UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

# Simple Total Field and Schlumberger Soundings Near Sugar City, Idaho

by

Adel A. R. Zohdy, Robert J. Bisdorf

and Dallas B. Jackson

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In 1977, the U.S. Geological Survey made a resistivity survey in the vicinity of Rexburg, Sugar City, Teton, and New Dale, Idaho. The survey consisted of two hundred eighty two (282) bipole-dipole total field stations (Zohdy, 1978a and b) and sixty eight (68) symmetric Schlumberger soundings (Zohdy and others, 1974). The purpose of the survey was to evaluate the geothermal potential near Sugar City. Results of the survey indicate that the most favorable area near Sugar City (for a warm water resource that may be usable for space heating) is near the southeast corner of the city. This conclusion is based on the similarity of the geoelectric structure between this area and the area near New Dale (where warm waters are present).

## Simple Total Field Map:

The bipole-dipole simple total field apparent resistivity map shown in figure 1 is based on the measurement of the total electric field at 282 stations about a current bipole (AB) 3.145 km in length. The current intensity used throughout the survey was 24 amperes. The lengths of the measuring dipoles (MN and MN′) was 76.2 meters (250 feet) and, at each station three components were measured along MN, MN′ and NN′ to ascertain the accuracy of the measurements. The field procedure and the reduction of the field data, for the computation of apparent resisitvities, followed what was described elsewhere by Zohdy (1978a).

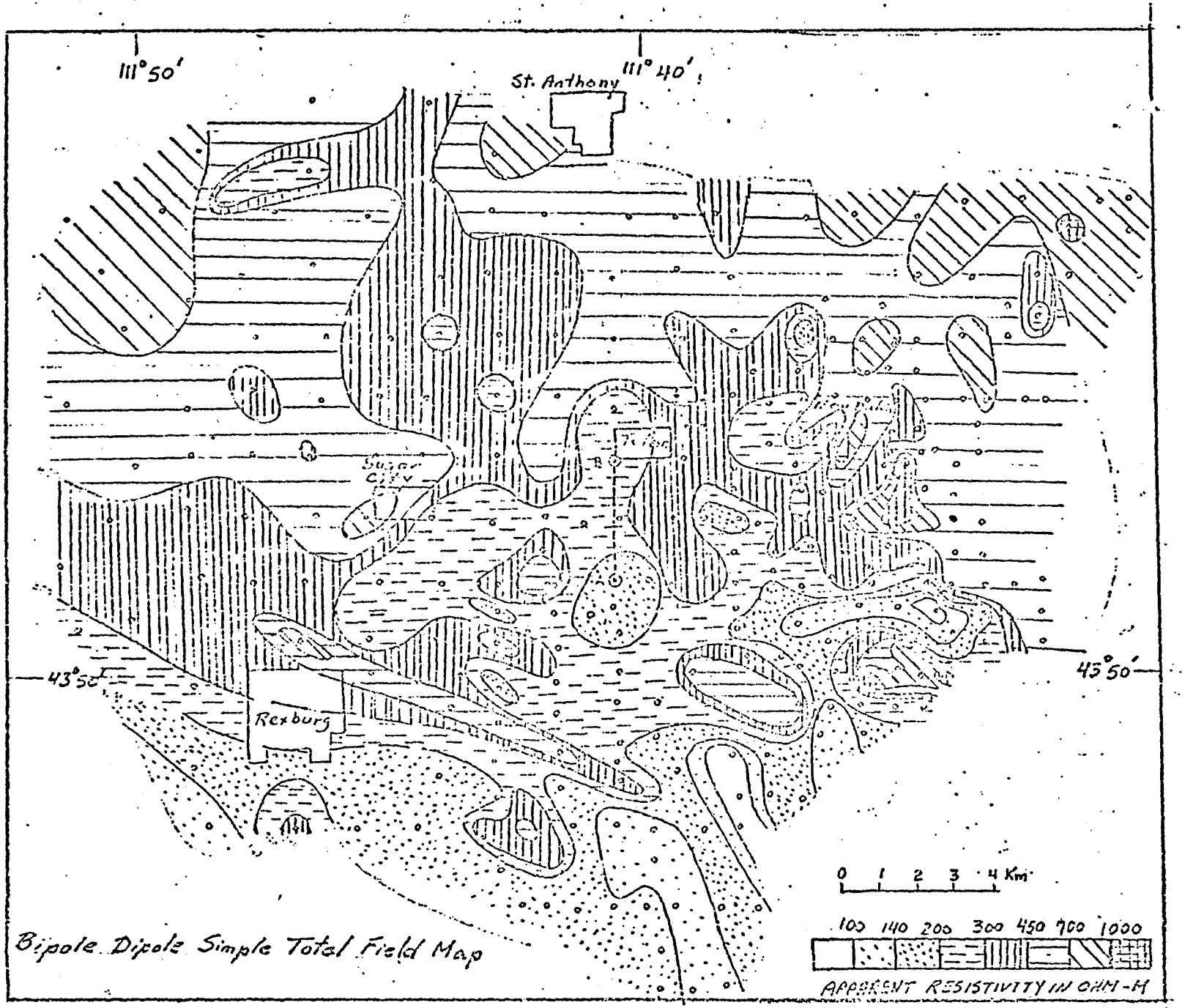


Figure 1.--Bipole-dipole simple total field apparent resistivity map near Rexburg, Sugar City, Teton, and New Dale, Idaho. Contours in ohm-meters.

The lowest measured simple-total-field apparent resistivity was slightly less than 100 ohm-meters and the highest was a little over 1,000 ohm-meters.

The map shows the following features:

(1) A crude outline of peanut-shaped contours in the immediate vicinity of the current bipole. This indicates that the section is only quasi horizontally layered in the vicinity of the current bipole (Zohdy, 1978b).

(2) A circular low of less than 200 ohm-meters around the A electrode, which is absent around electrode B (near the town of Teton), and a general decrease in apparent resistivity contours to the south of the center of the current bipole. Both these features indicate the thickening of relatively conductive materials to the south of the bipole.

(3) An apparent resistivity high at a distance of about 8 km east-southeast of electrode A, and another at a distance of about 7 km south-southwest of electrode A. The locations of these resistivity highs correlate well with locations of Bitters Butte; and Sommers and Webster Buttes, respectively.

(4) A pear-shaped apparent resistivity high that lies at a distance of about 2 km southeast of the town of New Dale. This high probably is produced by a buried volcanic plug.

(5) An elongated apparent resistivity high approximately ten (10) km in length and less than one kilometer in width trending west-northwest near the city of Rexburg. This narrow elongated high disregards all natural drainage patterns, near

surface geologic units and all cultural features (pipe lines, telephone lines, fences, and so on) in the area. It is therefore attributed to the presence of a deeply buried (more than one kilometer) ridge or dike system.

(6) The apparent resistivity contours show a steep gradient near New Dale, to the southeast of New Dale, and also near the southeast corner of Sugar City. This steep gradient indicates an abrupt lateral change in resistivity and may represent the detection of a quasi circular inner edge of a caldera. The second quasi circular outer edge is expressed by the apparent resistivity highs shown at the northeast and northwest boundaries of the map (see fig. 2).

(7) A study of the apparent resistivity contours suggests the detection of several lineaments (faults?) trending in the northeast and in the south-southeast directions. The location of these possible faults and the proposed edges of a caldera are outlined in figure 2 by single and double lines, respectively.

Schlumberger Soundings:

Figure 3 is an index map showing the location, azimuth, and number of the Schlumberger sounding stations and also the location of six cross sections. Figure 4 shows a contour map of interpreted true resistivity at a depth of 300 meters. The stippled areas designate resistivities of less than 100 ohm meters. Warm water (about 30°C) is produced from shallow wells (about 120 meters) in and to the northeast of the town of New Dale. Therefore, as evidenced by the location of the stippled areas

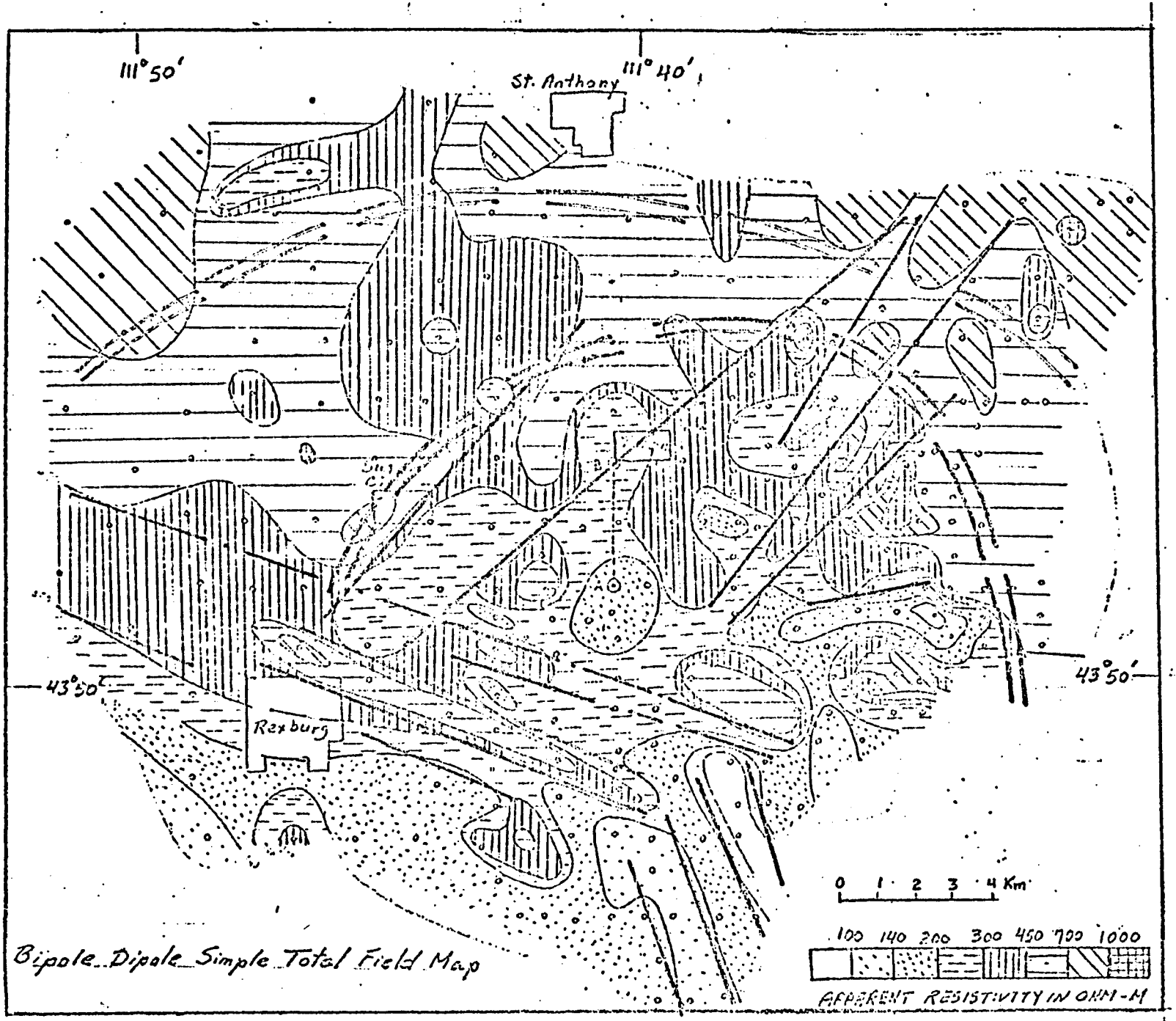


Figure 2.--Inferred structures. Single lines may represent faults, double lines may represent caldera edge.

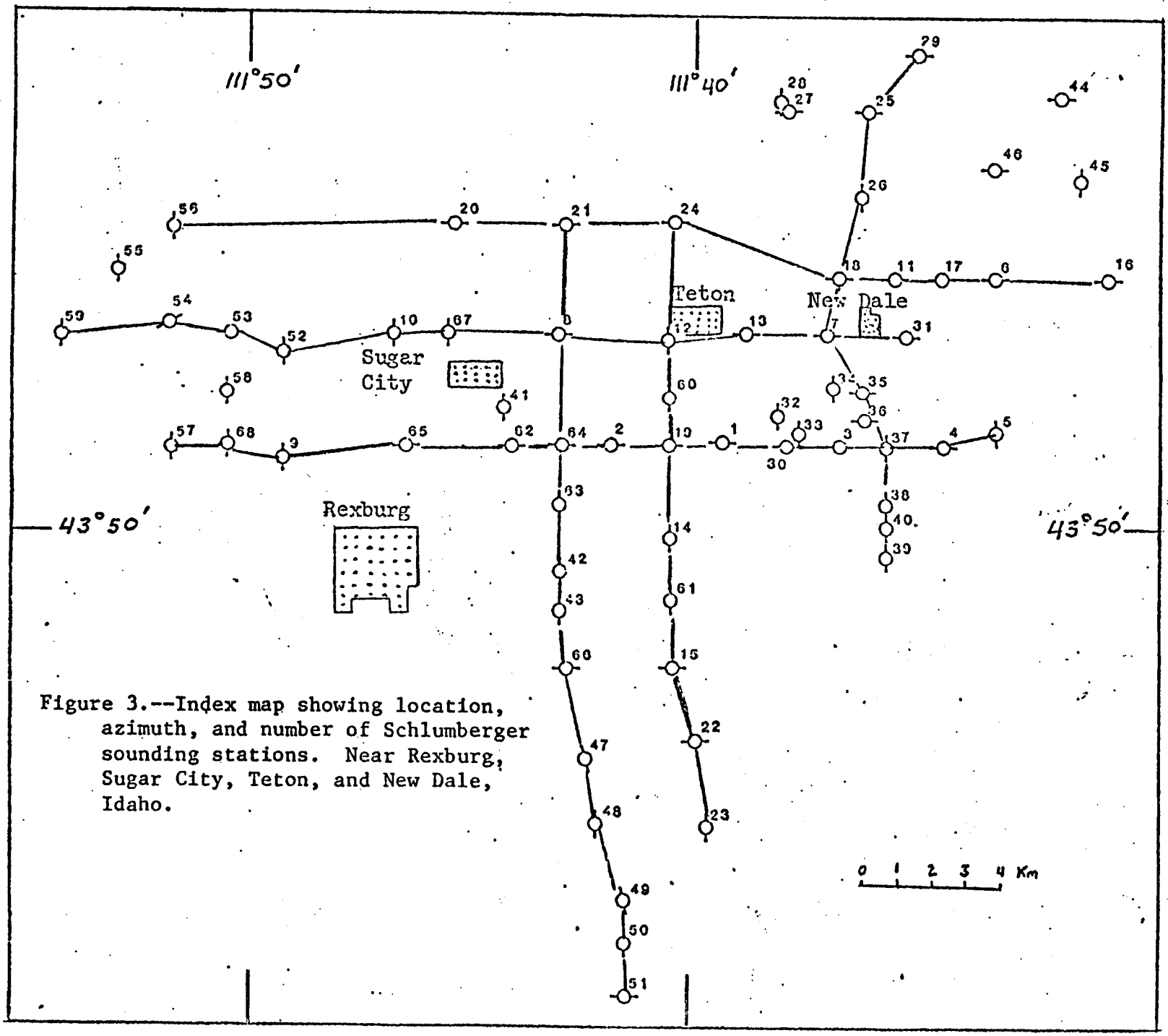


Figure 3.--Index map showing location, azimuth, and number of Schlumberger sounding stations. Near Rexburg, Sugar City, Teton, and New Dale, Idaho.

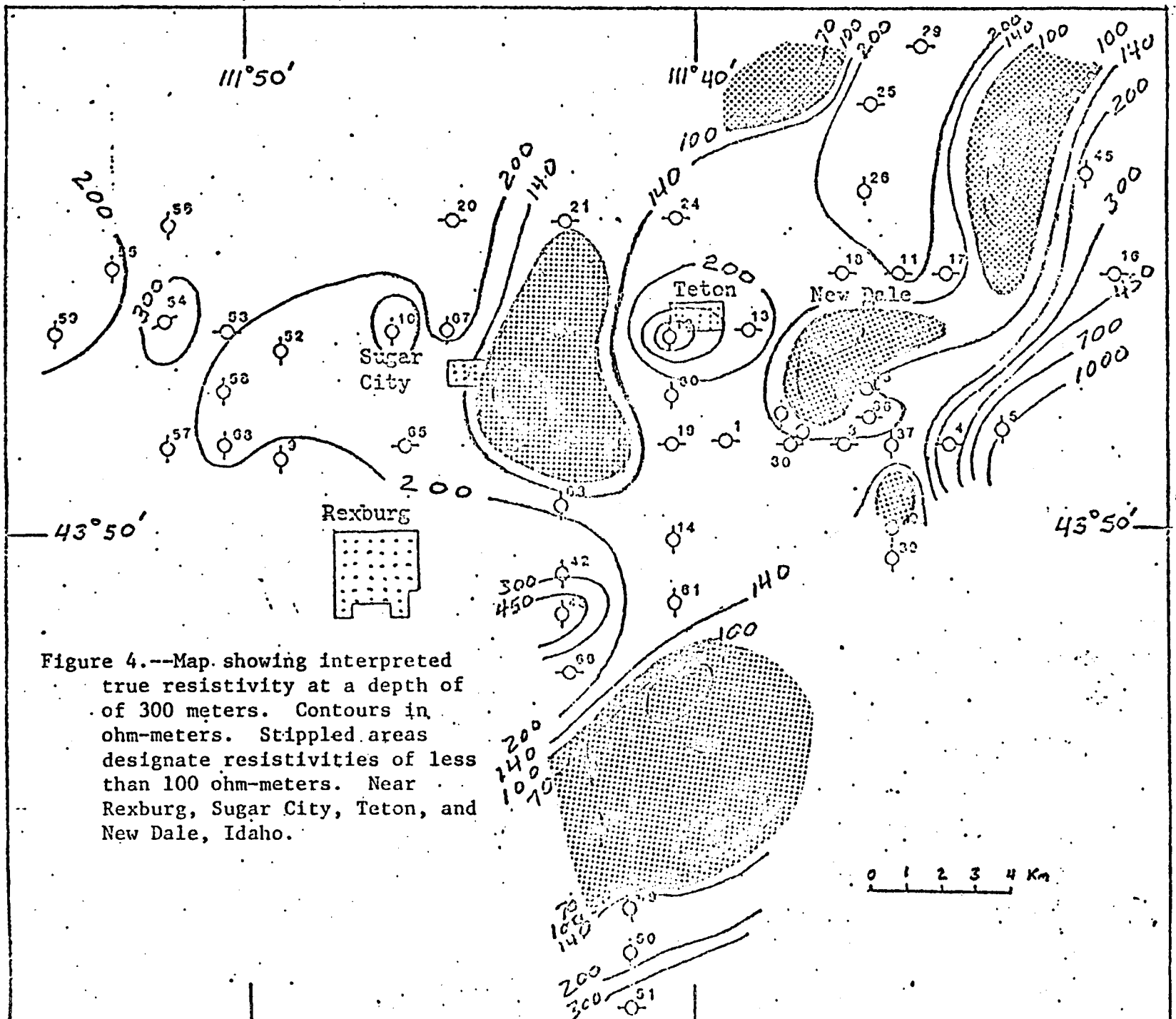


Figure 4.--Map showing interpreted true resistivity at a depth of of 300 meters. Contours in ohm-meters. Stippled areas designate resistivities of less than 100 ohm-meters. Near Rexburg, Sugar City, Teton, and New Dale, Idaho.

on the map, the most promising area for the existence of warm water near Sugar City, is near its southeastern corner. This location is corroborated further by the possible existence of a fault or the inner rim of a caldera as indicated on the total field map shown in figure 2.

Figures 5, 6, 7, 8, 9 and 10, show computer generated geoelectric sections along the six section lines shown in figure 3. These geoelectric sections depict contours of interpreted true resistivities in ohm meters. In each of figures 5, 6, 7, 8, 9 and 10, the top part represents a four-to-one vertically exaggerated representation of the upper 1,,000 meters, whereas the bottom part represents a one-to-one (no vertical exaggeration) representation of the pper 1,848 meters in the section. The stippled areas in the top part of each figure designate rocks with resistivities of less than 100 ohm-meters.

In general, low rock resistivities are associated with an increase in porosity, clay content, pore water salinity and/or water temperature. In this area, low resistivities of 2 to 5 ohm meters were not observed, such as were measured in other geothermal areas. Here, the lowest interpreted resistivities, as shown on the geoelectric sections and on the sounding curves, are of the order of 30 to 45 ohm meters. In part, this is attributed to the fact that the warmest waters near New Dale are about 33°C whereas the average ambient temperature is about 10°C.

The sounding curves are given in the Appendix and are numbered from Sugar City #1 to Sugar City #68. Several of the sounding curves were distorted either by strong lateral variations in rock resistivities or more commonly by cultural features such as fences with metal posts, buried irrigation pipe lines, and grounded power lines. Several of the

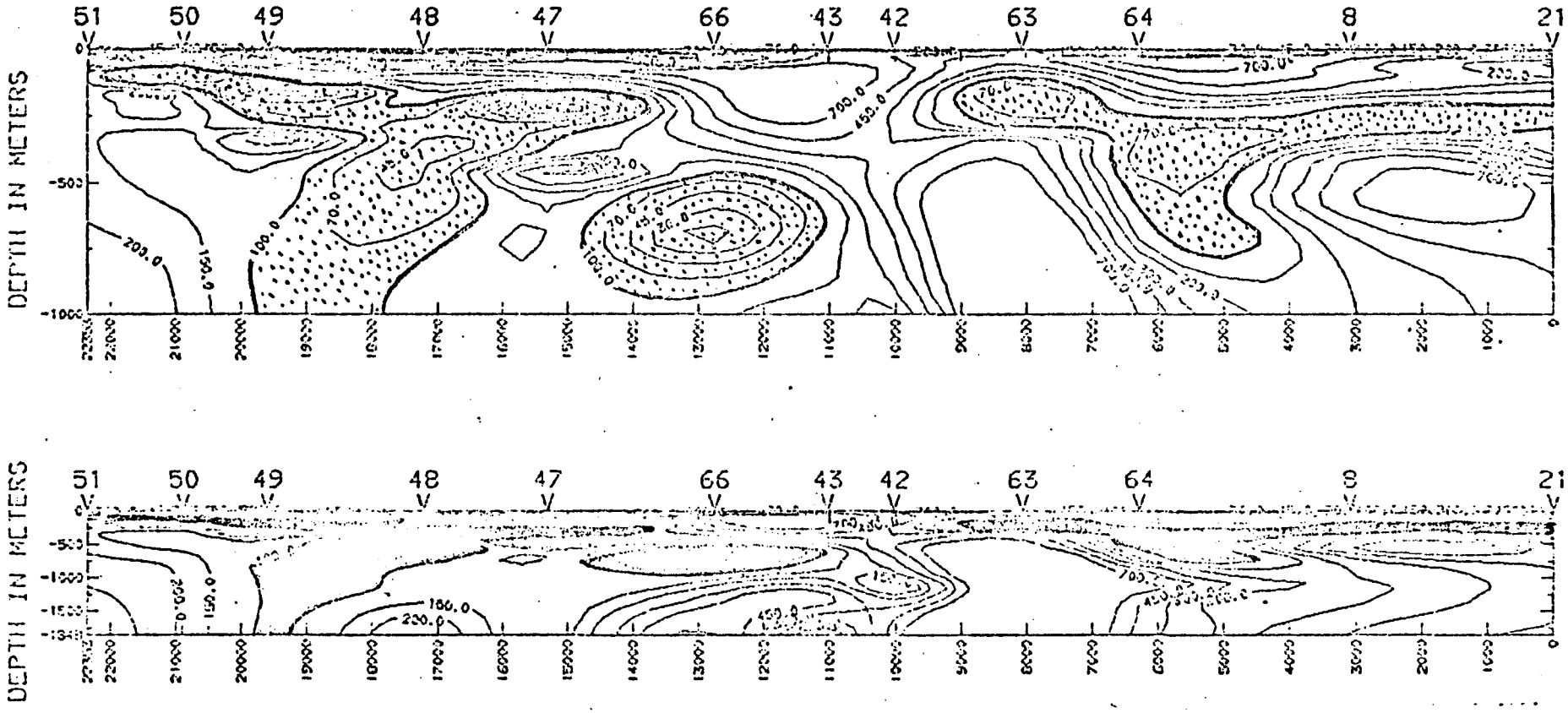


Figure 5.--Computer generated geoelectric section 51-21. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

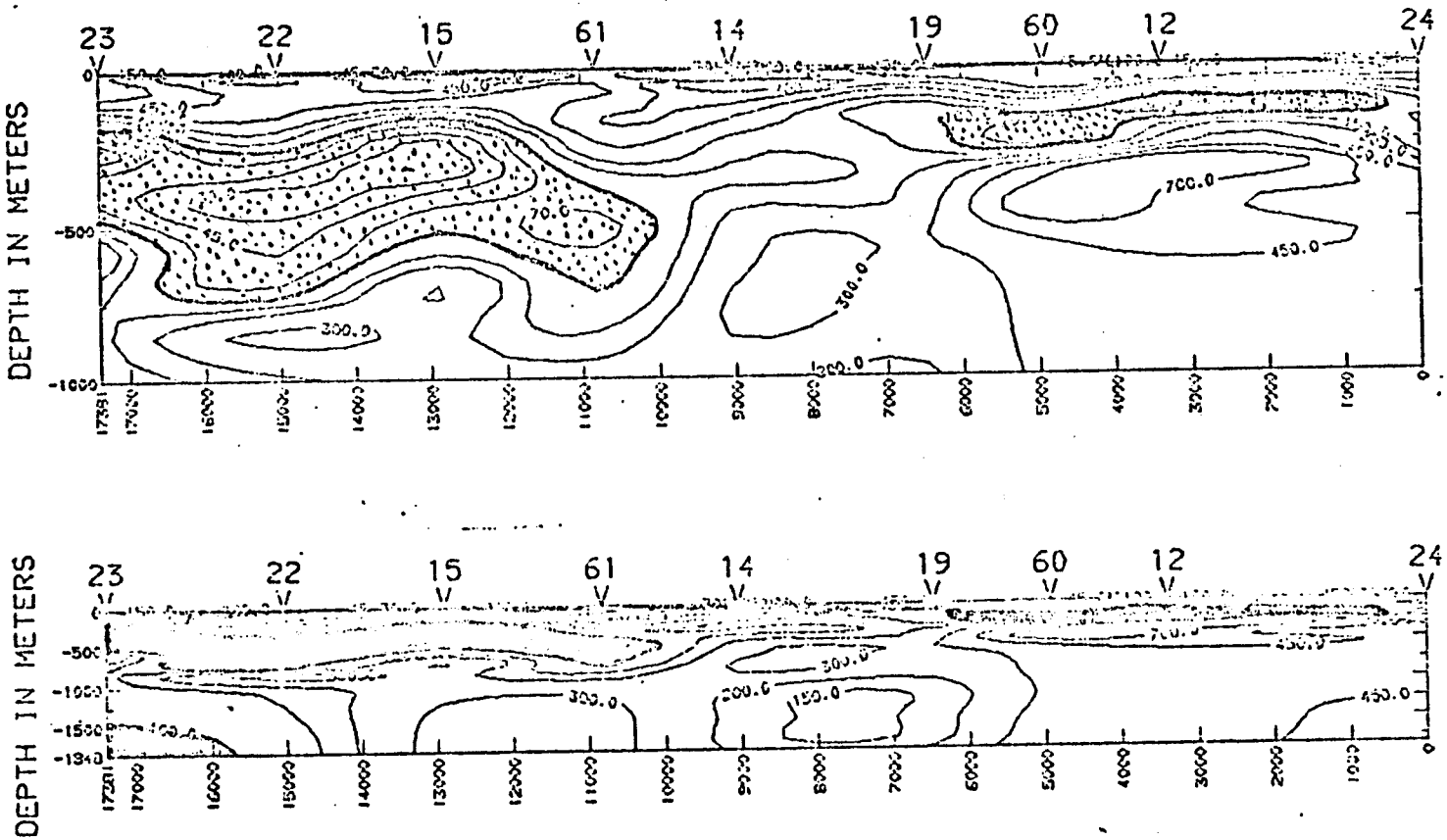


Figure 6.--Computer generated geoelectric section 23-24. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

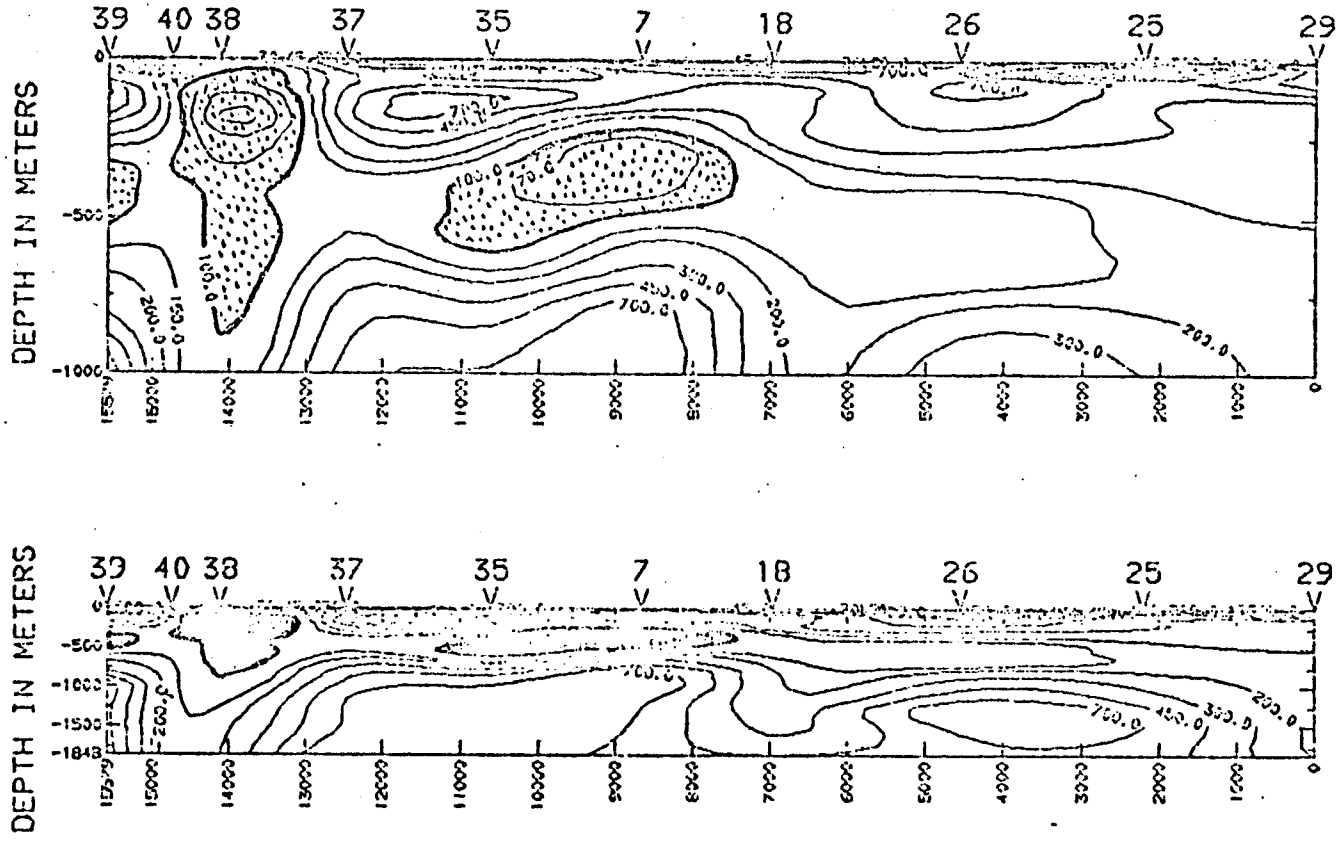


Figure 7.--Computer generated geoelectric section 39-29. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

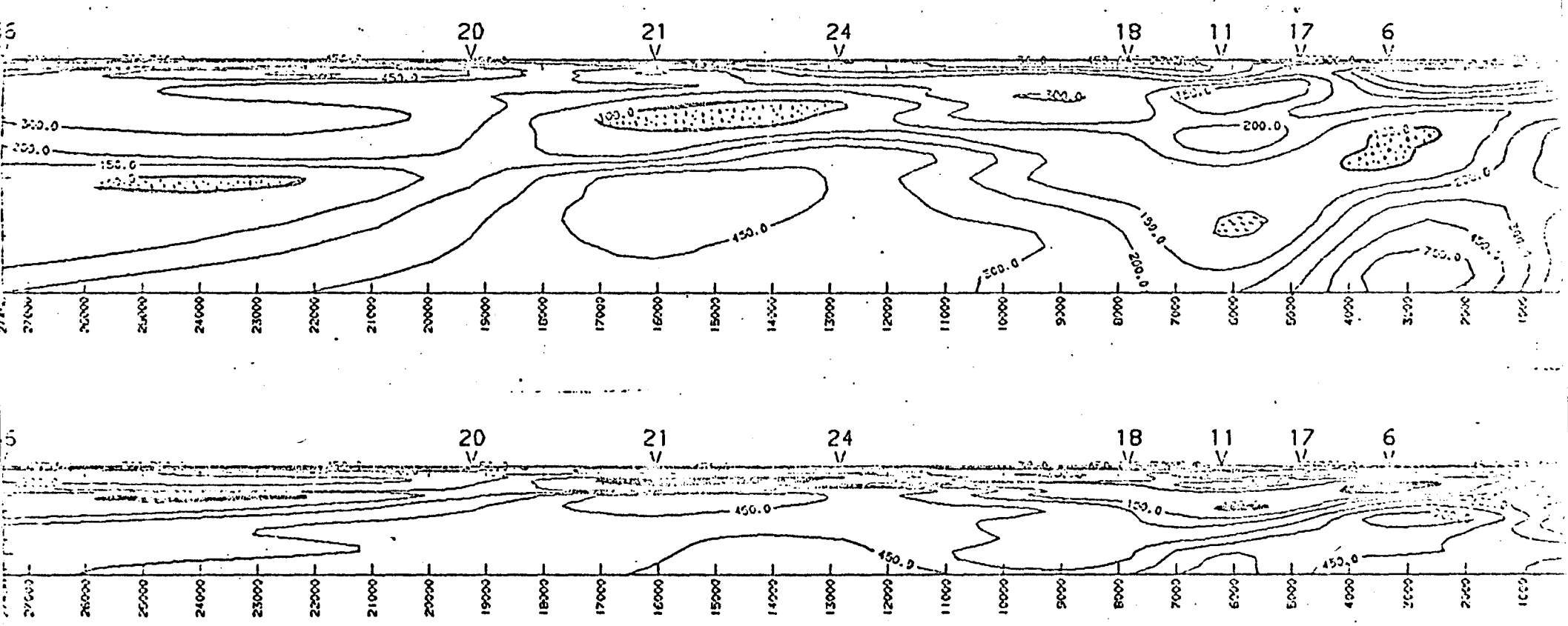


Figure 8.--Computer generated geoelectric section 56-16. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

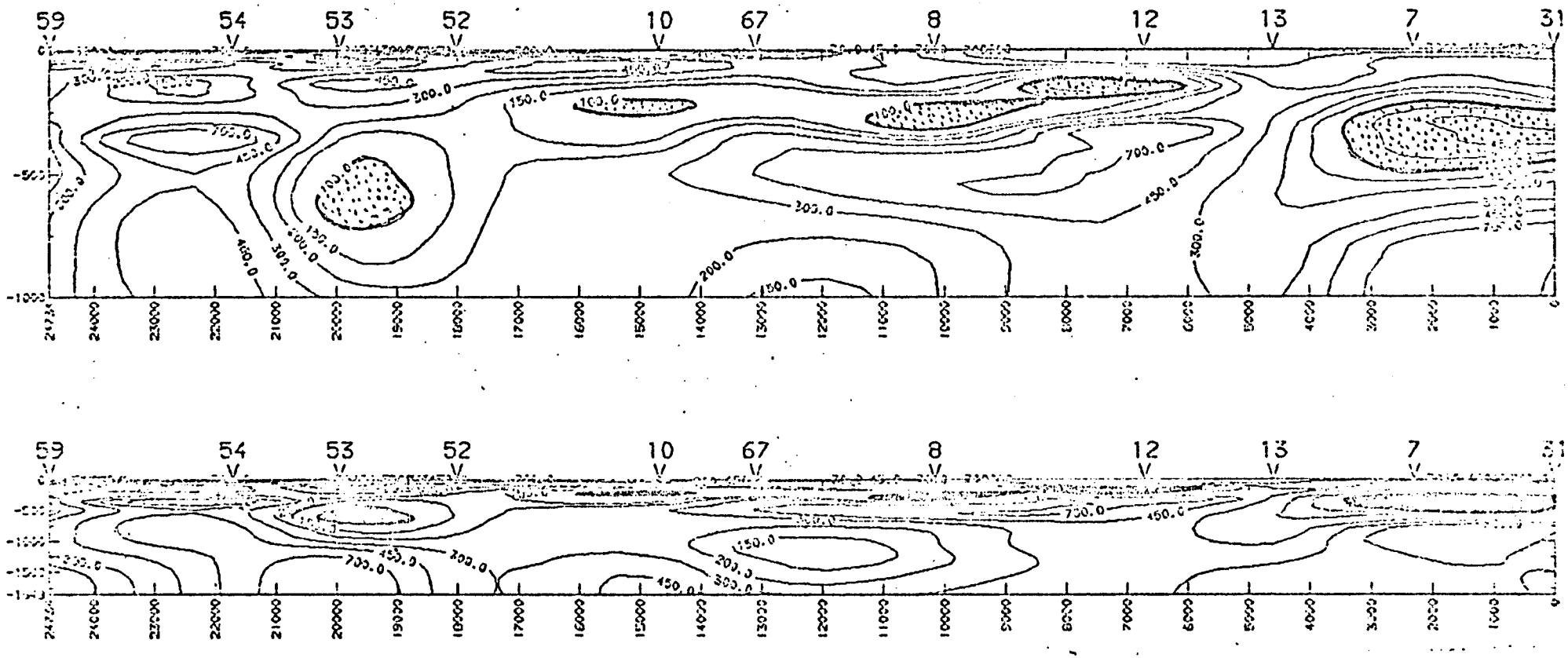


Figure 9.--Computer generated geoelectric section 59-31. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

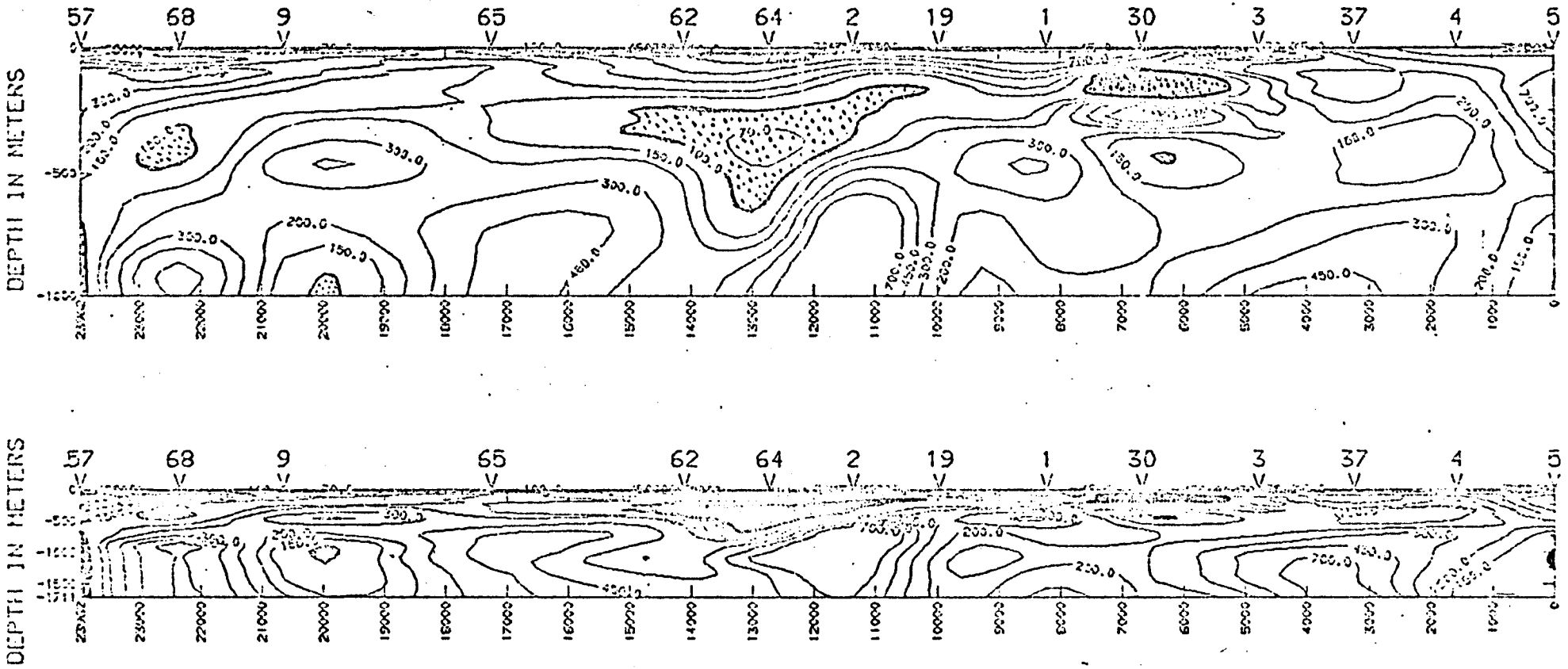


Figure 10.--Computer generated geoelectric section 57-5. Contours of interpreted true resistivity in ohm-meters. Top section, vertically exaggerated four times; bottom section without vertical exaggeration. Stippled (top section) and darkened (bottom section) designate less than 100 ohm meters.

sounding curves, such as Sugar City #5, 7, 11, 13, 14, 17, 18, 21, 26, 30, 36, 42, 53, 59 and 61, were smoothed, and/or extended (that is extrapolated) and reinterpreted. For those soundings, interpretations for both original and smoothed data are given on separate sheets.

All the sounding curves were automatically processed and interpreted (Zohdy, 1975) as shown in the graphs given in the appendix. Each graph shows the following:

(1) Field data designated by a segmented, solid-line curve, with diamond symbols for observed data.

(2) A shifted and digitized field curve designated by square symbols. The shifted field curve is obtained by shifting the various segments upward or downward generally with respect to the last segment on the segmented field curve (Zohdy and others, 1973). This shifted curve is then digitized at the rate of six points per logarithmic cycle (square symbols). These points were computed using a subroutine in a computer program for bicubic spline functions (Anderson, 1971).

(3) The theoretical best fitting sounding curve is designated by plus (+) symbols. This theoretical curve is the output of the automatic interpretation for the digitized curve. The computer program used here is an updated version of the one published earlier by the senior author (Zohdy, 1973).

(4) The detailed layering for which the theoretical curve is calculated.

(5) The D.Z. (Dar Zarrouk) curve for the detailed layering. The ordinate values for the D.Z. curves are shifted upward or

downward by one logarithmic cycle to avoid cluttering the graphs. The D.Z. curves can be used to obtain equivalent and simpler solutions containing fewer number of layers and in which certain constraints can be imposed on the layer thicknesses and resistivities (Zohdy, 1974).

All these graphs were generated on a Hewlett Packard 7203A graphic plotter. The plotter driving subroutines were developed by the second author, R. J. Bisdorf.

## References


Anderson, W. L., 1971, Application of bicubic spline functions to two dimensional gridded data: NTIS (Natl. Tech. Inf. Service), PB-203579, Springfield, Va.

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_____1974, The use of Dar Zarrouk curves in the interpretation of VES data: U.S. Geol. Survey Bull. 1313-D, 41 p.

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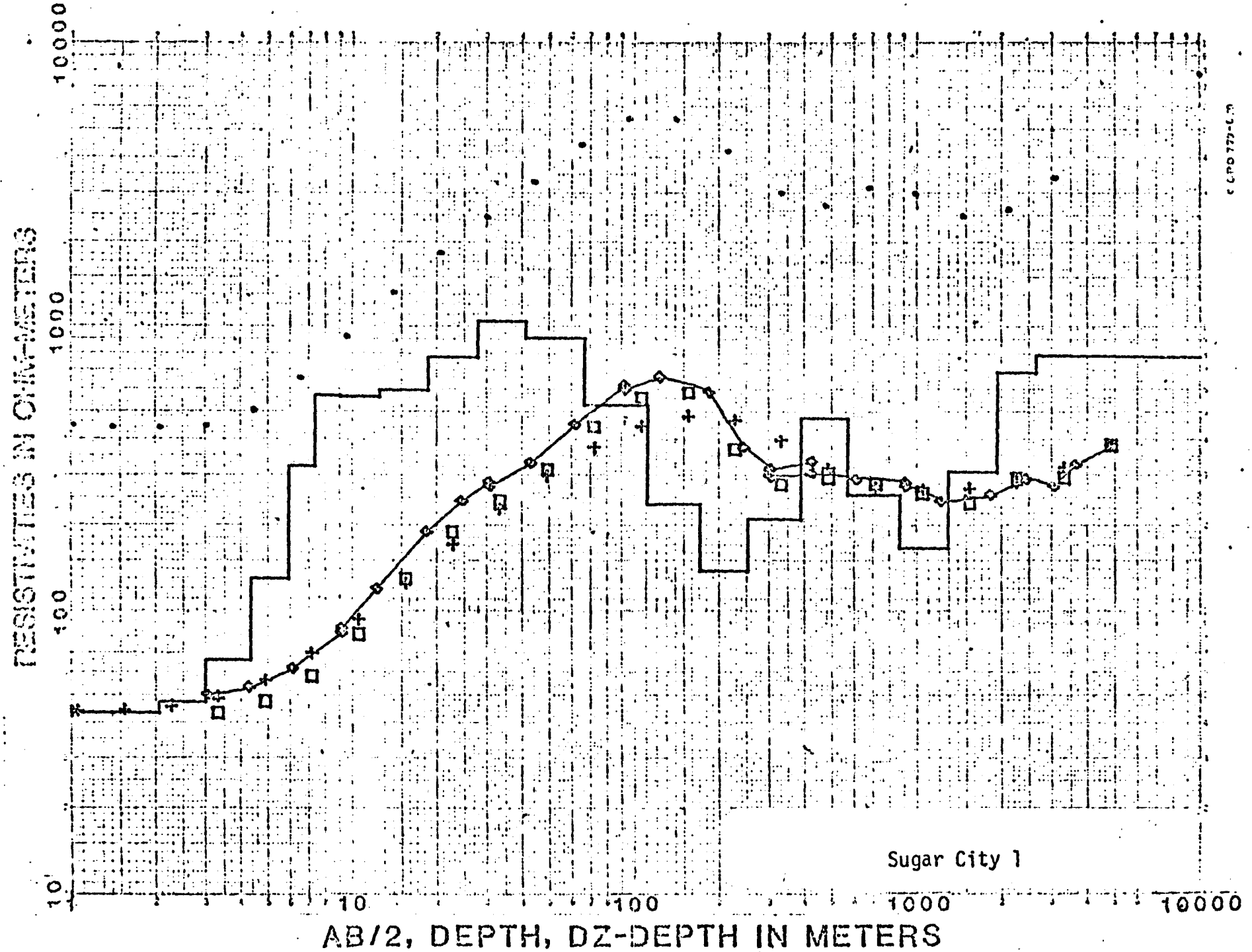
# Appendix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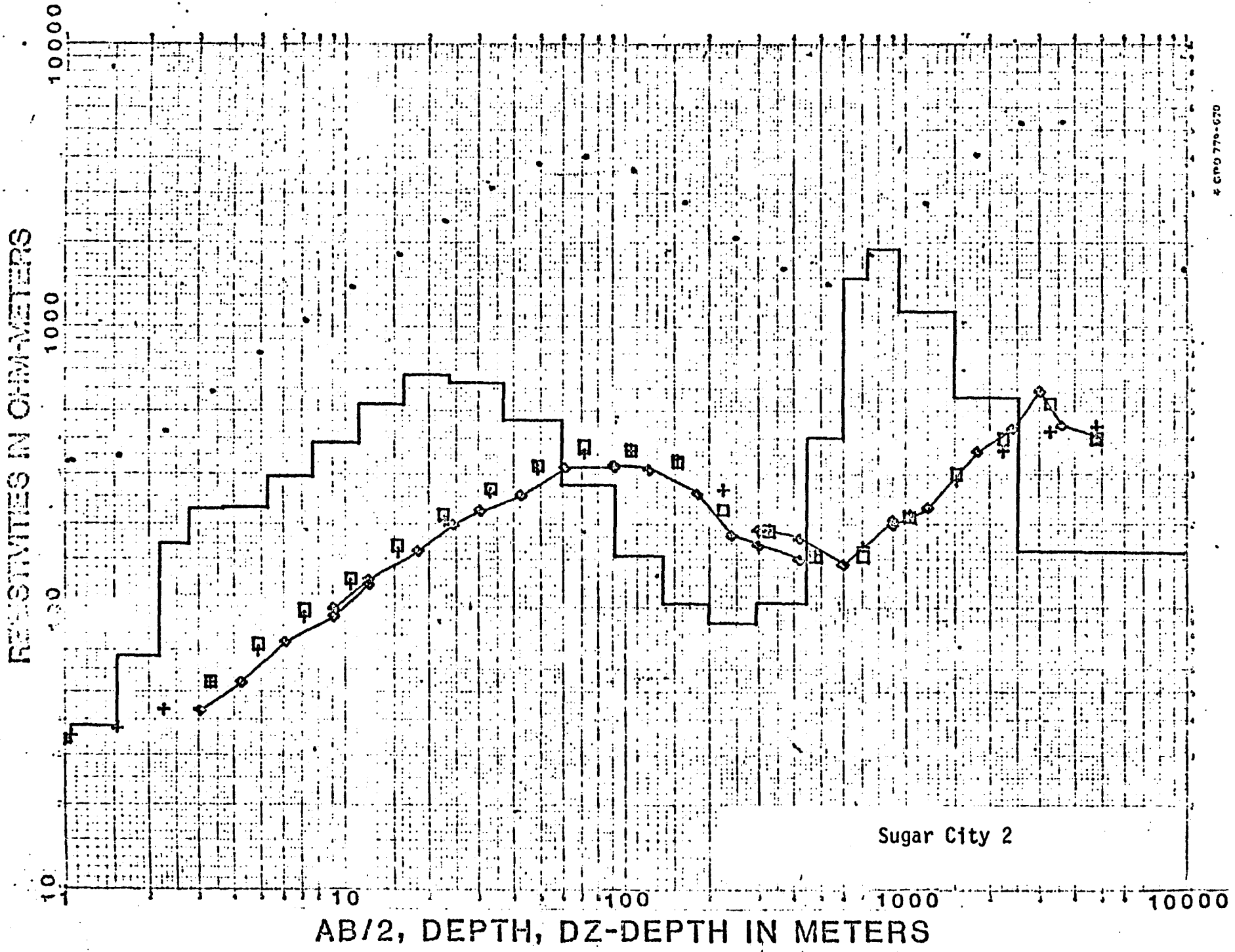
1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 1


RESISTIVITIES IN OHM-METERS
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1000
100
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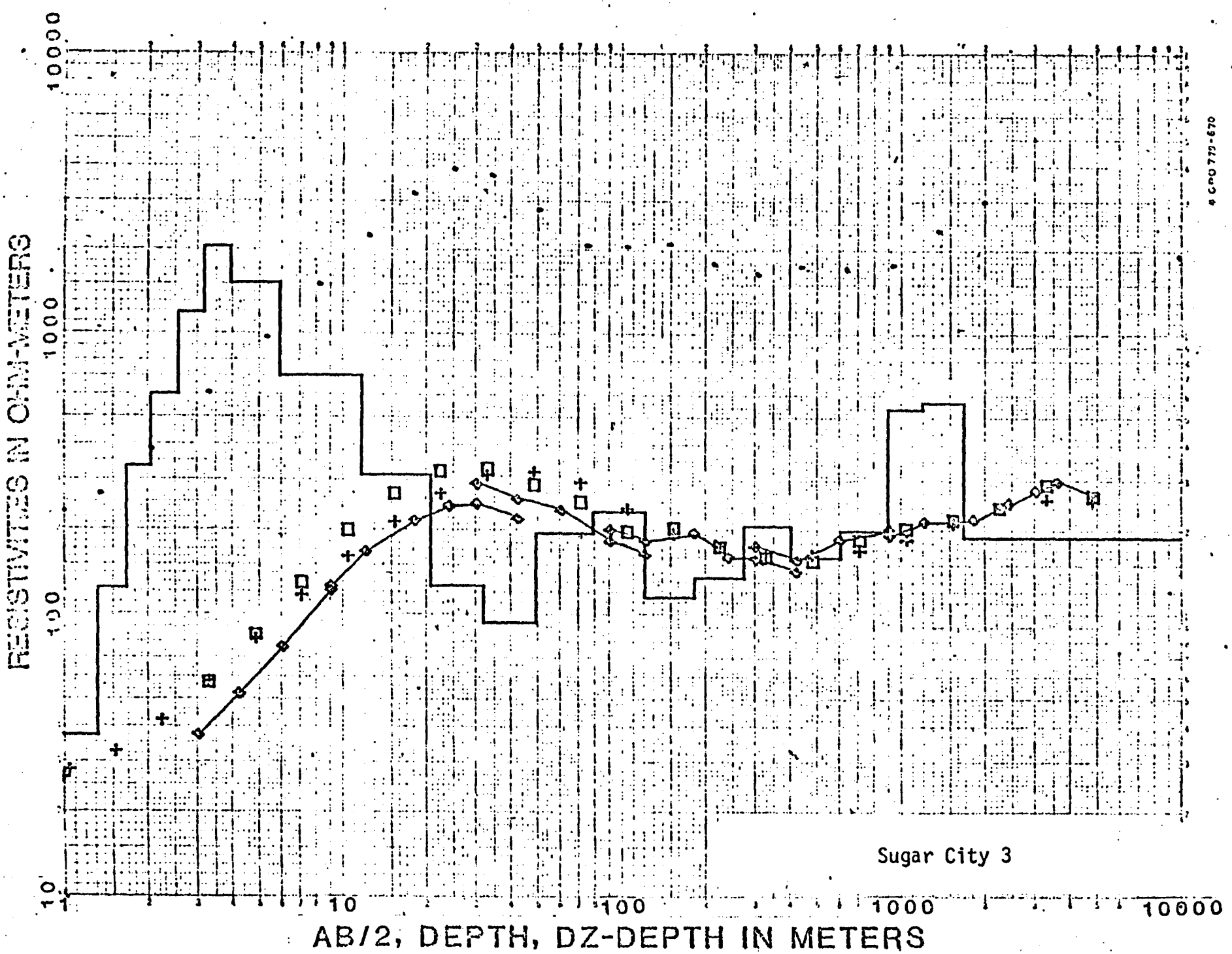
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 2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10
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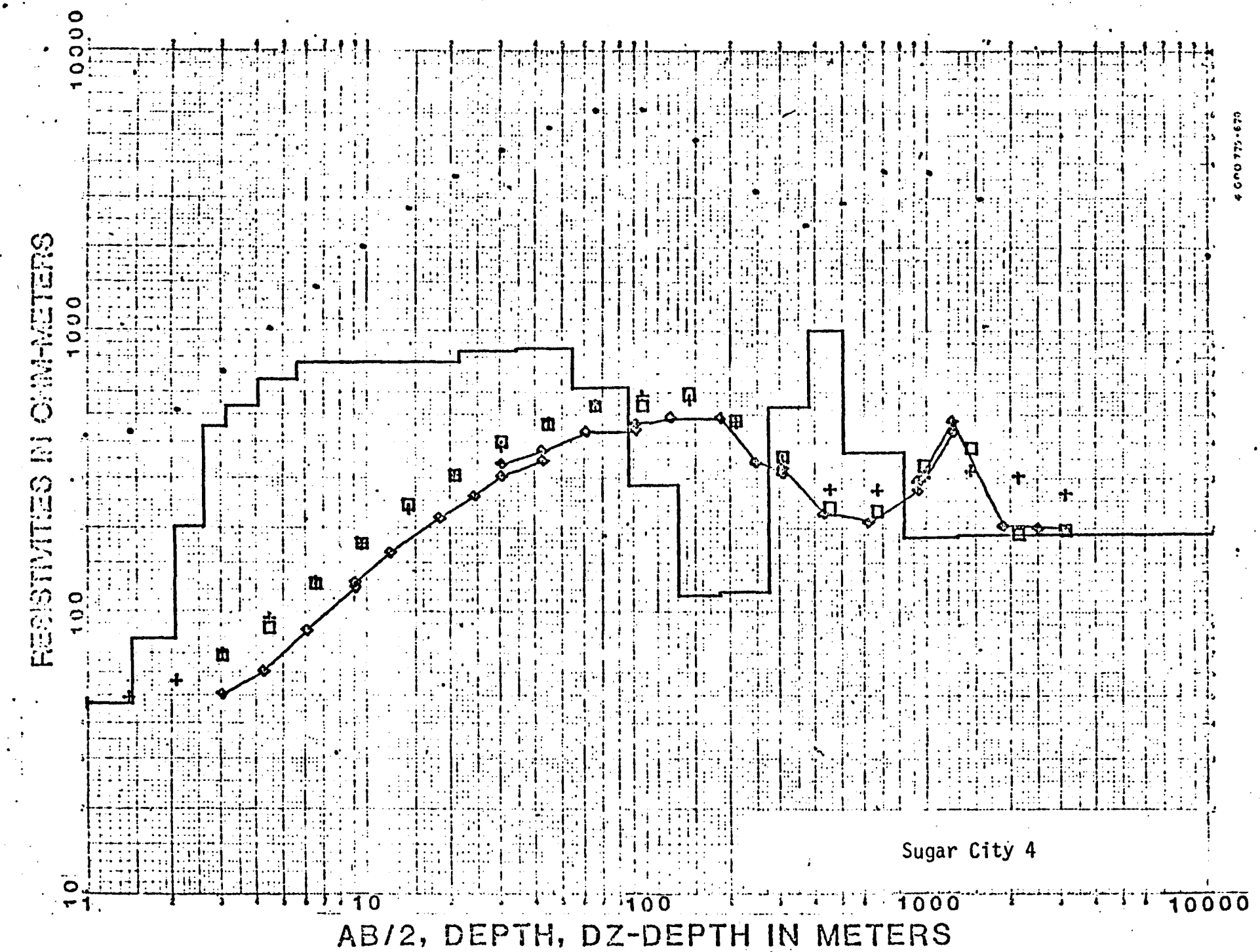
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 3
CPO 773-670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AB/2, DEPTH, DZ-DEPTH IN METERS
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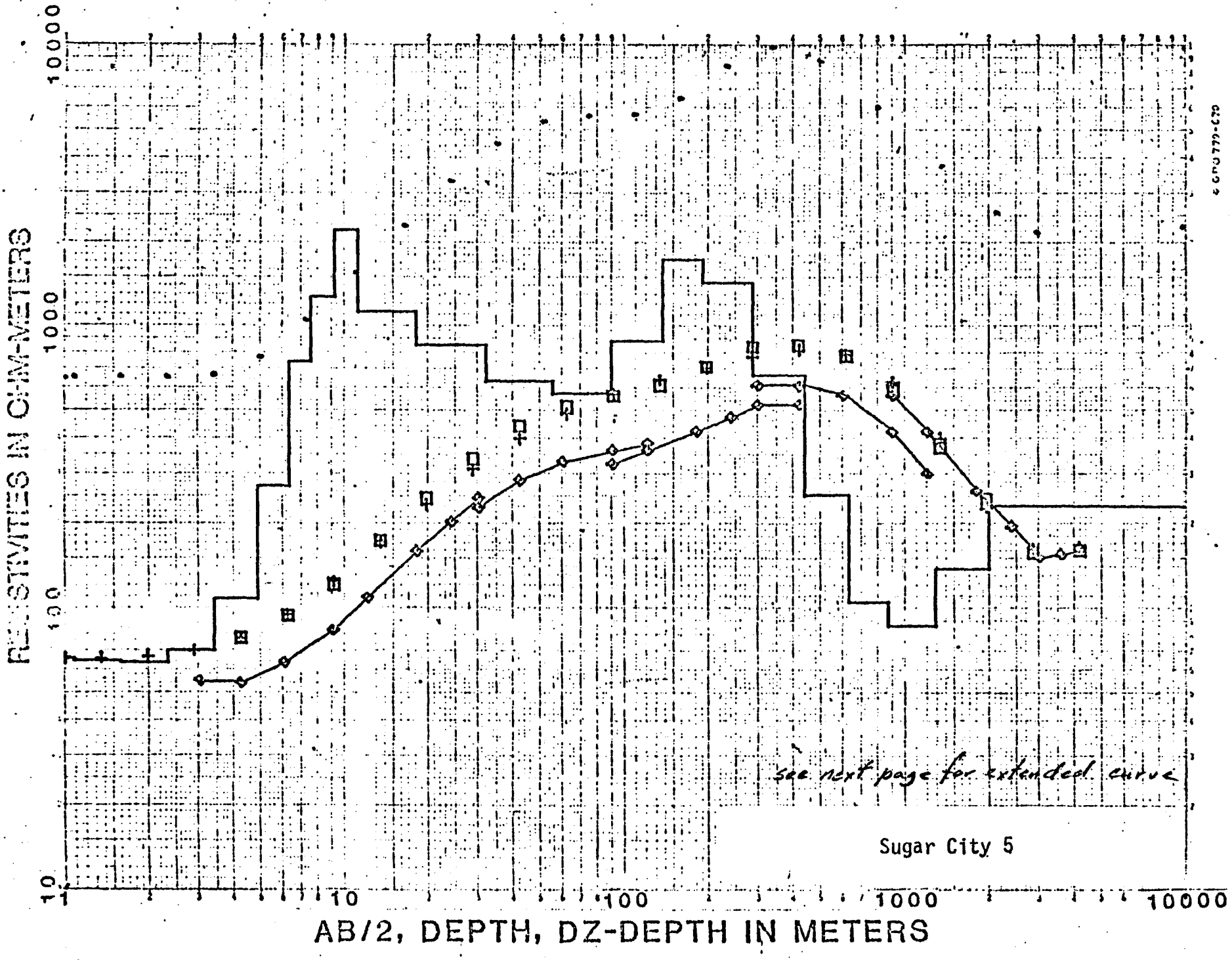
RESISTIVITIES IN OHM-METERS
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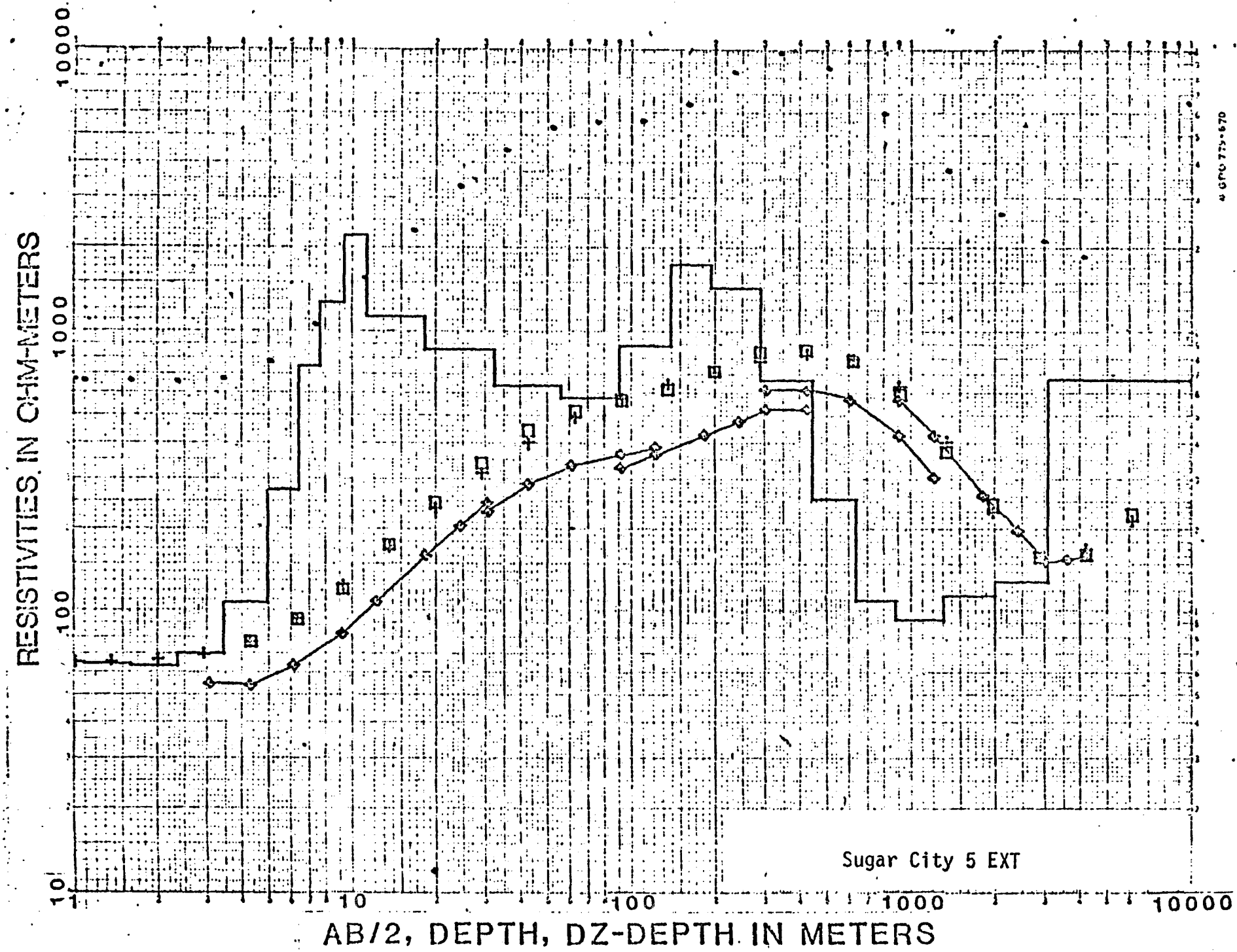
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for extended curve
Sugar City 5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10
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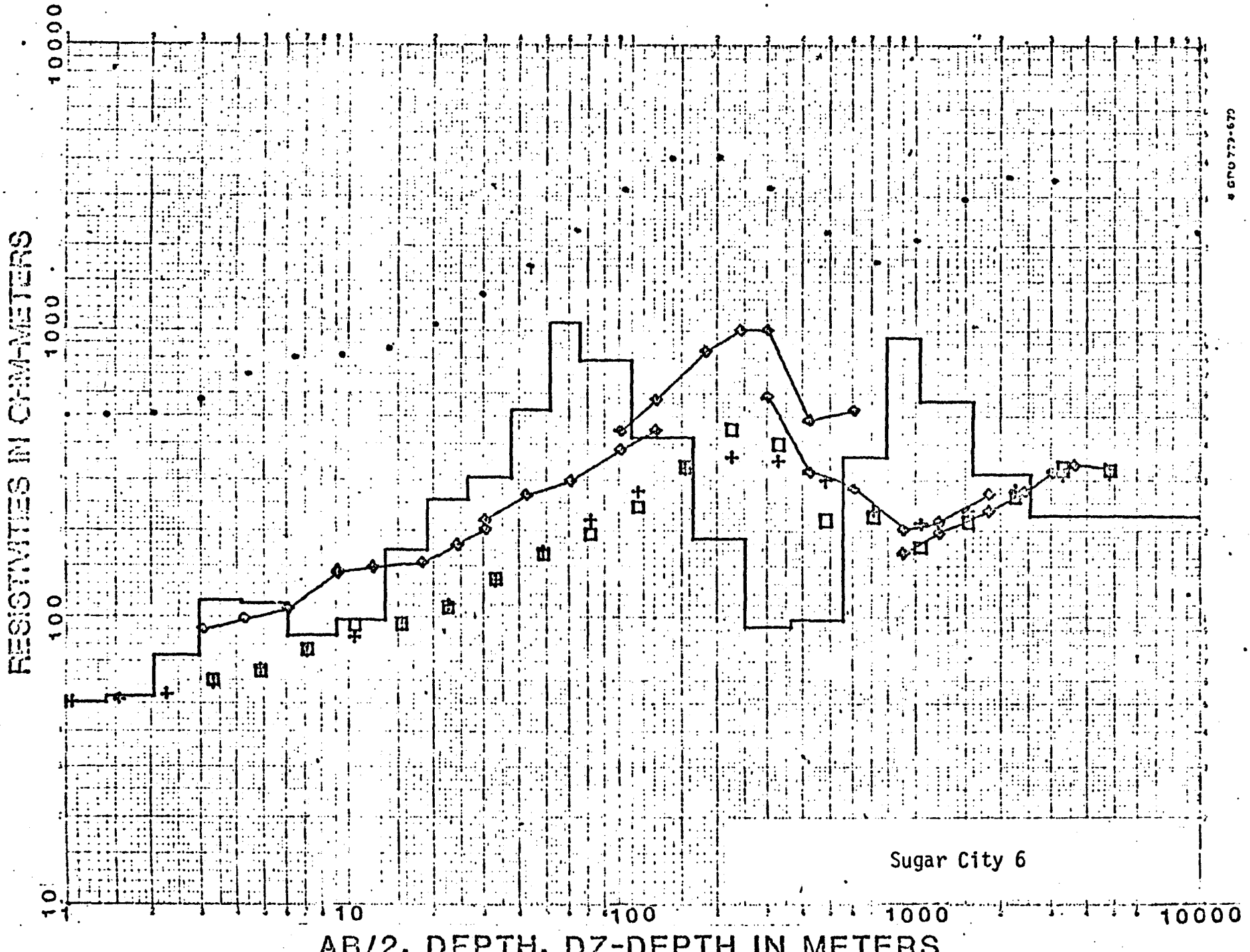
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 5 EXT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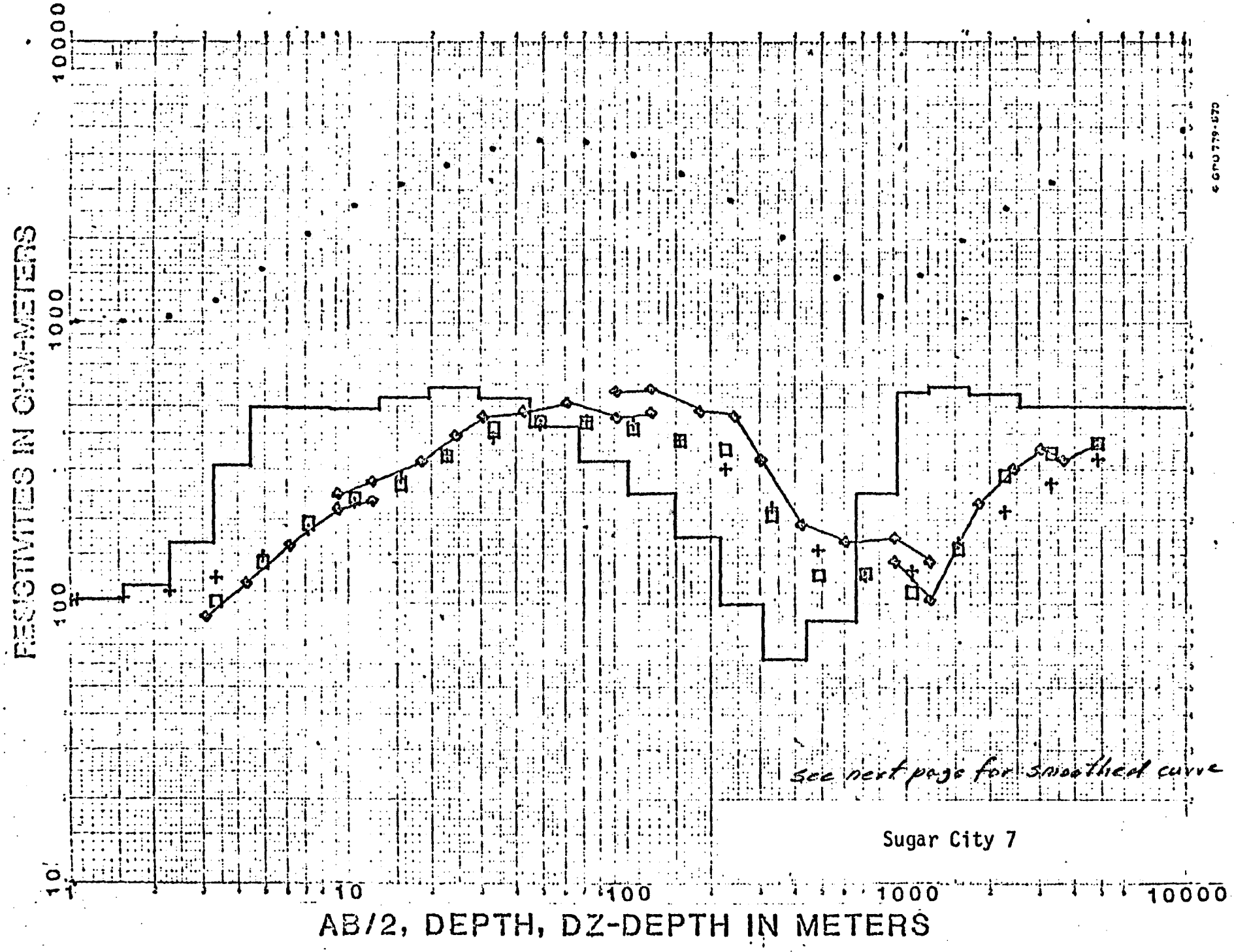
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 6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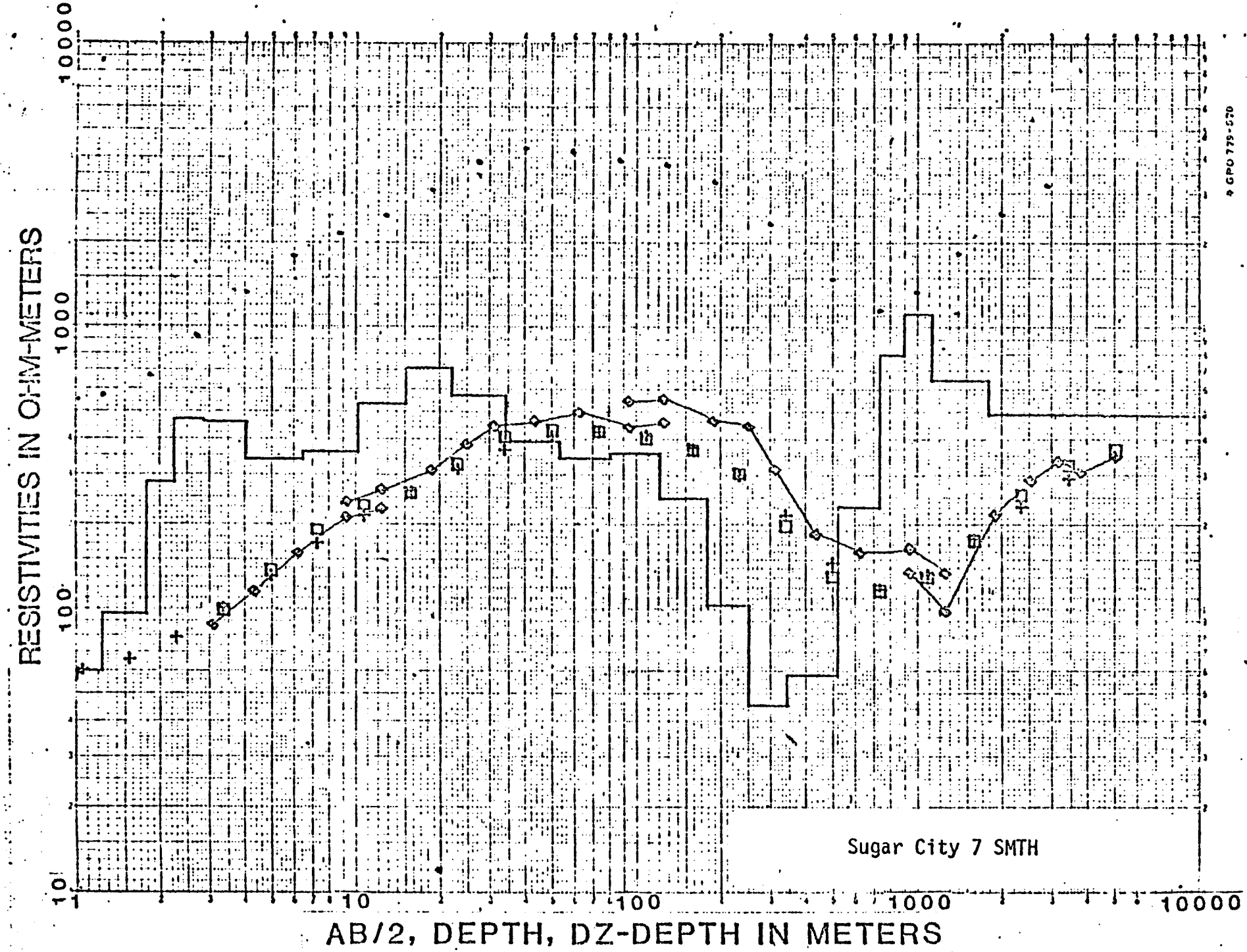
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
See next page for smoothed curve
Sugar City 7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10
100
1000
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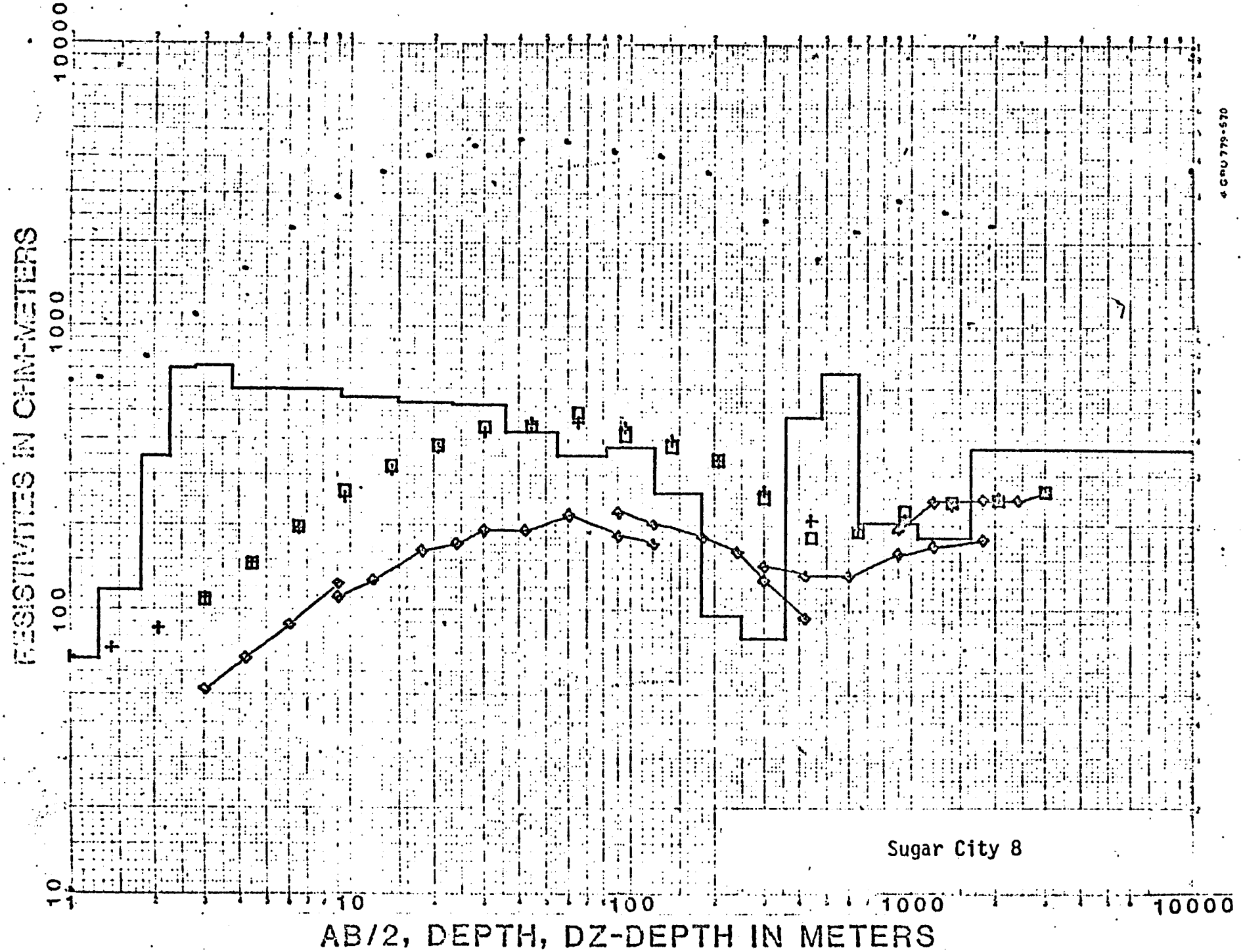
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 7 SMTH
GPO 775-550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10
1
10
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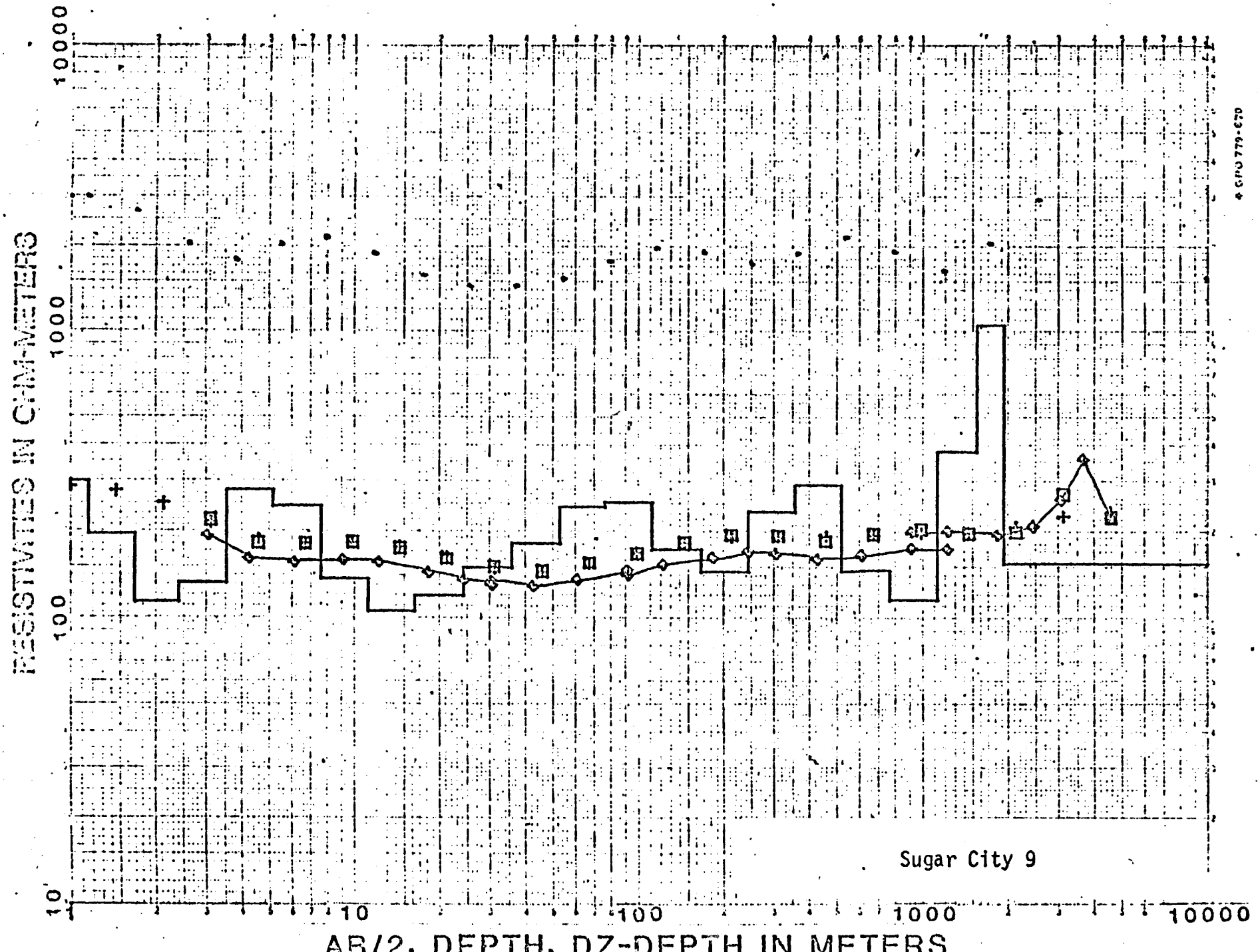
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 8
GRU 779-570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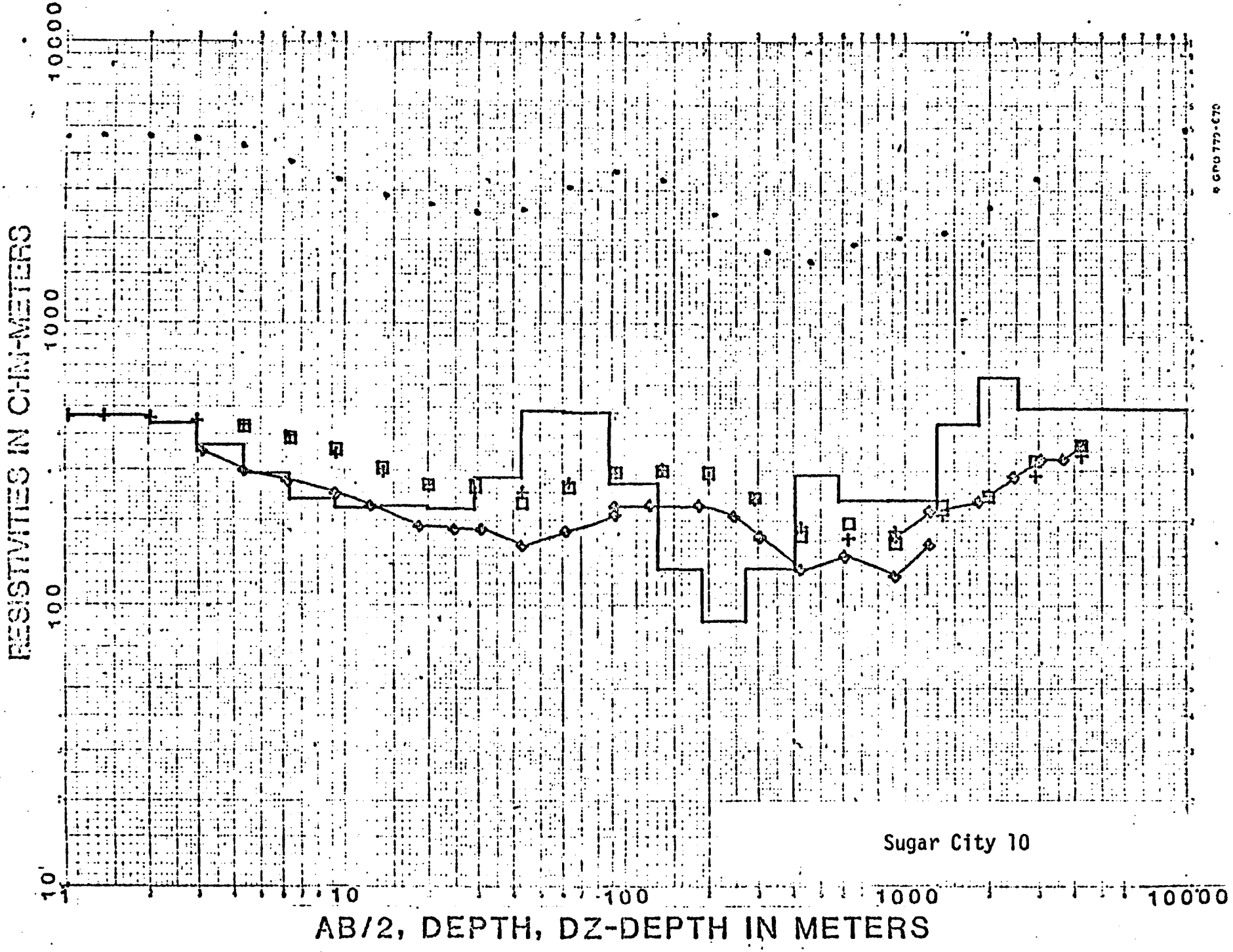
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 9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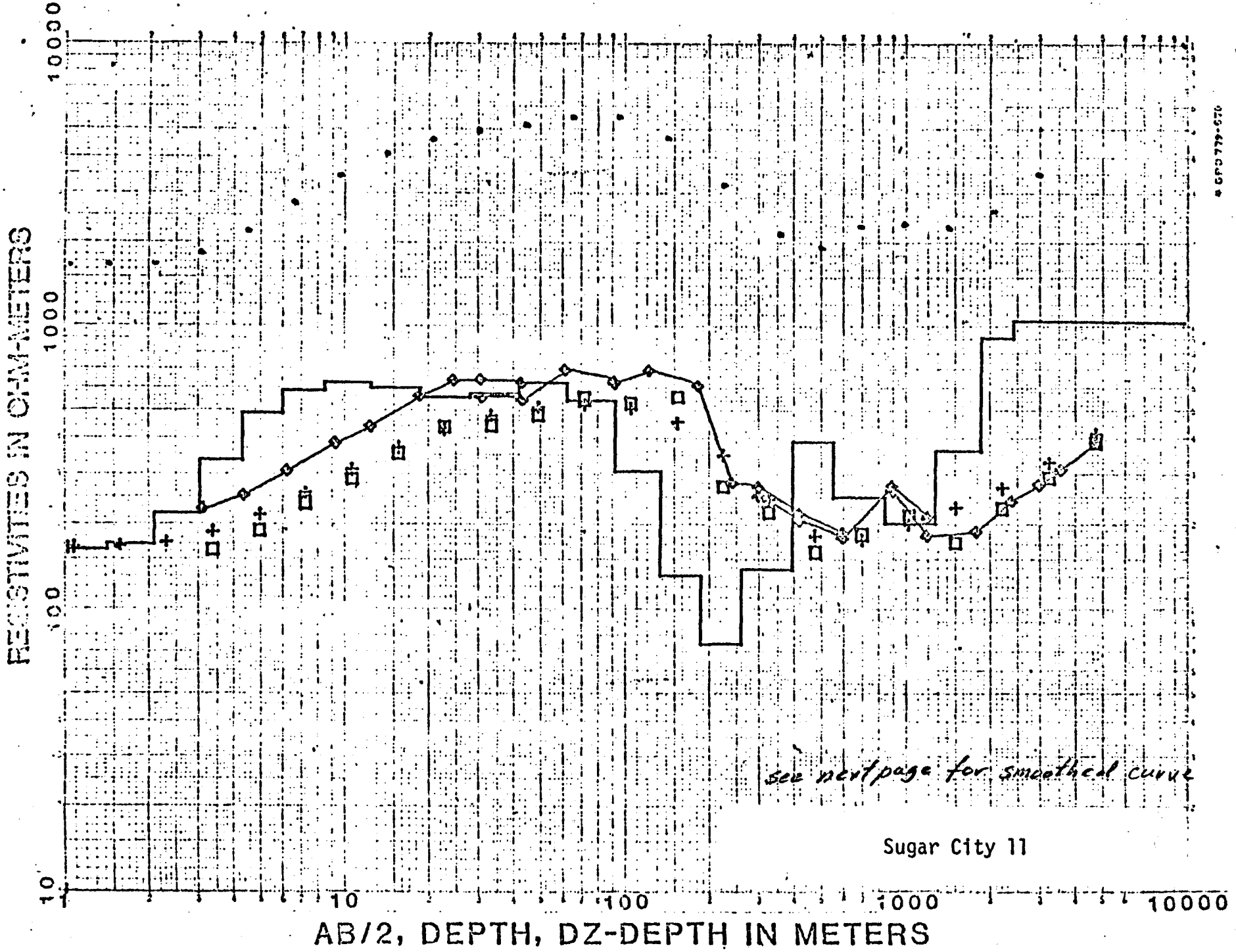
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 10


RESISTIVITIES IN OHM-METERS
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1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 11

3/

Sugar City 11 SMTH
AB/2, DEPTH, DZ-DEPTH IN METERS
RESISTIVITIES IN OHM-METERS
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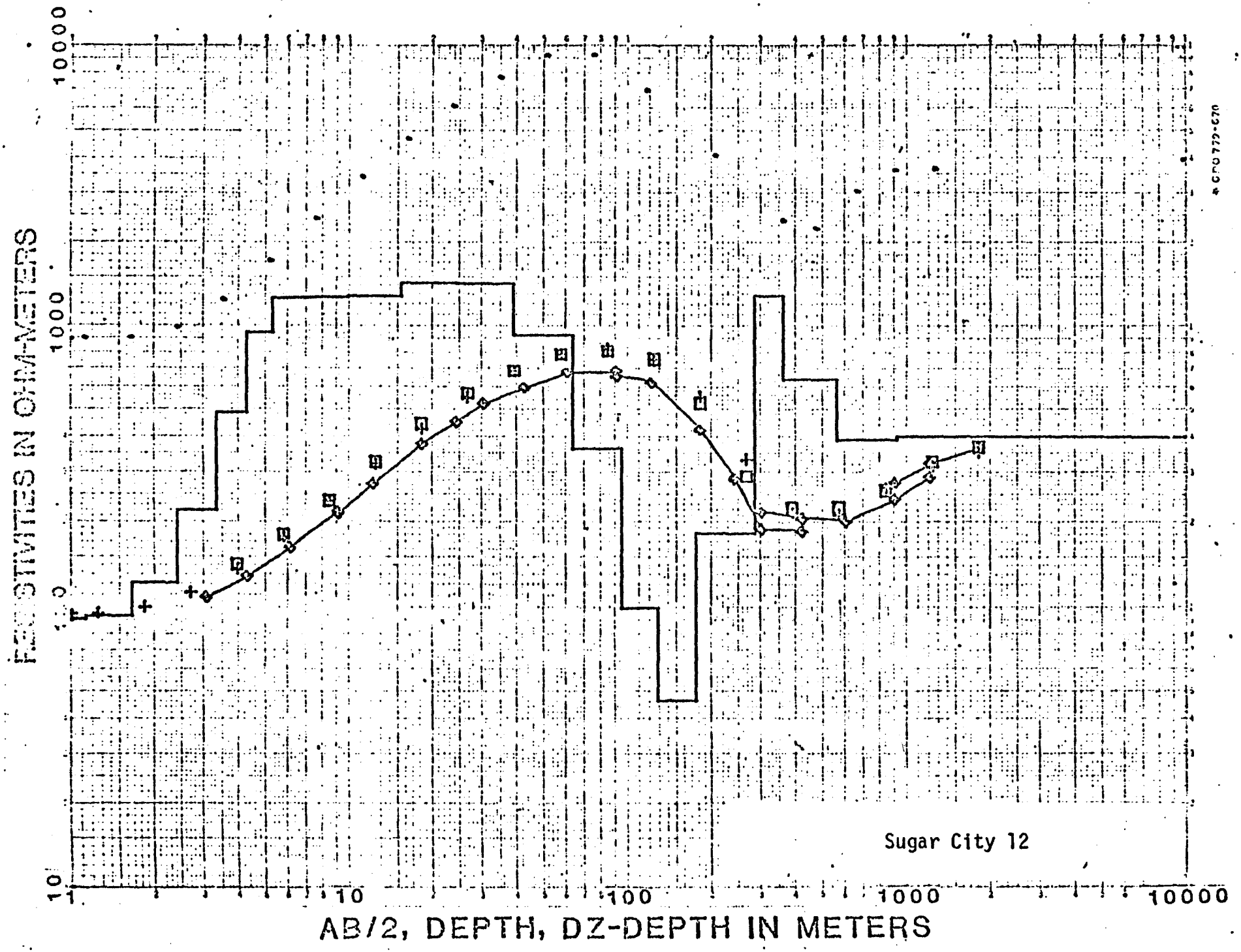
1000
100
10
1
10000
1000
100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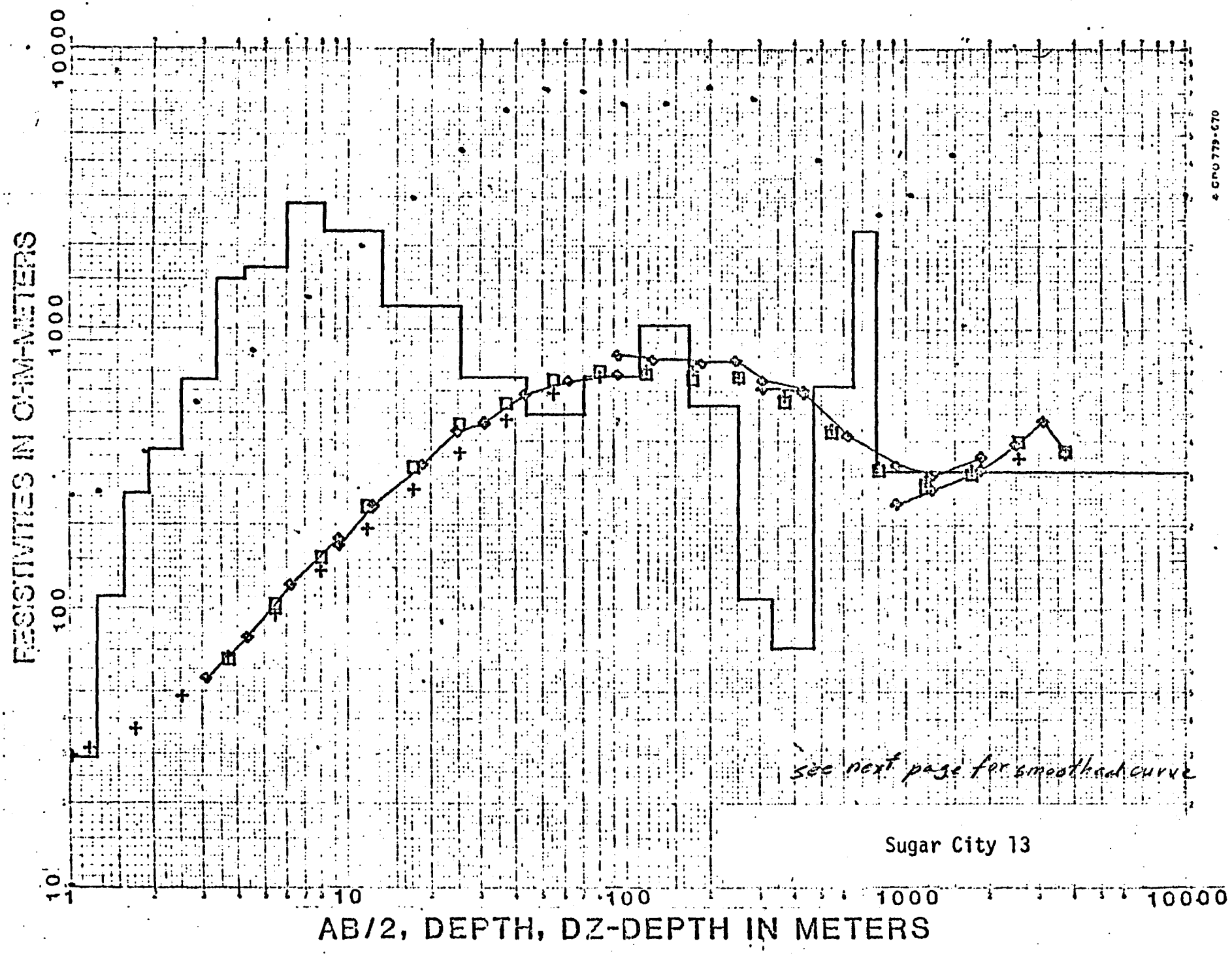
RESISTIVITIES IN OHM-METERS
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 12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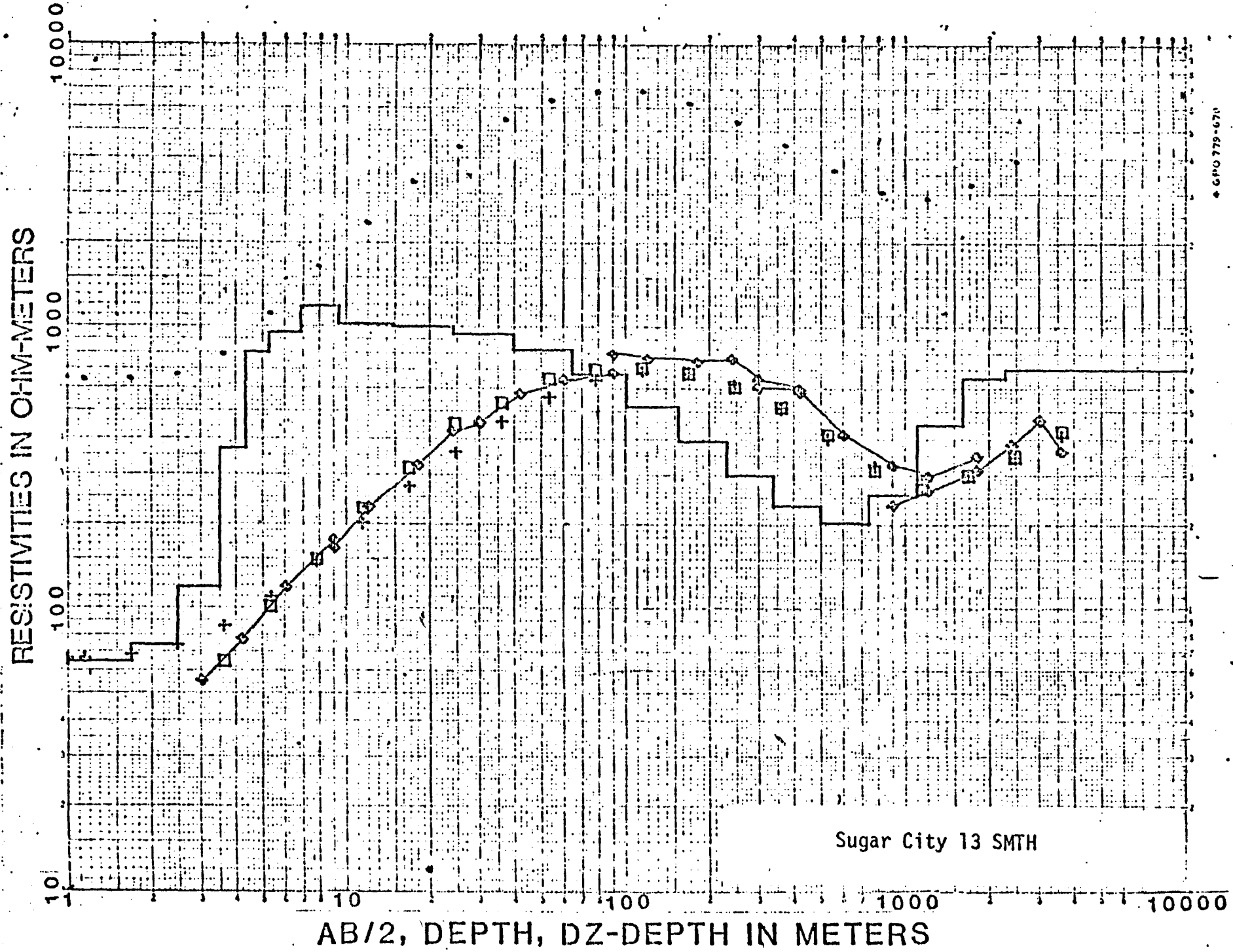
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 13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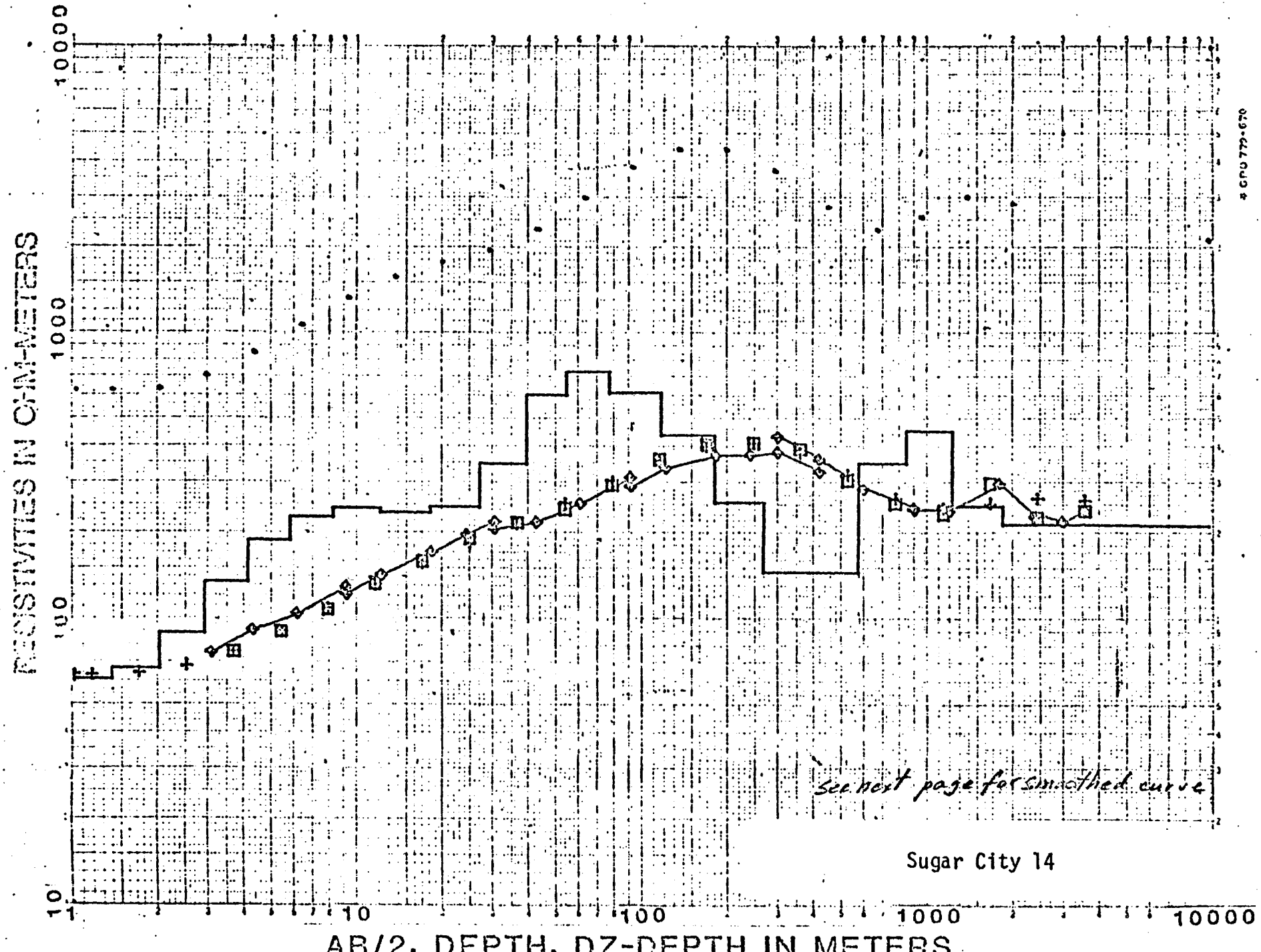
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 13 SMTH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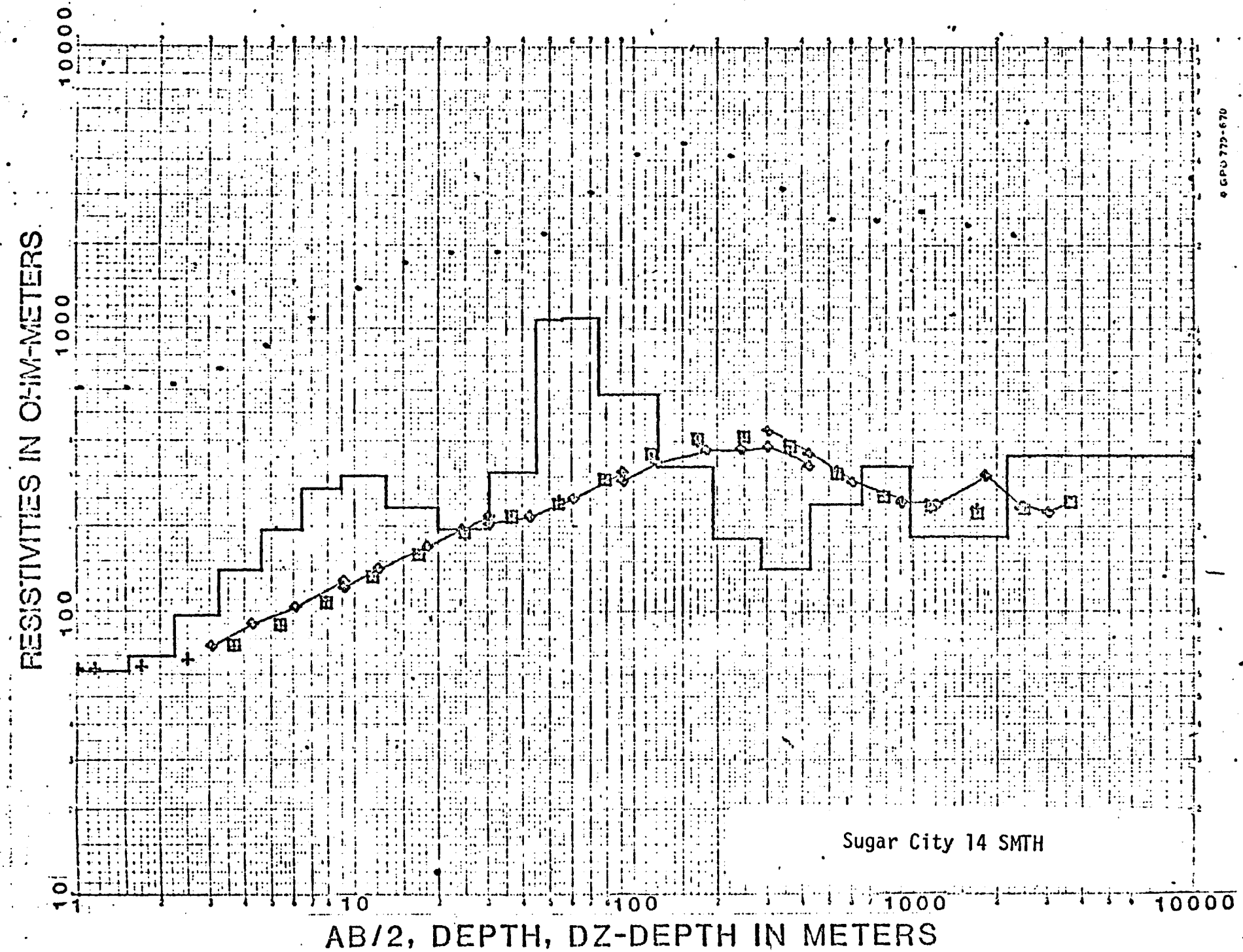
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 14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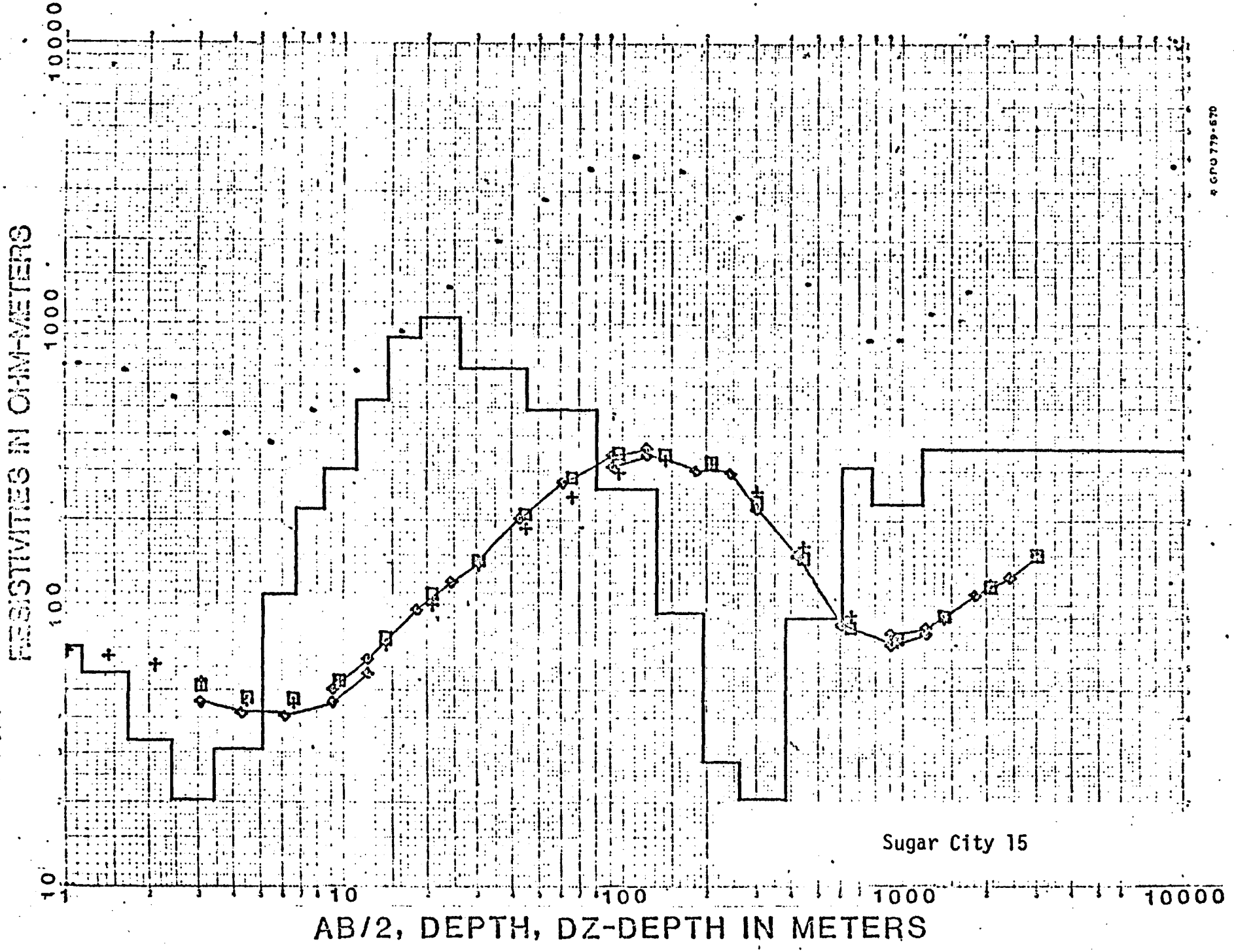
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 14 SMTH
GPO 722-670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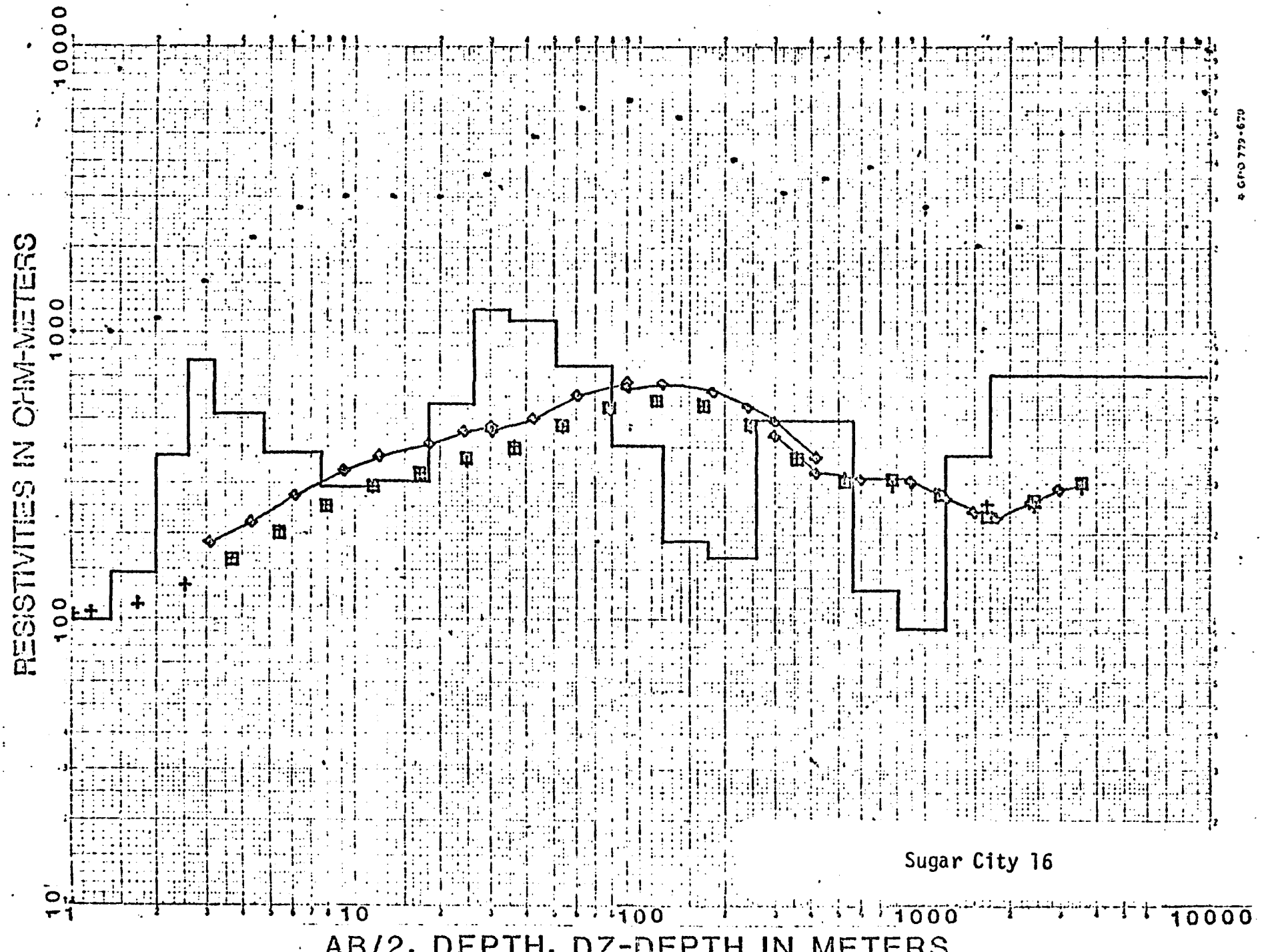
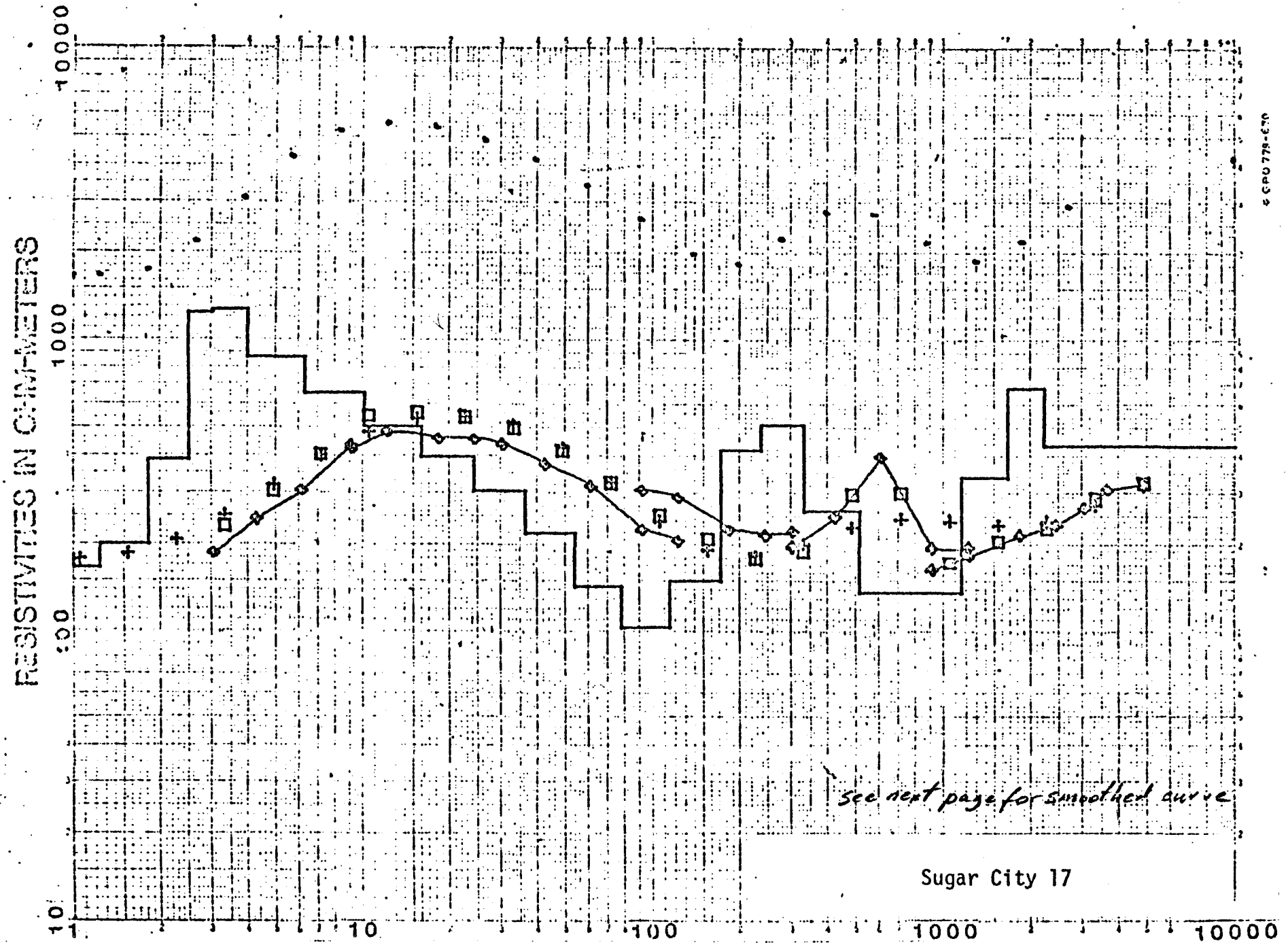
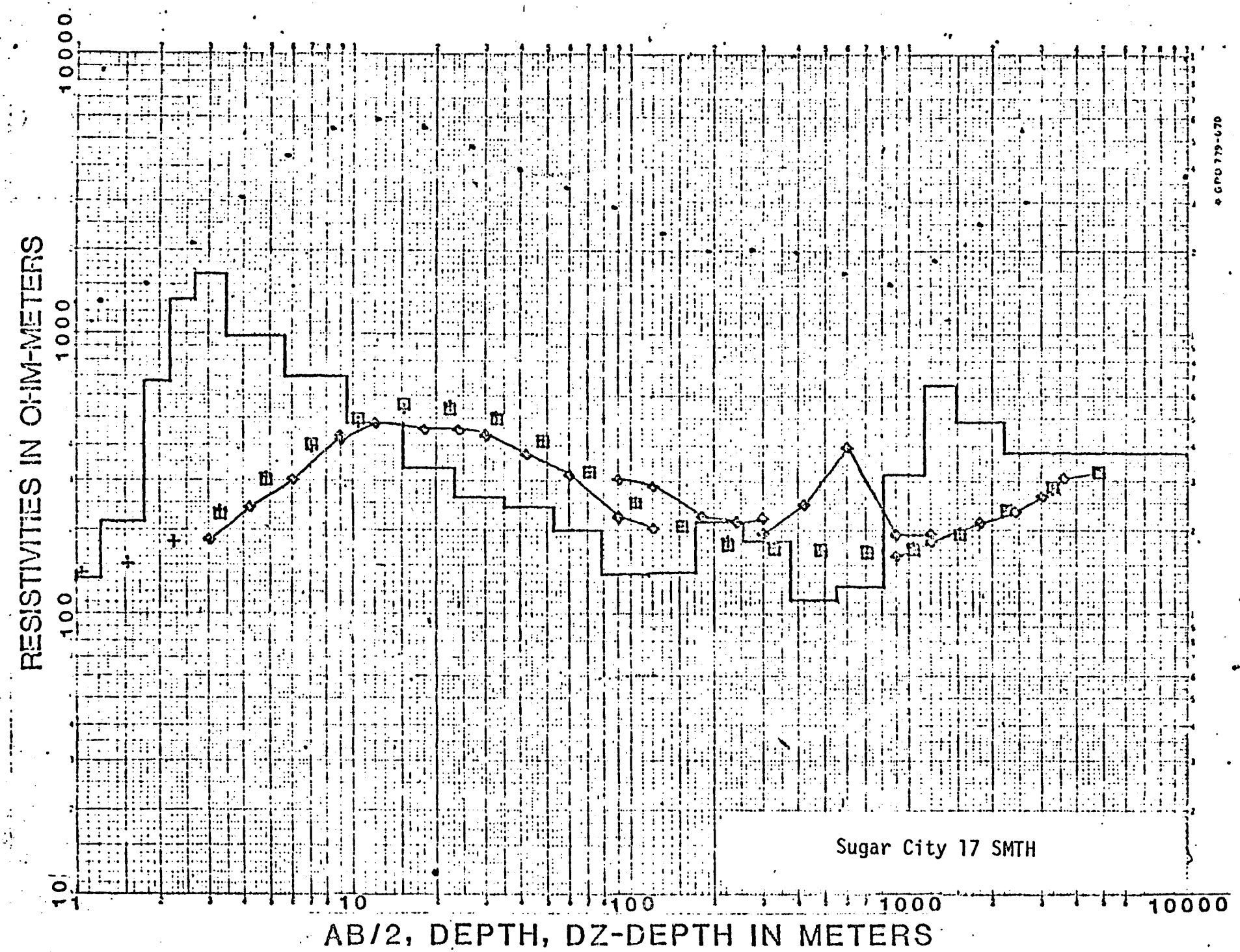
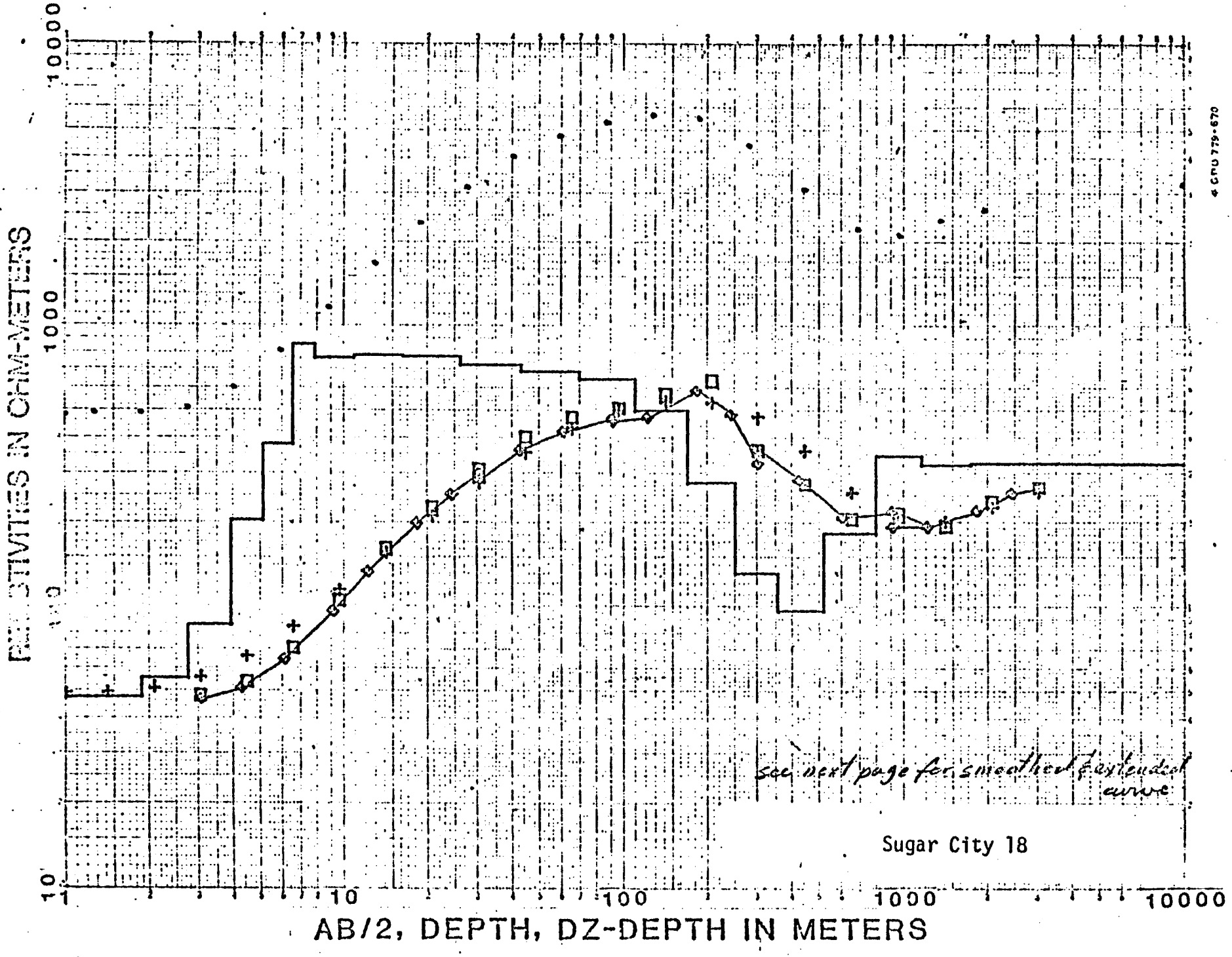
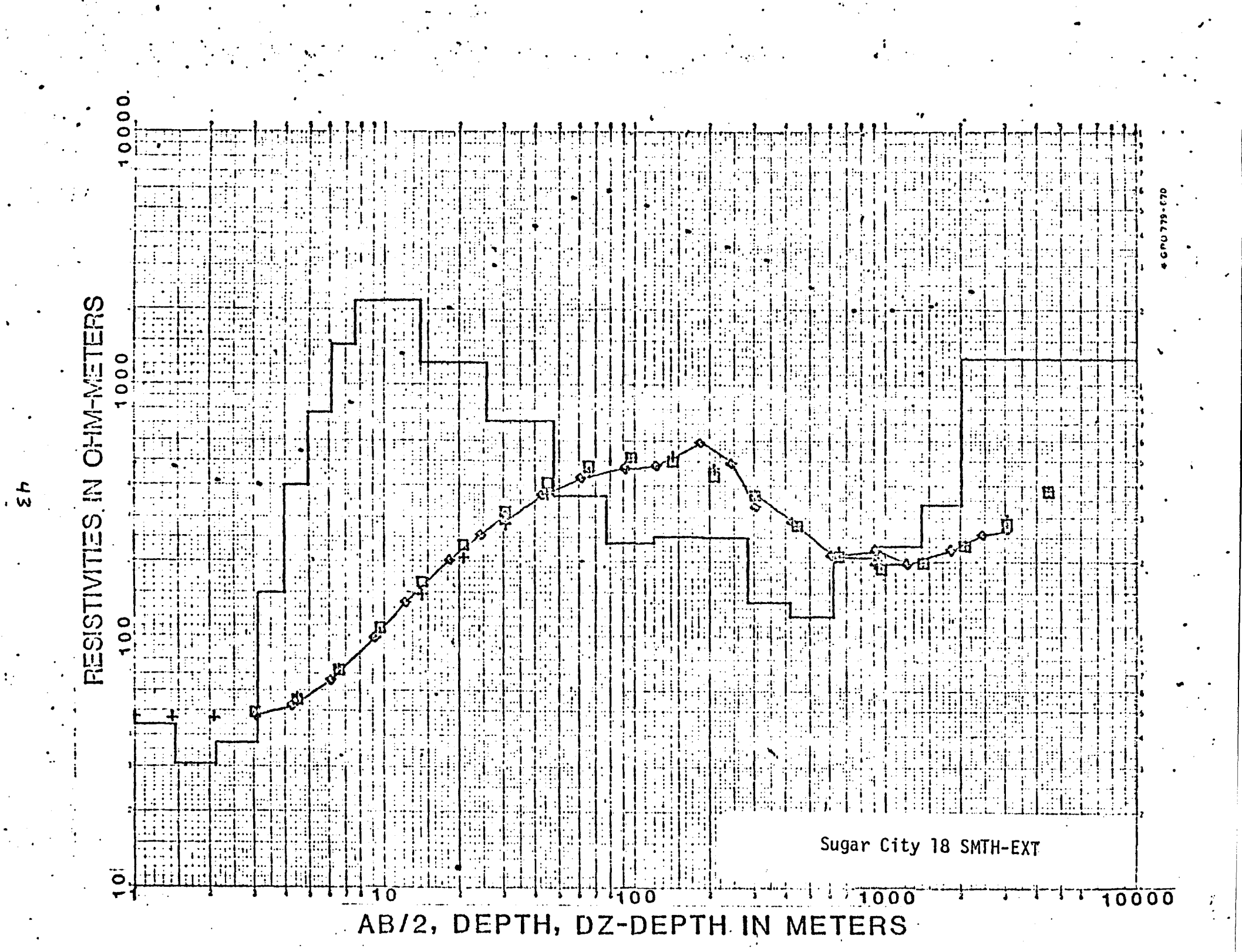
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 15

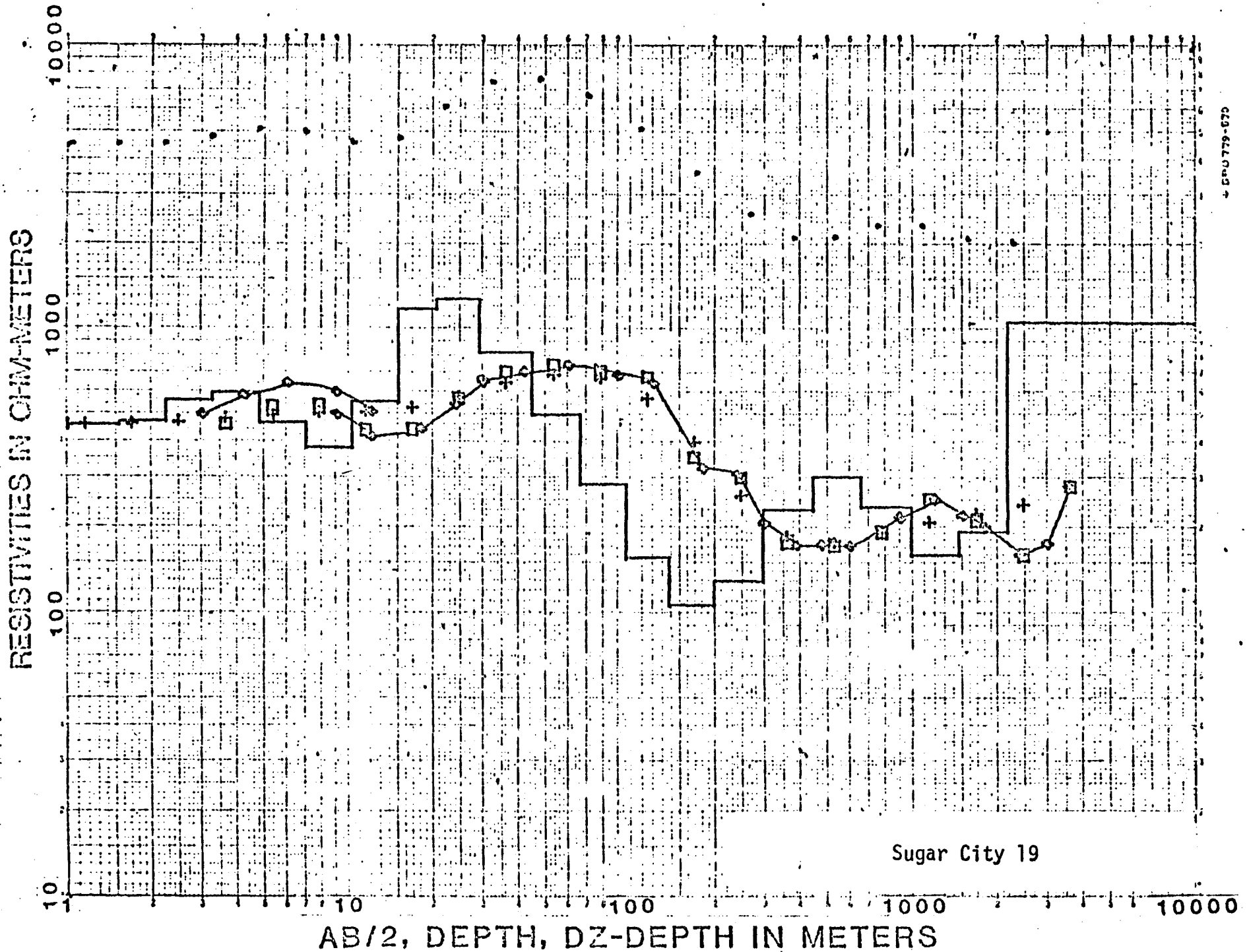

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 16

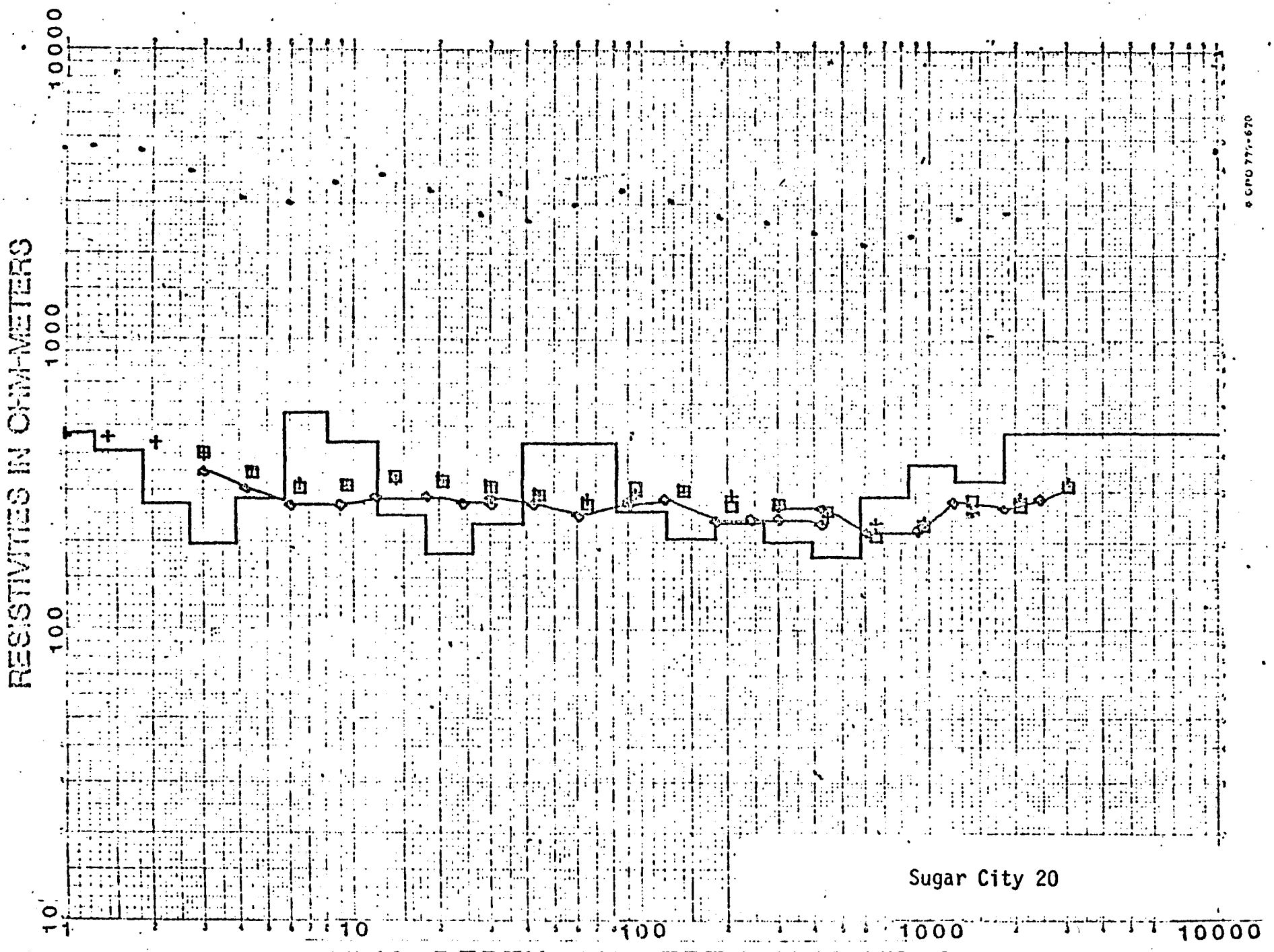

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
See next page for smoothed curve
Sugar City 17

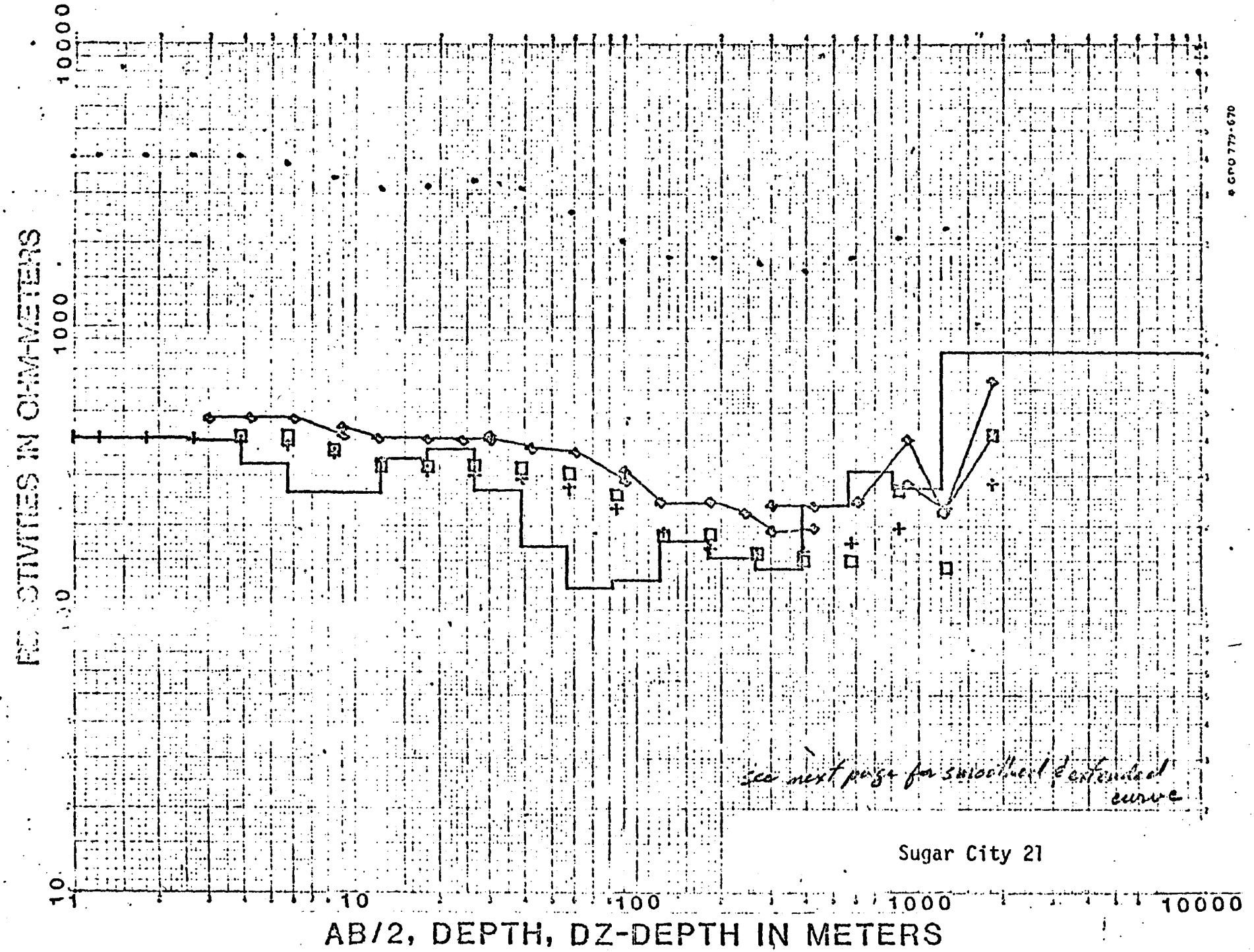

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 17 SMTH

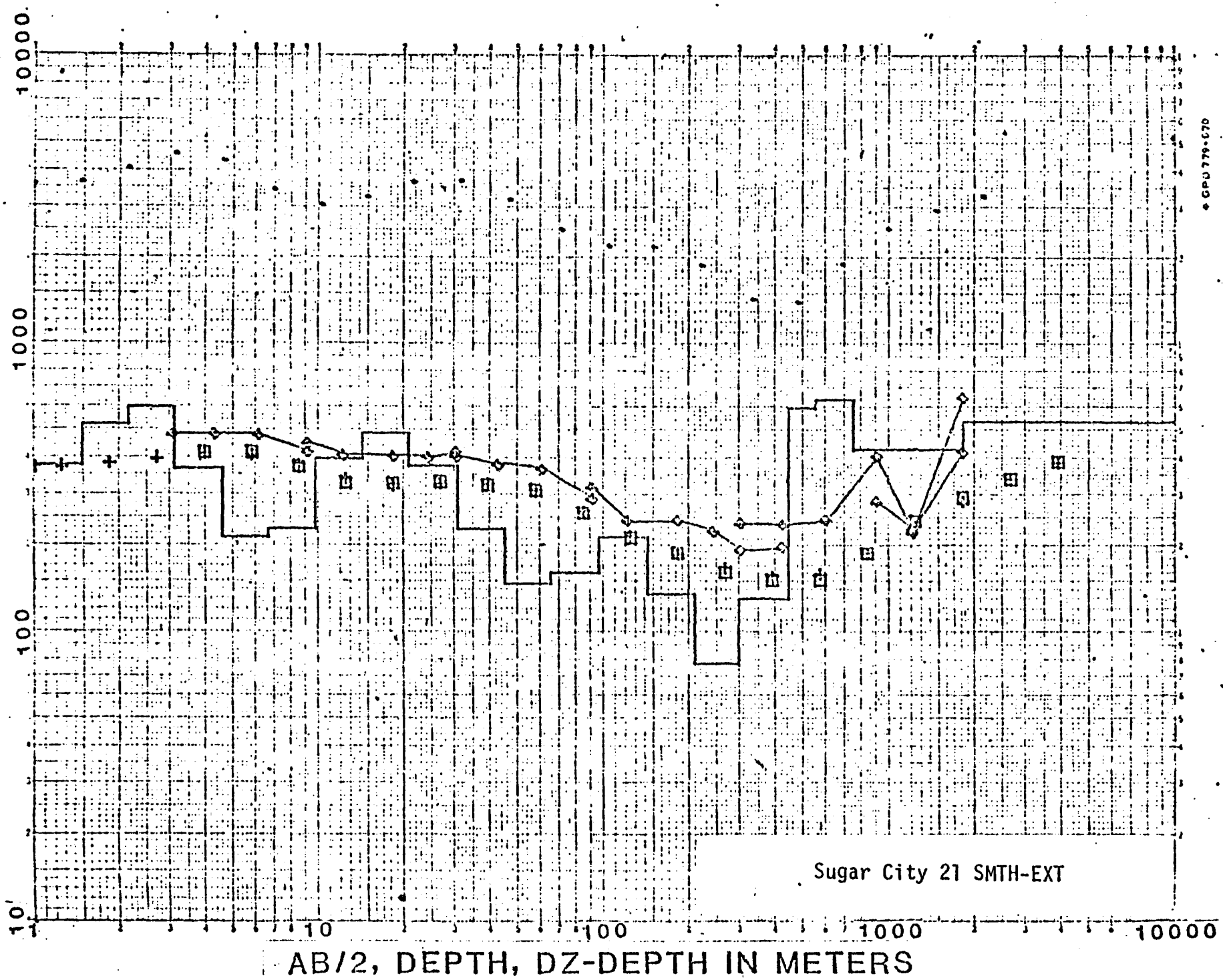

RESISTIVITIES IN OHM-METERS
10000
1000
10
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed & extended curve
Sugar City 18


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 18 SMTH-EXT
GPO 779-670

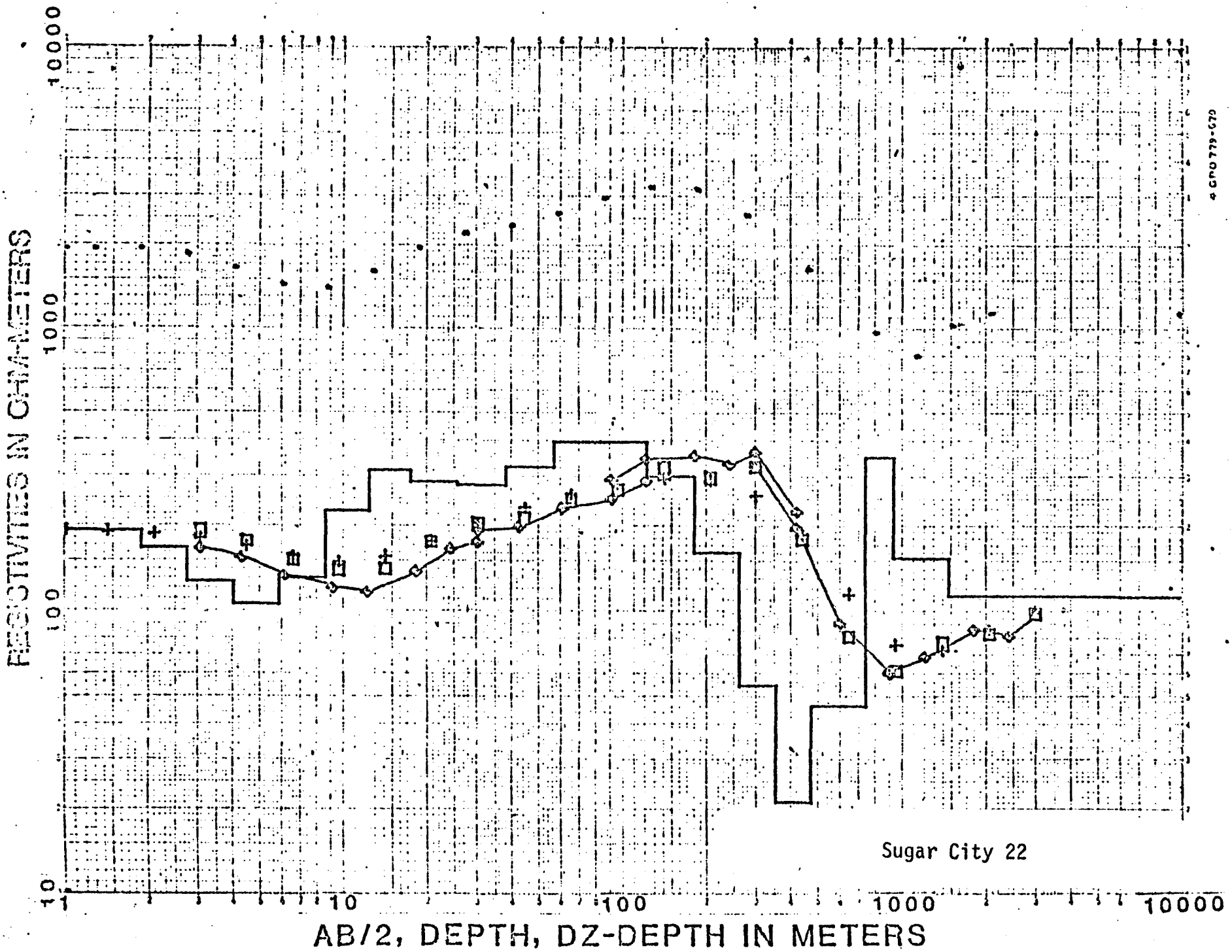

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 19

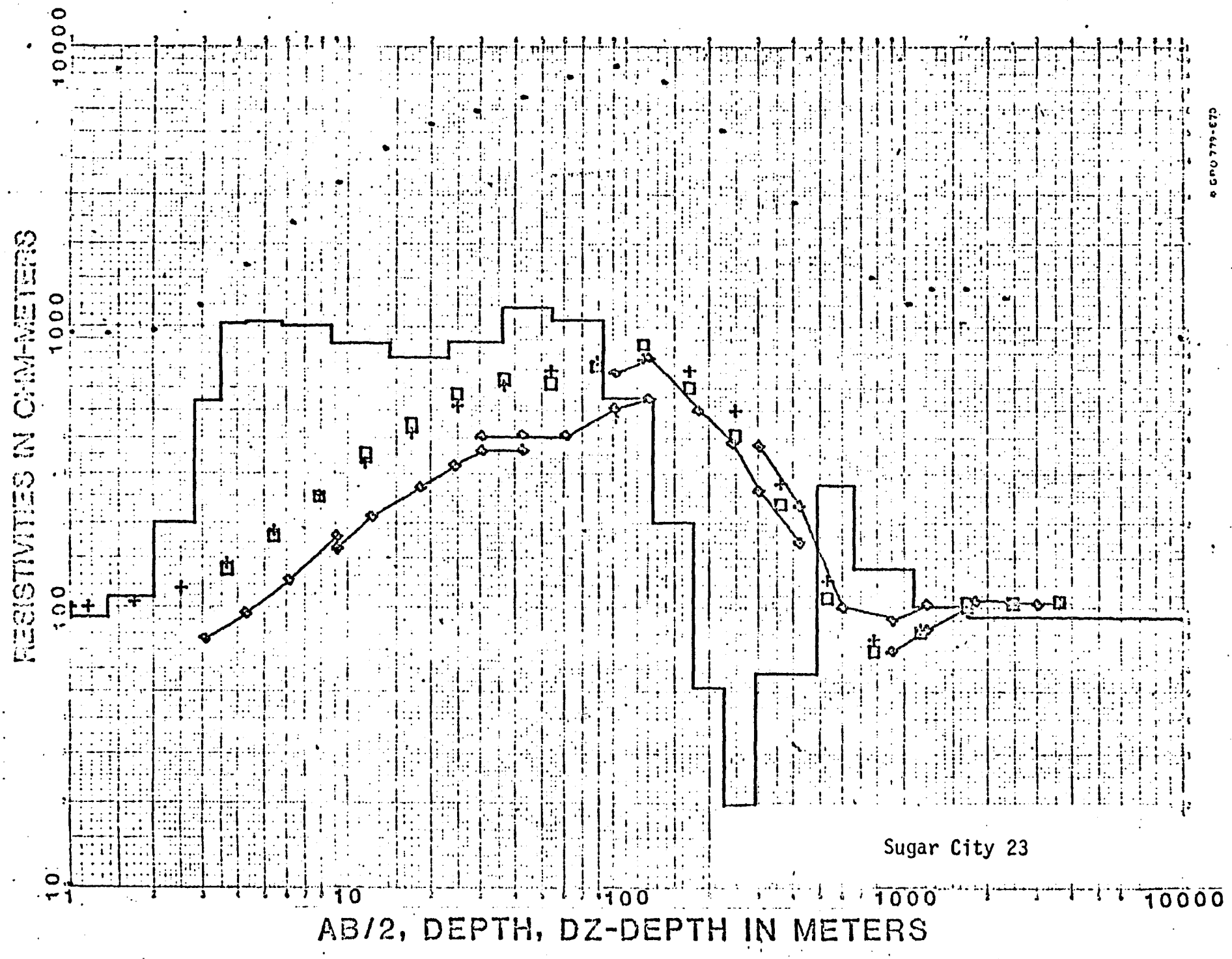

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 20

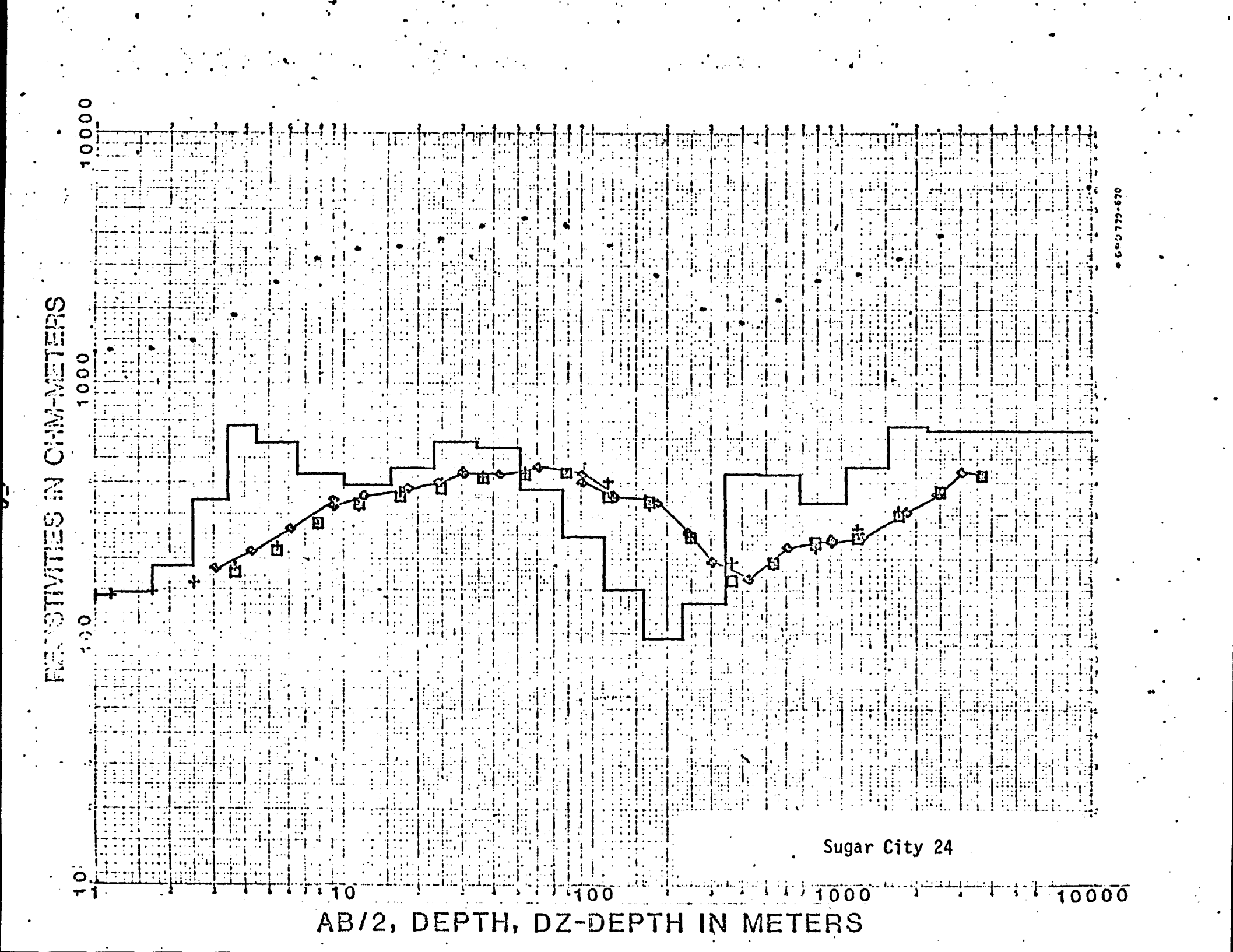

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
GRO 779-670
see next page for smoothed extended curve
Sugar City 21

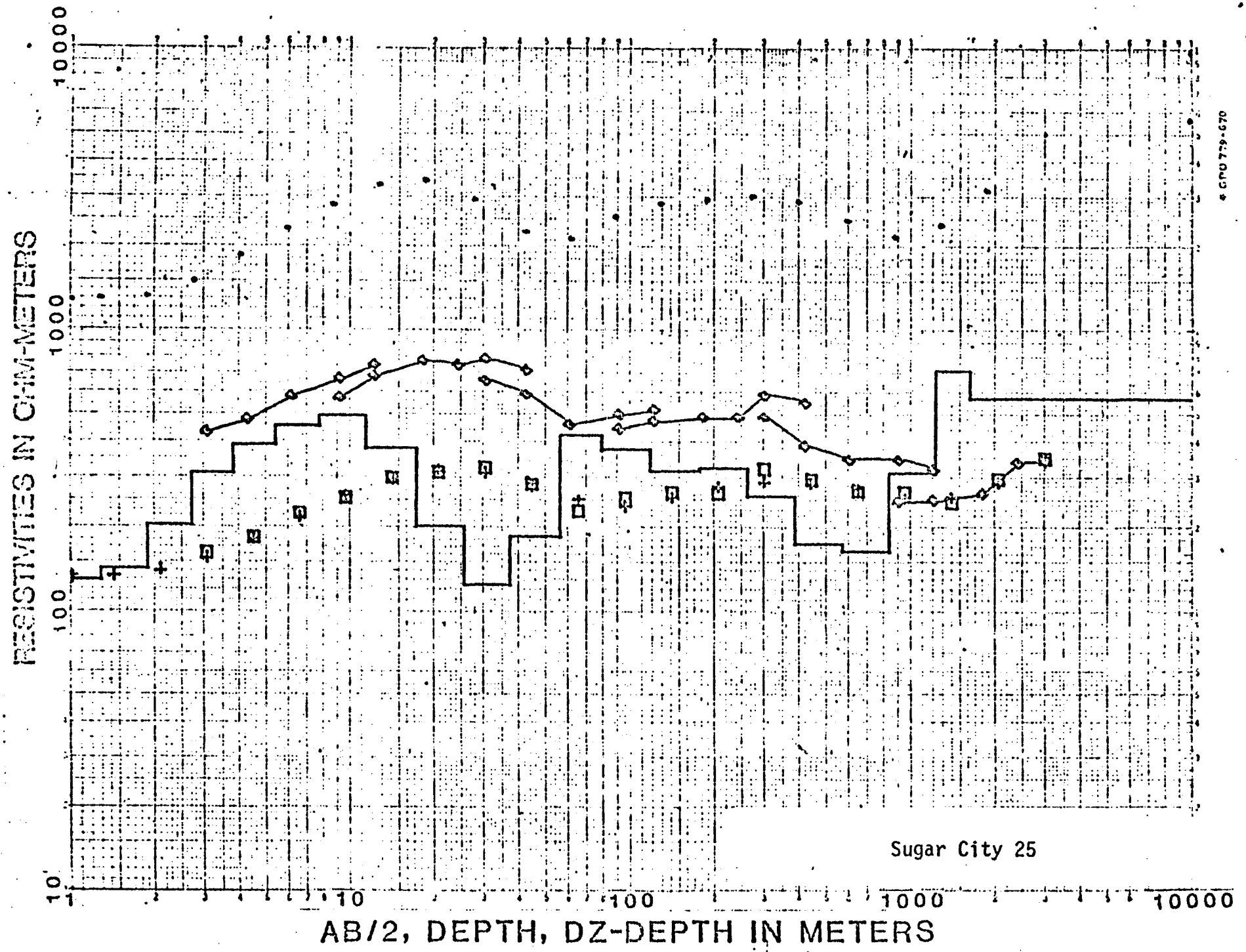

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 21 SMTH-EXT
GPO 779-670

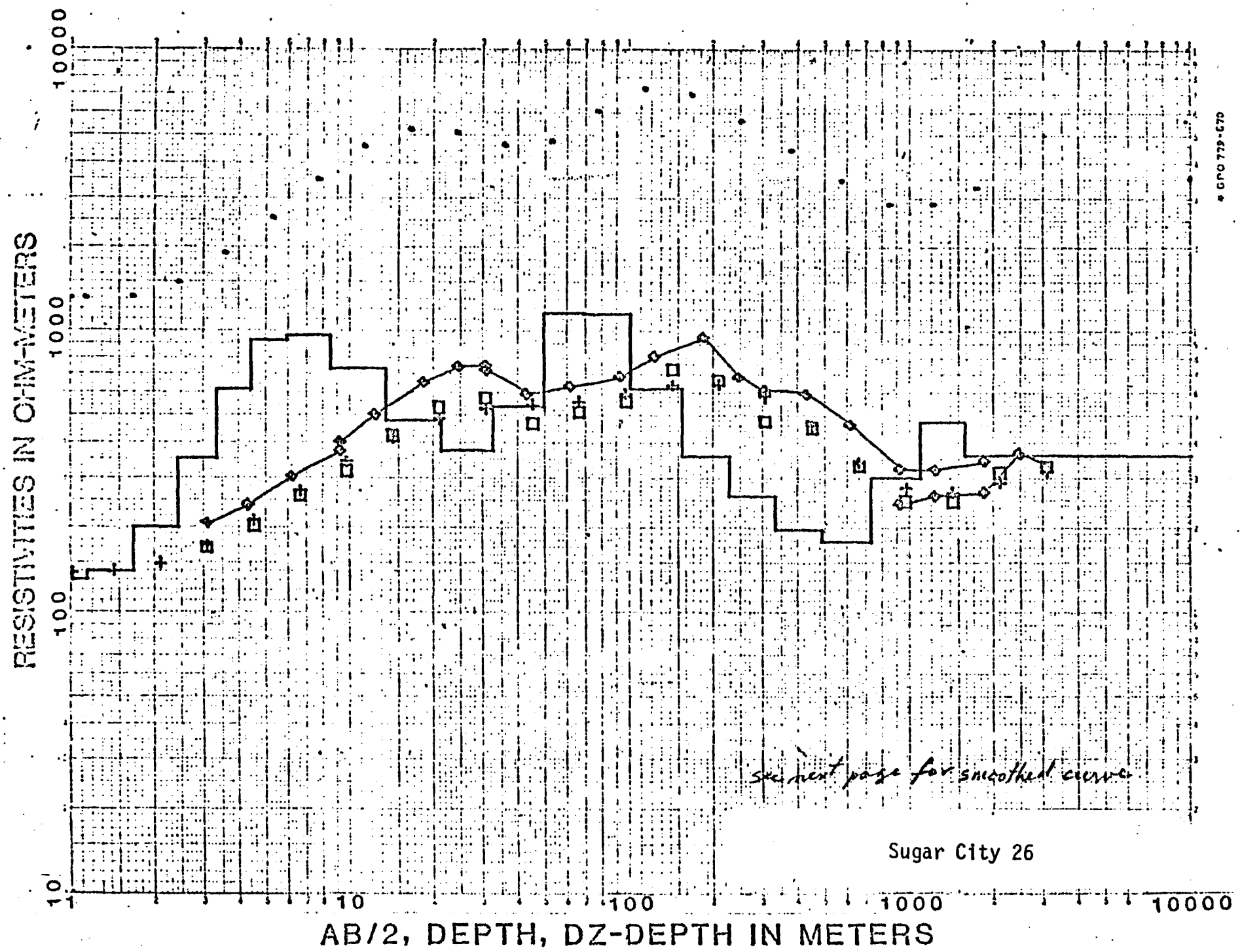
47

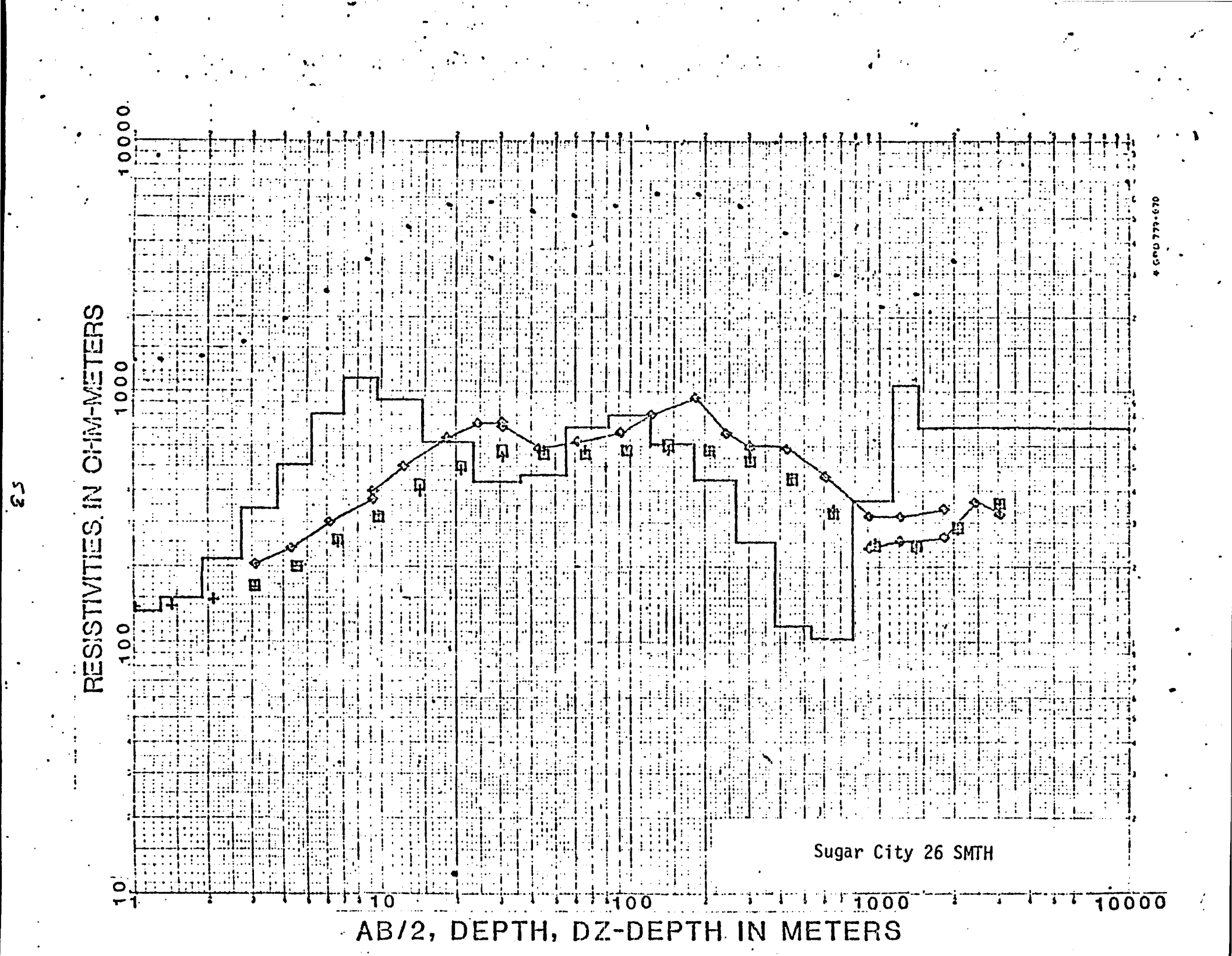

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 22

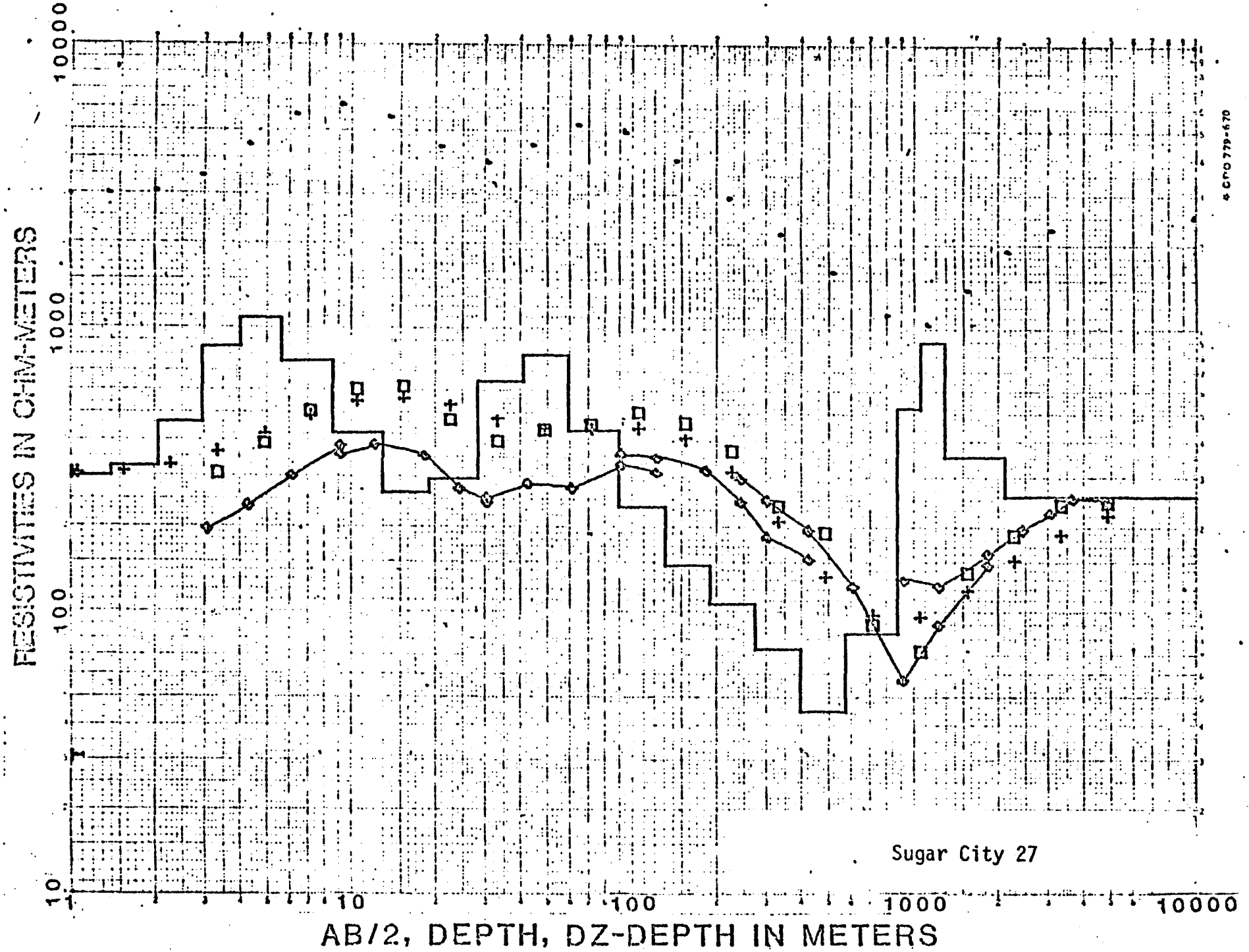

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 23

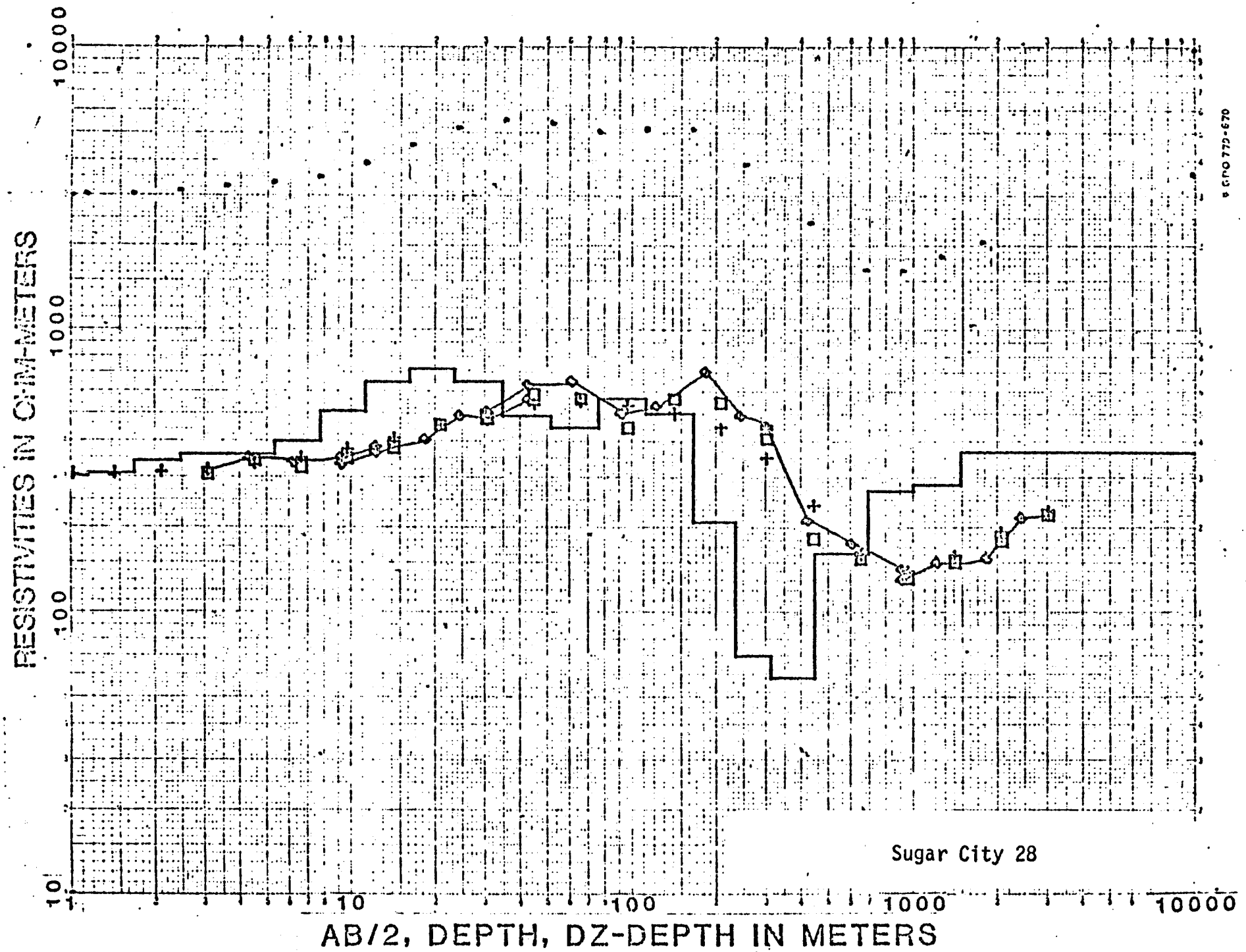

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 24


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 25

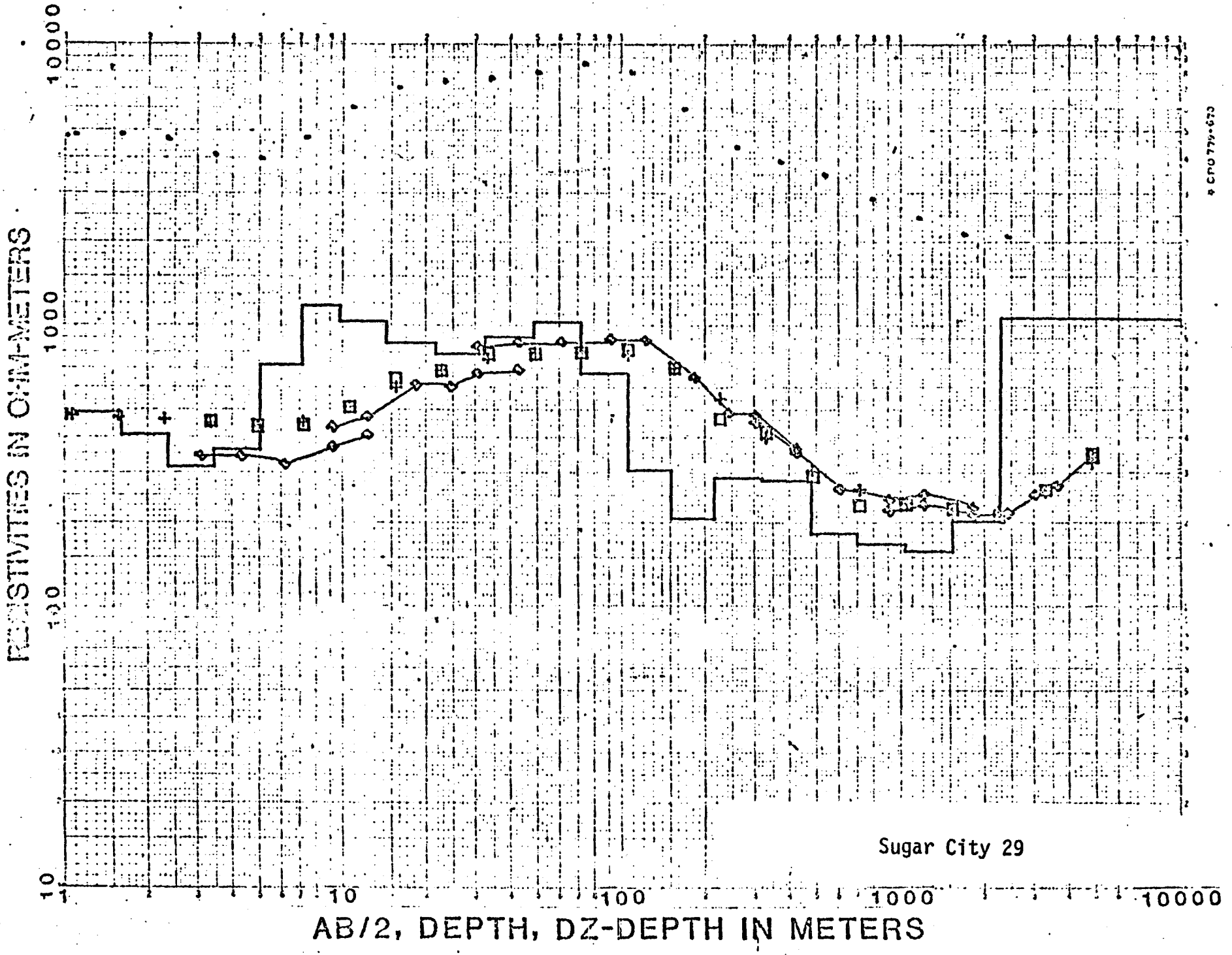

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 26

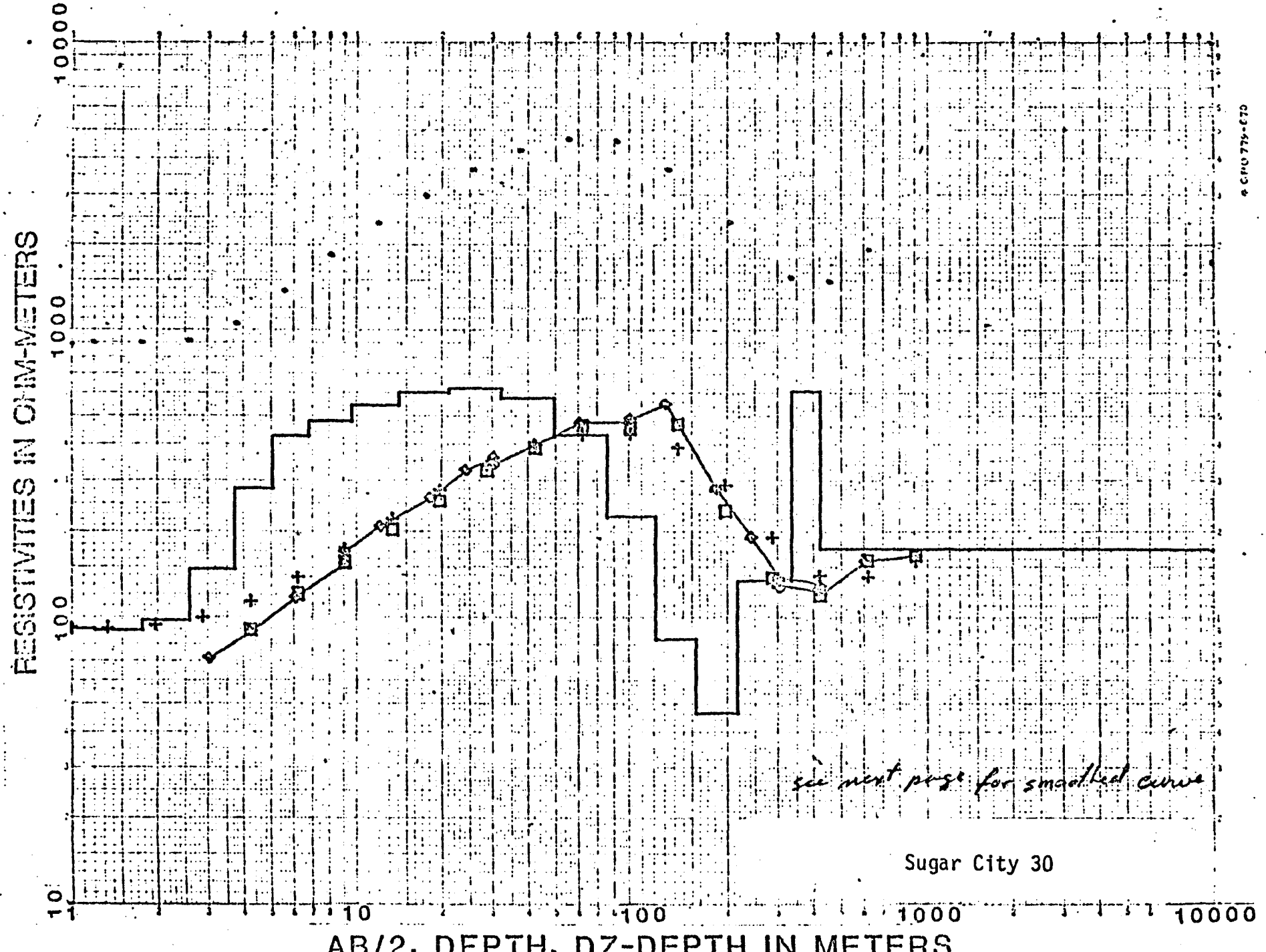

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 26 SMTH


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 27
CRO 779-670

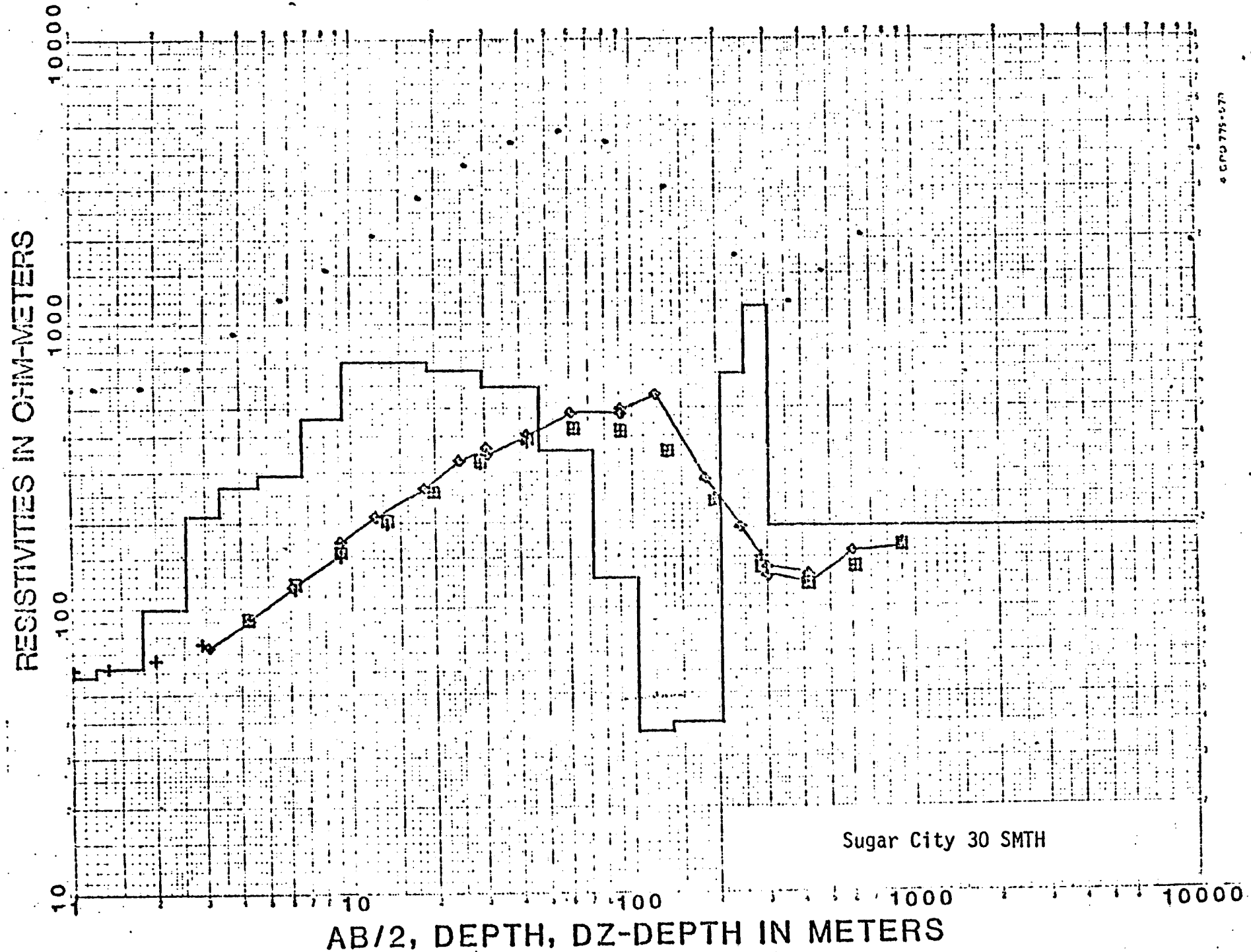

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 28

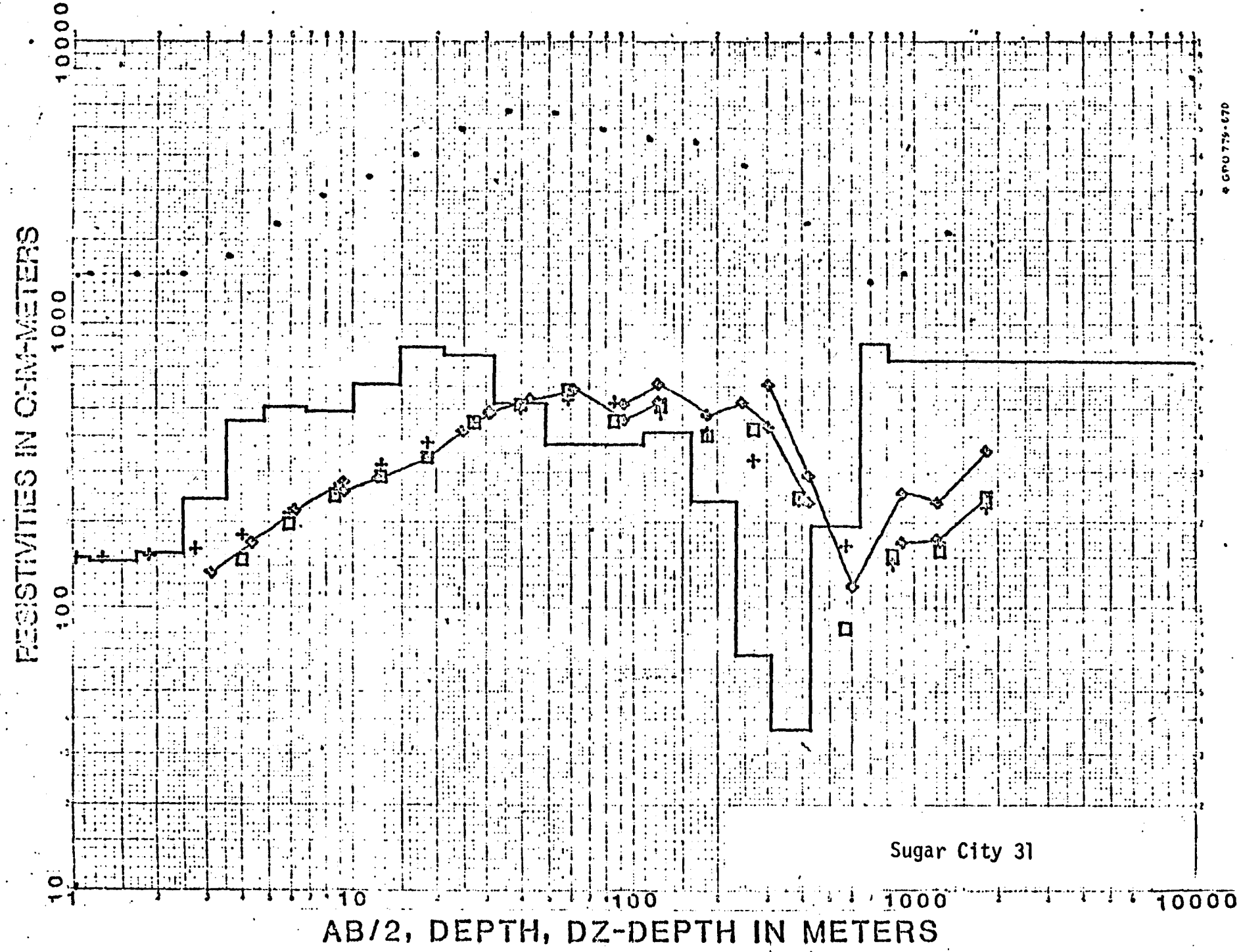
55

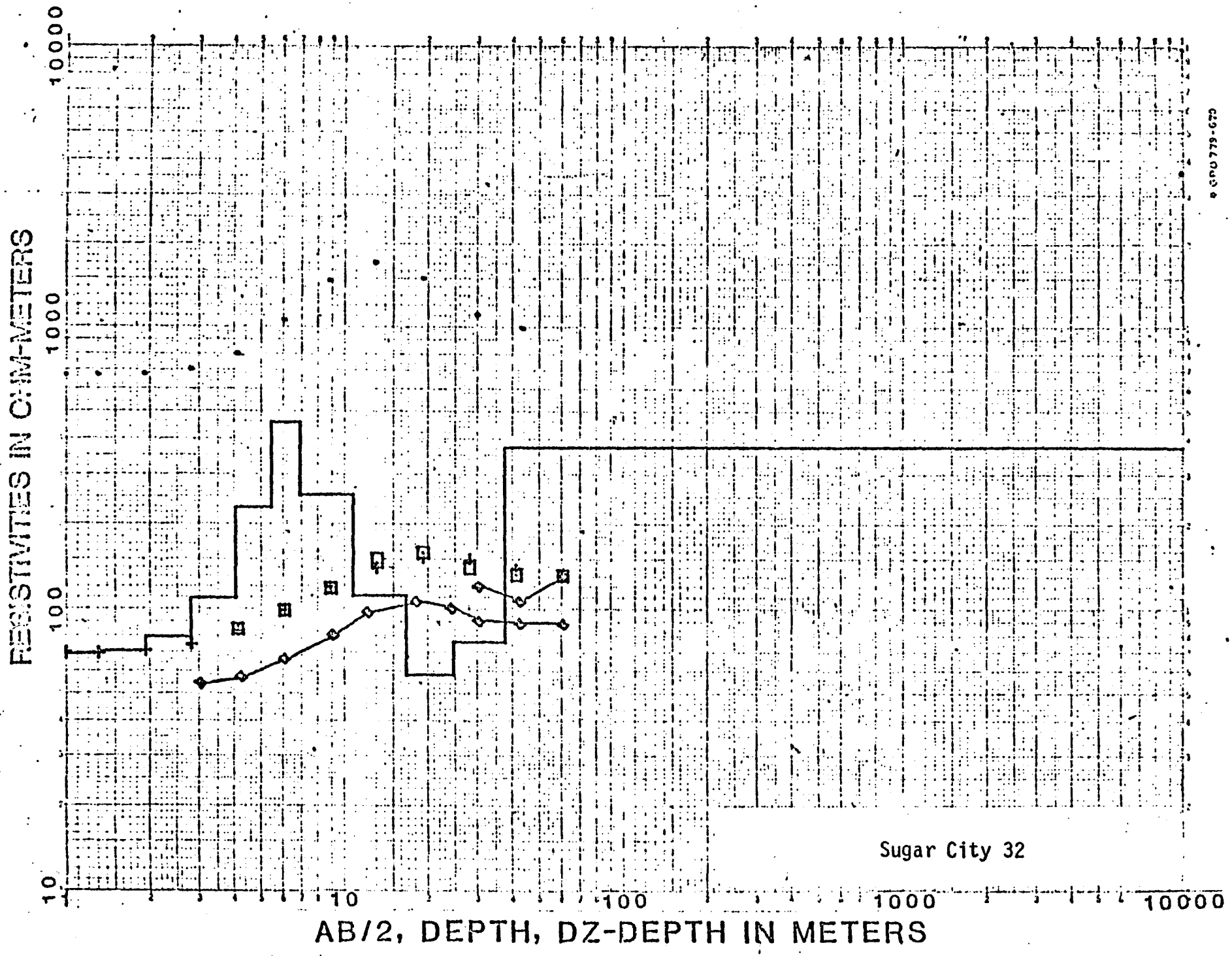

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 29


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 30

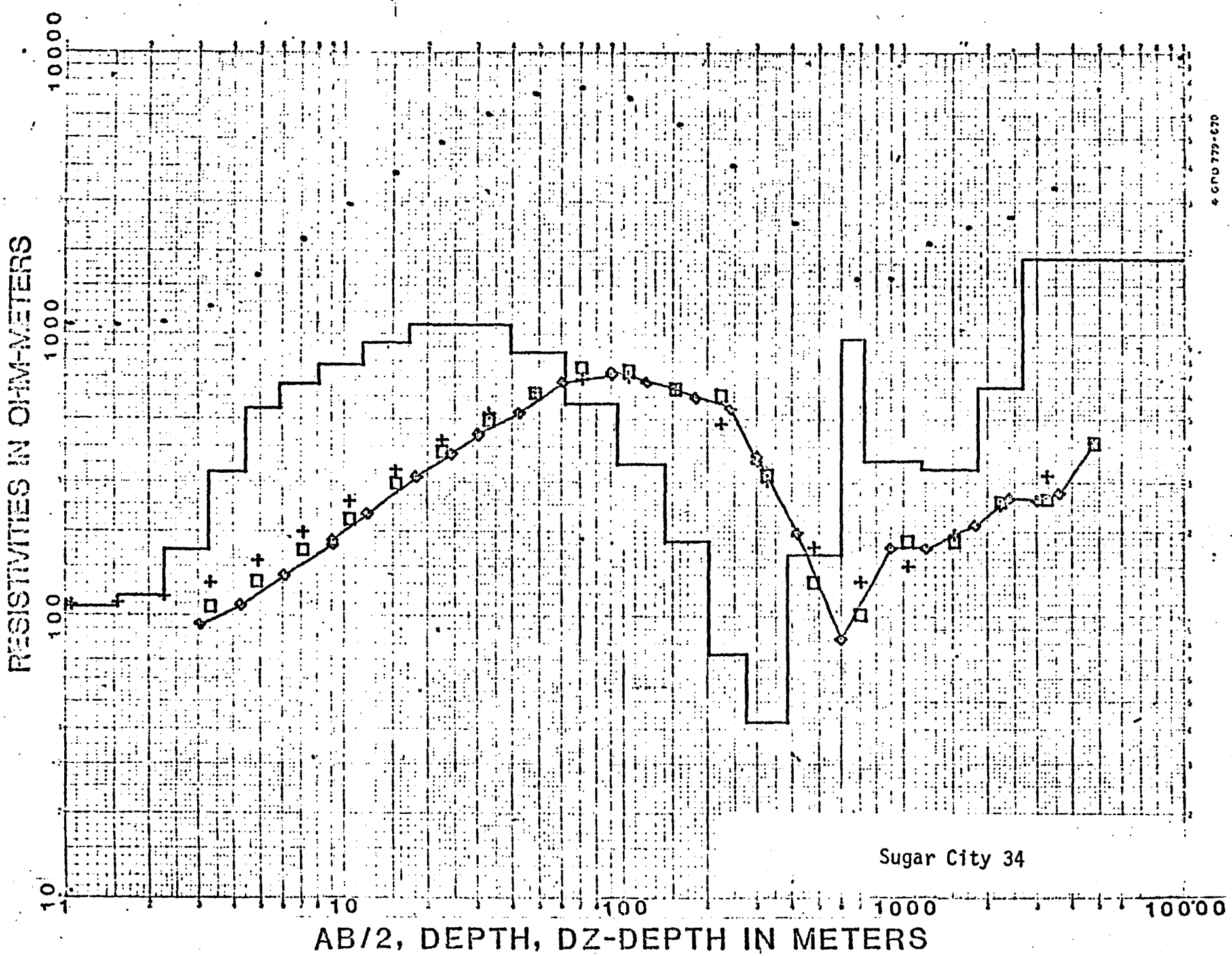
57

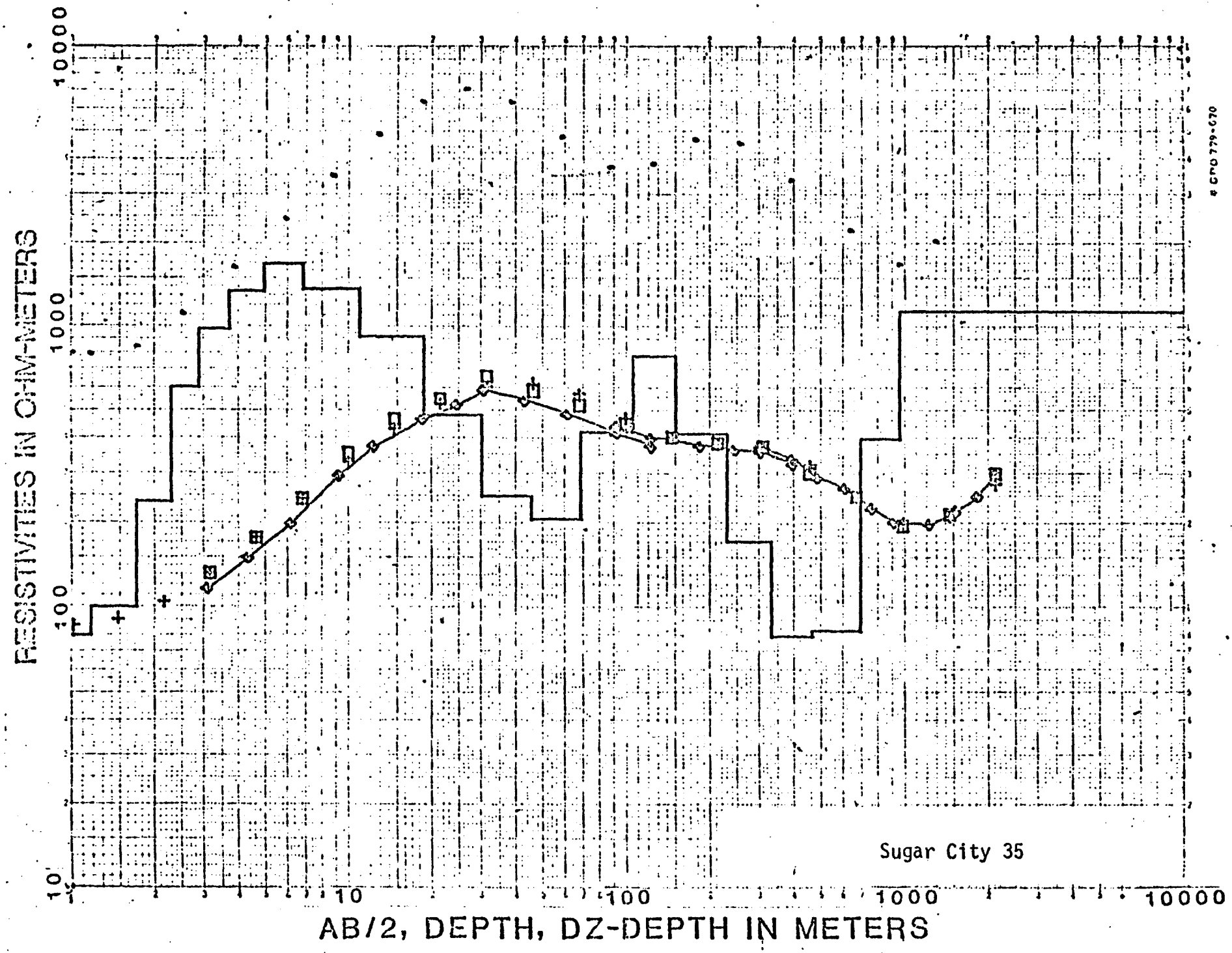

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 30 SMTH

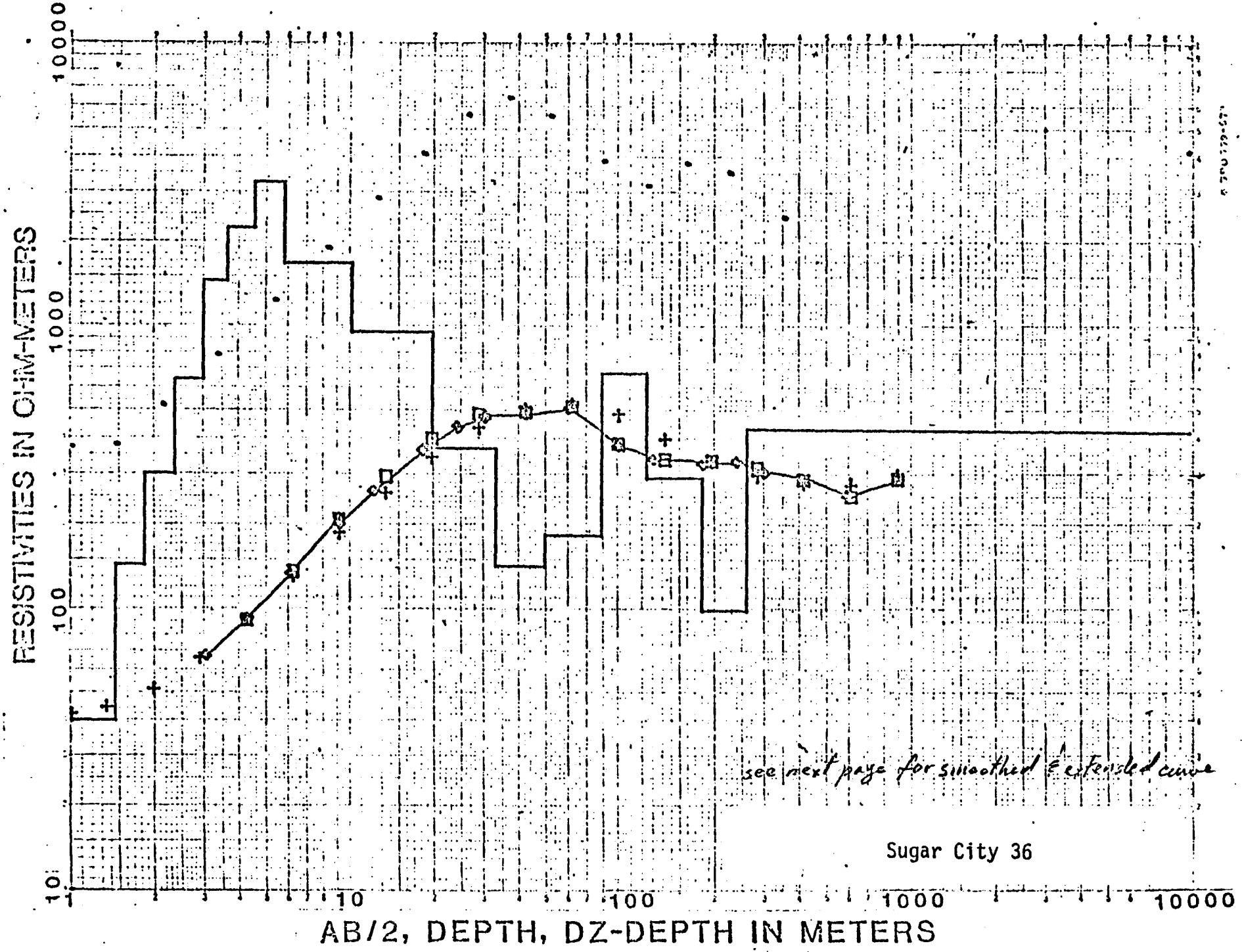

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 31


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 32

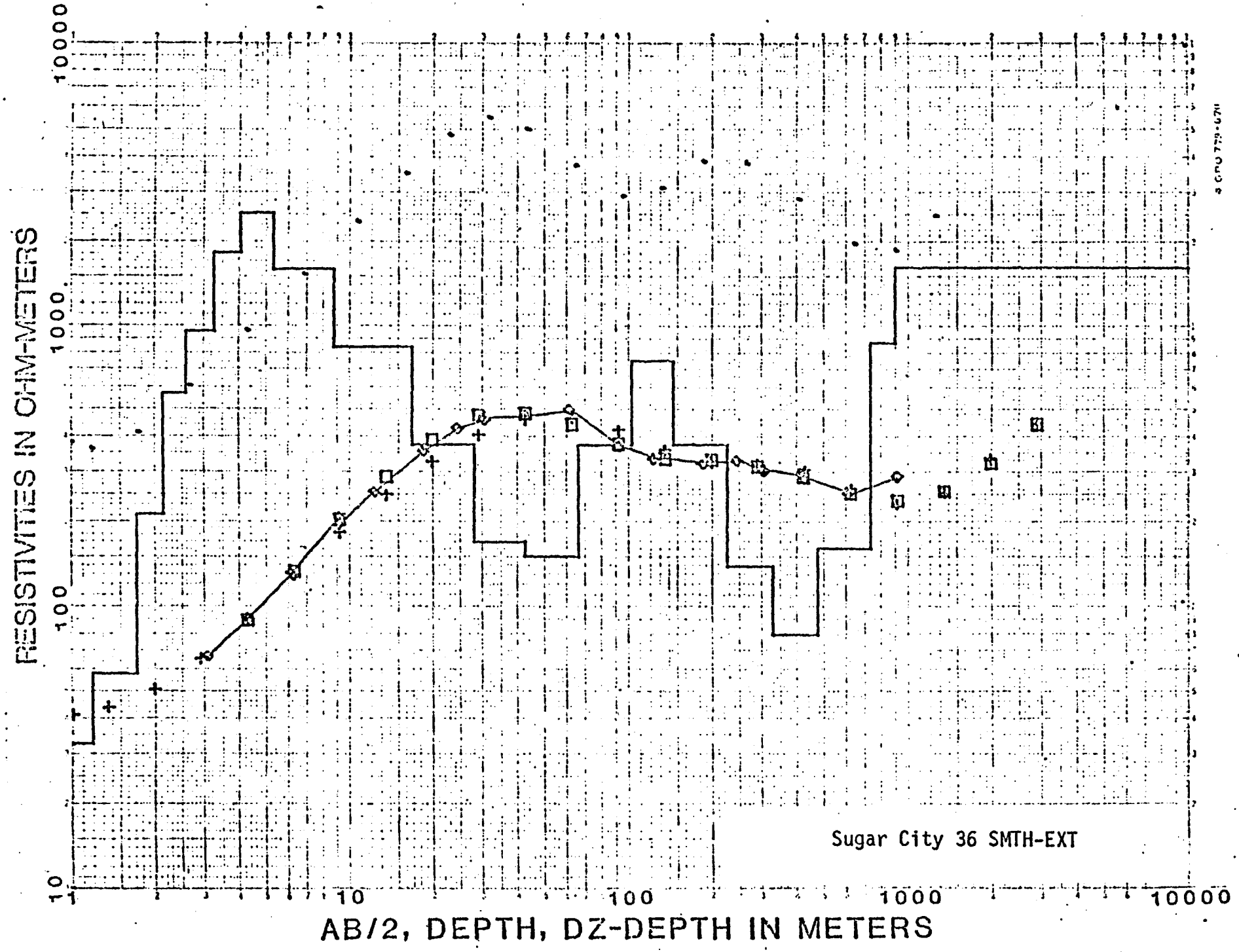
Sugar City 33
AB/2, DEPTH, DZ-DEPTH IN METERS
1
10
100
1000
10000
RESISTIVITIES IN OHM-METERS
1
100
1000
10000

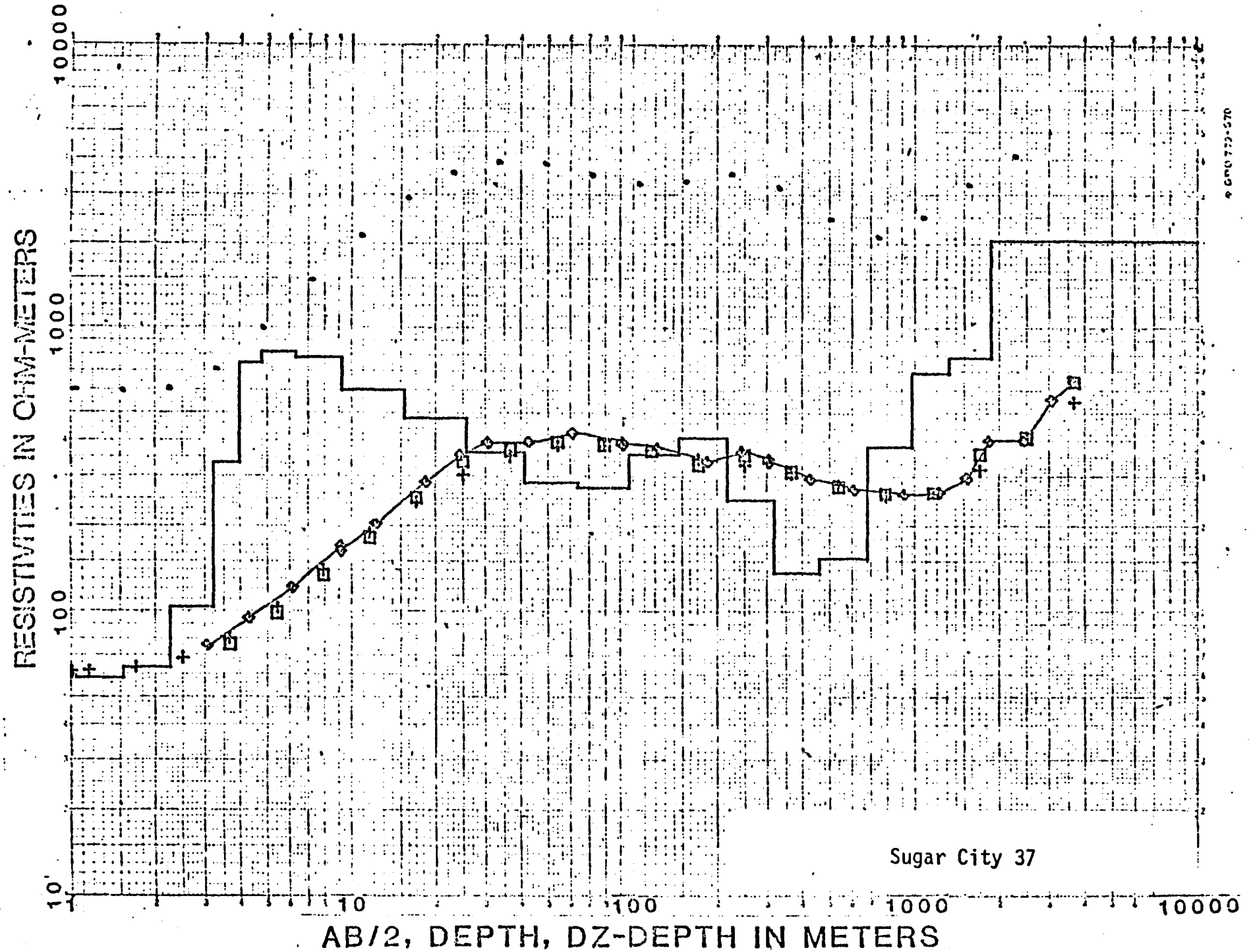

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 34

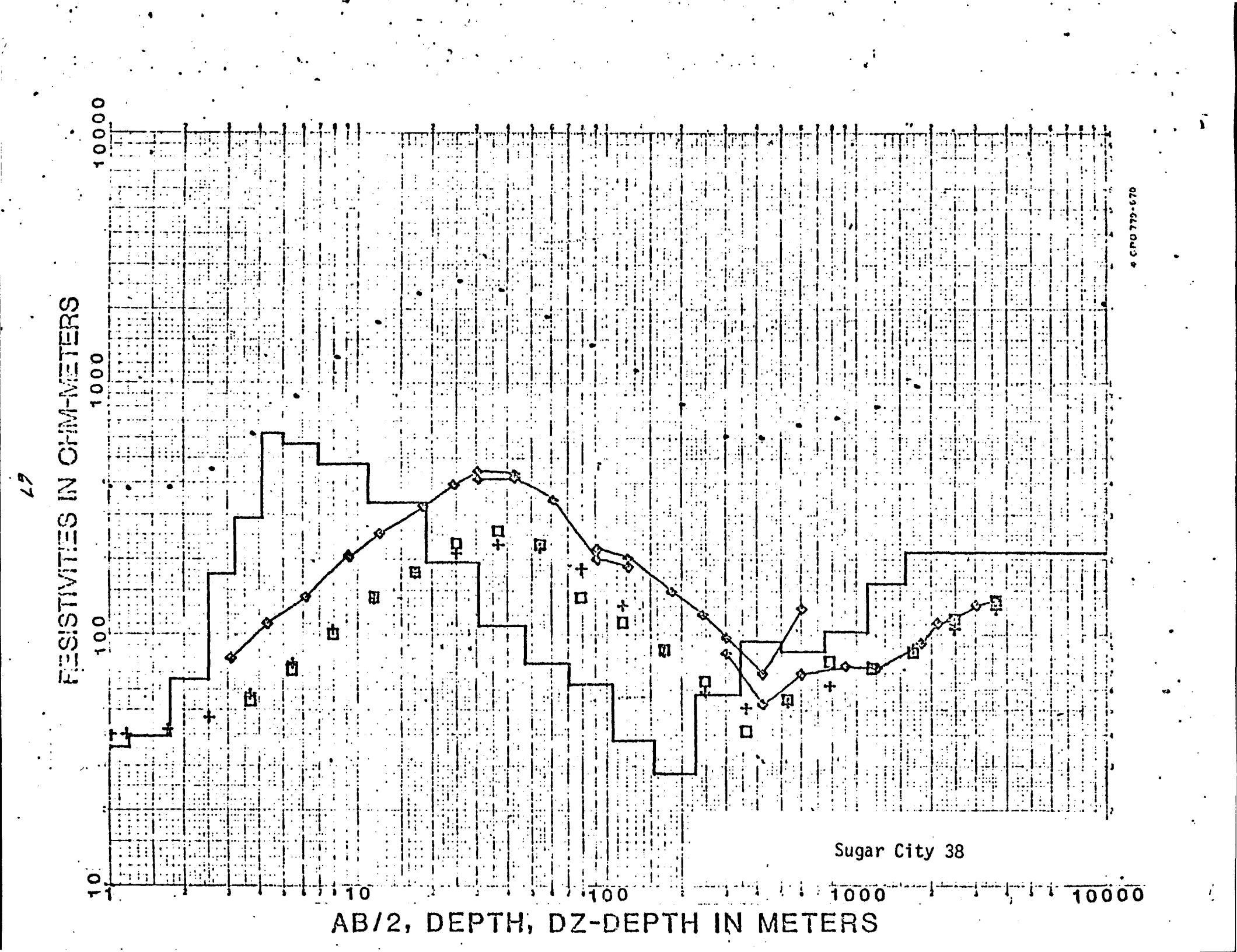

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 35

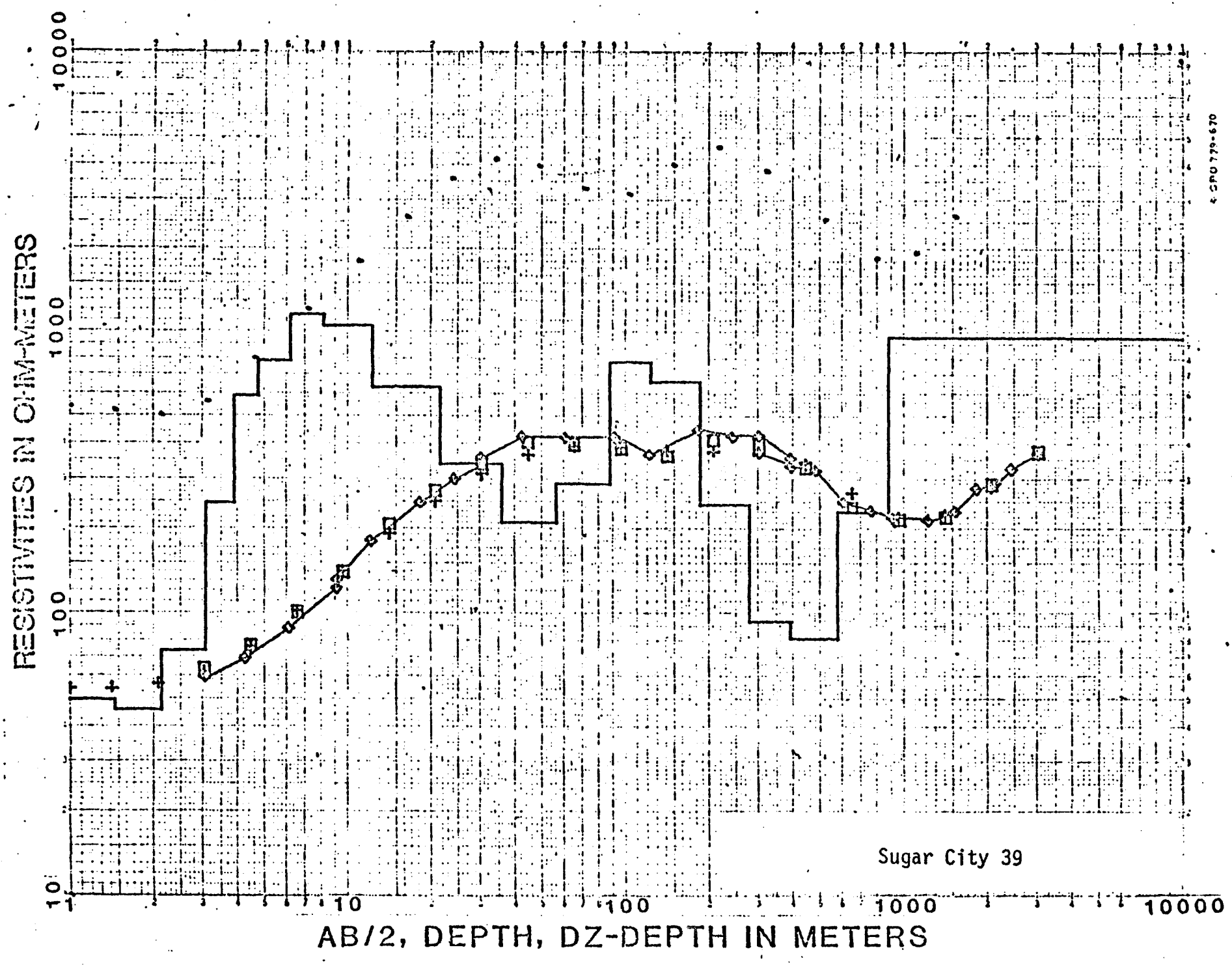

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed & extended curve
Sugar City 36

69

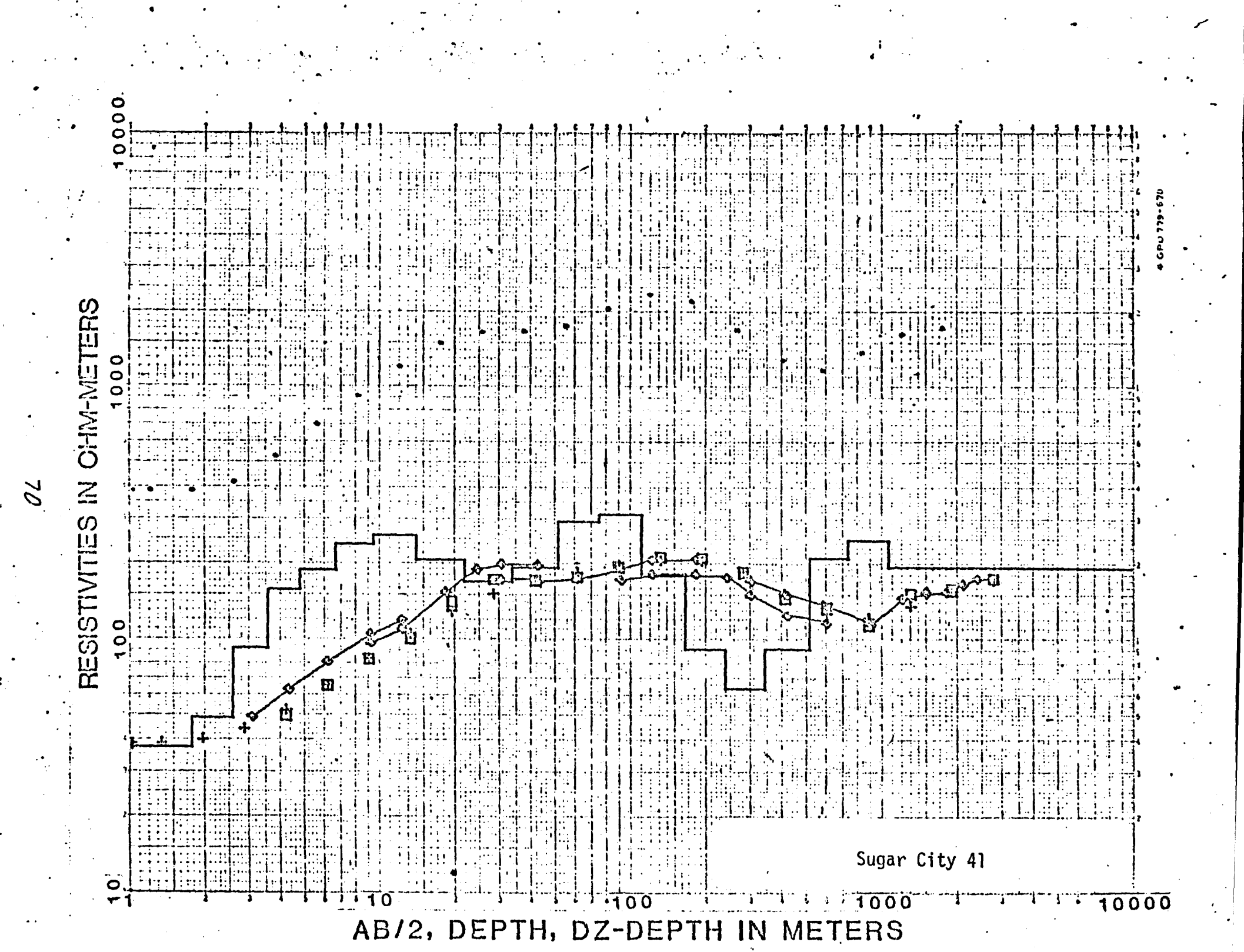

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 36 SMTH-EXT

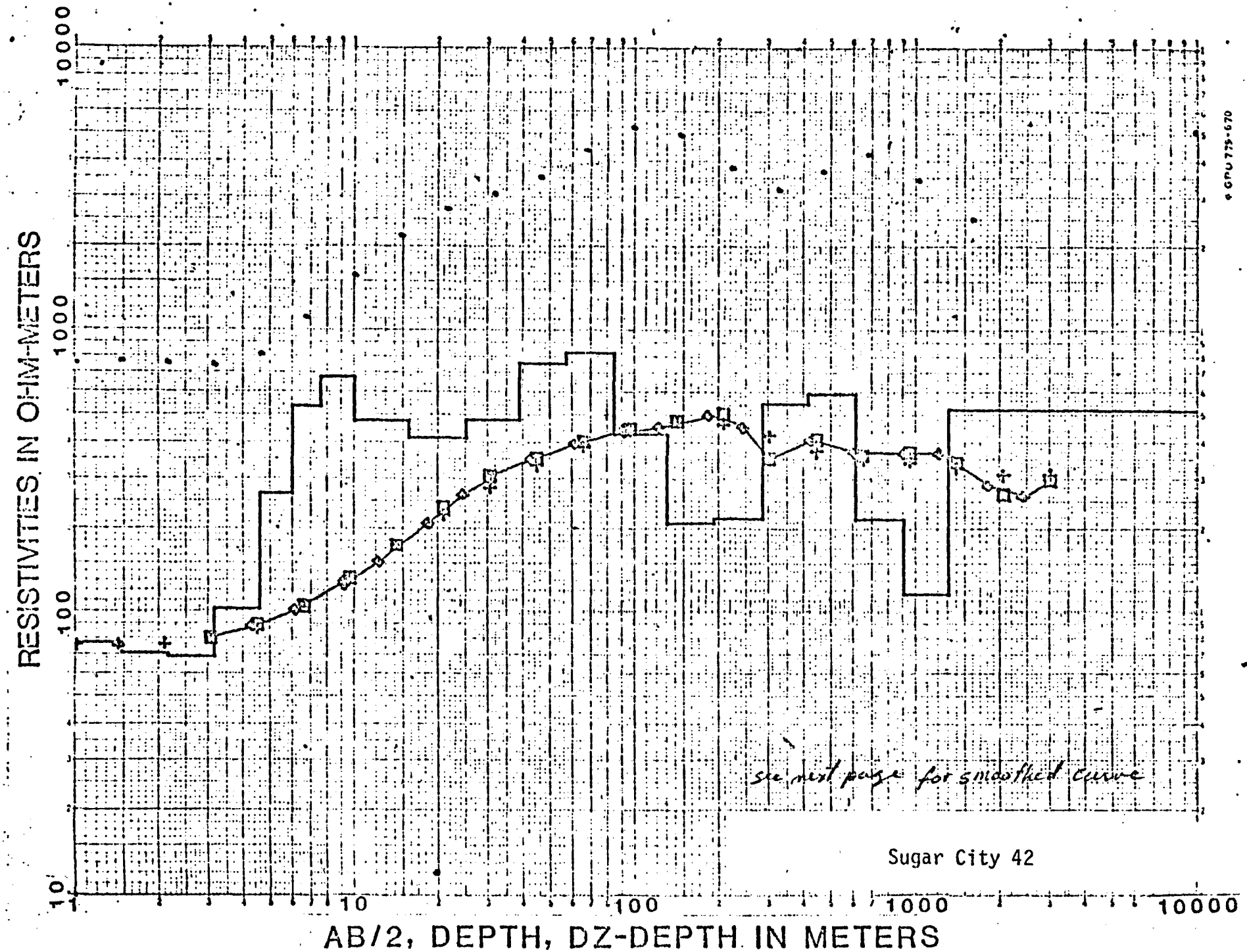

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 37

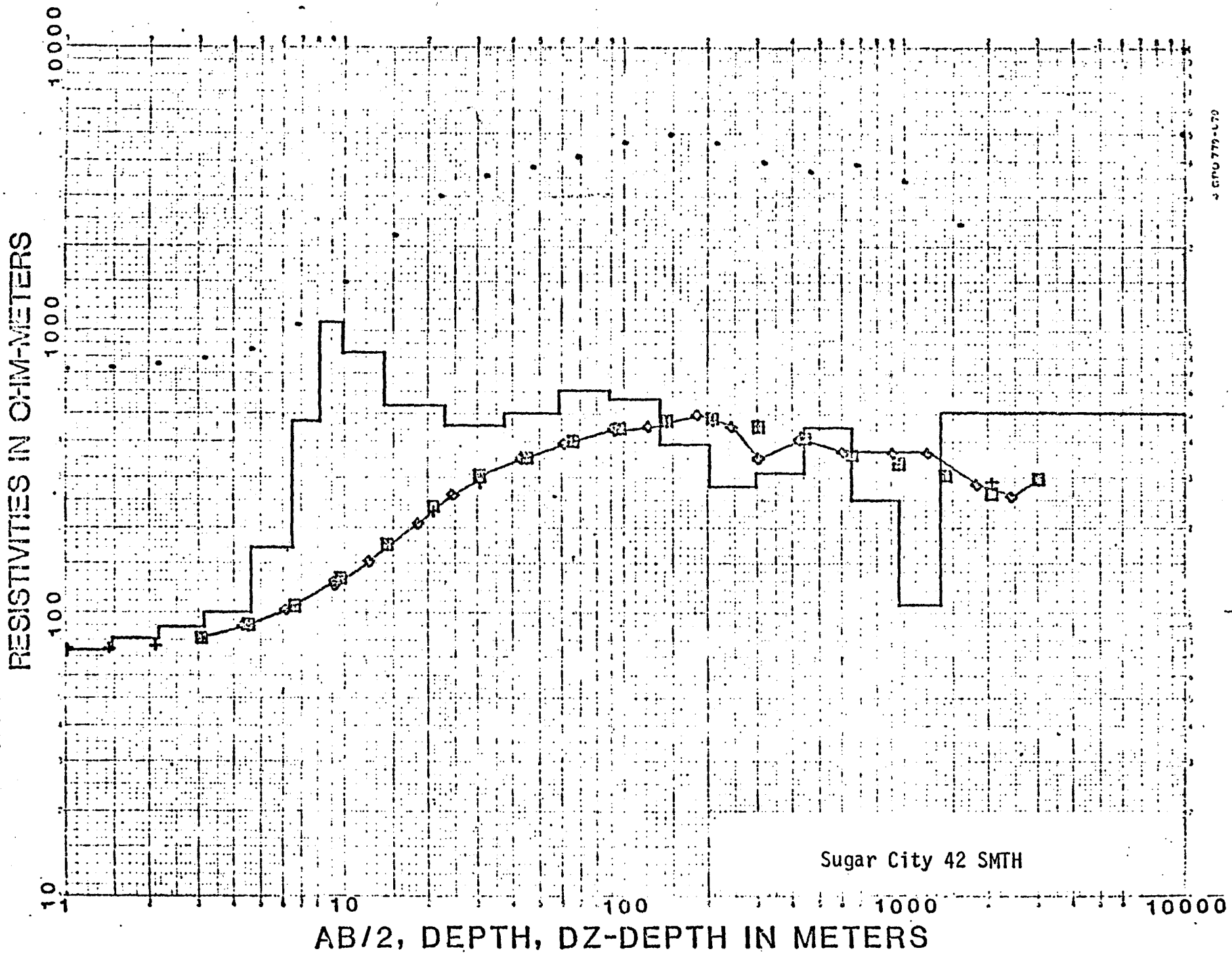

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 38
CPO 779-670

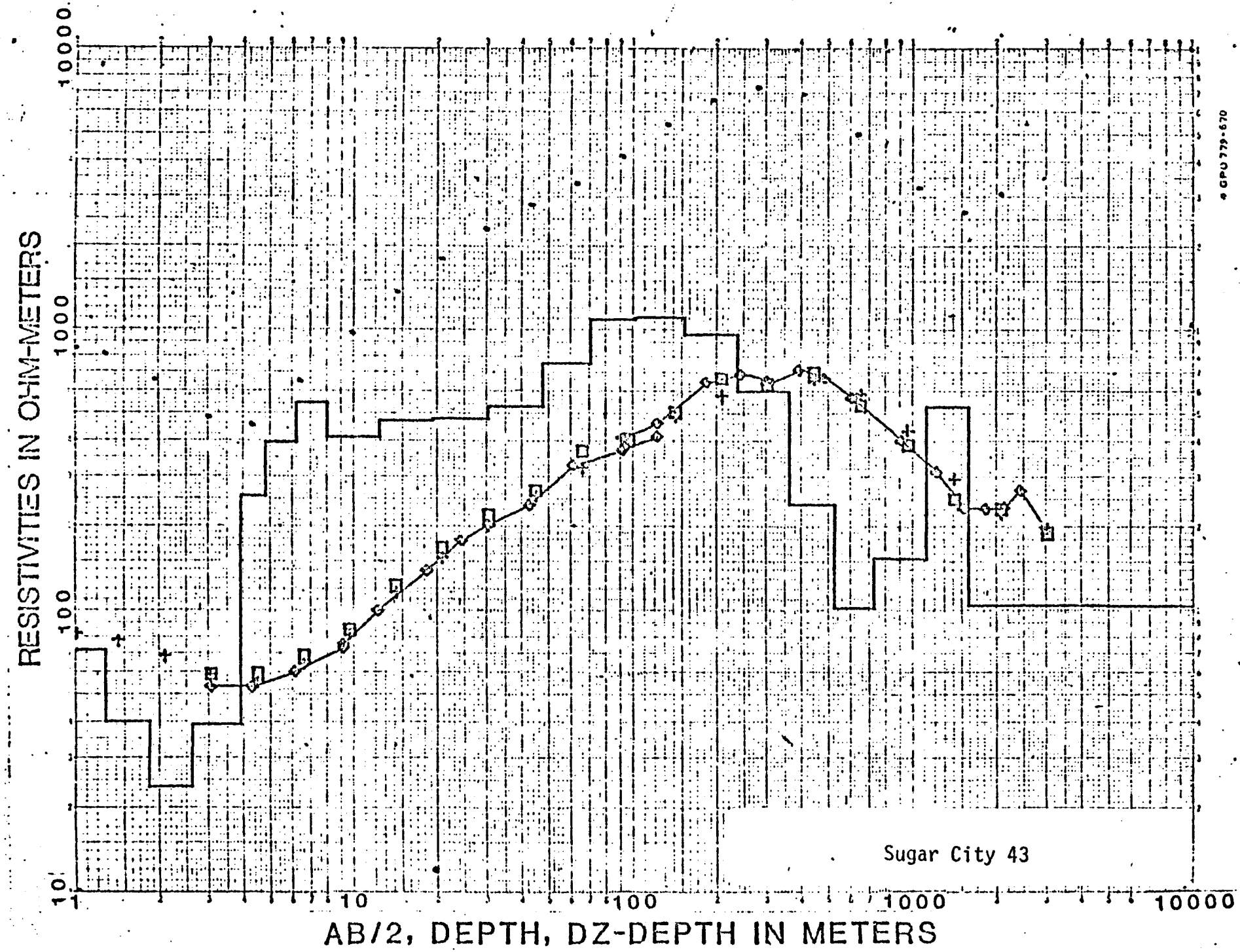

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 39

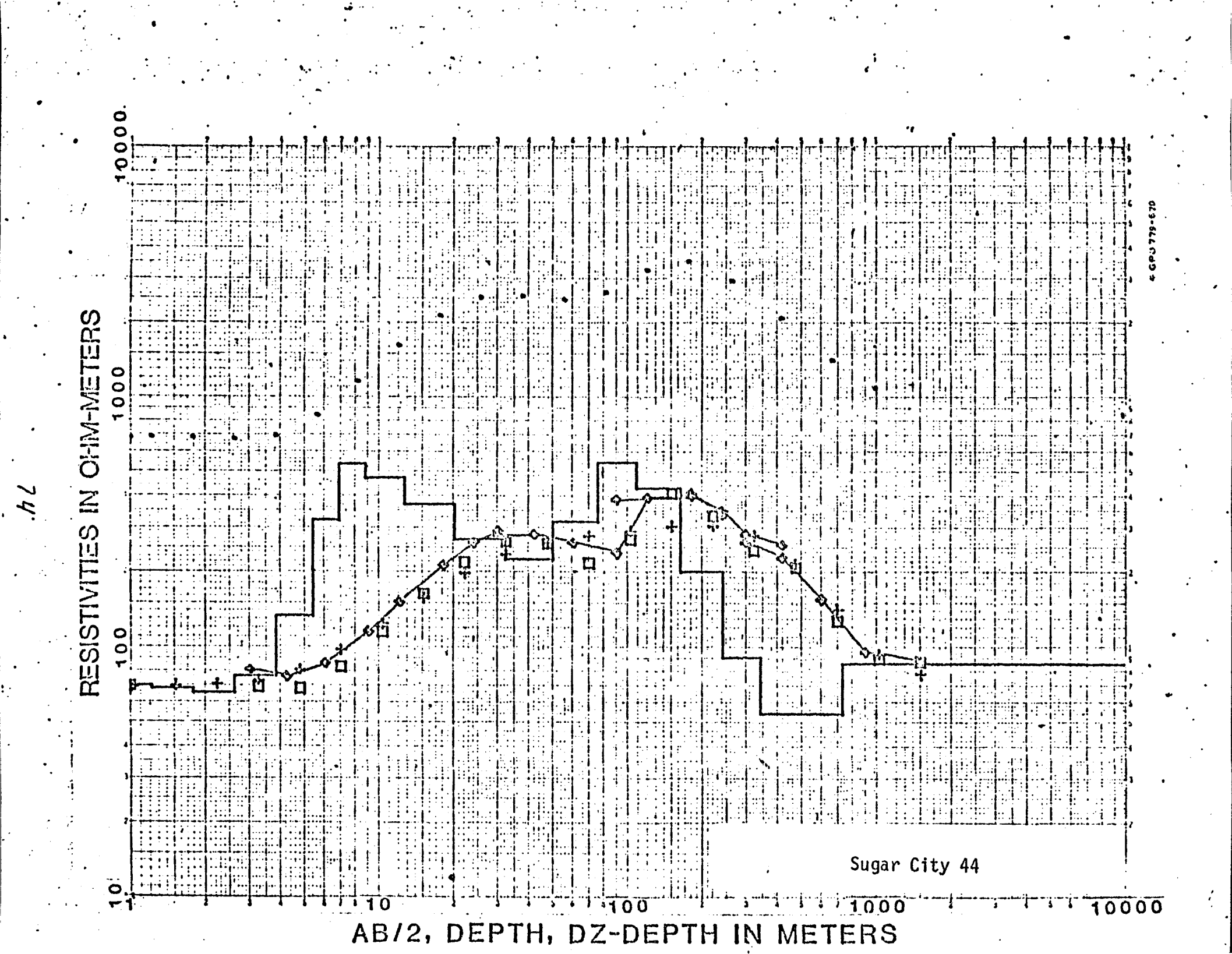
Sugar City 40
AB/2, DEPTH, DZ-DEPTH IN METERS
10000
1000
100
10
1
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1

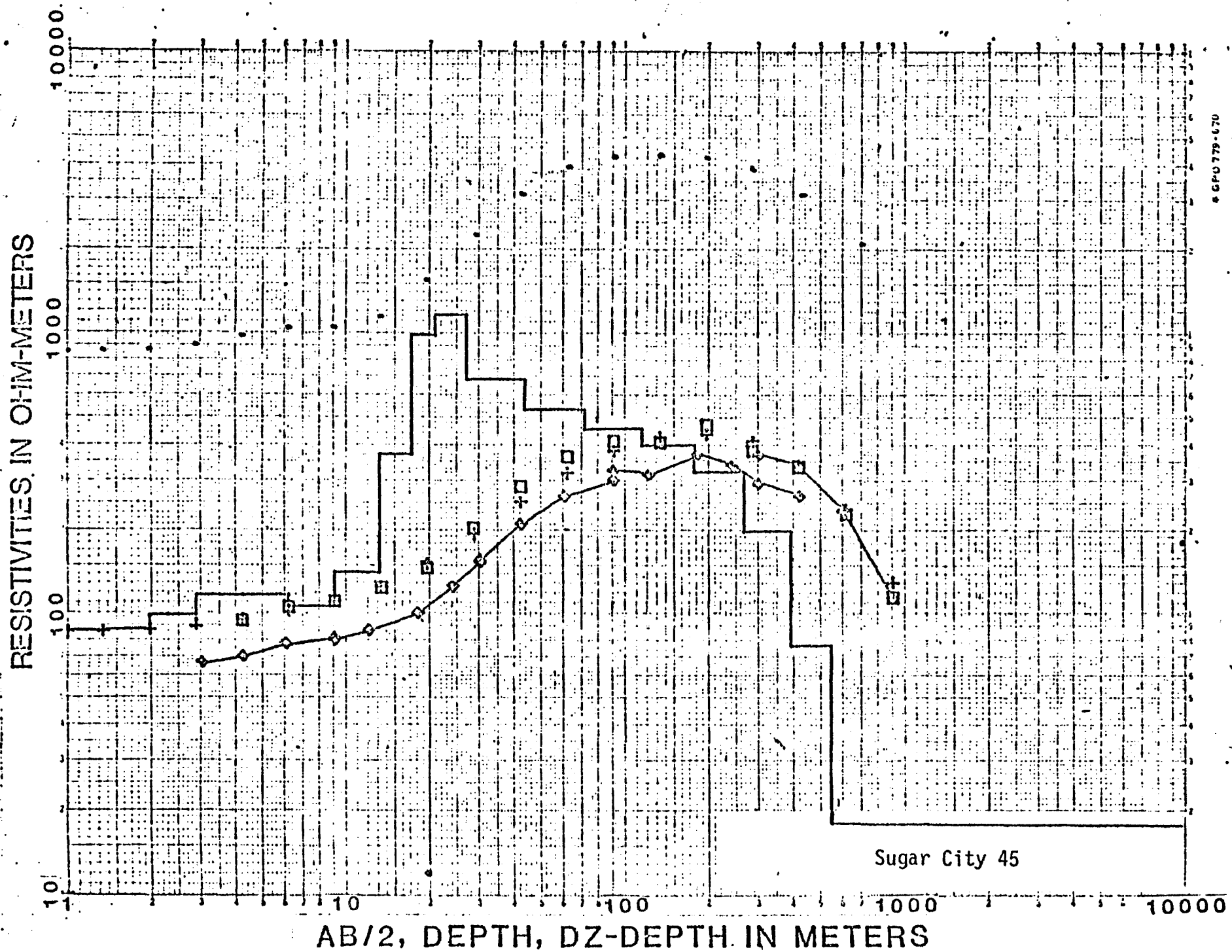

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 41
GPU 779-670


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 42
GPU 775-670

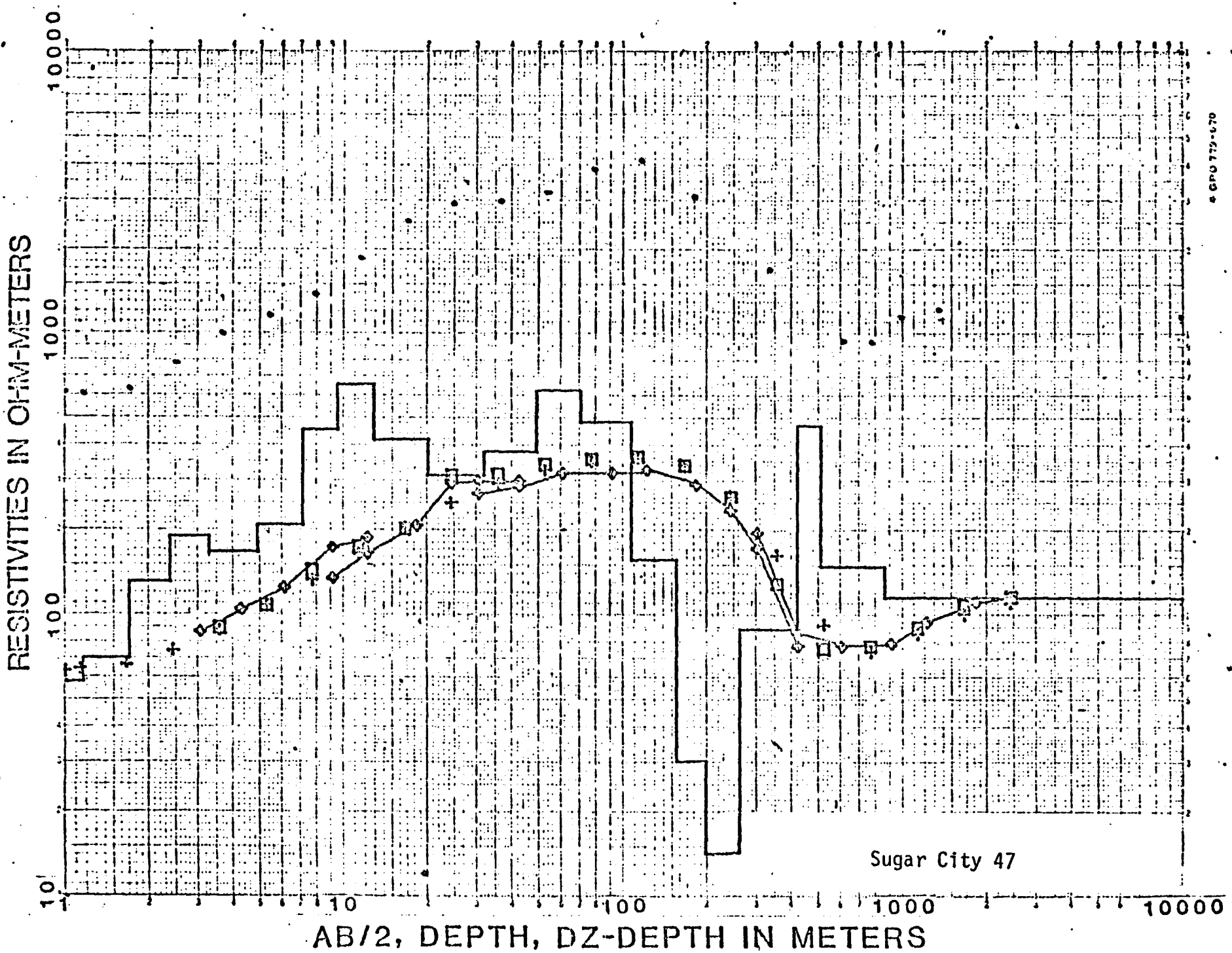

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 42 SMTH


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 43
GPO 779-670

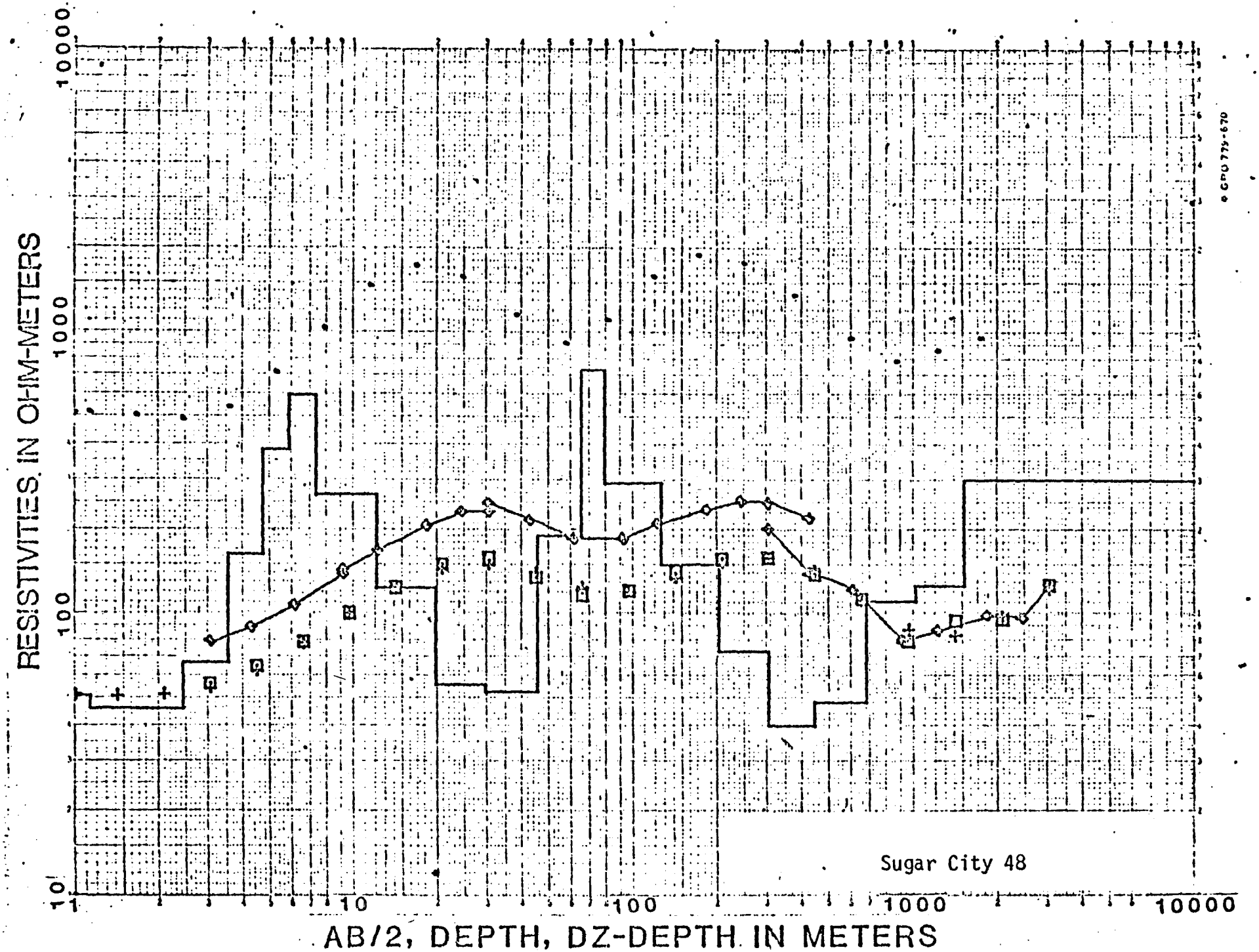

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 44

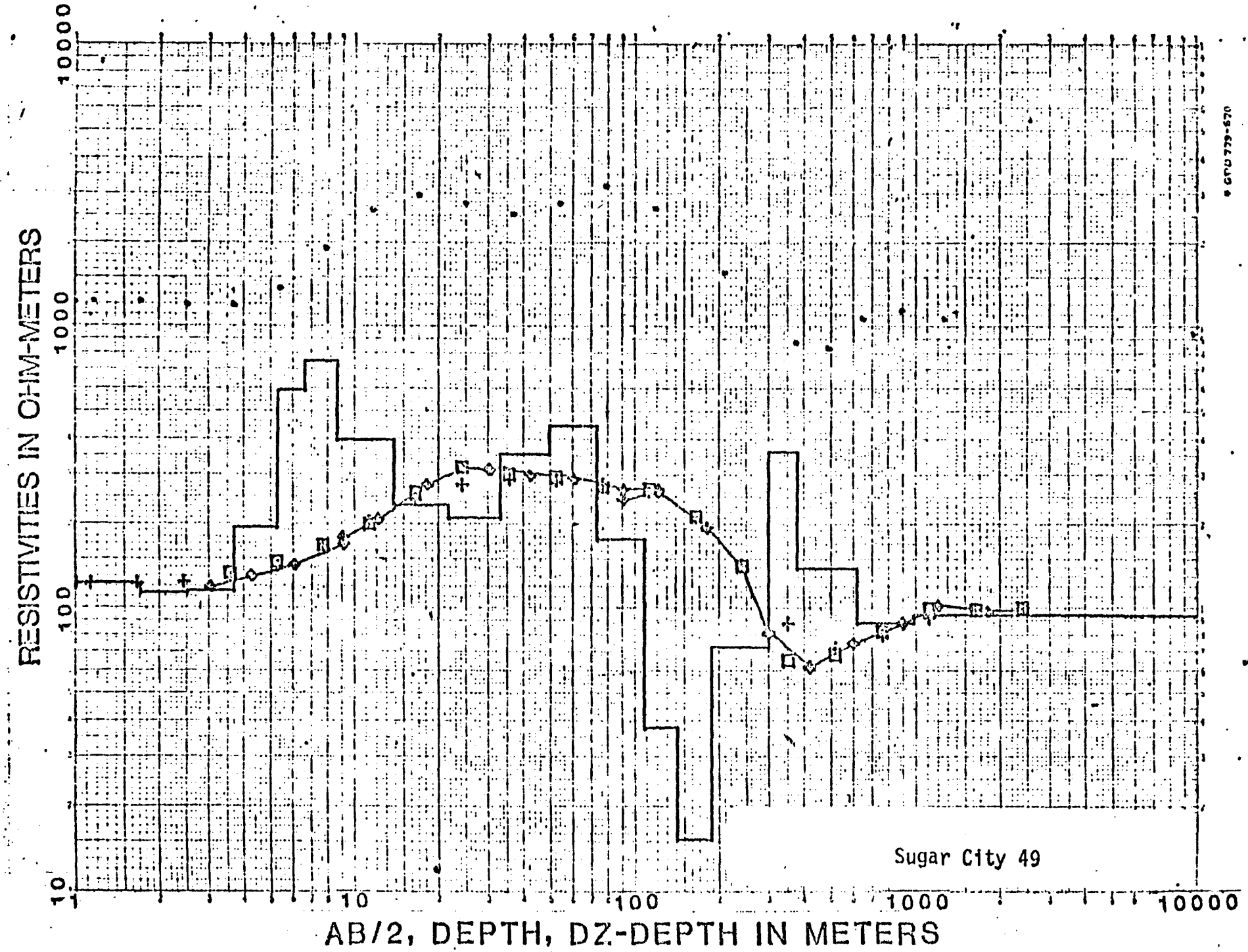

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 45
GPO 779-670

Sugar City 46
AB/2, DEPTH, DZ-DEPTH IN METERS
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10000
1000
100
10

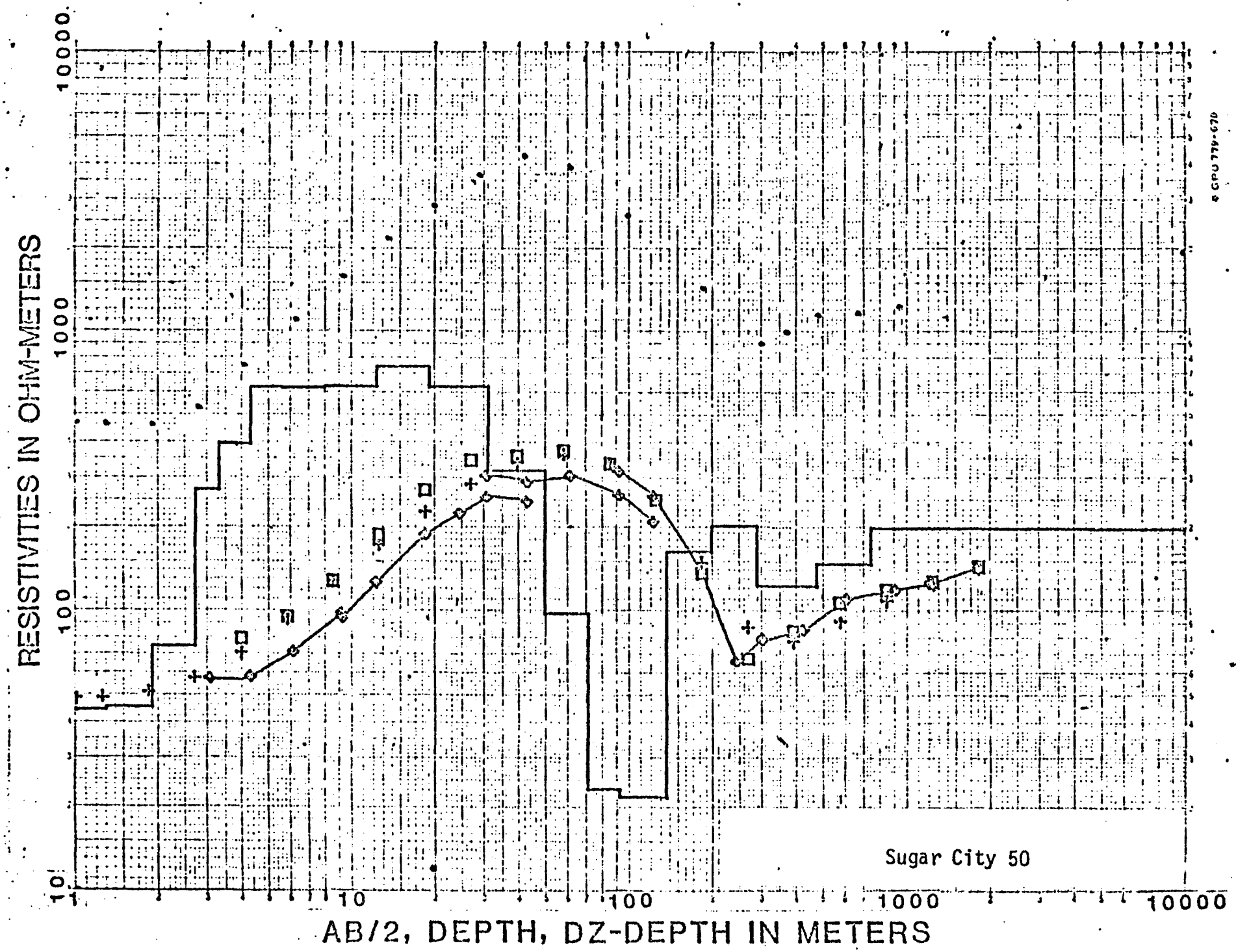

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 47

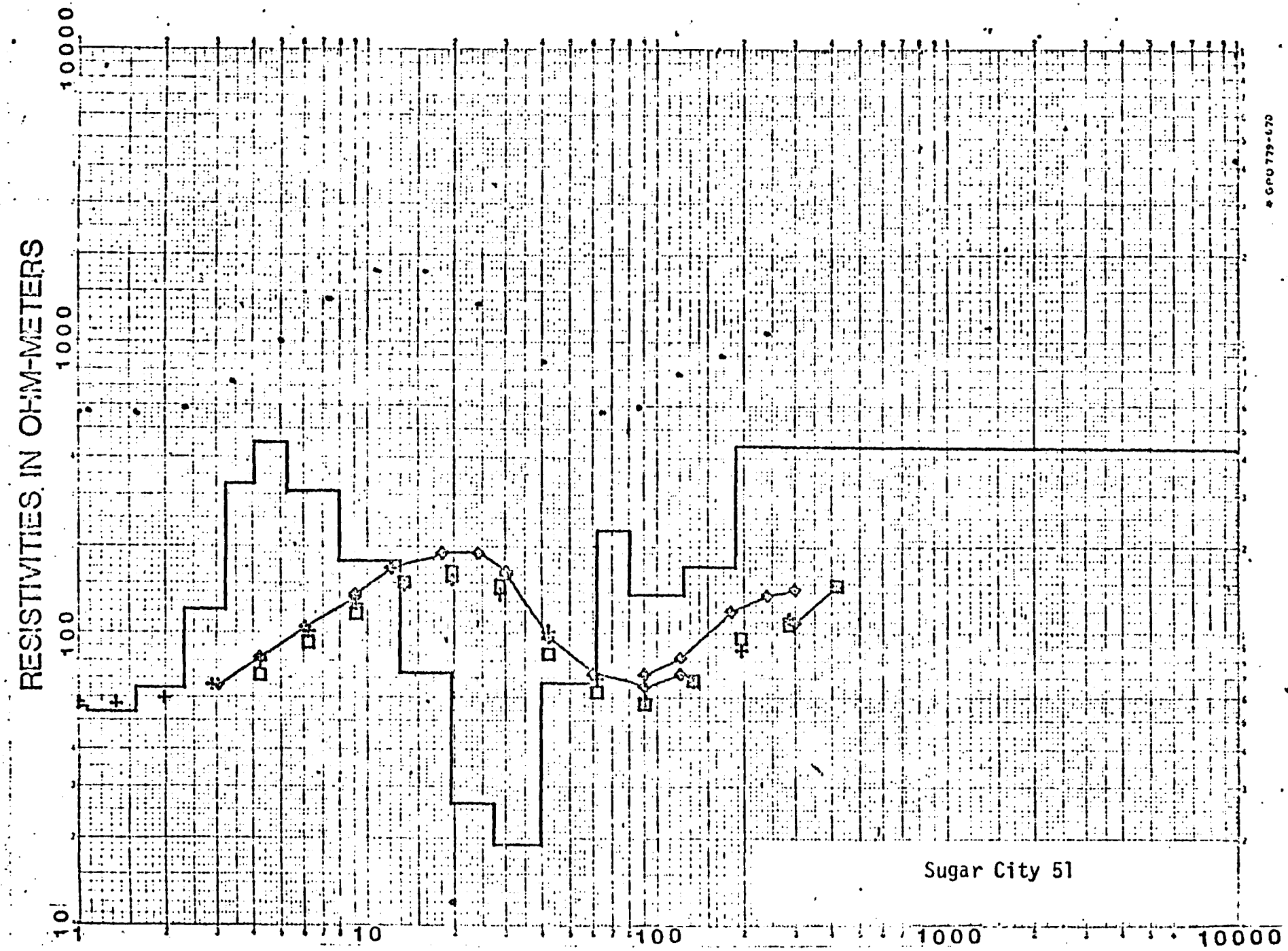
77


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 48
© GPO 775-670

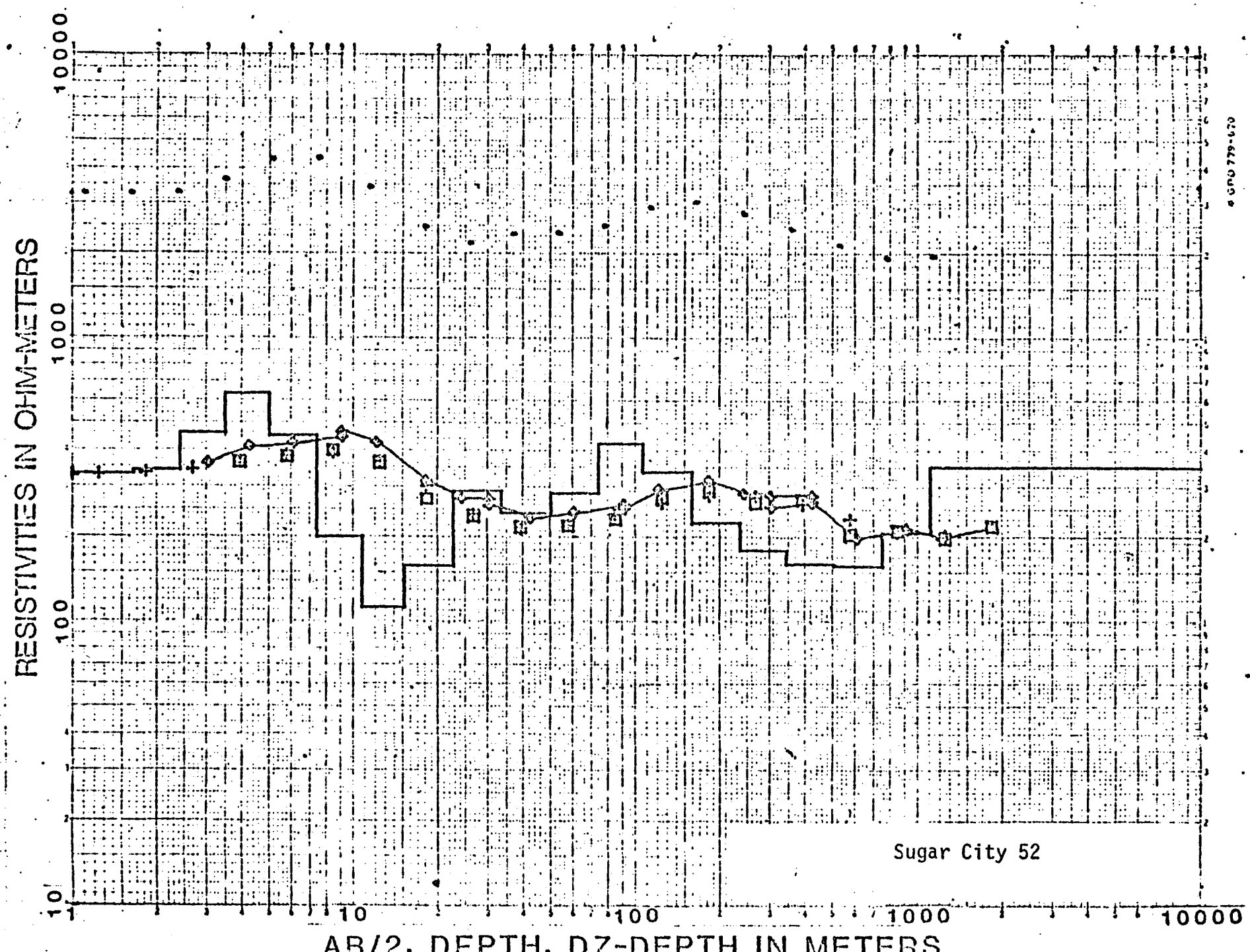

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 49

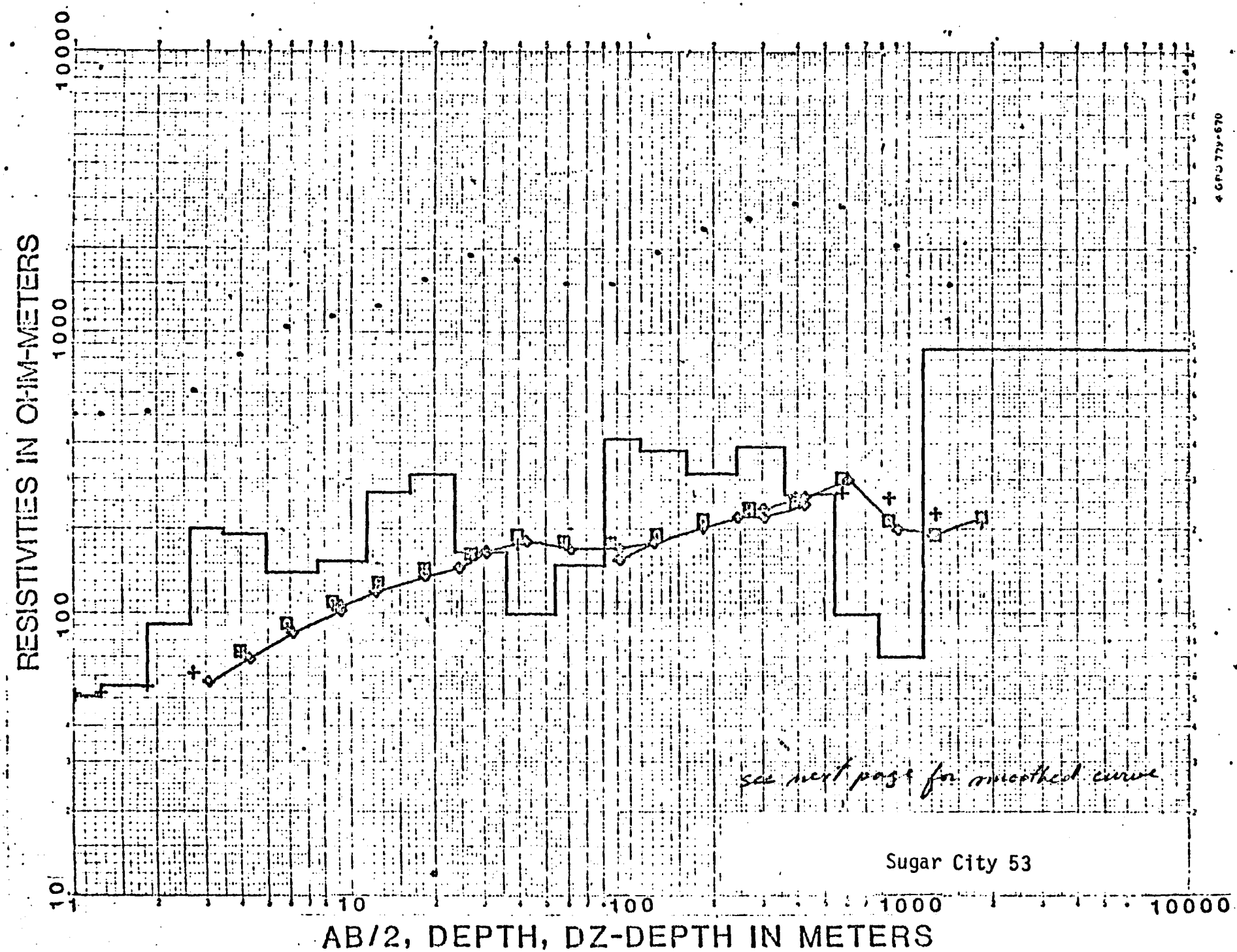
79


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 50
GPU 779-670

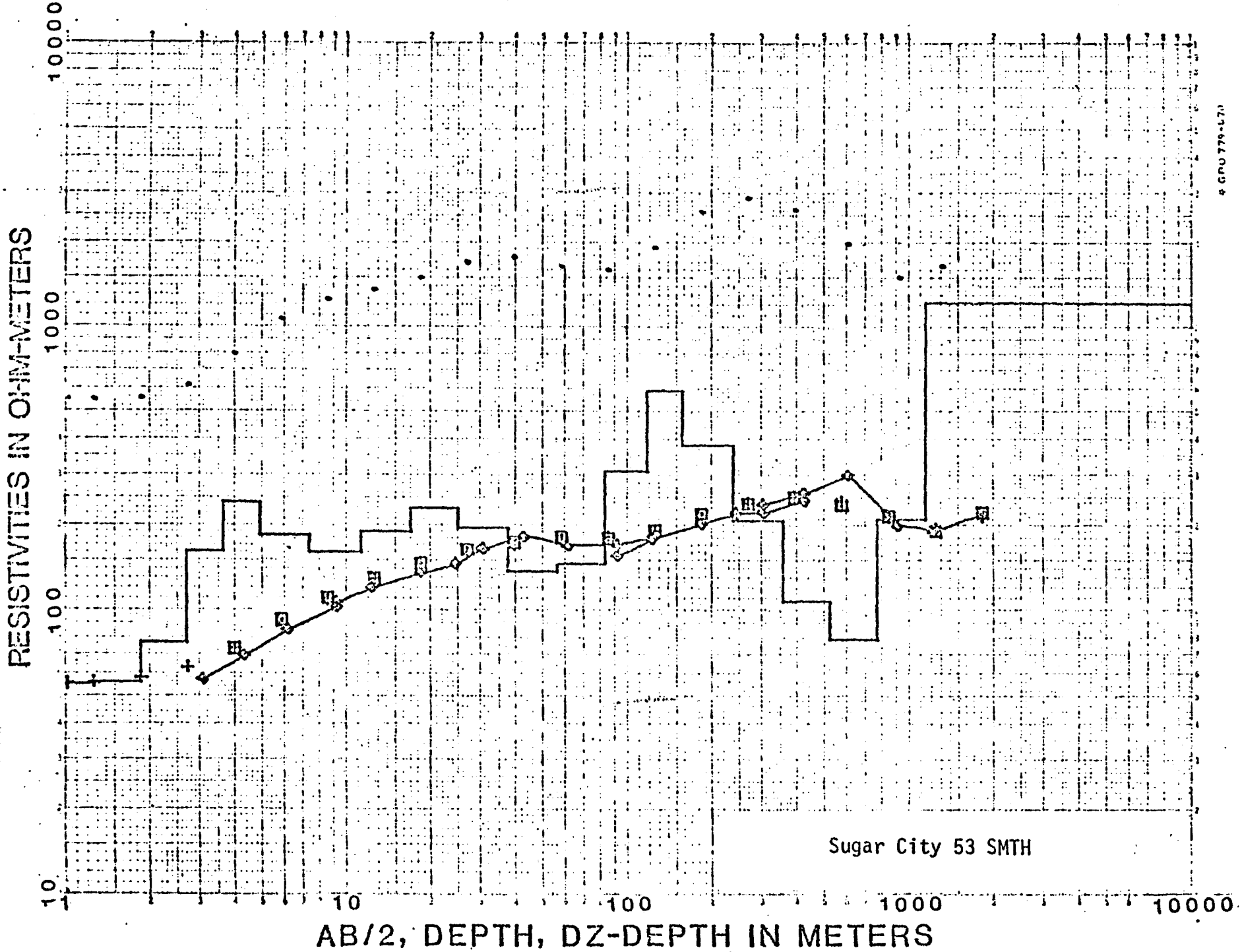

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 51
GPO 779-670

18

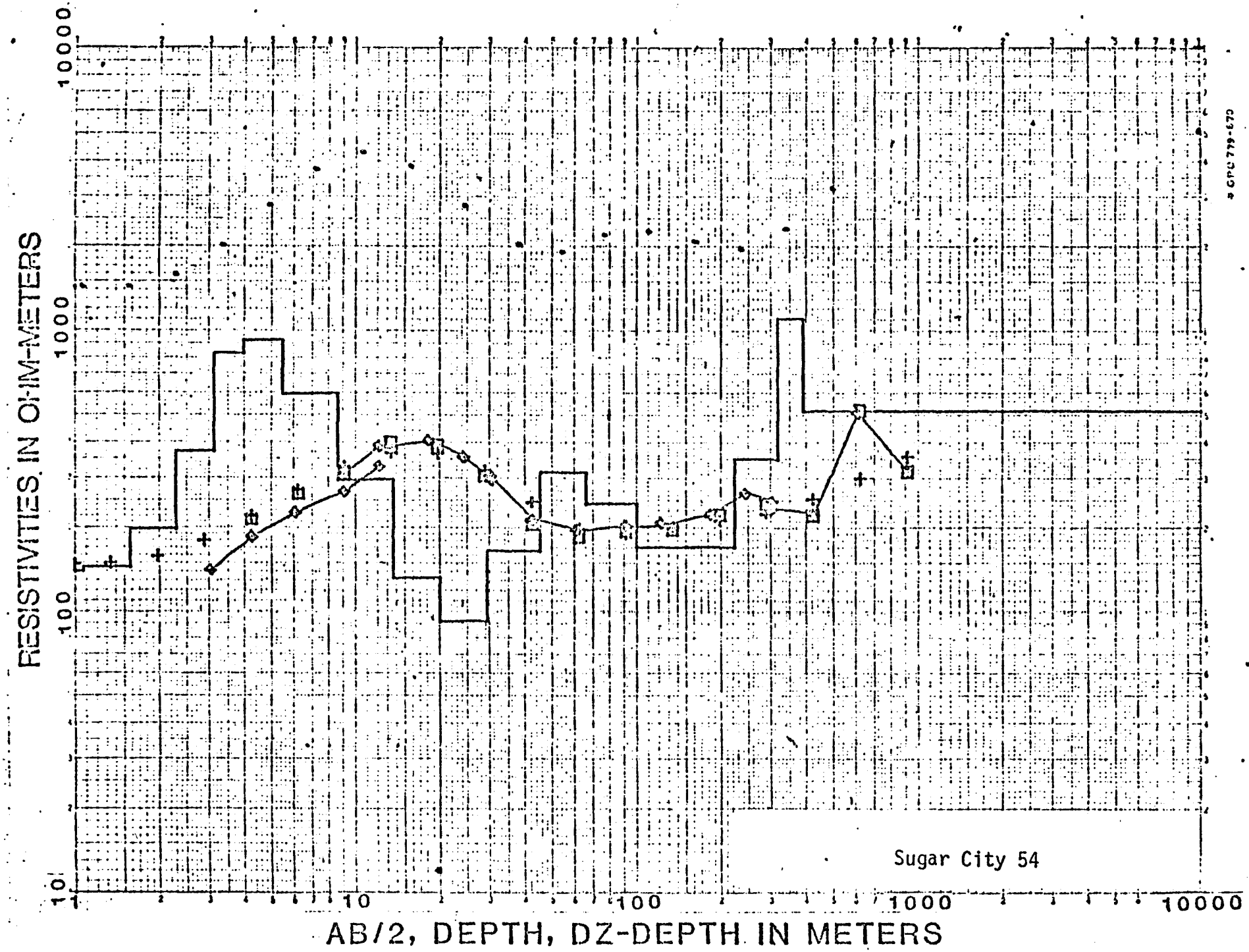

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 52

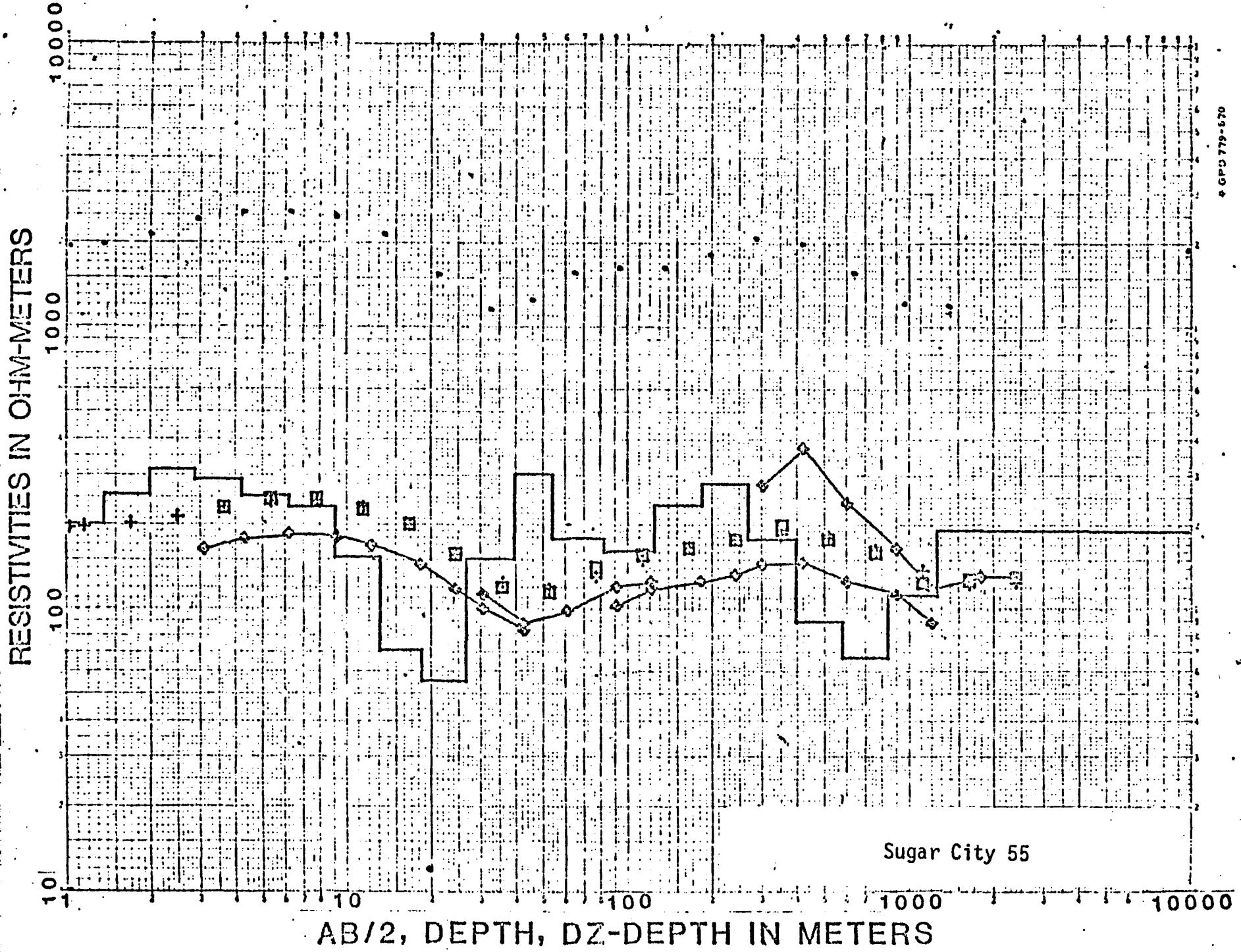

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
see next page for smoothed curve
Sugar City 53

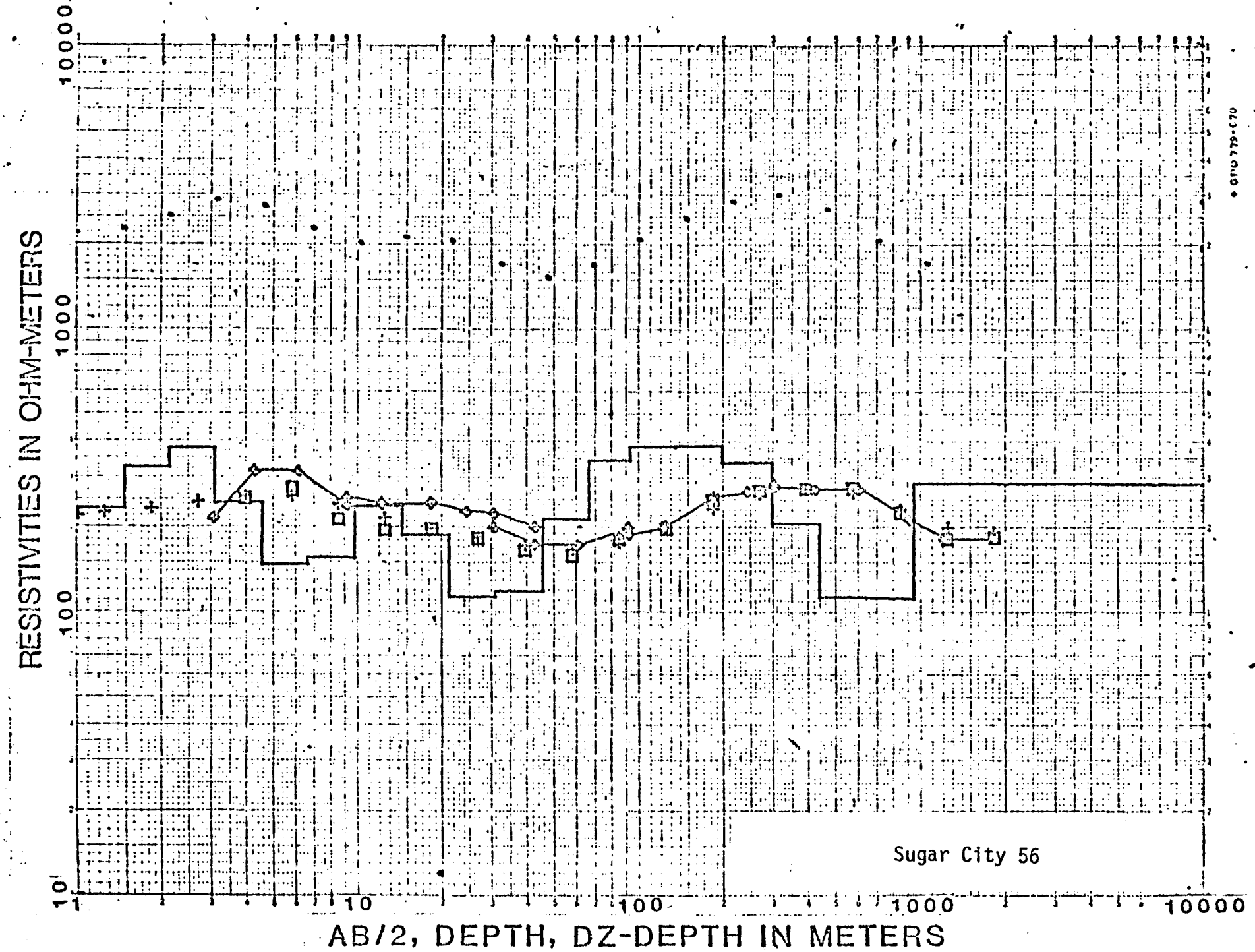
E8


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 53 SMTH

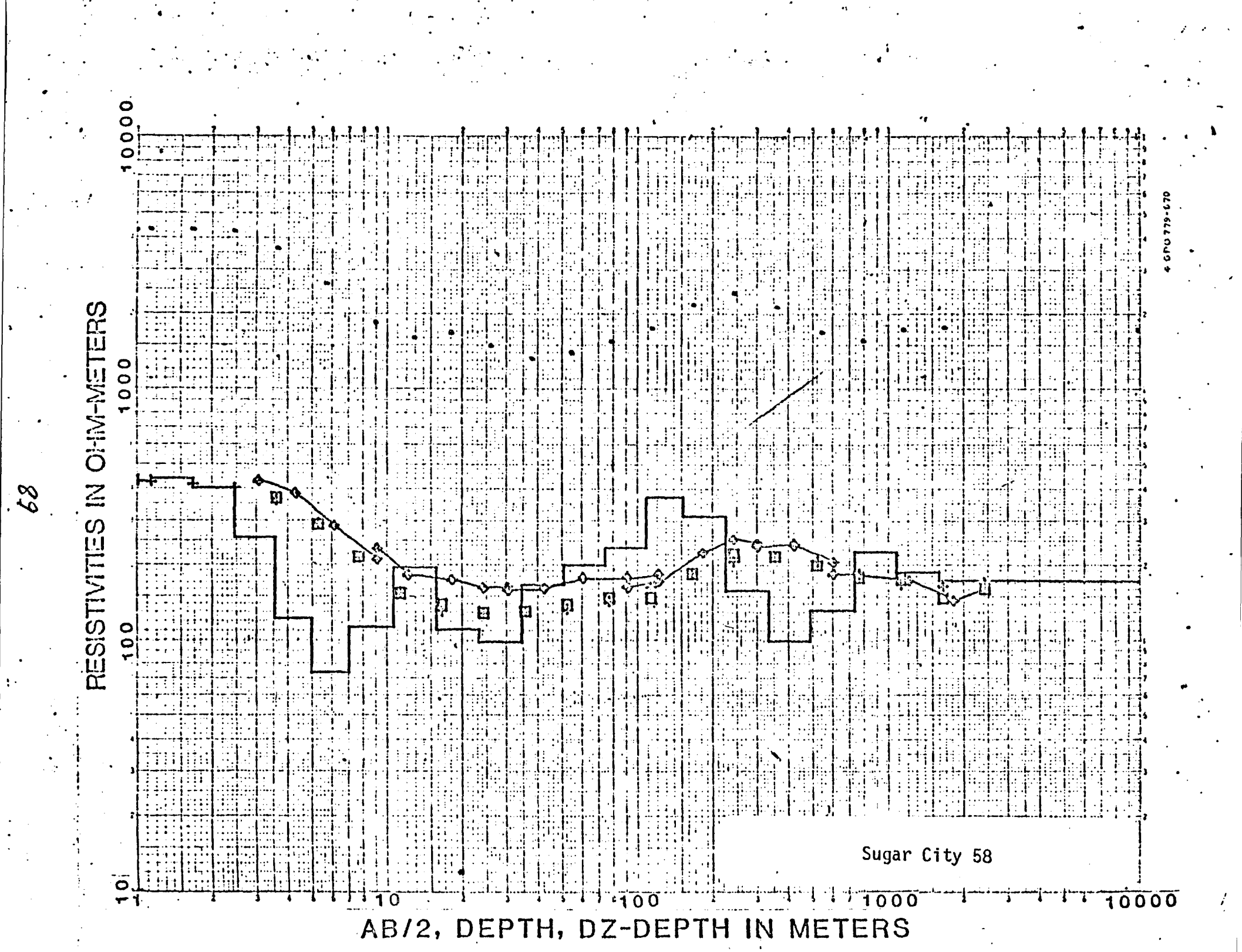
48


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 54

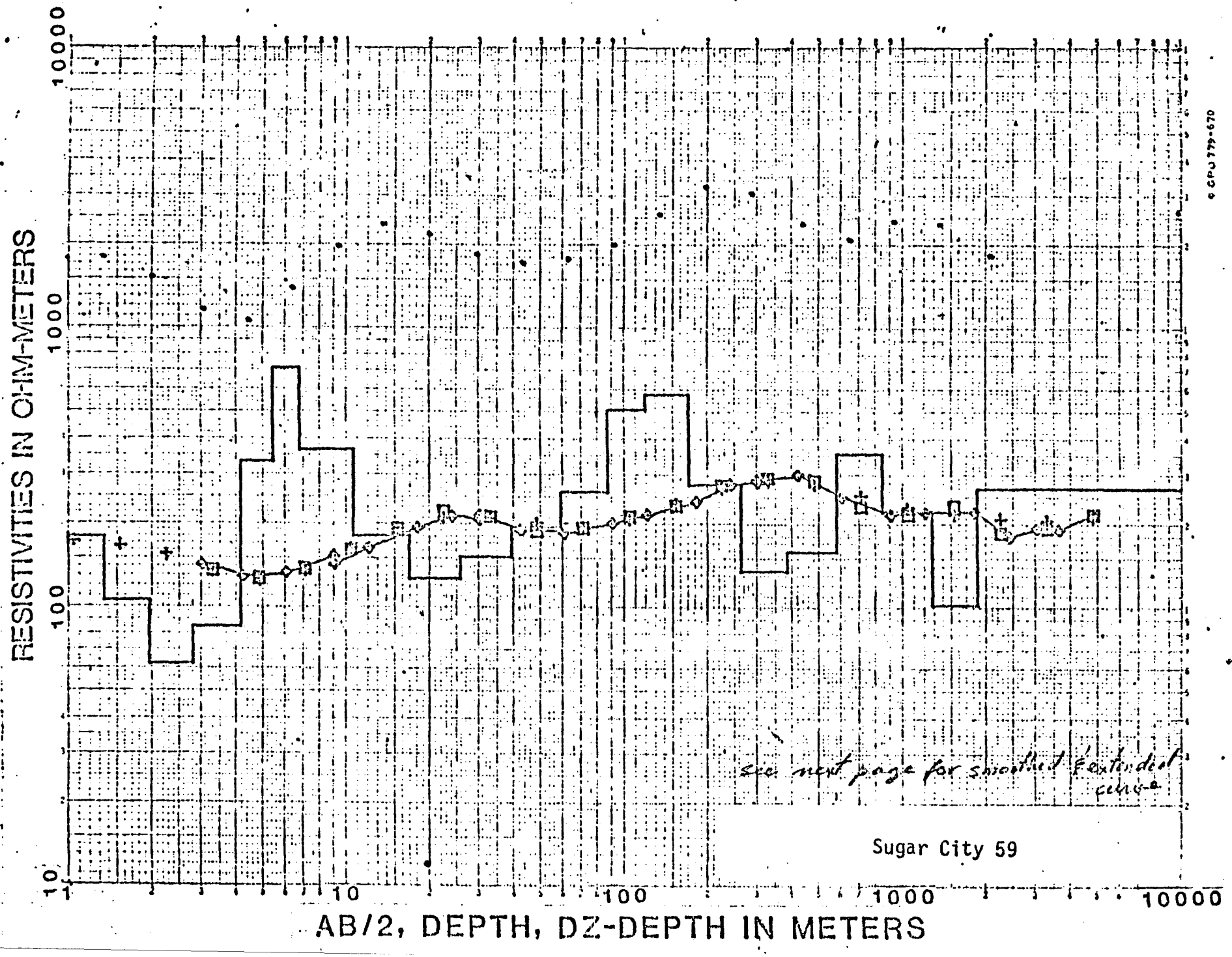

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 55
GPO 779-570


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 56

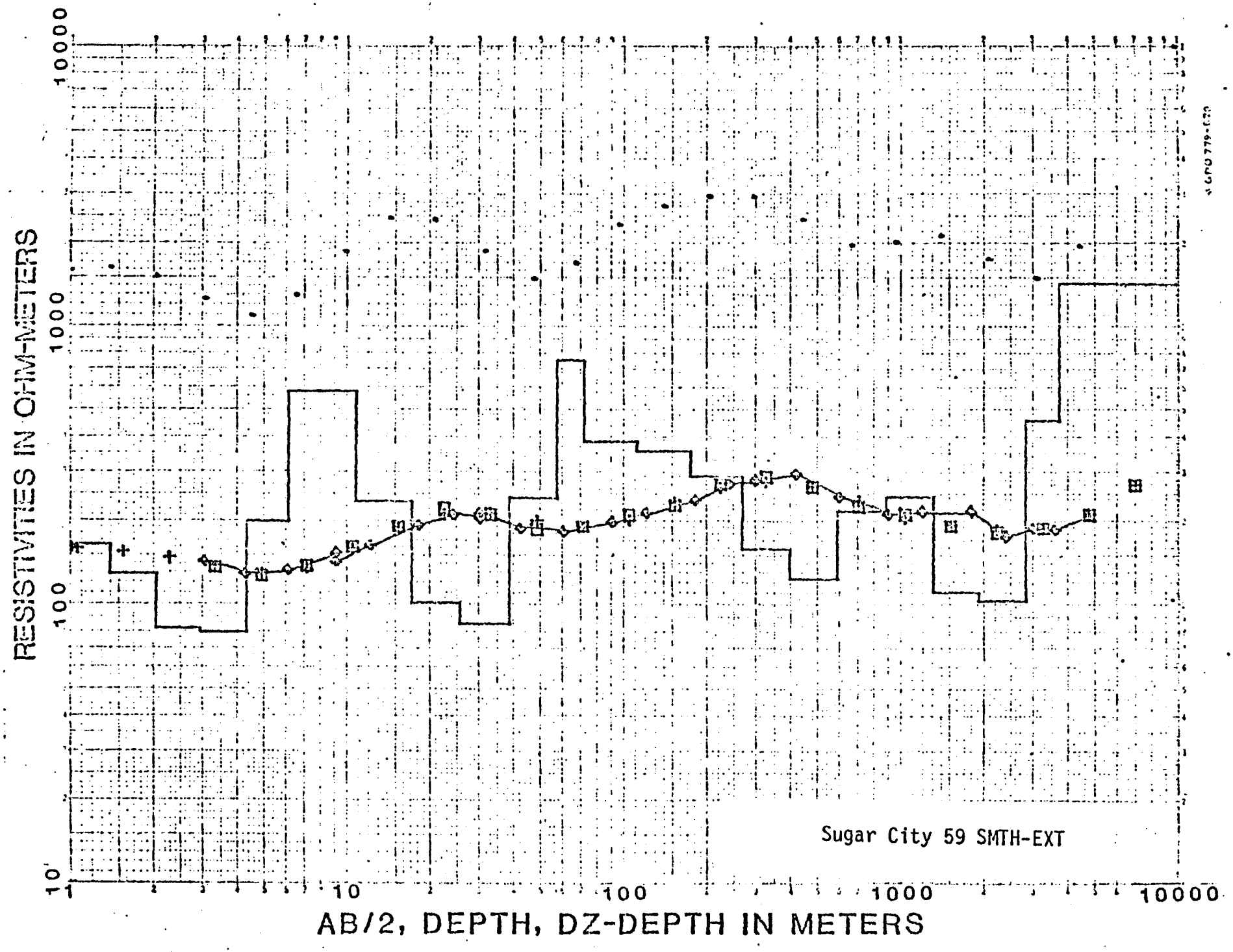
Sugar City 57
AB/2, DEPTH, DZ-DEPTH IN METERS
10000
1000
100
10
1
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1

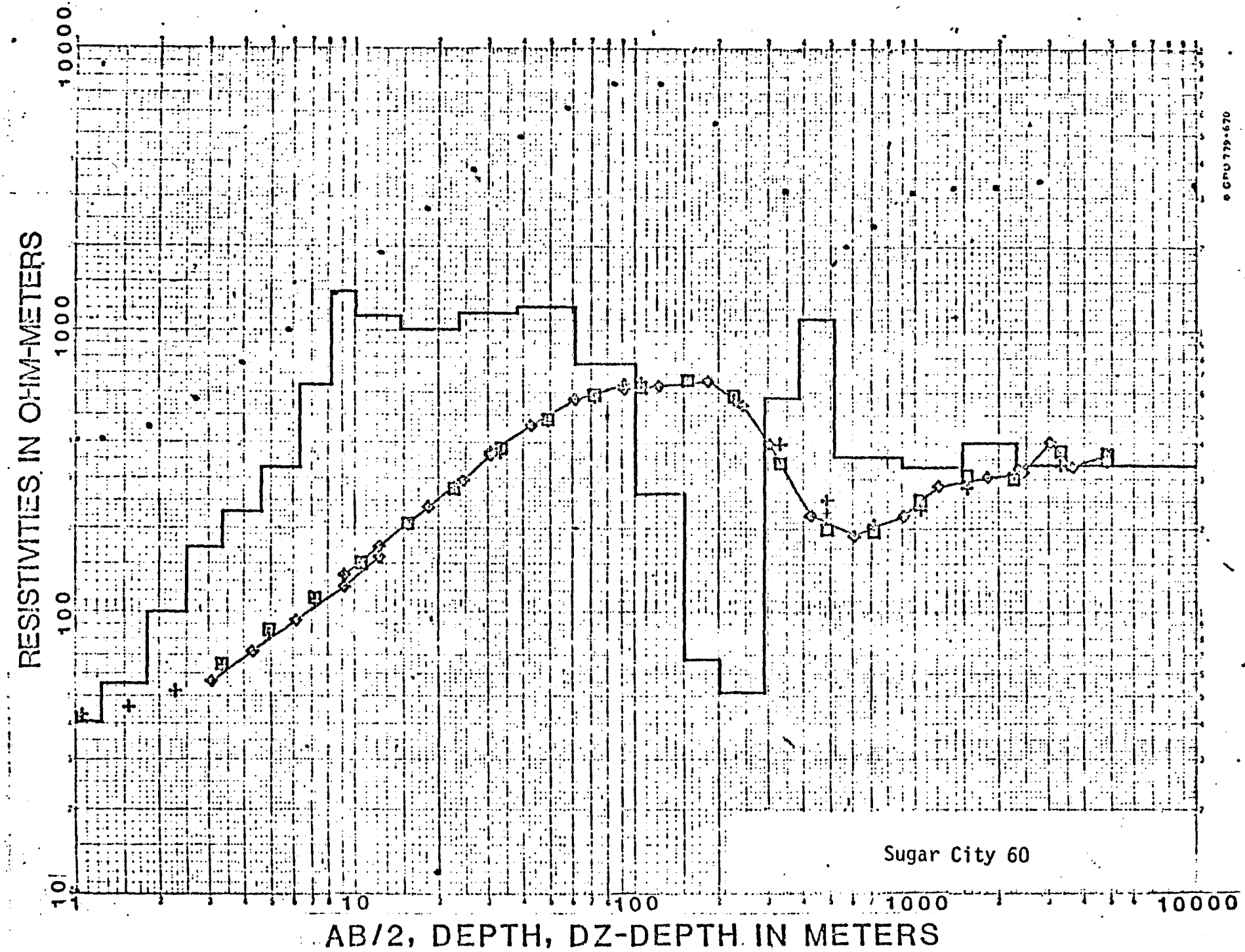

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 58
4 GPO 779-670

68

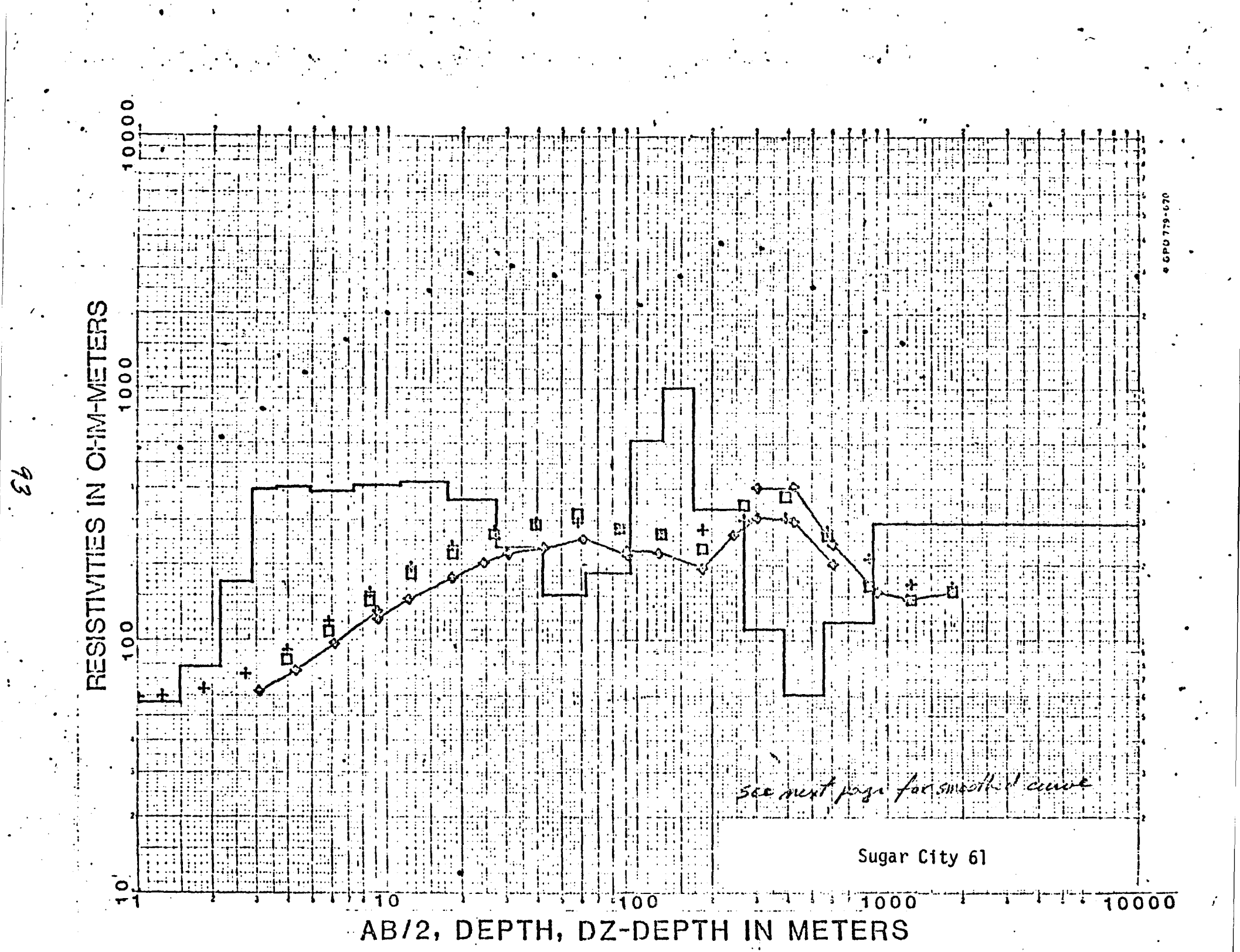

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
© GPU 779-670
see next page for smoothed & extended curve
Sugar City 59

96

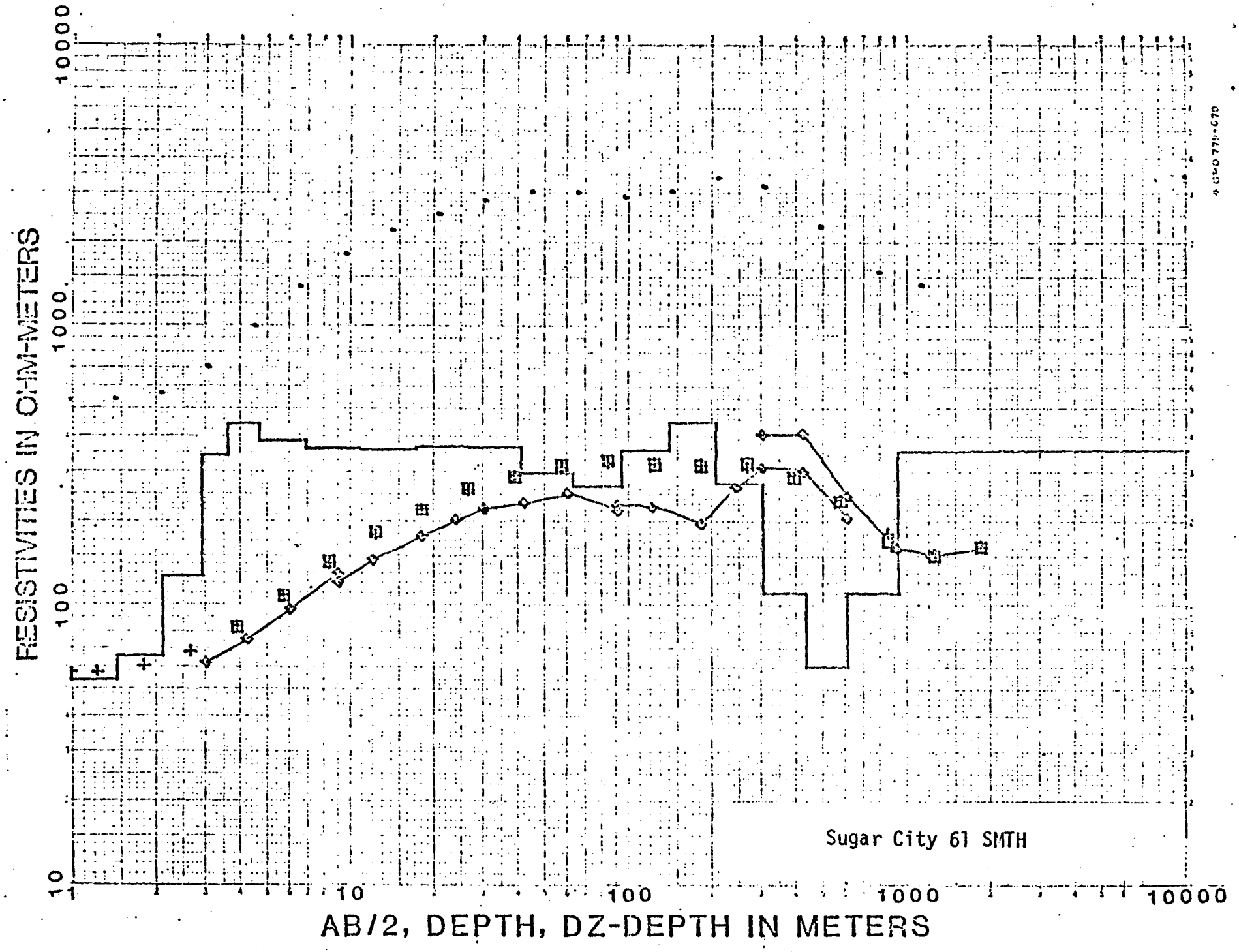

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 59 SMTH-EXT


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 60

92

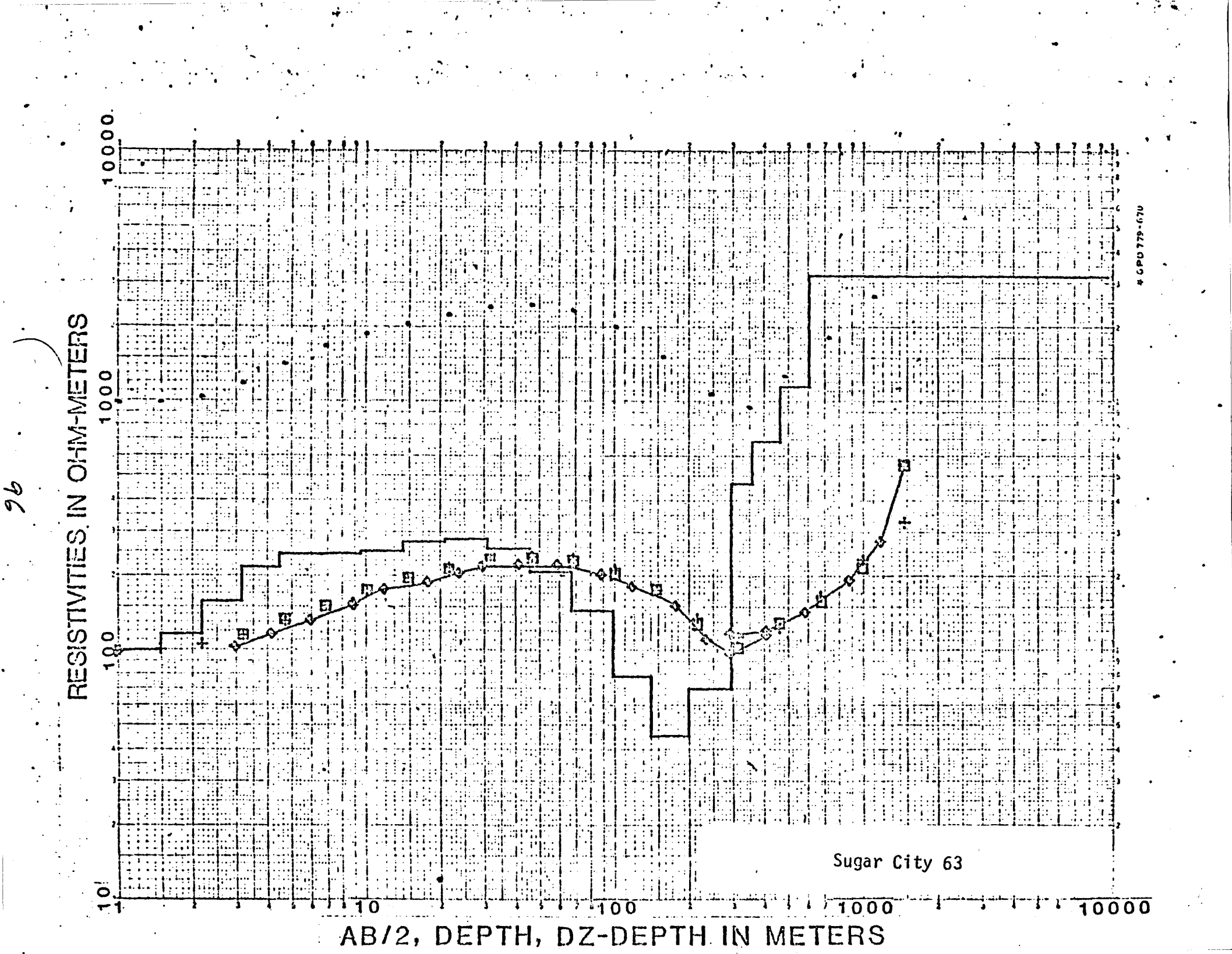

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
See next page for smoothed curve
Sugar City 61
GPO 779-670

43


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 61 SMTH

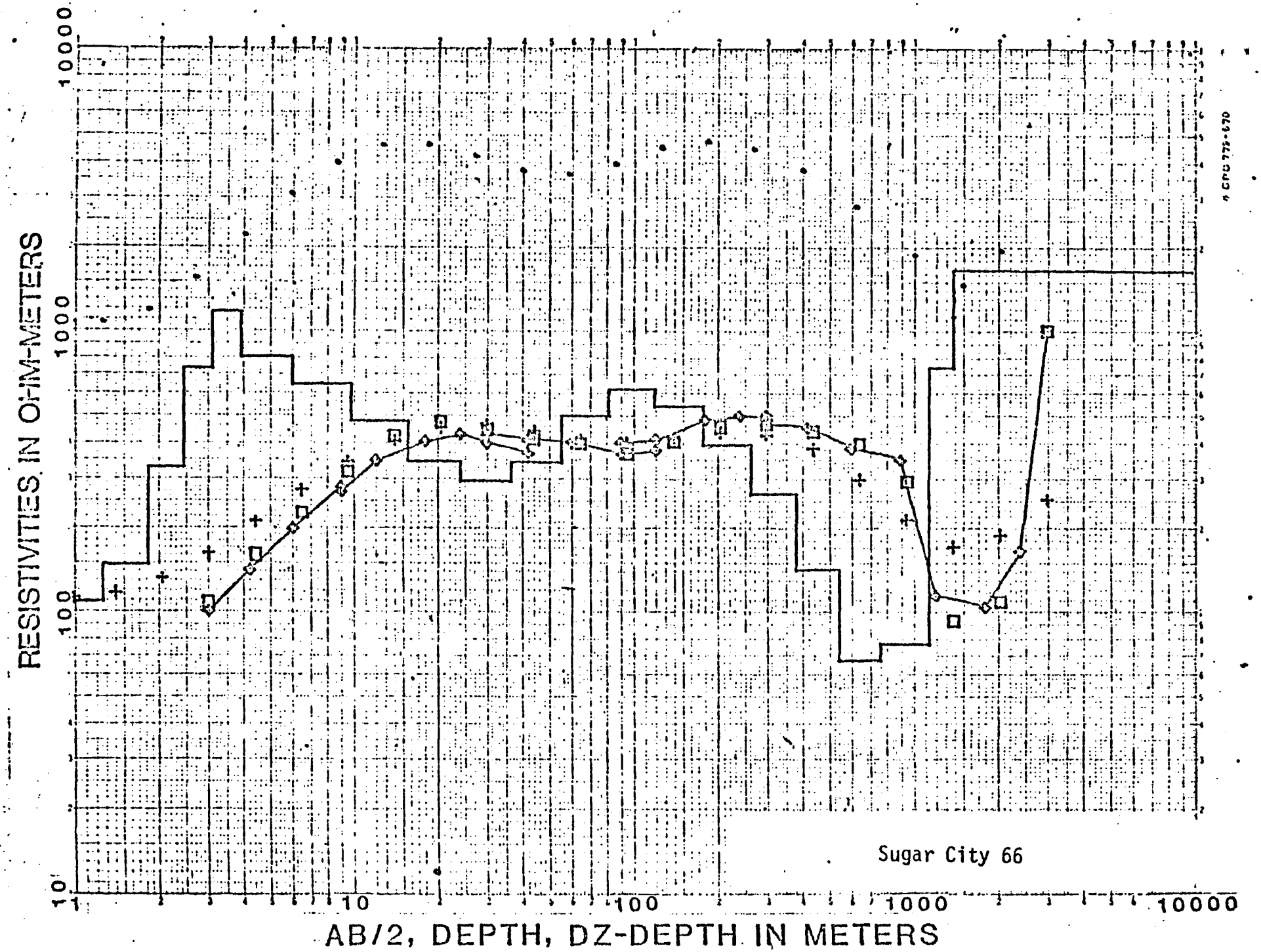
94

Sugar City 62
AB/2, DEPTH, DZ-DEPTH IN METERS
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10000
1000
100
10

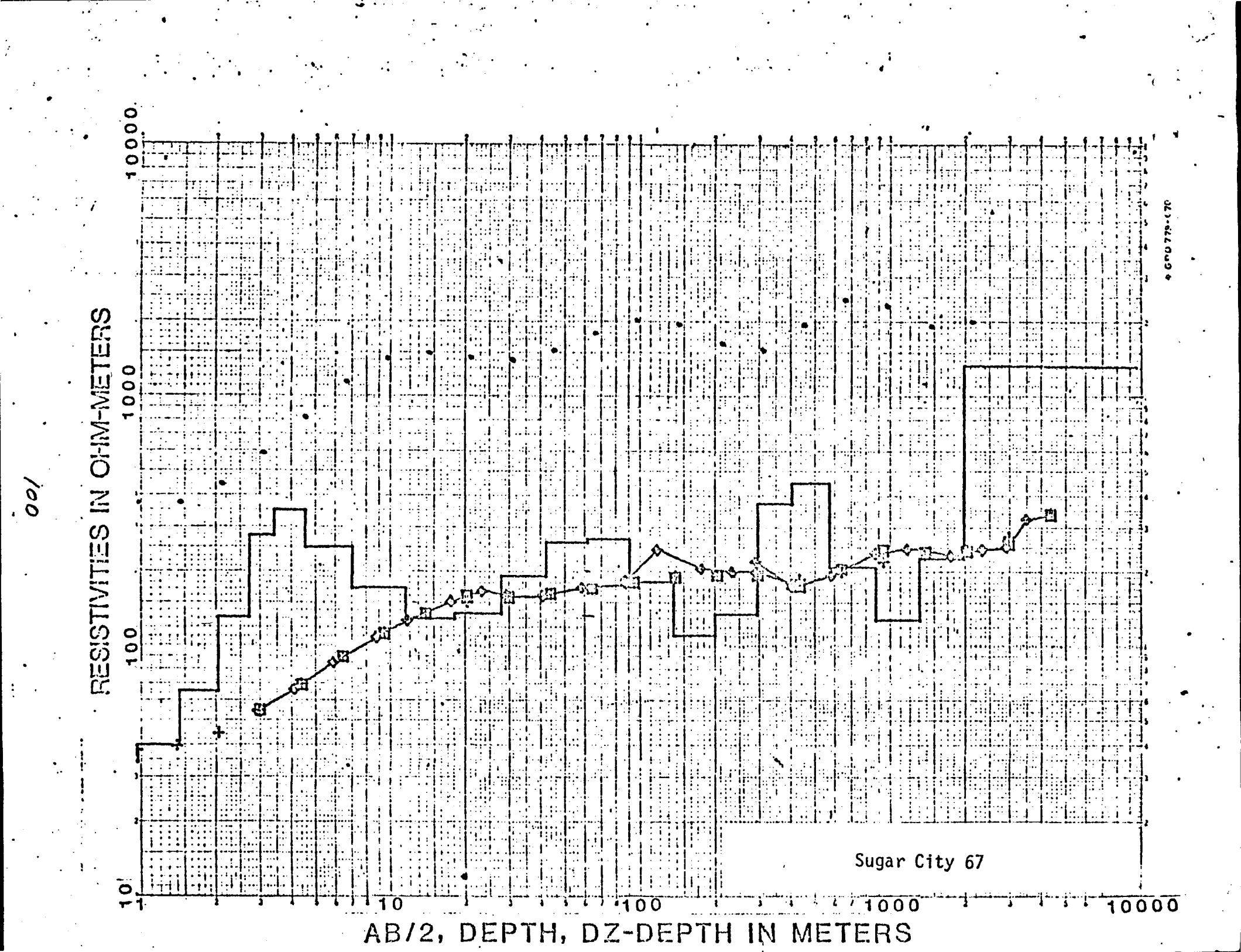

RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 63

Sugar City 64
AB/2, DEPTH, DZ-DEPTH IN METERS
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10000
1000
100
10

Sugar City 65
AB/2, DEPTH, DZ-DEPTH IN METERS
RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10000
1000
100
10


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 66

66


RESISTIVITIES IN OHM-METERS
10000
1000
100
10
1
10
100
1000
10000
AB/2, DEPTH, DZ-DEPTH IN METERS
Sugar City 67

Sugar City 68
AB/2, DEPTH, DZ-DEPTH IN METERS
10000
1000
100
10
1
10000
1000
100
10
1
RESISTIVITIES IN OHM-METERS

# Aerojet Nuclear Company

## ELECTRIC WELL LOG

| | |
|---|---|
| COMPANY HAROLD SMITH | PHONE NO. |
| ADDRESS RT. 1 | CITY HAGERMAN |
| COUNTY | STATE IDAHO |
| WELL NAME & LOCATION AT SMITH HOME 2¼ MILES S.E. OF HAGERMAN | |

| | |
|---|---|
| DRILLING CONTRACTOR | PHONE NO. |
| ADDRESS | CITY |
| STATE | DRILLER |

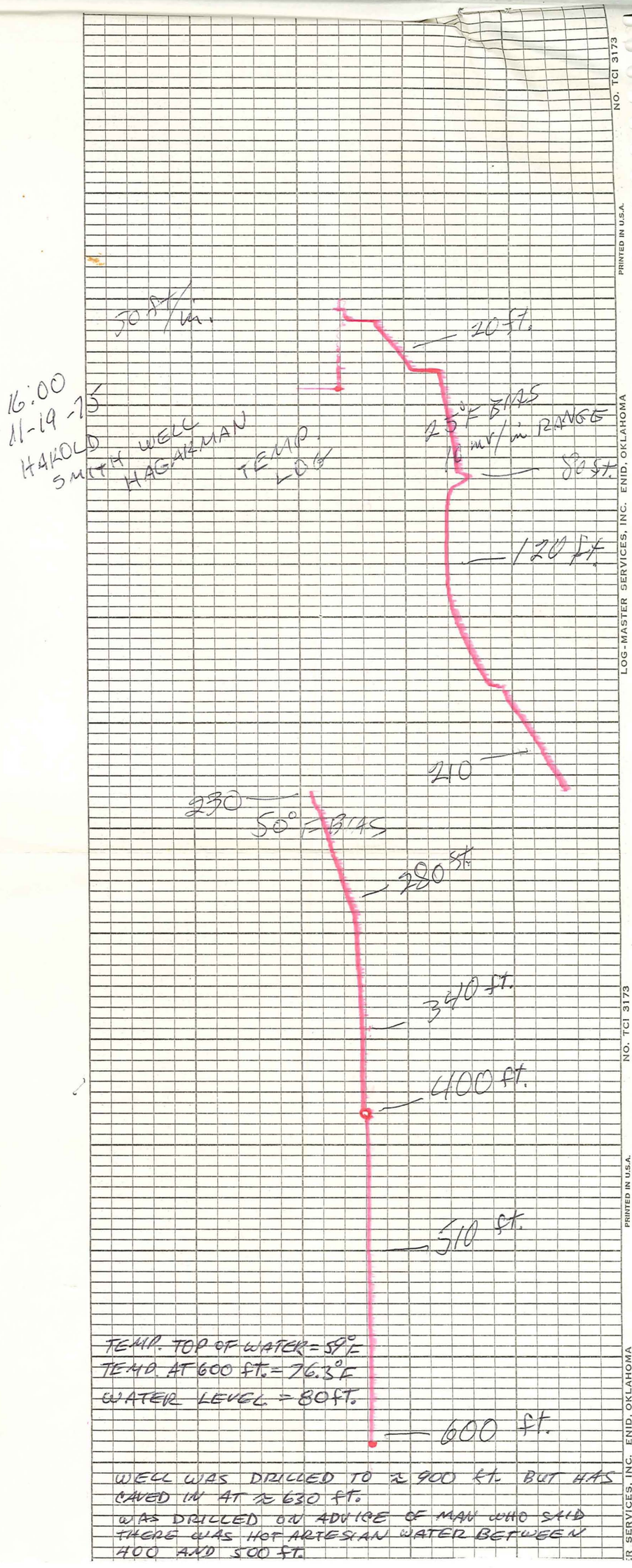
| | | | |
|---|---|---|---|
| DATE 11-19-75 | TIME 16:00 | RUN NO. 5 | |
| DEPTH, DRILLER SMITH 900' CAVED AT 630' | | DEPTH, LOGGER | |
| CASING SIZE | DEPTH | CASING SIZE, 8' | DEPTH |
| TYPE OF LOG TEMP. | | DIRECTION OF LOG DOWN | |
| LOGGED INTERVAL G.L. TO 600' | | DEPTH TO WATER 80' | |

| LOG SCALES: DEPTH | LEFT, MILLIVOLTS/IN. | RIGHT, MILLIVOLTS/IN. |
|---|---|---|
| G.L. | | 25°F BIAS, 10 mv/in. |
| 230' | | 50°F BIAS, 10 mv/in. |

REMARKS 59°F AT TOP OF WATER, 75°F AT 280', AND 76.3°F AT 600'.

LOGGER C. L. Cooper

CGC


30 ft/in.
20 ft.
16:00
11-19-75
HAROLD SMITH WELL
HAGARMAN
TEMP. LOG
25°F BIAS
10 mv/in RANGE
80 ft.
120 ft.
210
230
50°F BIAS
280 ft.
340 ft.
400 ft.
510 ft.
600 ft.
TEMP. TOP OF WATER = 59°F
TEMP. AT 600 ft. = 76.3°F
WATER LEVEL = 80 ft.
WELL WAS DRILLED TO ≈ 900 ft. BUT HAS CAVED IN AT ≈ 630 ft.
WAS DRILLED ON ADVICE OF MAN WHO SAID THERE WAS HOT ARTESIAN WATER BETWEEN 400 AND 500 ft.
NO. TCI 3173
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LOG-MASTER SERVICES, INC. ENID, OKLAHOMA