	16.00	16.00	52.49	16220.0	12.103
5.49	18.00	18.00	59.05	16435.0	11.793
6.10	20.00	20.00	65.62	16725.0	11.382
6.71	22.00	22.00	72.18	16821.0	11.248
7.32	24.00	24.00	78.74	16843.0	11.217
7.92	26.00	26.00	85.30	16845.0	11.214
8.53	28.00	28.00	91.86	16836.0	11.227
9.14	30.00	30.00	98.42	16798.0	11.280
10.67	35.00	35.00	114.83	16645.0	11.494
11.58	38.00	38.00	124.67	16272.0	12.027

Table 26. Temperatures in hydrologic test well LV-42

LV-42 NOV 14, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	17690.0	10.071
0.61	2.00	2.00	6.56	8972.0	26.664
0.91	3.00	3.00	9.84	8562.0	27.869
1.22	4.00	4.00	13.12	8171.0	29.081
1.52	5.00	5.00	16.40	7399.0	31.694
1.83	6.00	6.00	19.68	6559.0	34.896
2.13	7.00	7.00	22.97	6156.0	36.611
2.44	8.00	8.00	26.25	5893.0	37.801
2.74	9.00	9.00	29.53	5732.0	38.560
3.05	10.00	10.00	32.81	5560.0	39.398
3.66	12.00	12.00	39.37	5224.0	41.127
4.27	14.00	14.00	45.93	4929.0	42.754
4.88	16.00	16.00	52.49	4808.0	43.454
5.49	18.00	18.00	59.05	4545.0	45.049
6.10	20.00	20.00	65.62	4341.0	46.361
6.58	21.60	21.60	70.87	4025.0	48.542

Table 27. Temperatures in hydrologic test well LV-44

LV-44 NOV 14, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	20128.0	7.094
0.61	2.00	2.00	6.56	19460.0	7.867
0.91	3.00	3.00	9.84	19284.0	8.076
1.22	4.00	4.00	13.12	18782.0	8.684
1.52	5.00	5.00	16.40	18570.0	8.946
1.83	6.00	6.00	19.68	18014.0	9.649
2.13	7.00	7.00	22.97	17640.0	10.137
2.44	8.00	8.00	26.25	17467.0	10.367
2.74	9.00	9.00	29.53	17310.0	10.577
3.05	10.00	10.00	32.81	17250.0	10.658
3.66	12.00	12.00	39.37	17024.0	10.967
4.27	14.00	14.00	45.93	16980.0	11.027
4.88	16.00	16.00	52.49	16979.0	11.029
5.49	18.00	18.00	59.05	16984.0	11.022
6.10	20.00	20.00	65.62	16983.0	11.023
7.62	25.00	25.00	82.02	16845.0	11.214
9.14	30.00	30.00	98.42	16525.0	11.664
10.67	35.00	35.00	114.83	16255.0	12.052
12.19	40.00	40.00	131.23	16019.0	12.397
13.72	45.00	45.00	147.64	15716.0	12.848
15.24	50.00	50.00	164.04	15368.0	13.379
16.76	55.00	55.00	180.45	14913.0	14.094
18.29	60.00	60.00	196.85	14733.0	14.384
19.81	65.00	65.00	213.25	14555.0	14.674
21.34	70.00	70.00	229.66	14171.0	15.315
22.86	75.00	75.00	246.06	13947.0	15.698
23.16	76.00	76.00	249.34	13906.0	15.769

Table 28. Temperatures in hydrologic test well LV-45

LV-45 NOV 15, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	17927.0	9.762
0.61	2.00	2.00	6.56	17907.0	9.788
0.91	3.00	3.00	9.84	17654.0	10.118
1.22	4.00	4.00	13.12	17319.0	10.565
1.52	5.00	5.00	16.40	16959.0	11.056
1.83	6.00	6.00	19.68	16691.0	11.430
2.13	7.00	7.00	22.97	16368.0	11.889
2.74	9.00	9.00	29.53	15936.0	12.519
3.05	10.00	10.00	32.81	15600.0	13.024
3.66	12.00	12.00	39.37	15461.0	13.236
4.27	14.00	14.00	45.93	15207.0	13.629
4.88	16.00	16.00	52.49	15075.0	13.837
5.49	18.00	18.00	59.05	14987.0	13.976
6.10	20.00	20.00	65.62	14873.0	14.158
7.62	25.00	25.00	82.02	14629.0	14.553
9.14	30.00	30.00	98.42	14339.0	15.033
10.67	35.00	35.00	114.83	13938.0	15.714
12.19	40.00	40.00	131.23	13565.0	16.368
13.72	45.00	45.00	147.64	13190.0	17.047
15.24	50.00	50.00	164.04	12894.0	17.599
16.76	55.00	55.00	180.45	12620.0	18.122
18.29	60.00	60.00	196.85	12394.0	18.564
19.81	65.00	65.00	213.25	12156.0	19.040
21.34	70.00	70.00	229.66	11941.0	19.478
22.86	75.00	75.00	246.06	11672.0	20.040
24.38	80.00	80.00	262.47	11385.0	20.656
25.91	85.00	85.00	278.87	11133.0	21.212
27.43	90.00	90.00	295.27	10876.0	21.794
28.96	95.00	95.00	311.68	10604.0	22.427
29.54	96.90	96.90	317.91	10522.0	22.621

Table 29. Temperatures in hydrologic test well LV-46

LV-46 NOV 13, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	17120.0	10.835
0.61	2.00	2.00	6.56	16999.0	11.001
0.91	3.00	3.00	9.84	16861.0	11.192
1.22	4.00	4.00	13.12	16681.0	11.444
1.52	5.00	5.00	16.40	16387.0	11.862
1.83	6.00	6.00	19.68	16219.0	12.104
2.13	7.00	7.00	22.97	15933.0	12.524
2.44	8.00	8.00	26.25	15854.0	12.641
2.74	9.00	9.00	29.53	15762.0	12.779
3.05	10.00	10.00	32.81	15507.0	13.165
3.66	12.00	12.00	39.37	15349.0	13.408
4.27	14.00	14.00	45.93	15063.0	13.856
4.88	16.00	16.00	52.49	14818.0	14.246
5.49	18.00	18.00	59.05	14615.0	14.576
6.10	20.00	20.00	65.62	14410.0	14.914
7.62	25.00	25.00	82.02	13901.0	15.778
9.14	30.00	30.00	98.42	13365.0	16.728
10.67	35.00	35.00	114.83	12740.0	17.892
12.19	40.00	40.00	131.23	12144.0	19.064
13.72	45.00	45.00	147.64	11682.0	20.019
15.24	50.00	50.00	164.04	11217.0	21.025
16.76	55.00	55.00	180.45	10800.0	21.969
18.29	60.00	60.00	196.85	10446.0	22.803
19.81	65.00	65.00	213.25	10063.0	23.743
21.34	70.00	70.00	229.66	9692.0	24.694
22.86	75.00	75.00	246.06	9393.0	25.491
24.38	80.00	80.00	262.47	9152.0	26.155
25.91	85.00	85.00	278.87	8881.0	26.926
27.43	90.00	90.00	295.27	8604.0	27.743
28.96	95.00	95.00	311.68	8351.0	28.515
30.48	100.00	100.00	328.08	8191.0	29.018
31.70	104.00	104.00	341.21	7970.0	29.731

Table 30. Temperatures in hydrologic test well LV-47

LV-47 NOV 13, 1973

----- INPUT -----		----- ZCORR -----		RESISTANCE	TEMPERATURE
Z METERS	Z FEET	Z METERS	Z FEET		
0.30	1.00	1.00	3.28	17248.0	10.661
0.61	2.00	2.00	6.56	17102.0	10.860
0.91	3.00	3.00	9.84	17007.0	10.990
1.22	4.00	4.00	13.12	16830.0	11.235
1.52	5.00	5.00	16.40	16803.0	11.273
1.83	6.00	6.00	19.68	16682.0	11.442
2.13	7.00	7.00	22.97	16395.0	11.850
2.44	8.00	8.00	26.25	16333.0	11.939
2.74	9.00	9.00	29.53	16233.0	12.084
3.05	10.00	10.00	32.81	16170.0	12.175
3.66	12.00	12.00	39.37	16065.0	12.329
4.27	14.00	14.00	45.93	16013.0	12.406
4.88	16.00	16.00	52.49	15943.0	12.509
5.49	18.00	18.00	59.05	16027.0	12.385
6.10	20.00	20.00	65.62	16093.0	12.288
7.62	25.00	25.00	82.02	16076.0	12.313
9.14	30.00	30.00	98.42	15549.0	13.101
10.67	35.00	35.00	114.83	15737.0	12.817
12.19	40.00	40.00	131.23	15360.0	13.391
13.72	45.00	45.00	147.64	14971.0	14.001
15.24	50.00	50.00	164.04	14554.0	14.676
16.76	55.00	55.00	180.45	14206.0	15.256
18.29	60.00	60.00	196.85	13763.0	16.018
19.81	65.00	65.00	213.25	13483.0	16.515
21.34	70.00	70.00	229.66	13149.0	17.123
22.86	75.00	75.00	246.06	12813.0	17.752
24.38	80.00	80.00	262.47	12475.0	18.405
25.91	85.00	85.00	278.87	12163.0	19.026
27.43	90.00	90.00	295.27	11847.0	19.673
28.96	95.00	95.00	311.68	11639.0	20.110
30.48	100.00	100.00	328.08	11505.0	20.396
31.30	102.70	102.70	336.94	11300.0	20.842

Table 31. Conductivities from shallow hydrologic test wells

HOLE ID.	DEPTH	SAMP.	LITHOLOGY	K WET	RHO WET	PHI	COMMENTS
LV-3	98.2	F		3.63		N.P.	
LV-3	98.2	F		3.86		N.P.	
LV-3	98.2	F		4.58		N.P.	
LV-6	57.2	F		1.02		N.P.	
LV-6	57.2	F		0.55		N.P.	
LV-7	97.8	F		1.81		N.P.	
LV-7	97.8	F		1.81		N.P.	
LV-7	97.8	F		1.91		N.P.	
LV-7	97.8	F		3.69		N.P.	
LV-7	97.8	F		2.28		N.P.	
LV-7	97.8	F		1.81		N.P.	
LV-7	98.2	F		1.83		N.P.	
LV-7	98.2	F		1.83		N.P.	
LV-7	98.2	F		1.80		N.P.	
LV-9	48.2	F		2.51		N.P.	
LV-9	48.2	F		2.36		N.P.	
LV-11	96.8	F		3.08		N.P.	
LV-11	96.8	F		3.10		N.P.	
LV-11	96.8	F		3.12		N.P.	
LV-11	97.2	F		3.06		N.P.	
LV-11	97.8	F		3.19		N.P.	
LV-11	97.8	F		3.03		N.P.	
LV-11	97.8	F		3.13		N.P.	
LV-11	97.8	F		3.30		N.P.	
LV-11	97.8	F		3.04		N.P.	
LV-15	58.2	F		2.30		N.P.	
LV-15	58.2	F		2.21		N.P.	
LV-15	58.2	F		2.55		N.P.	
LV-15	58.2	F		1.79		N.P.	
LV-15	58.2	F		2.22		N.P.	
LV-16	97.2	F		2.03		N.P.	
LV-16	97.8	F		2.33		N.P.	
LV-16	97.8	F		2.36		N.P.	
LV-16	97.8	F		2.49		N.P.	
LV-20	98.2	F		0.40		N.P.	
LV-23	59.5	F		3.55		N.P.	
LV-23	59.5	F		3.01		N.P.	