

CONFIDENTIAL

PROGRESS REPORT

Schlumberger and Equatorial-Dipole Soundings
S2 to S5, Kelley Hot Springs, California

by

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13 June 1974

Four additional vertical electrical soundings using the Schlumberger and equatorial-dipole arrays were made in the Kelley Hot Springs area of California to supplement an earlier survey of mine (1973). In that report, two promising areas were outlined: (1) a closed, circular, resistivity low in the northern half of section 27, T.42N., R.10E., and (2) the area immediately northwest of a line trending about N.30°E. through sections 19, 17, and 9, T.42N., R.10E. A third topic of interest was the resistivity values outside the immediate prospect area.

Sounding S2 (labeled SED-2 in location map Figure 1) was located northeast of the closed anomaly mentioned above in order to minimize lateral effects of the higher resistivities trending north-northeast from Kelley Hot Springs as shown by the dipole mapping survey. The sounding was started with the Schlumberger array to $AB/2$ of 4000 ft and was continued with the equatorial-dipole array to \bar{R} of 12,130 ft. *The Schlumberger curve shows the resistivity curve as a function of AB/2 is identical to the equatorial-dipole apparent resistivity curve as a function of \bar{R} for a horizontally-stratified, laterally-homogeneous earth.* Preliminary interpretation (see Table 1) indicates an 1800 ft thick layer of very low resistivity (2 ohm-m) on an "electrical basement" of higher resistivity which, because of the scatter of the data at the change from Schlumberger array to equatorial dipole array, may be as low as 5 ohm-m or as high as 15 ohm-m.

The area west of the Kelley hot springs was investigated by sounding S4. There appears to be a relatively thin, 5 ohm-m layer between a thin surface layer of 12 ohm-m and an "electrical basement" of at least 12 ohm-m.

Soundings S3 and S5 were placed well outside the main survey area, one east and one southeast, for regional control. Sounding S3 shows a 3000 ft thick section of 3.6 ohm-m material, whereas a zone of similar resistivity at S5 is only 220 ft thick.

A larger generator, active filters in the pre-amplifiers, and chart recording of the received signal enabled approximately 50 additional dipole mapping stations to be taken about the same source as my first report. However, the low signal level, large amplitude telluric currents, and large transmitter-induced electromagnetic transients requires time consuming filtering of the data. Therefore, conclusions regarding the significance of the soundings must await the reduction of the dipole mapping stations and computer verification of the preliminary interpretations of the soundings.

Table 1: Auxiliary-point interpretations of soundings S2 to S5.

sounding	layer resistivity (ohm-m)	layer thickness (ft)	depth interval (ft)
S2	10	200	0 to 200
	6.5	600	200 to 800
	2	2200	800 to 3000
	12		3000 to 9000
S3	5.5	165	0 to 165
	27	165	165 to 330
	3.6	3000	330 to 3330
	11		3330 to 4000 or more
S4	12	400	0 to 400
	5	800	400 to 1200
	12		1200 to 3000 or more
S5	38	230	0 to 230
	4	220	230 to 550
	15		550 to 3000 or more

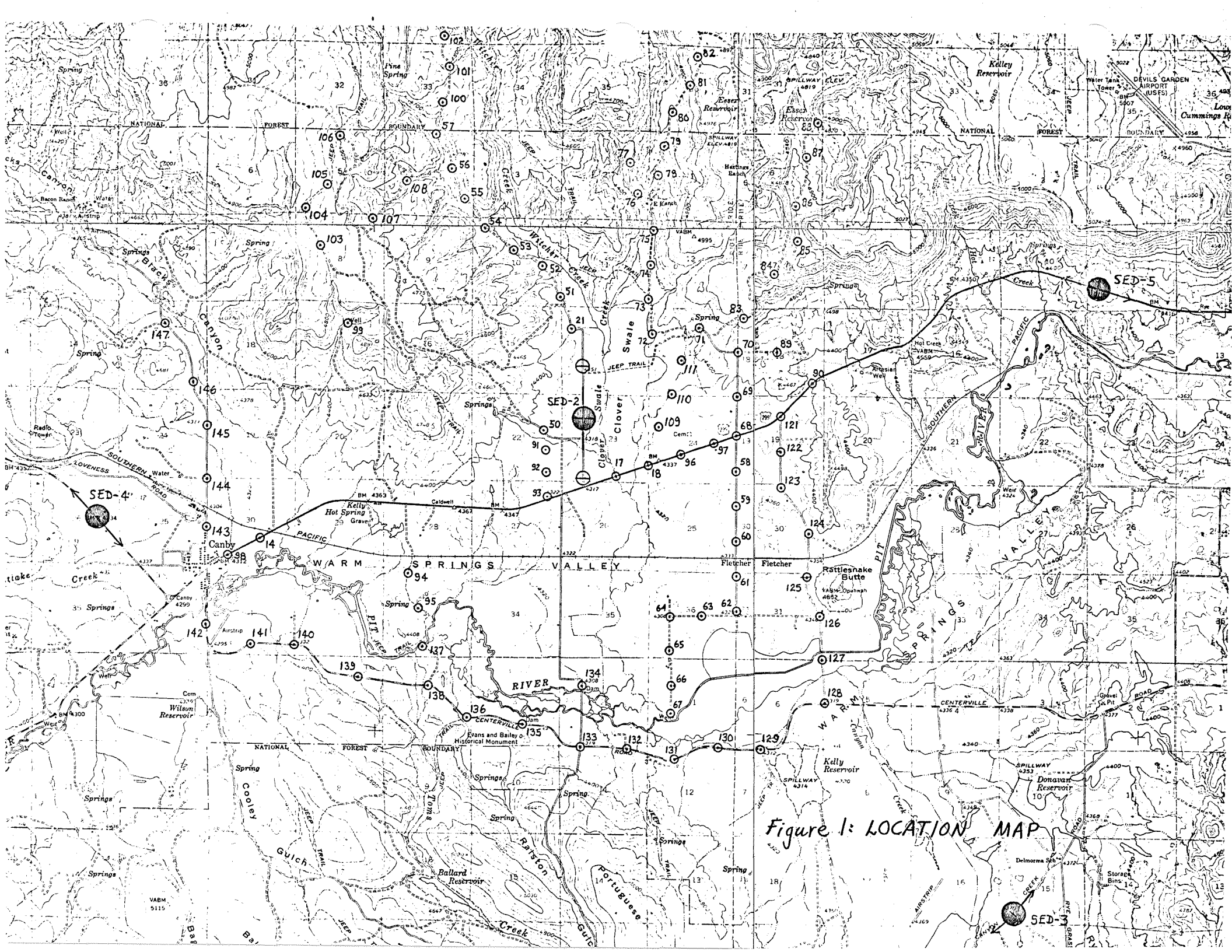
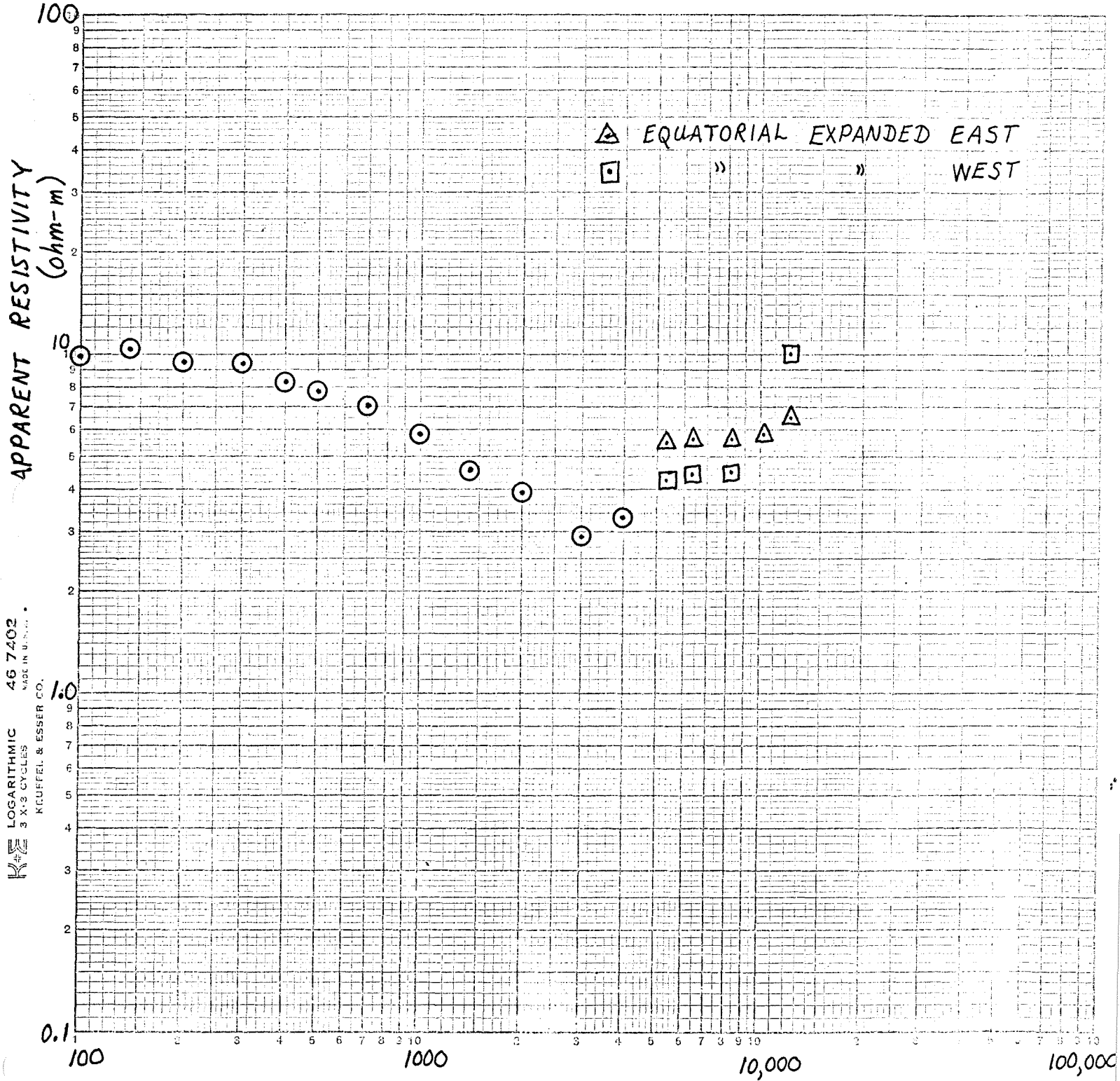
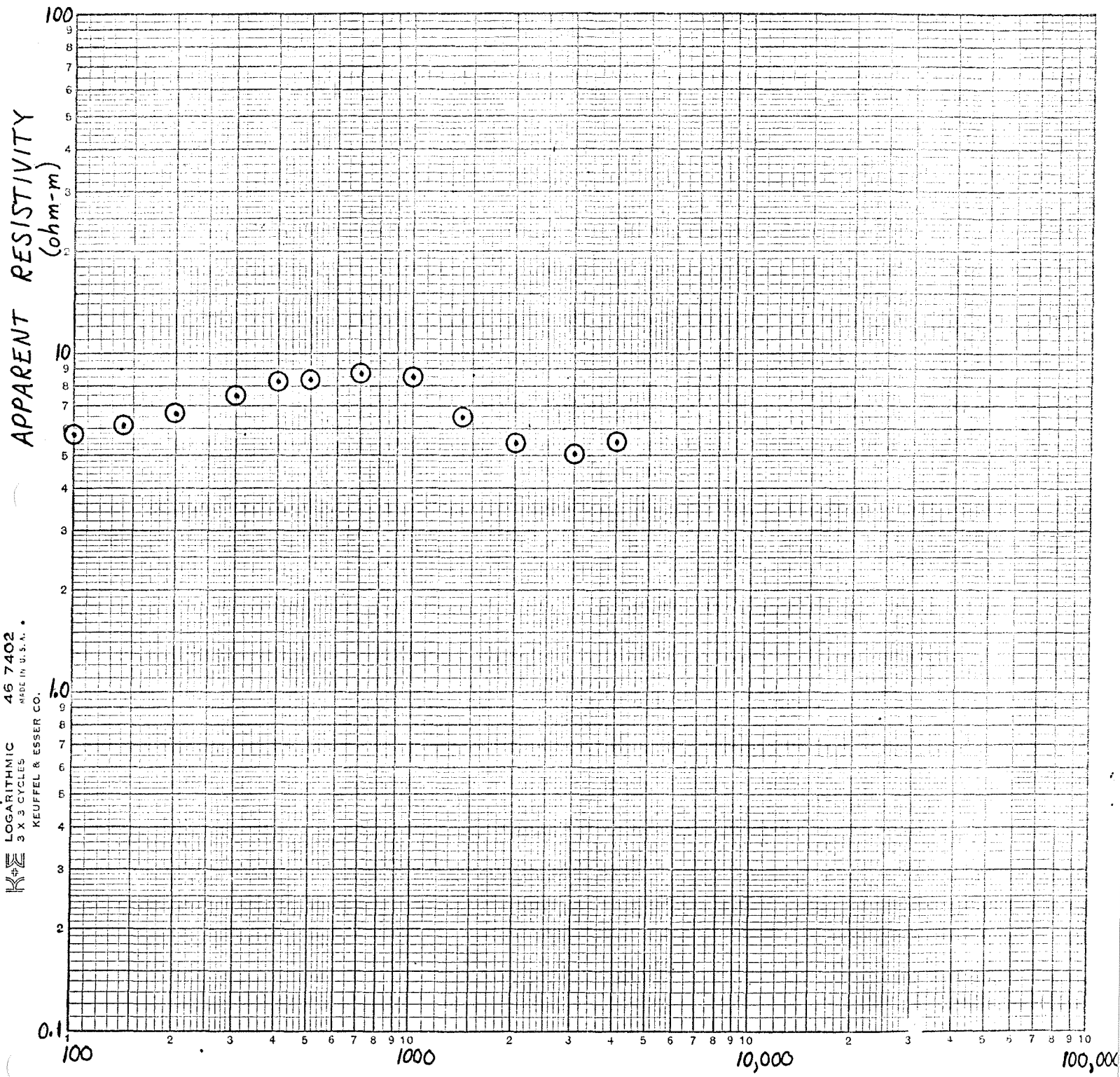


Figure 1: LOCATION MAP



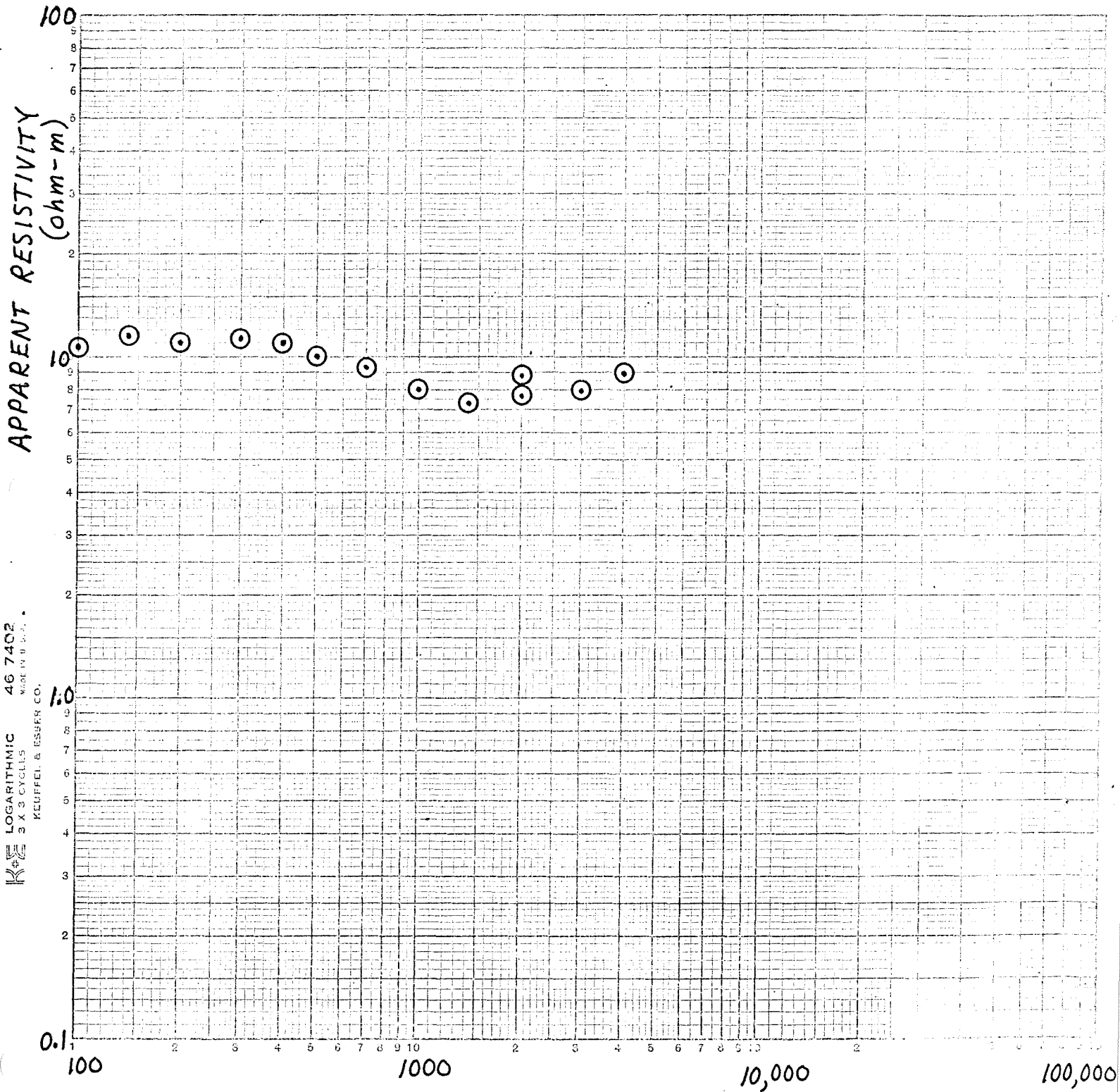
LOGARITHMIC 46 7402
3 X 3 CYCLES MADE IN U.S.A.
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$\frac{\overline{AB}}{2}$ or \overline{R} SEPARATION (ft)



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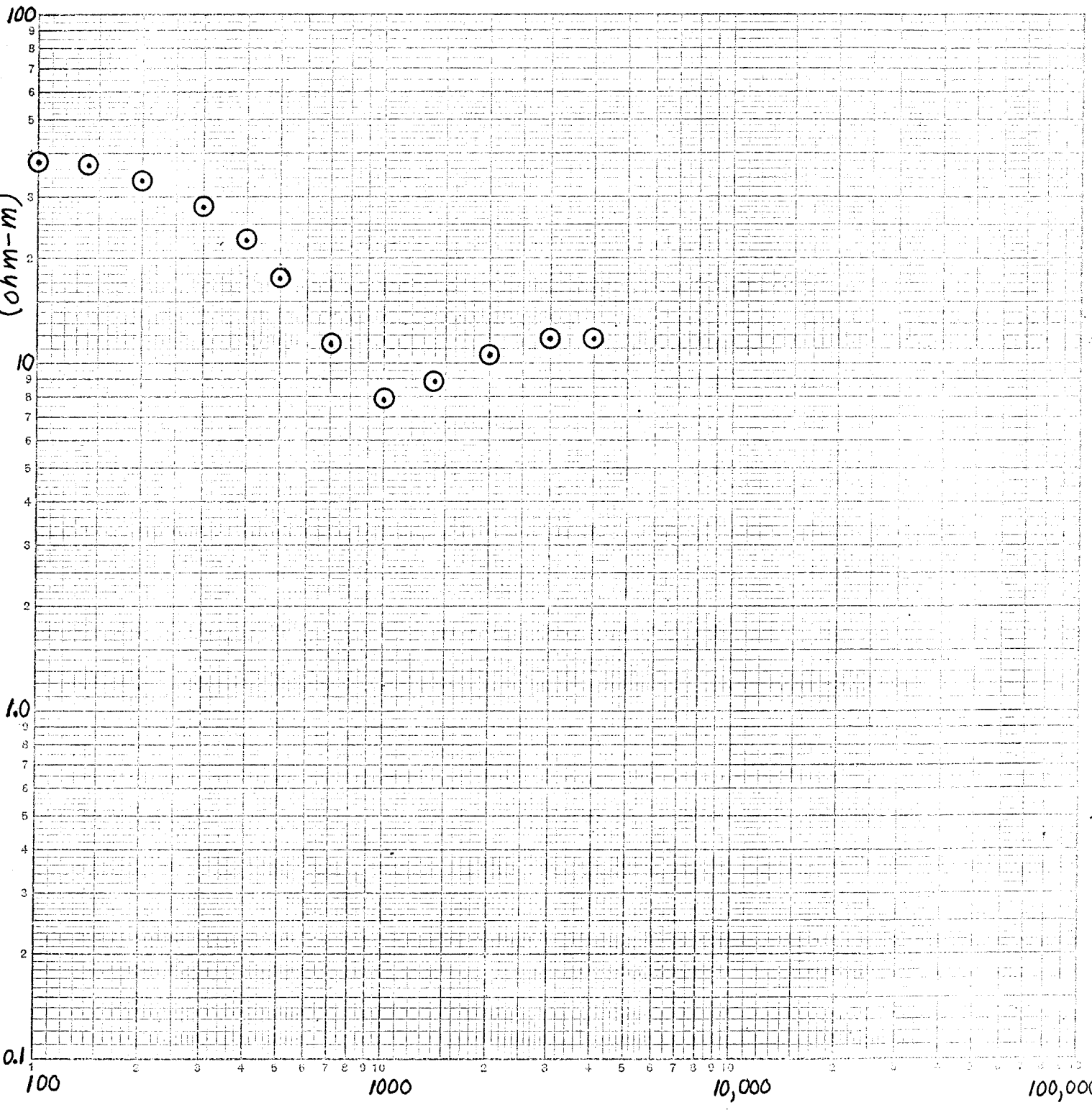
$\overline{AB}/2$ SEPARATION (ft)



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$\overline{AB}/2$ SEPARATION (ft)

APPARENT RESISTIVITY (ohm-m)



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$\overline{AB}/2$ SEPARATION (ft)