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SCHLUMBERGER SOUNDINGS IN THE OASIS VALLEY NEAR BEATTY, NEVADA

By

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In 1997 the U.S. Geological Survey made 36 direct current (dc) electrical soundings in the Oasis Valley near Beatty, Nevada, using the Schlumberger array. The soundings were made to determine the resistivity structure as an aid in evaluating the hydrologic conditions. The purpose of this report is to present the sounding data and its automatic interpretation.

Figure 1 is a map of the sounding locations, number and direction of expansion of the Schlumbegher array. The soundings are represented by circles and the direction of expansion by short bold lines adjacent to the circles. Table 1 gives the sounding number, x coordinate, y coordinate, and elevation of the soundings. The x and y coordinates are in kilometers UTM zone 11 using the North America horizontal datum of 1927. The elevations are in feet using the North American vertical datum of 1929.

DC RESISTIVITY SOUNDING

Schlumberger sounding is a geophysical technique that uses variations in the electrical resistivity of earth materials to help detect buried geologic structures. Dc resistivity (the inverse of conductivity) is a fundamental rock property that varies due to rock type, clay content, porosity and the quantity and quality of the water contained in the rock. Resistivity is normally expressed in ohm-m. Within a given rock type, the resistivity of the rock is primarily dependant on the quality and quantity of water and the amount of clay present. Generally speaking, higher clay content and/or poorer quality (higher TDS and/or chlorides) ground water lowers the rock resistivity.

Schlumberger sounding uses a symmetric electrode array to vertically explore the subsurface. The name Schlumberger derives from Conrad Schlumberger, an early proponent of the array geometry. Schlumberger soundings are processed by computer modeling of the sounding data as a series of horizontal layers (Zohdy, 1989 and Zohdy and Bisdorf, 1989). More detailed explanations of processing and automatic interpretation procedure can be found in Bisdorf (1985) and Zohdy and others (1993). A series of individual soundings can be combined to generate a geoelectrical cross section of interpreted resistivity. Cross sections, which can be thought of as vertical slices through the ground, similar to a road cut, are easier to interpret than individual soundings and show lateral as well as vertical variations of resistivity.

The data were interpreted using an automatic computerized interpretation program (Zohdy and Bisdorf, 1989) written for IBM PC's and compatible computers. The soundings are designated OASIS 1 through OASIS 36. For each sounding curve, the data in the appendix includes:

1) A sounding title designated by the name of the survey area followed by the sounding number. Several sounding titles have the suffix S denoting that the field

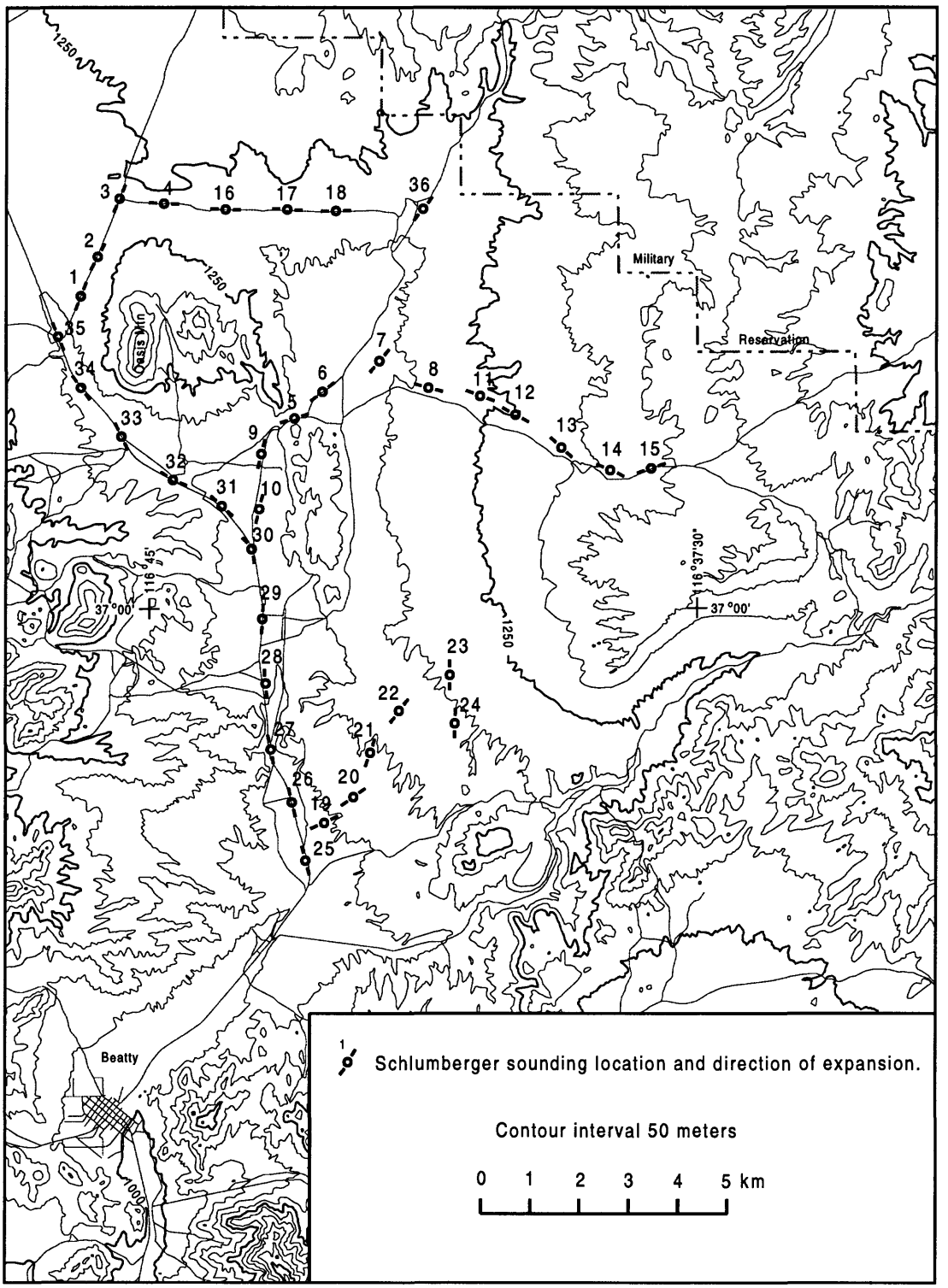

Figure 1. Map showing the location, number, and direction of expansion of the Schlumberger soundings.

Sounding Number	x (km)	y (km)	Elevation (feet)
1	520.84	4101.00	4010.
2	521.18	4101.80	4050.
3	521.62	4102.99	4065.
4	522.52	4102.89	4040.
5	525.17	4098.55	3800.
6	525.74	4099.08	3845.
7	526.90	4099.70	3900.
8	527.89	4099.16	3960.
9	524.50	4097.83	3750.
10	524.46	4096.71	3705.
11	528.94	4099.00	4040.
12	529.66	4098.62	4100.
13	530.59	4097.96	4190.
14	531.59	4097.50	4270.
15	532.42	4097.54	4360.
16	523.77	4102.77	3995.
17	525.02	4102.77	4020.
18	526.01	4102.74	3980.

Sounding Number	x (km)	y (km)	Elevation (feet)
19	525.79	4090.39	3580.
20	526.38	4090.91	3670.
21	526.72	4091.81	3750.
22	527.31	4092.66	3835.
23	528.34	4093.38	3960.
24	528.45	4092.41	3925.
25	525.41	4089.63	3515.
26	525.13	4090.80	3525.
27	524.70	4091.88	3580.
28	524.60	4093.21	3620.
29	524.53	4094.50	3635.
30	524.31	4095.90	3700.
31	523.70	4096.77	3740.
32	522.71	4097.30	3795.
33	521.66	4098.18	3870.
34	520.84	4099.16	3890.
35	520.38	4100.19	3925.
36	527.78	4102.78	3960.

Table 1. Schlumberger sounding coordinates. Horizontal coordinates (x and y) are in kilometers UTM zone 11 using the North American horizontal datum of 1927. Elevations are in feet using the North American vertical datum of 1929.

data were smoothed before the inversion was performed. Only the interpreted sounding titles will have suffixes.

2) A tabulation of the AB/2 electrode spacings (in meters and feet) and corresponding apparent resistivities (in ohm-meters).

3) A log-log plot of the field data points. Each set of data points that were made with the same potential electrode spacing (MN) is connected with a solid line. Measurements were made at MN/2 spacings of .6, 2, 20, 60, and 200 feet as appropriate.

4) A tabulation of the automatically interpreted layering, with depths in meters and feet and the corresponding resistivity values in ohm-meters.

5) A log-log plot of the results of the automatic interpretation program. The circles represent the shifted-digitized field data, the continuous curve represents the sounding curve calculated from the interpreted layering, and the step-function curve represents the interpreted layering.

RESISTIVITY CROSS SECTIONS

Resistivity cross sections are generated from individual sounding interpretations. Each sounding interpretation is sampled in a manner to approximate a continuous vertical distribution of resistivity with depth (Bisdorf, 1982). This vertical data is then horizontally interpolated to create a grid. Color values are assigned based on the interpolated resistivity values and the desired contour levels. Triangles on the upper surface of the cross section designate the sounding locations. Topographic information, input as sounding elevations, is represented by connecting the surface location of the soundings by straight lines. The cross sections are vertically exaggerated five times.

The color scale shows interpreted resistivities ranging from low resistivities (<7 ohm-m) in the cool colors (blues and greens) to high resistivities (>300 ohm-m) in the warm colors (yellow-red). As a general guide to interpreting the cross sections, the following correlation between resistivity range and possible earth material is given:

less than 10 ohm-m	Fine grained clay rich sediments (saturated or unsaturated), altered volcanic rocks.
10 to 45 ohm-m	saturated alluvium, zeolitized volcanic rocks
45 to 150 ohm-m	unsaturated alluvium, non- to moderately- welded tuff or rhyolite
greater than 150 ohm-m	moderately- to densely- welded tuff, other volcanic rocks

Figure 2 shows a resistivity cross section that is oriented predominately east-west. On the west side of the cross section, under soundings 35, 1 and 2, is a zone with resistivities of 45 to 150 ohm-m starting at a depth of about 150 m. This zone probably represents a non- to moderately- welded tuff.

Figure 3 shows a resistivity cross section again oriented predominately east-west. A shallow zone under soundings 8, 11, 12, and 13 has resistivities greater than 150 ohm-m and probably represent unsaturated alluvium. The 45 to 150 ohm-m material present under soundings 9, 5, and 6 is representative of a non- to moderately-welded tuff. This material extends to greater than 250 m depth under soundings 5 and 6. The 45 to 150 ohm-m material present under sounding 15 at a depth of about 150 m probably represents a rhyolite or ash flow tuff.

Figure 4 shows a resistivity cross section that is oriented north-south along the Amargosa River. The 45 to 150 ohm-m material present under soundings 33 and 32 is representative of a non- to moderately- welded tuff. Under sounding 27 and somewhat under sounding 26 is a zone of resistivities of 45 to greater than 150 ohm-m. This zone is probably represents a moderately- to highly- welded tuff, dense rhyolite or other competent material. This unit has a higher resistivity possibly due to high quartz content or reduced porosity.

Figure 5 shows a northeast-southwest oriented cross section. The high (>150 ohm-m) and moderately high (45 to 150 ohm-m) resistivity materials in the upper 20m of the cross section represent unsaturated alluvium. The 45 to 150 ohm-m material deeper than 20m represents unsaturated alluvium or non- to moderately- welded tuff.

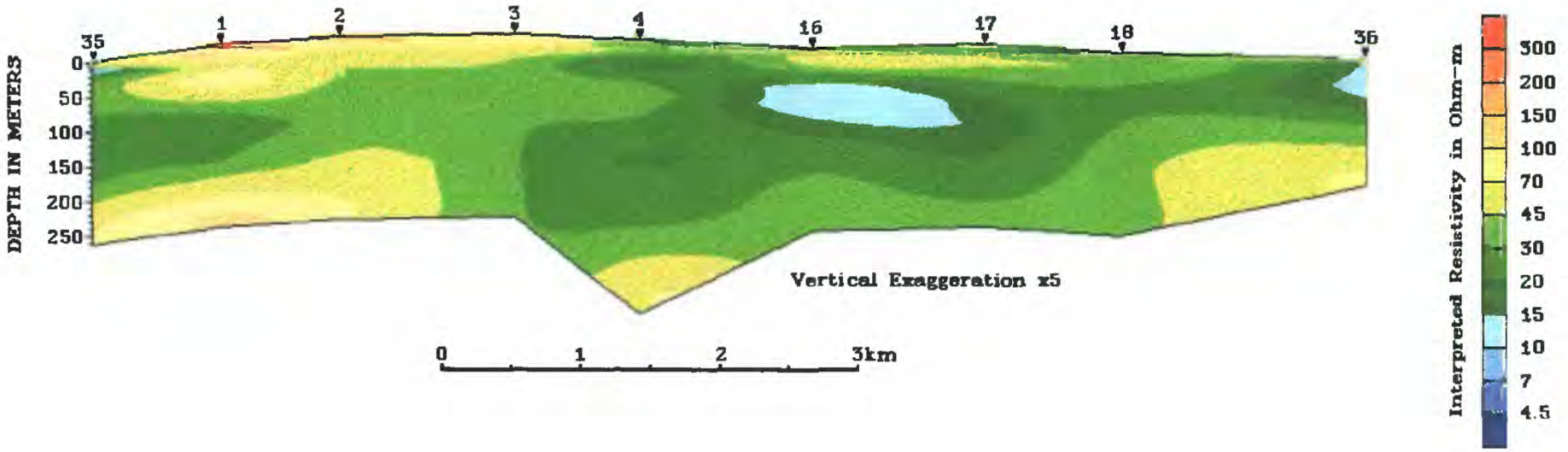

Figure 2. Geoelectrical cross section oriented east-west (see figure 1 for location).

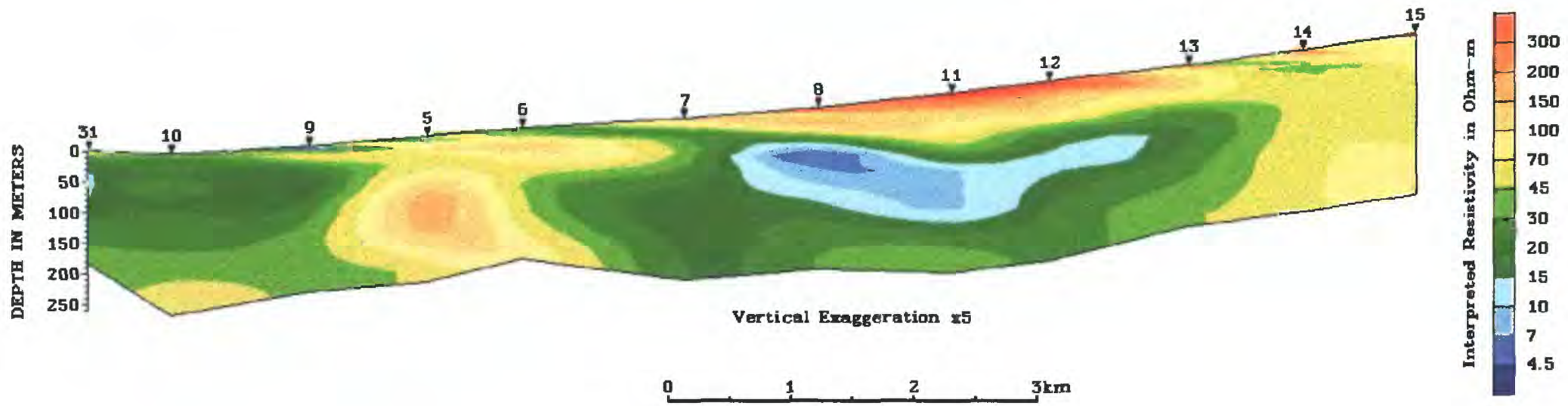

Figure 3. Geoelectrical cross section oriented east-west (see figure 1 for location).

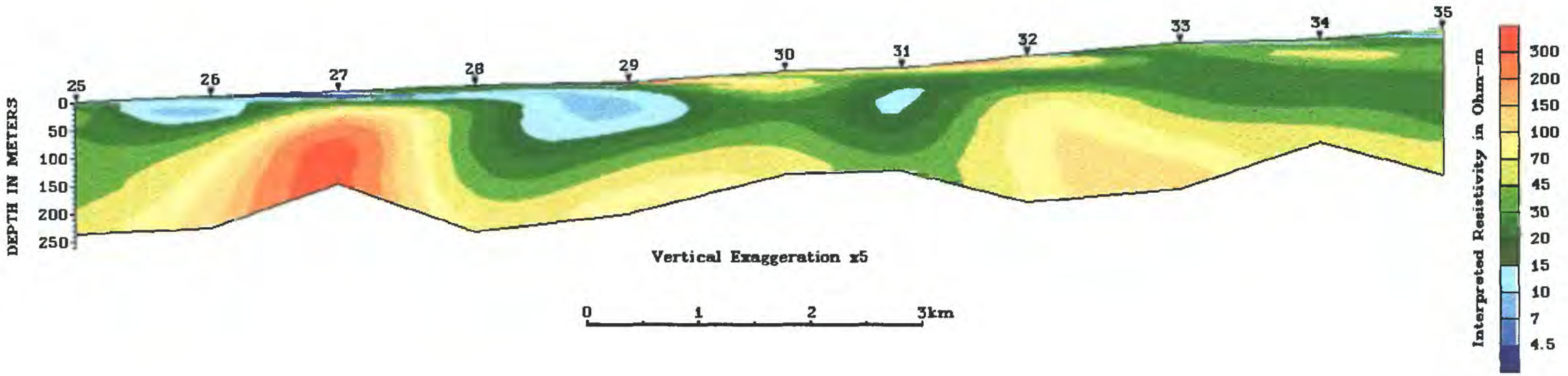

Figure 4. Geoelectrical cross section oriented north-south (see figure 1 for location).

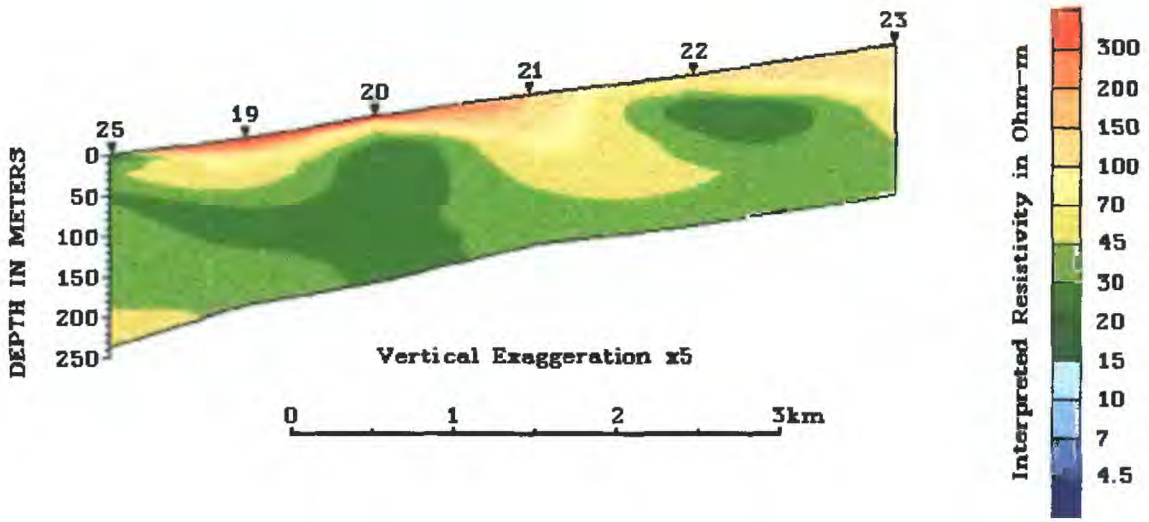

Figure 5. Geoelectrical cross section oriented east-west (see figure 1 for location).

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Bisdorf, R.J., 1982, Schlumberger sounding investigations in the Date Creek Basin, Arizona: U.S. Geological Survey Open-File Report 82-953, 55 p.

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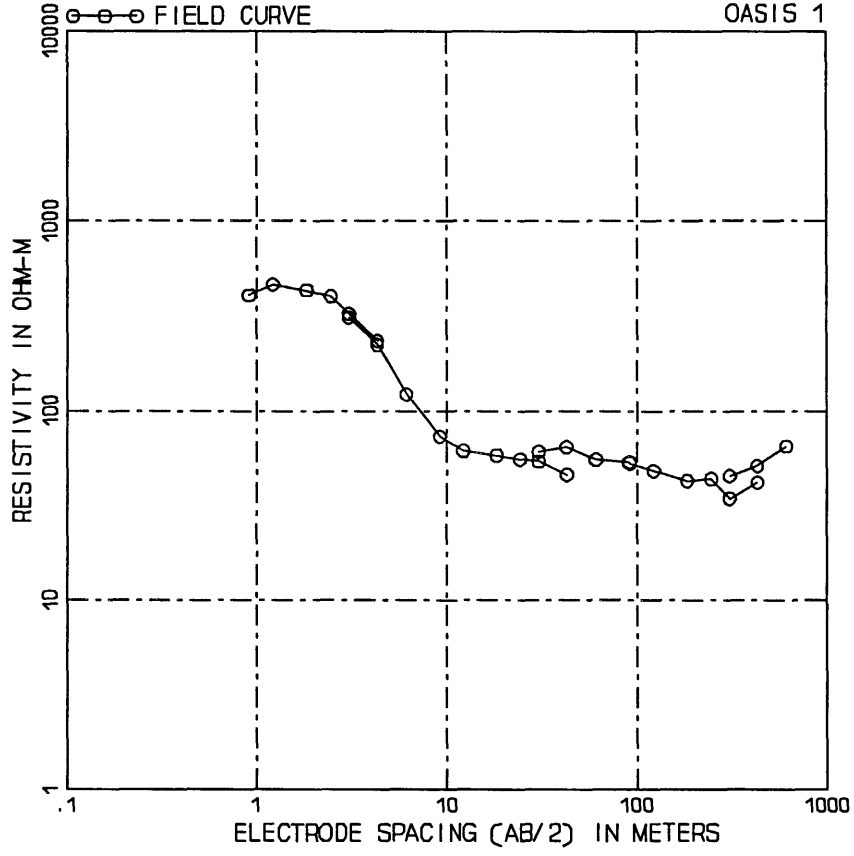
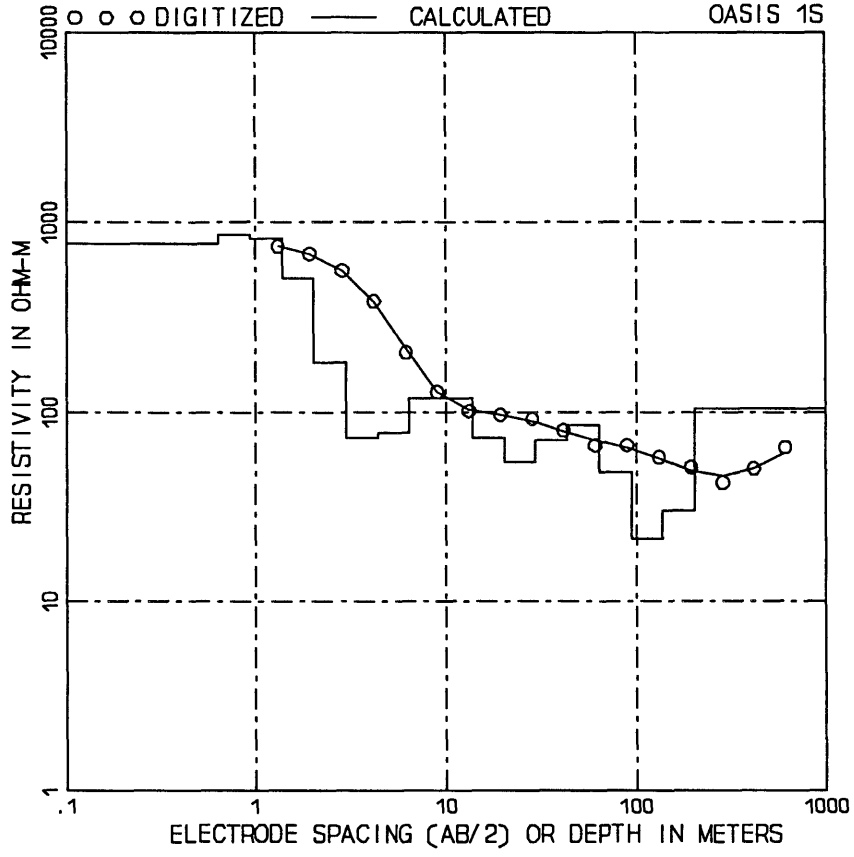
Zohdy, A.A.R., Bisdorf, R.J., and Martin, Peter, 1993, A study of sea-water intrusion using Schlumberger soundings near Oxnard, California: U.S. Geological Survey Open-File Report 93-524, 139 p.

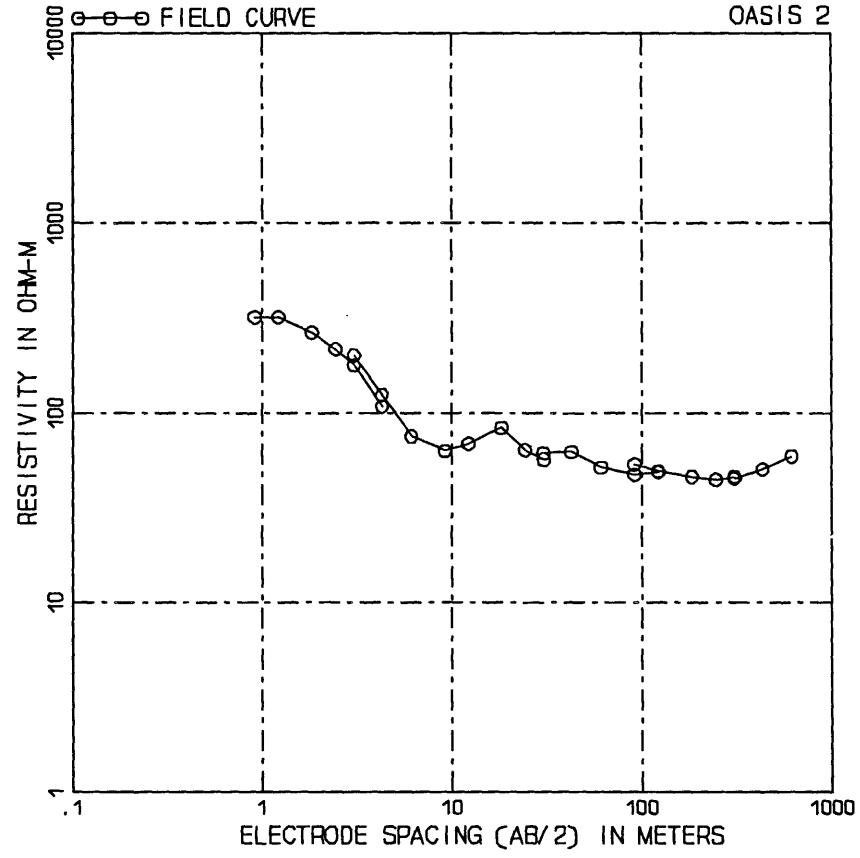
APPENDIX

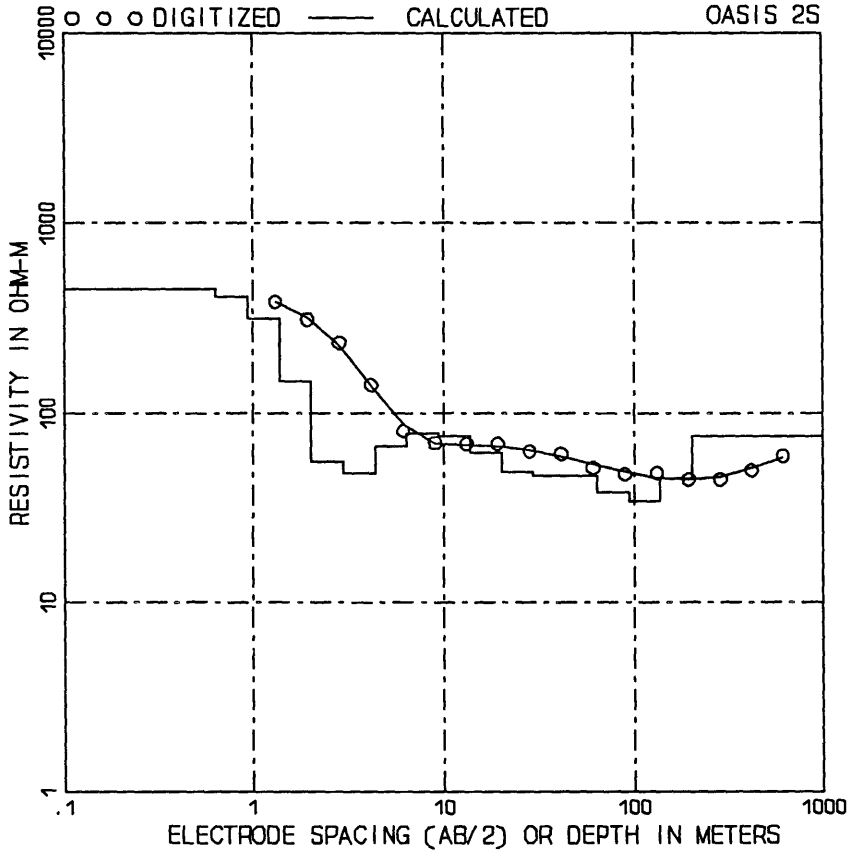




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	405.00	42.67	(140.00)	46.00
1.22	(4.00)	462.00	30.48	(100.00)	60.40
1.83	(6.00)	430.00	42.67	(140.00)	64.10
2.44	(8.00)	400.00	60.96	(200.00)	54.90
3.05	(10.00)	324.00	91.44	(300.00)	53.70
4.27	(14.00)	233.00	91.44	(300.00)	52.90
3.05	(10.00)	308.00	121.92	(400.00)	48.10
4.27	(14.00)	222.00	182.88	(600.00)	42.60
6.10	(20.00)	122.00	243.84	(800.00)	43.50
9.14	(30.00)	73.20	304.80	(1000.00)	34.30
12.19	(40.00)	61.30	426.72	(1400.00)	41.80
18.29	(60.00)	58.00	304.80	(1000.00)	45.20
24.38	(80.00)	55.20	426.72	(1400.00)	51.20
30.48	(100.00)	54.00	609.60	(2000.00)	64.90

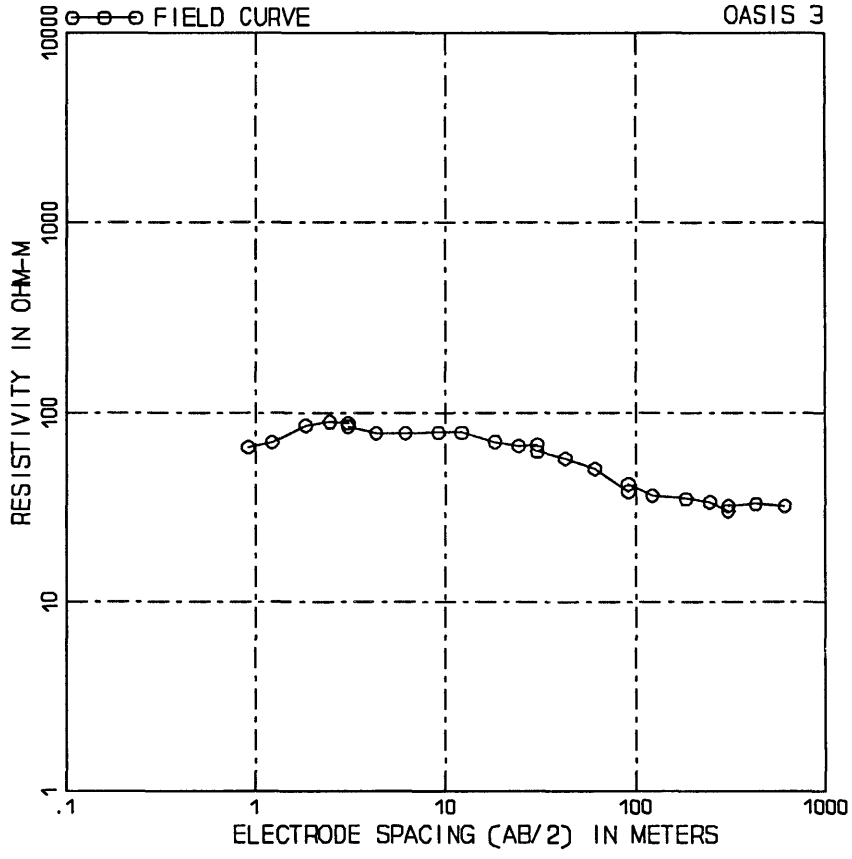
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	769.38	13.75	(45.12)	118.11
0.94	(3.07)	859.41	20.18	(66.22)	73.28
1.38	(4.51)	816.77	29.63	(97.20)	54.28
2.02	(6.62)	505.18	43.49	(142.67)	71.03
2.96	(9.72)	182.12	63.83	(209.41)	84.90
4.35	(14.27)	73.29	93.69	(307.37)	47.89
6.38	(20.94)	77.76	137.51	(451.16)	21.51
9.37	(30.74)	117.64	201.84	(662.22)	30.12
			99999.00	(99999.00)	104.62

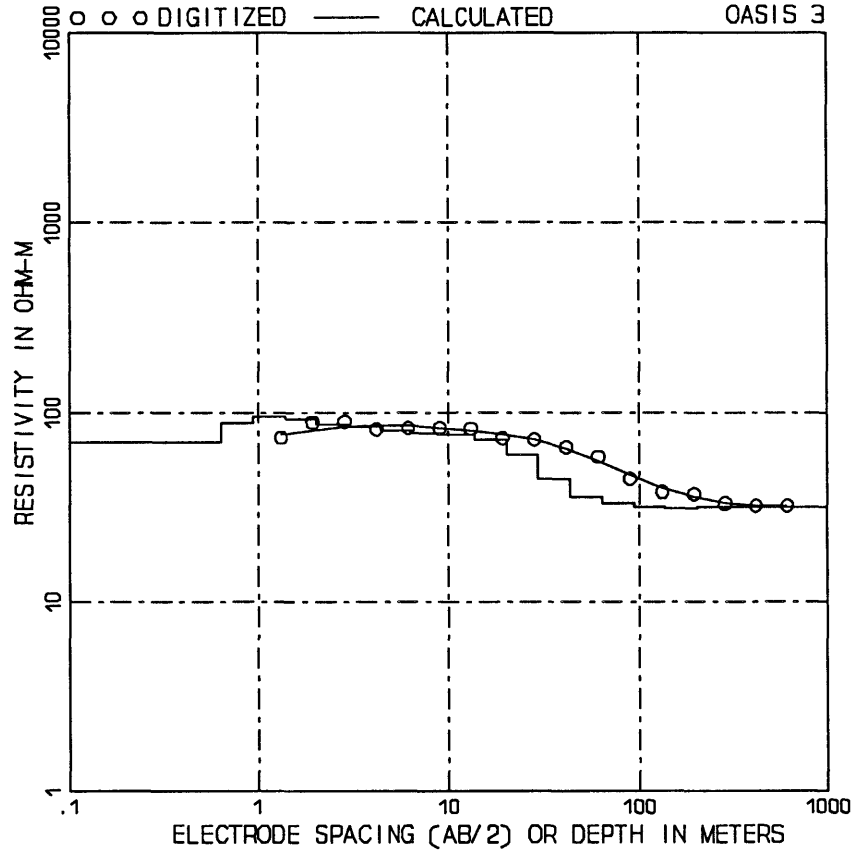




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	318.00	30.48	(100.00)	56.60
1.22	(4.00)	319.00	30.48	(100.00)	61.00
1.83	(6.00)	264.00	42.67	(140.00)	61.90
2.44	(8.00)	216.00	60.96	(200.00)	51.50
3.05	(10.00)	178.00	91.44	(300.00)	47.30
4.27	(14.00)	108.00	121.92	(400.00)	48.70
3.05	(10.00)	201.00	91.44	(300.00)	53.70
4.27	(14.00)	124.00	121.92	(400.00)	49.10
6.10	(20.00)	74.90	182.88	(600.00)	46.00
9.14	(30.00)	62.90	243.84	(800.00)	44.30
12.19	(40.00)	68.50	304.80	(1000.00)	46.10
18.29	(60.00)	83.20	304.80	(1000.00)	45.20
24.38	(80.00)	63.50	426.72	(1400.00)	50.20
			609.60	(2000.00)	59.10

DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	449.01	13.75	(45.12)	75.19
0.94	(3.07)	407.84	20.18	(66.22)	61.46
1.38	(4.51)	311.61	29.63	(97.20)	48.42
2.02	(6.62)	146.02	43.49	(142.67)	46.44
2.96	(9.72)	55.01	63.83	(209.41)	46.49
4.35	(14.27)	47.81	93.69	(307.37)	38.16
6.38	(20.94)	66.12	137.51	(451.16)	33.96
9.37	(30.74)	77.52	201.84	(662.22)	44.88
			99999.00	(99999.00)	75.51





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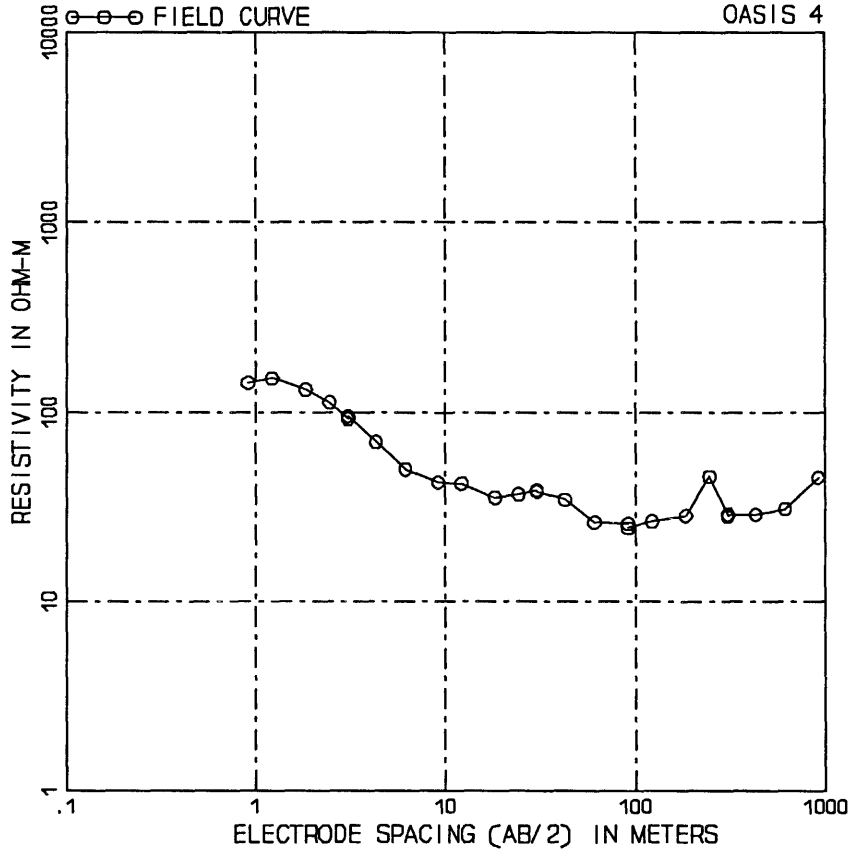
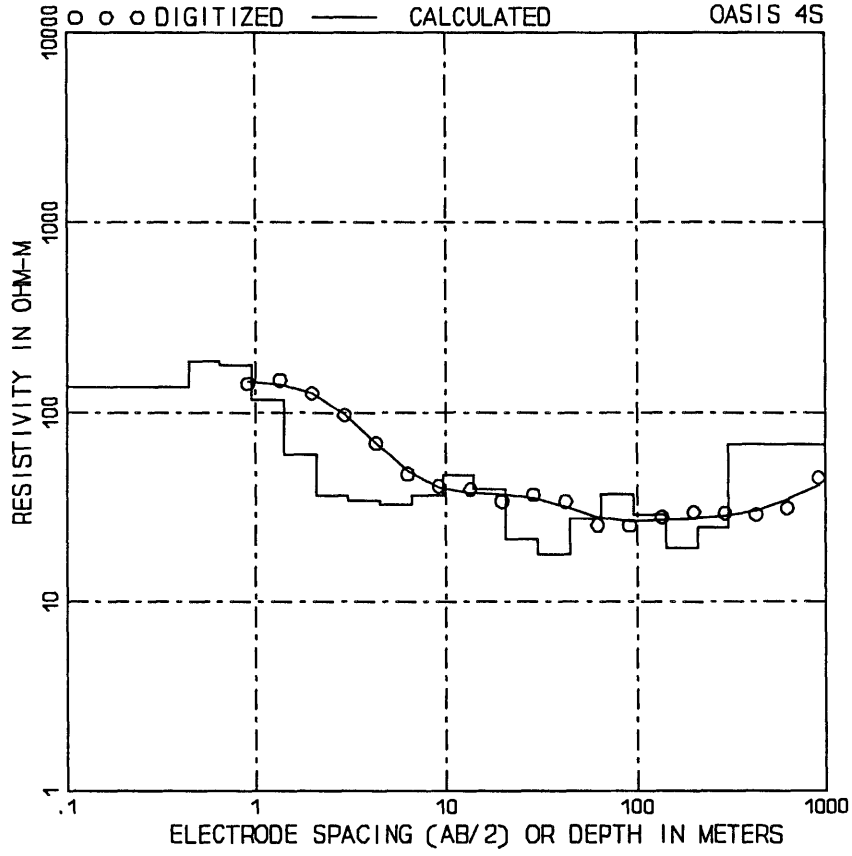
1.22	(4.00)	69.80	30.48	(100.00)	61.90
1.83	(6.00)	85.40	42.67	(140.00)	56.90
2.44	(8.00)	88.80	60.96	(200.00)	50.40
3.05	(10.00)	87.70	91.44	(300.00)	38.20
3.05	(10.00)	84.20	91.44	(300.00)	41.70
4.27	(14.00)	77.80	121.92	(400.00)	36.40
6.10	(20.00)	77.90	182.88	(600.00)	34.90
9.14	(30.00)	78.30	243.84	(800.00)	33.50
12.19	(40.00)	78.30	304.80	(1000.00)	30.30
18.29	(60.00)	69.90	304.80	(1000.00)	32.10
24.38	(80.00)	66.60	426.72	(1400.00)	32.80
			609.60	(2000.00)	32.00

DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	69.85	13.75	(45.12)	76.35
0.94	(3.07)	87.22	20.18	(66.22)	71.83
1.38	(4.51)	94.60	29.63	(97.20)	59.34
2.02	(6.62)	91.26	43.49	(142.67)	44.45
2.96	(9.72)	86.09	63.83	(209.41)	35.85
4.35	(14.27)	83.22	93.69	(307.37)	32.84
6.38	(20.94)	80.49	137.51	(451.16)	31.42
9.37	(30.74)	77.80	201.84	(662.22)	30.97
			99999.00	(99999.00)	31.51





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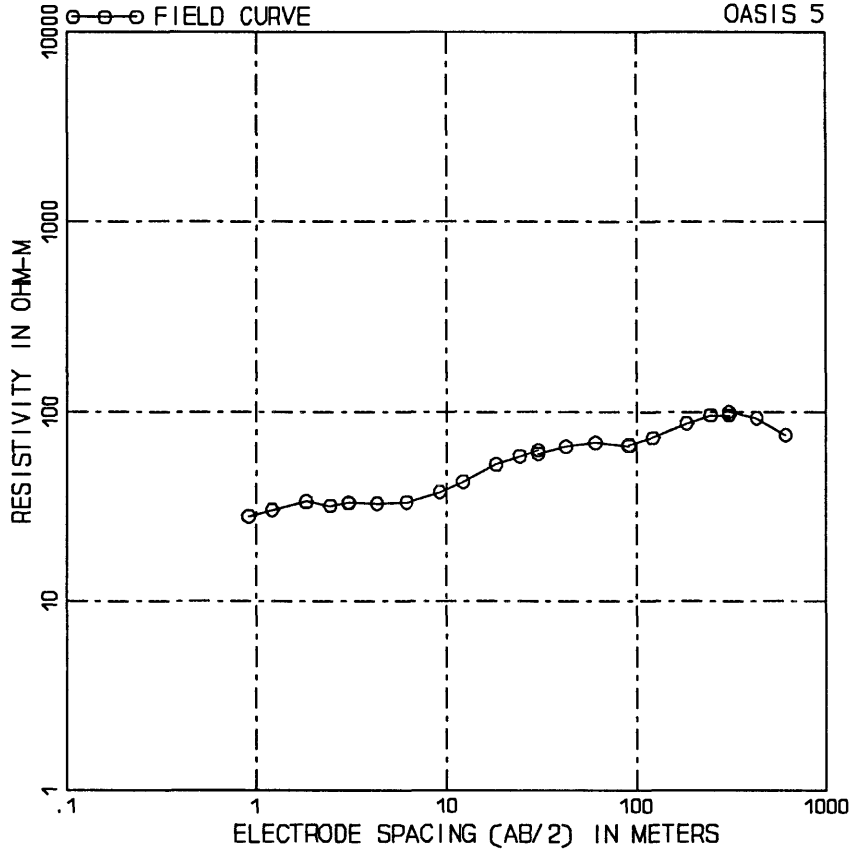
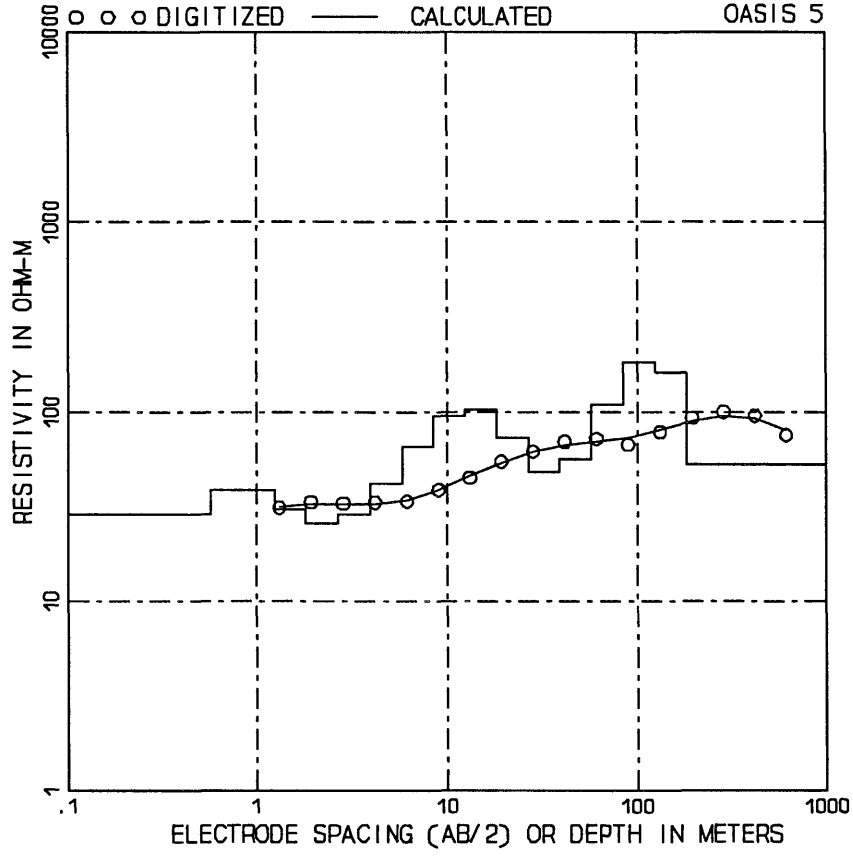
0.91	(3.00)	142.00	30.48	(100.00)	37.90
1.22	(4.00)	150.00	42.67	(140.00)	34.40
1.83	(6.00)	131.00	60.96	(200.00)	26.10
2.44	(8.00)	112.00	91.44	(300.00)	25.70
3.05	(10.00)	91.70	91.44	(300.00)	24.50
3.05	(10.00)	95.00	121.92	(400.00)	26.50
4.27	(14.00)	69.40	182.88	(600.00)	28.40
6.10	(20.00)	49.80	243.84	(800.00)	45.50
9.14	(30.00)	42.30	304.80	(1000.00)	28.10
12.19	(40.00)	42.00	304.80	(1000.00)	28.90
18.29	(60.00)	35.40	426.72	(1400.00)	28.70
24.38	(80.00)	36.70	609.60	(2000.00)	30.80
30.48	(100.00)	38.70	914.40	(3000.00)	45.00

DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.44	(1.46)	136.64	14.05	(46.11)	46.72
0.65	(2.14)	185.15	20.63	(67.67)	39.22
0.96	(3.14)	177.18	30.28	(99.33)	21.47
1.41	(4.61)	116.38	44.44	(145.80)	17.75
2.06	(6.77)	59.59	65.23	(214.01)	27.43
3.03	(9.93)	36.56	95.74	(314.12)	36.86
4.44	(14.58)	34.26	140.53	(461.06)	28.75
6.52	(21.40)	32.56	206.27	(676.74)	19.11
9.57	(31.41)	36.18	302.77	(993.32)	24.59
			99999.00	(99999.00)	67.86





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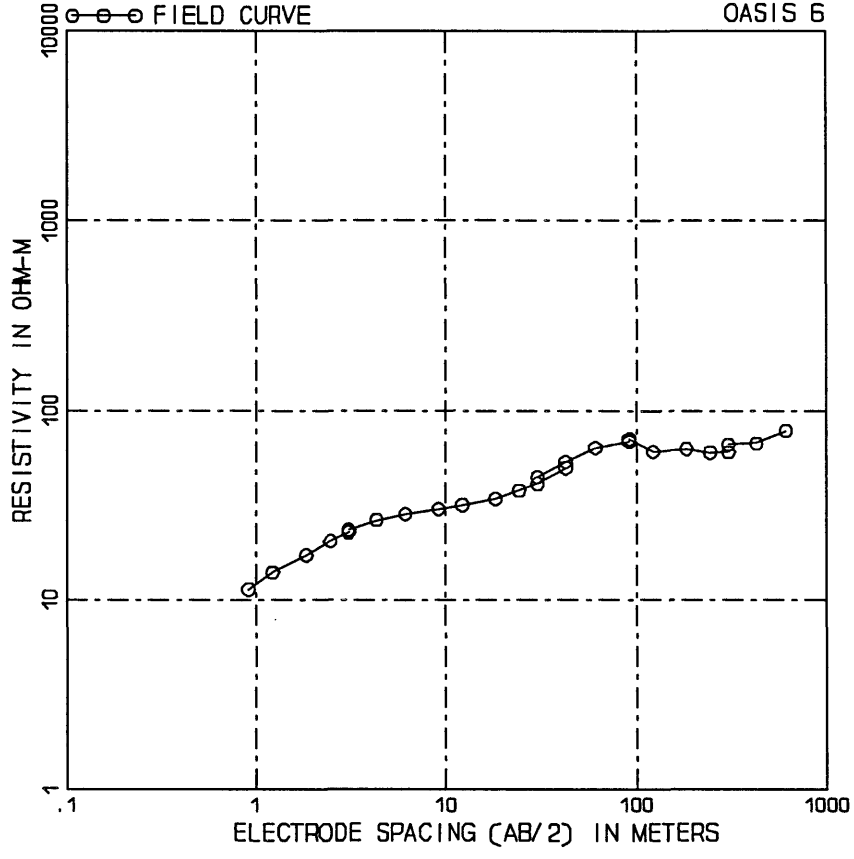
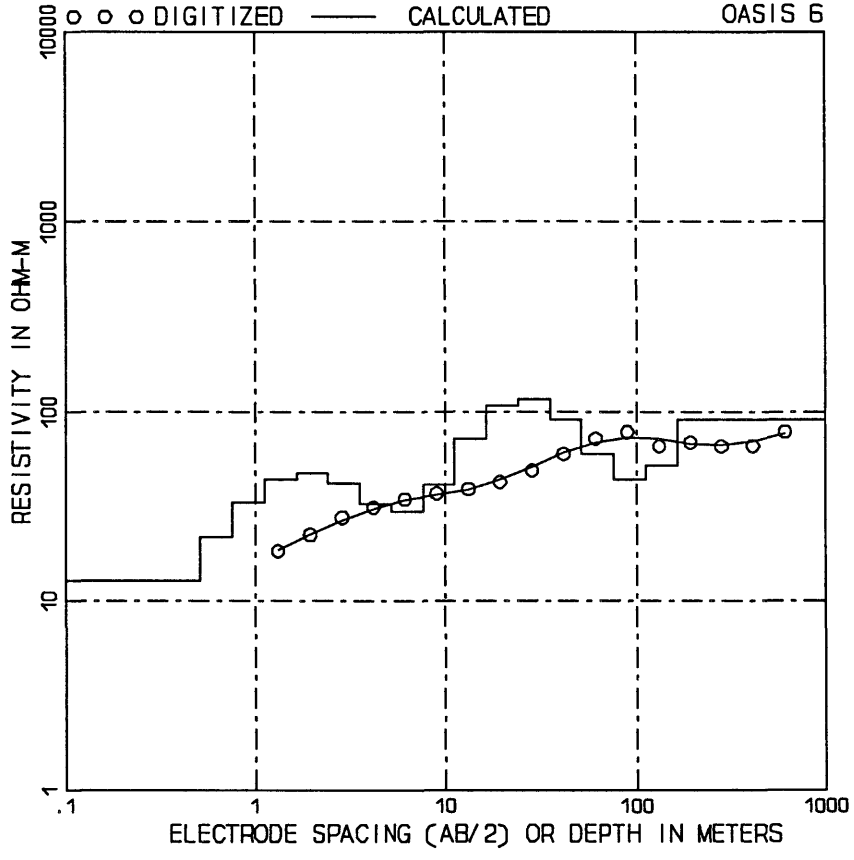
0.91	(3.00)	28.00	30.48	(100.00)	62.60
1.22	(4.00)	30.30	30.48	(100.00)	60.00
1.83	(6.00)	33.40	42.67	(140.00)	65.10
2.44	(8.00)	31.80	60.96	(200.00)	68.30
3.05	(10.00)	33.00	91.44	(300.00)	65.90
3.05	(10.00)	32.80	91.44	(300.00)	66.80
4.27	(14.00)	32.70	121.92	(400.00)	72.50
6.10	(20.00)	33.30	182.88	(600.00)	86.90
9.14	(30.00)	37.60	243.84	(800.00)	95.60
12.19	(40.00)	42.60	304.80	(1000.00)	95.50
18.29	(60.00)	52.40	304.80	(1000.00)	99.40
24.38	(80.00)	58.10	426.72	(1400.00)	92.50
			609.60	(2000.00)	75.00

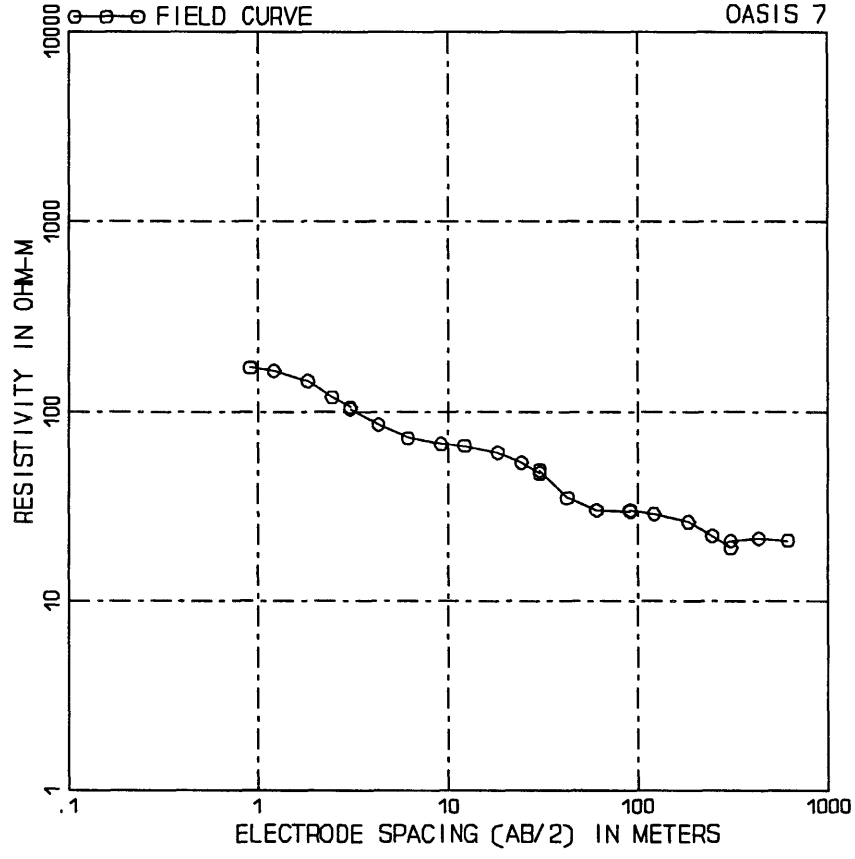
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.57	(1.88)	28.56	12.38	(40.60)	95.10
0.84	(2.77)	38.70	18.17	(59.60)	102.93
1.24	(4.06)	38.81	26.66	(87.48)	72.73
1.82	(5.96)	30.75	39.14	(128.40)	47.98
2.67	(8.75)	25.62	57.45	(188.47)	56.28
3.91	(12.84)	28.72	84.32	(276.64)	108.75
5.74	(18.85)	41.44	123.76	(406.05)	182.37
8.43	(27.66)	65.20	181.66	(595.99)	161.20
			99999.00	(99999.00)	52.76

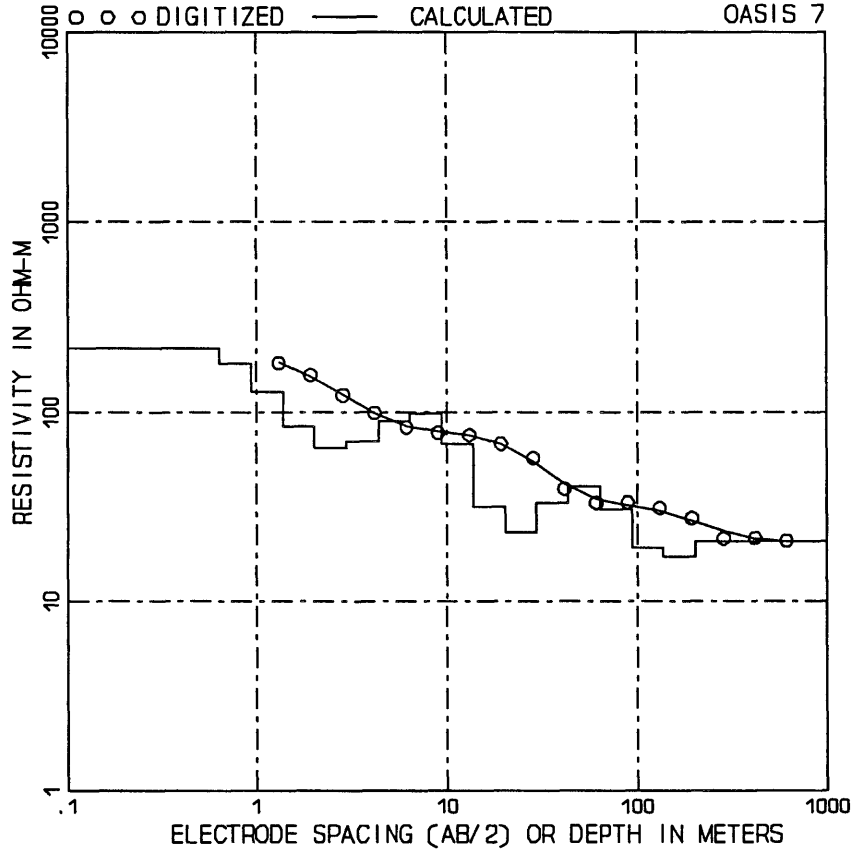




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	11.40	42.67	(140.00)	49.80
1.22	(4.00)	14.00	30.48	(100.00)	44.30
1.83	(6.00)	17.20	42.67	(140.00)	53.50
2.44	(8.00)	20.40	60.96	(200.00)	63.60
3.05	(10.00)	22.70	91.44	(300.00)	68.50
3.05	(10.00)	23.40	91.44	(300.00)	70.80
4.27	(14.00)	26.40	121.92	(400.00)	60.40
6.10	(20.00)	28.30	182.88	(600.00)	62.80
9.14	(30.00)	30.20	243.84	(800.00)	60.00
12.19	(40.00)	31.70	304.80	(1000.00)	60.20
18.29	(60.00)	34.20	304.80	(1000.00)	66.00
24.38	(80.00)	37.80	426.72	(1400.00)	67.00
30.48	(100.00)	40.90	609.60	(2000.00)	78.10

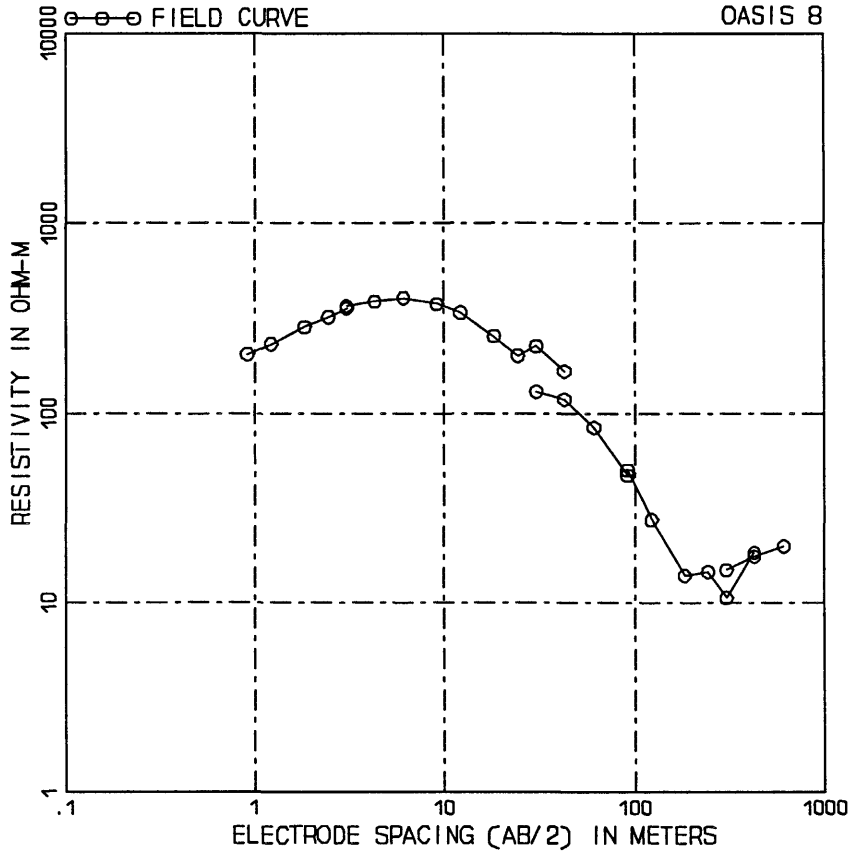
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.52	(1.70)	12.76	11.14	(36.54)	41.35
0.76	(2.49)	21.74	16.35	(53.64)	71.57
1.11	(3.65)	33.14	24.00	(78.73)	107.25
1.63	(5.36)	43.38	35.22	(115.56)	115.86
2.40	(7.87)	47.29	51.70	(169.62)	91.14
3.52	(11.56)	41.69	75.89	(248.97)	59.46
5.17	(16.96)	32.34	111.39	(365.44)	43.71
7.59	(24.90)	29.78	163.49	(536.39)	51.99
			99999.00	(99999.00)	90.75

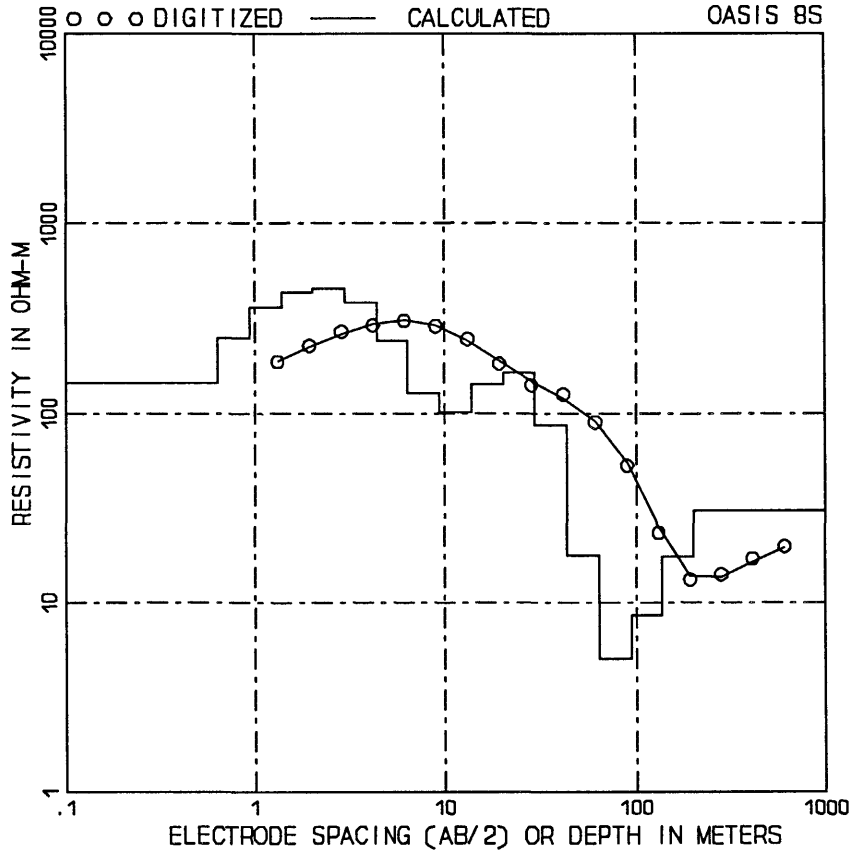




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	170.00	30.48	(100.00)	47.00
1.22	(4.00)	163.00	30.48	(100.00)	49.00
1.83	(6.00)	144.00	42.67	(140.00)	35.00
2.44	(8.00)	119.00	60.96	(200.00)	30.20
3.05	(10.00)	105.00	91.44	(300.00)	29.80
3.05	(10.00)	103.00	91.44	(300.00)	30.20
4.27	(14.00)	85.30	121.92	(400.00)	28.90
6.10	(20.00)	72.40	182.88	(600.00)	26.10
9.14	(30.00)	67.20	243.84	(800.00)	22.10
12.19	(40.00)	65.90	304.80	(1000.00)	19.10
18.29	(60.00)	60.50	304.80	(1000.00)	20.70
24.38	(80.00)	53.70	426.72	(1400.00)	21.50
			609.60	(2000.00)	20.90

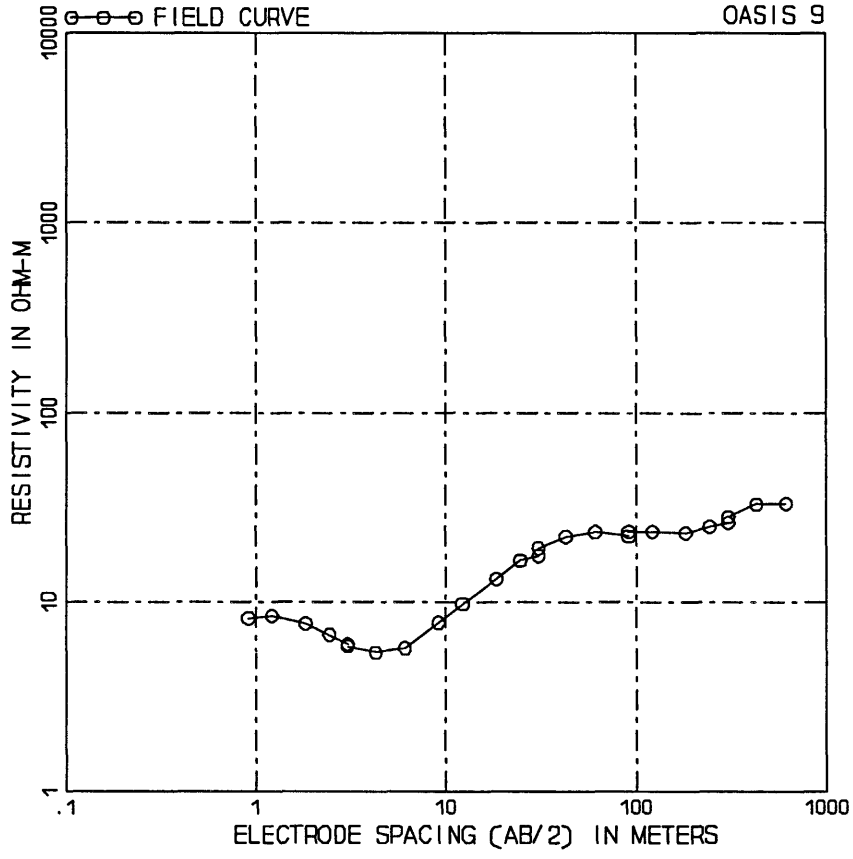
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	214.58	13.75	(45.12)	67.20
0.94	(3.07)	178.98	20.18	(66.22)	31.73
1.38	(4.51)	127.18	29.63	(97.20)	23.27
2.02	(6.62)	84.03	43.49	(142.67)	32.90
2.96	(9.72)	64.64	63.83	(209.41)	40.42
4.35	(14.27)	69.06	93.69	(307.37)	30.39
6.38	(20.94)	88.53	137.51	(451.16)	19.21
9.37	(30.74)	97.48	201.84	(662.22)	17.25
			99999.00	(99999.00)	20.64

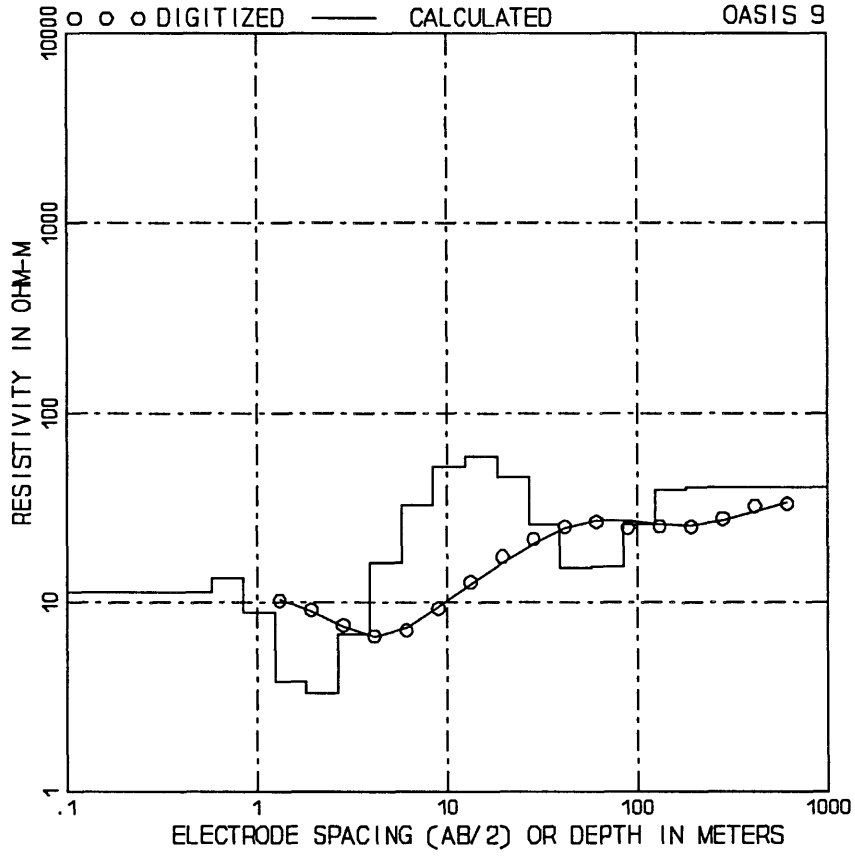




AB/2, m	(ft)	App. Res.
0.91	(3.00)	204.00
1.22	(4.00)	231.00
1.83	(6.00)	284.00
2.44	(8.00)	320.00
3.05	(10.00)	355.00
3.05	(10.00)	365.00
4.27	(14.00)	387.00
6.10	(20.00)	404.00
9.14	(30.00)	375.00
12.19	(40.00)	337.00
18.29	(60.00)	254.00
24.38	(80.00)	201.00
30.48	(100.00)	225.00
42.67	(140.00)	166.00
30.48	(100.00)	130.00
42.67	(140.00)	118.00
60.96	(200.00)	84.10
91.44	(300.00)	46.90
91.44	(300.00)	50.00
121.92	(400.00)	27.30
182.88	(600.00)	13.90
243.84	(800.00)	14.50
304.80	(1000.00)	10.60
426.72	(1400.00)	18.30
304.80	(1000.00)	14.90
426.72	(1400.00)	17.50
609.60	(2000.00)	19.80

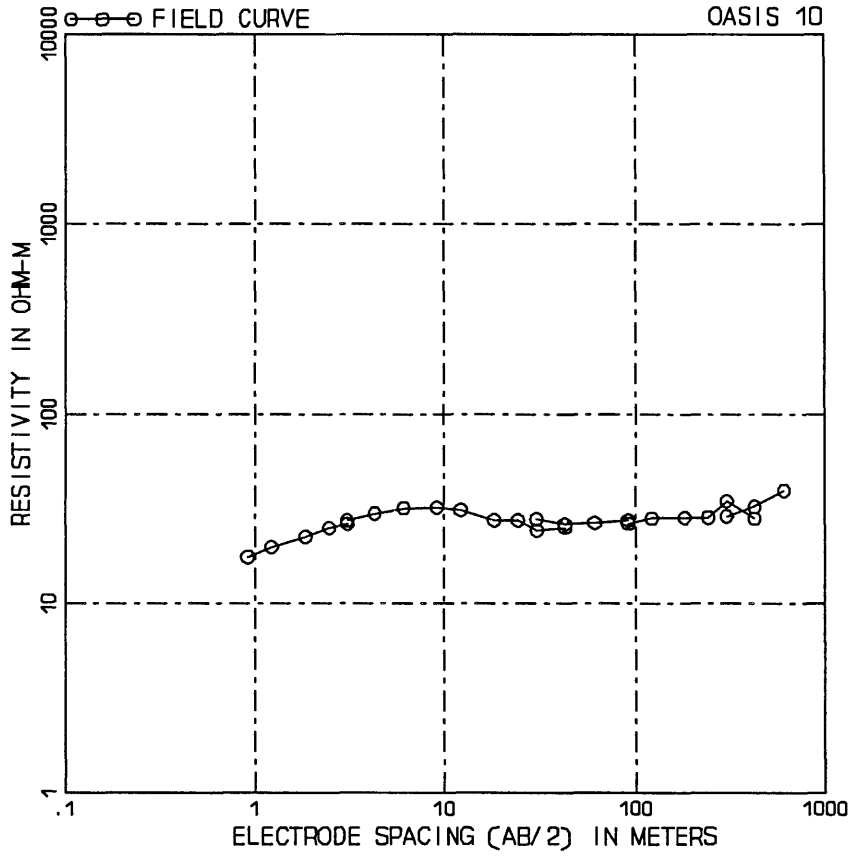
DEPTH, m	(ft)	RESIS.
0.64	(2.09)	144.61
0.94	(3.07)	249.86
1.38	(4.51)	362.30
2.02	(6.62)	437.26
2.96	(9.72)	451.62
4.35	(14.27)	382.32
6.38	(20.94)	242.32
9.37	(30.74)	128.10
13.75	(45.12)	101.25
20.18	(66.22)	141.65
29.63	(97.20)	162.04
43.49	(142.67)	86.64
63.83	(209.41)	17.66
93.69	(307.37)	5.02
137.51	(451.16)	8.55
201.84	(662.22)	17.55
99999.00	(99999.00)	30.62

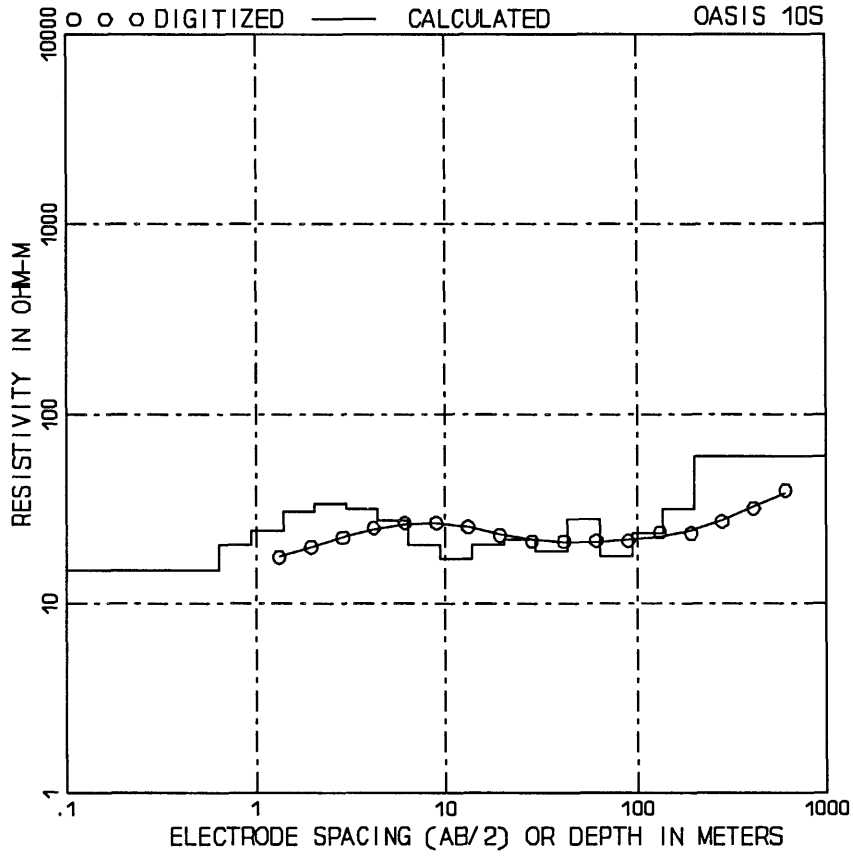




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	8.23	30.48	(100.00)	17.60
1.22	(4.00)	8.43	30.48	(100.00)	19.30
1.83	(6.00)	7.70	42.67	(140.00)	22.20
2.44	(8.00)	6.73	60.96	(200.00)	23.40
3.05	(10.00)	6.01	91.44	(300.00)	22.30
3.05	(10.00)	5.86	91.44	(300.00)	23.60
4.27	(14.00)	5.43	121.92	(400.00)	23.60
6.10	(20.00)	5.70	182.88	(600.00)	23.10
9.14	(30.00)	7.79	243.84	(800.00)	25.10
12.19	(40.00)	9.78	304.80	(1000.00)	26.20
18.29	(60.00)	13.30	304.80	(1000.00)	28.10
24.38	(80.00)	16.60	426.72	(1400.00)	32.80
			609.60	(2000.00)	33.10

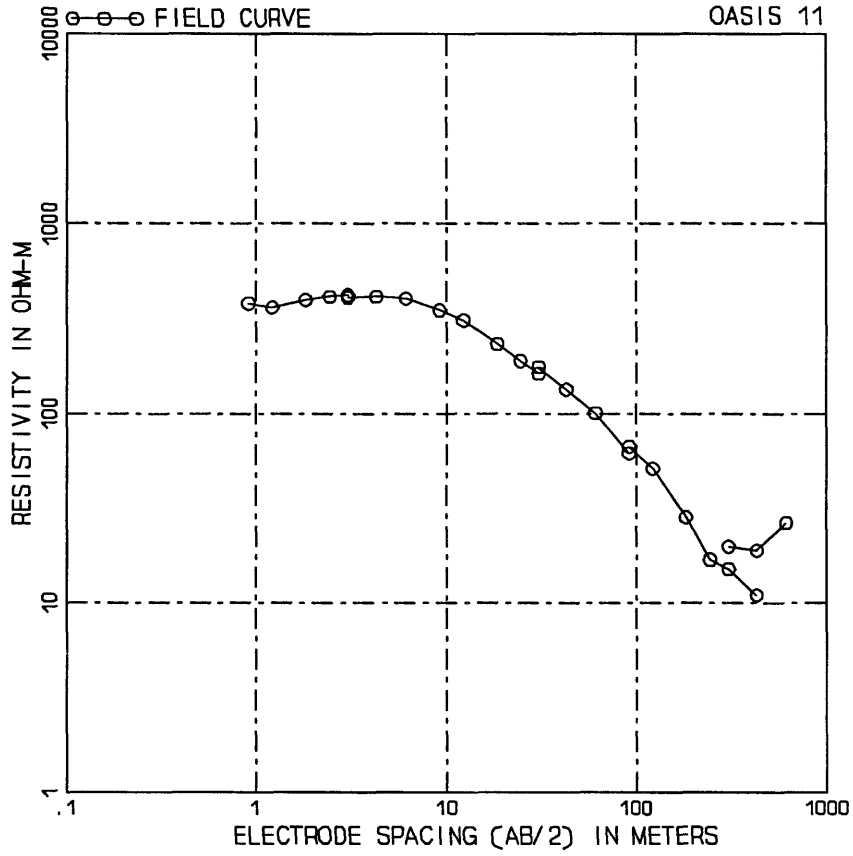
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.57	(1.88)	11.33	12.38	(40.60)	51.40
0.84	(2.77)	13.41	18.17	(59.60)	58.53
1.24	(4.06)	8.90	26.66	(87.48)	45.59
1.82	(5.96)	3.84	39.14	(128.40)	25.96
2.67	(8.75)	3.32	57.45	(188.47)	15.27
3.91	(12.84)	6.84	84.32	(276.64)	15.47
5.74	(18.85)	16.30	123.76	(406.05)	25.94
8.43	(27.66)	32.78	181.66	(595.99)	38.91
			99999.00	(99999.00)	40.21

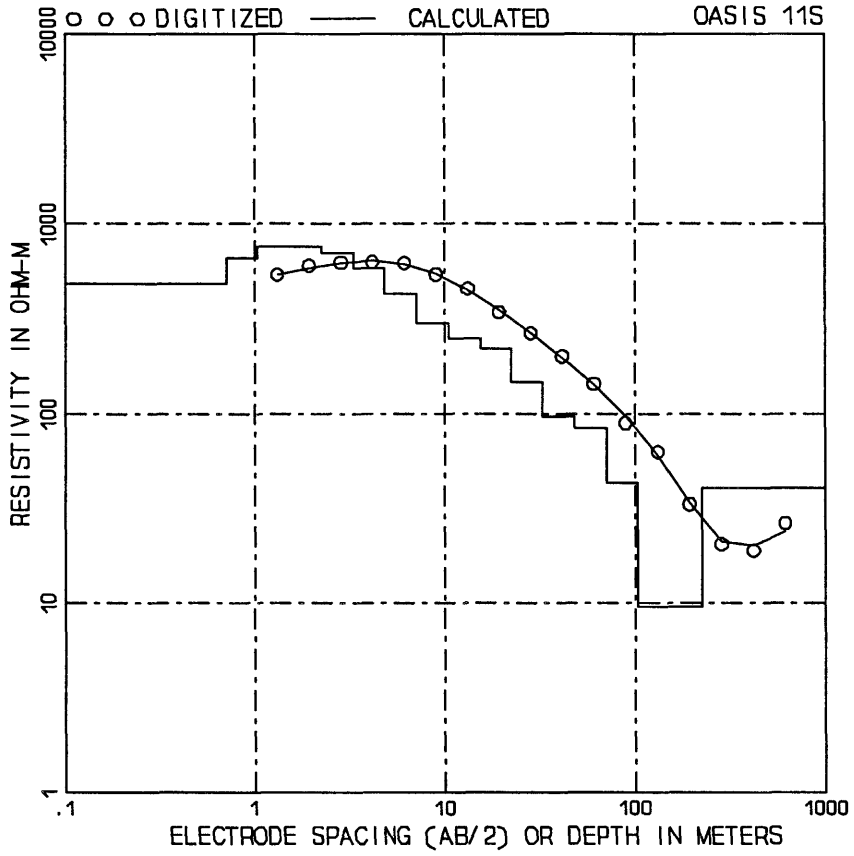




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	17.60	42.67	(140.00)	25.20
1.22	(4.00)	19.80	30.48	(100.00)	27.80
1.83	(6.00)	22.50	42.67	(140.00)	26.20
2.44	(8.00)	25.00	60.96	(200.00)	26.70
3.05	(10.00)	26.30	91.44	(300.00)	27.40
3.05	(10.00)	27.30	91.44	(300.00)	26.40
4.27	(14.00)	29.80	121.92	(400.00)	28.10
6.10	(20.00)	31.80	182.88	(600.00)	28.40
9.14	(30.00)	32.00	243.84	(800.00)	28.50
12.19	(40.00)	31.10	304.80	(1000.00)	34.70
18.29	(60.00)	27.50	426.72	(1400.00)	28.10
24.38	(80.00)	27.40	304.80	(1000.00)	28.90
30.48	(100.00)	24.40	426.72	(1400.00)	32.40
			609.60	(2000.00)	39.40

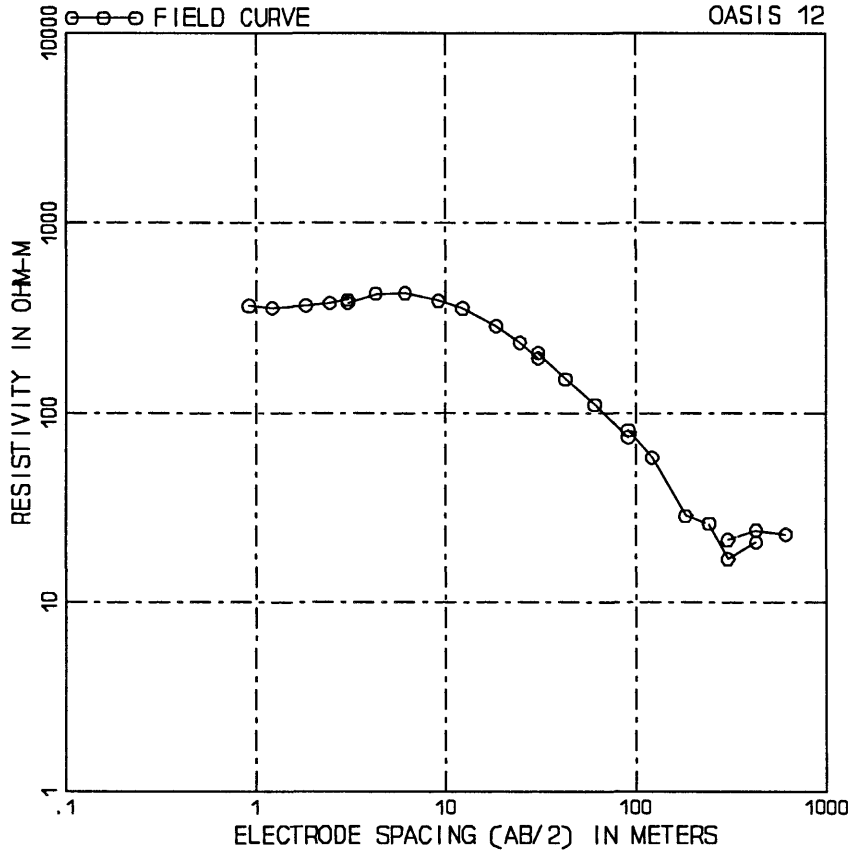
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	15.06	13.75	(45.12)	17.34
0.94	(3.07)	20.40	20.18	(66.22)	20.31
1.38	(4.51)	24.30	29.63	(97.20)	21.61
2.02	(6.62)	30.81	43.49	(142.67)	18.81
2.96	(9.72)	33.64	63.83	(209.41)	27.84
4.35	(14.27)	31.40	93.69	(307.37)	17.70
6.38	(20.94)	27.38	137.51	(451.16)	23.51
9.37	(30.74)	20.55	201.84	(662.22)	31.35
			99999.00	(99999.00)	59.58

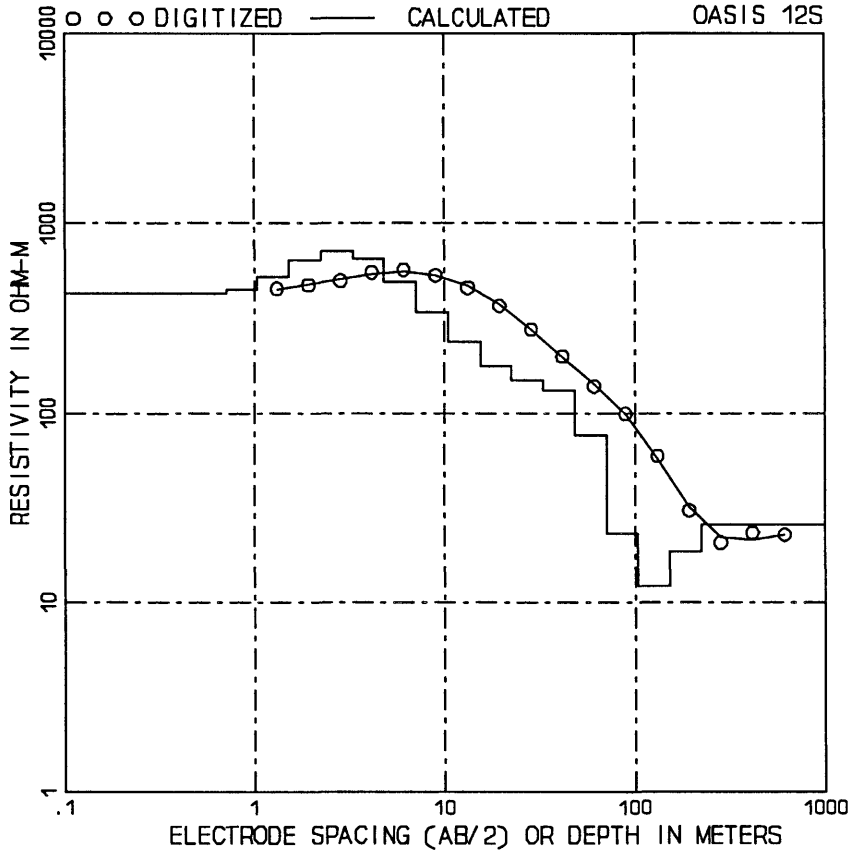




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	379.00	30.48	(100.00)	175.00
1.22	(4.00)	359.00	42.67	(140.00)	134.00
1.83	(6.00)	396.00	60.96	(200.00)	100.00
2.44	(8.00)	411.00	91.44	(300.00)	61.60
3.05	(10.00)	419.00	91.44	(300.00)	66.80
3.05	(10.00)	406.00	121.92	(400.00)	51.10
4.27	(14.00)	411.00	182.88	(600.00)	28.40
6.10	(20.00)	401.00	243.84	(800.00)	16.90
9.14	(30.00)	348.00	304.80	(1000.00)	15.10
12.19	(40.00)	308.00	426.72	(1400.00)	11.00
18.29	(60.00)	232.00	304.80	(1000.00)	19.90
24.38	(80.00)	189.00	426.72	(1400.00)	18.90
30.48	(100.00)	162.00	609.60	(2000.00)	26.40

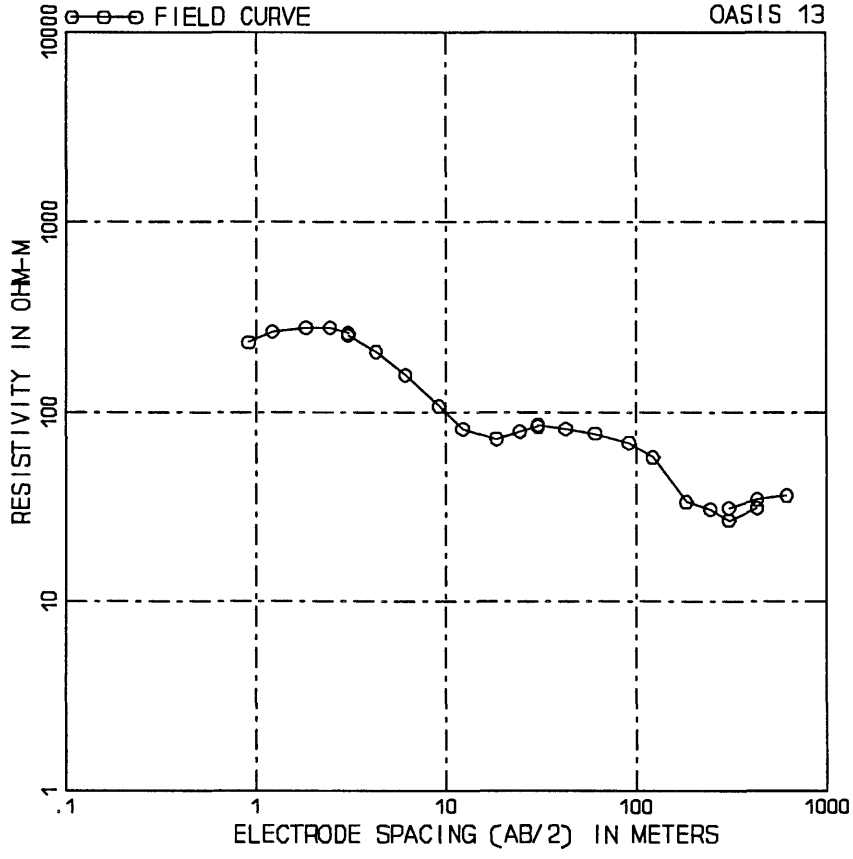
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.71	(2.33)	486.97	15.28	(50.13)	247.66
1.04	(3.42)	654.97	22.43	(73.58)	218.28
1.53	(5.01)	754.41	32.92	(108.00)	147.36
2.24	(7.36)	760.71	48.32	(158.52)	96.13
3.29	(10.80)	704.40	70.92	(232.68)	84.20
4.83	(15.85)	585.82	104.10	(341.53)	42.95
7.09	(23.27)	428.32	152.79	(501.29)	9.52
10.41	(34.15)	300.87	224.27	(735.80)	9.51
			99999.00	(99999.00)	40.21

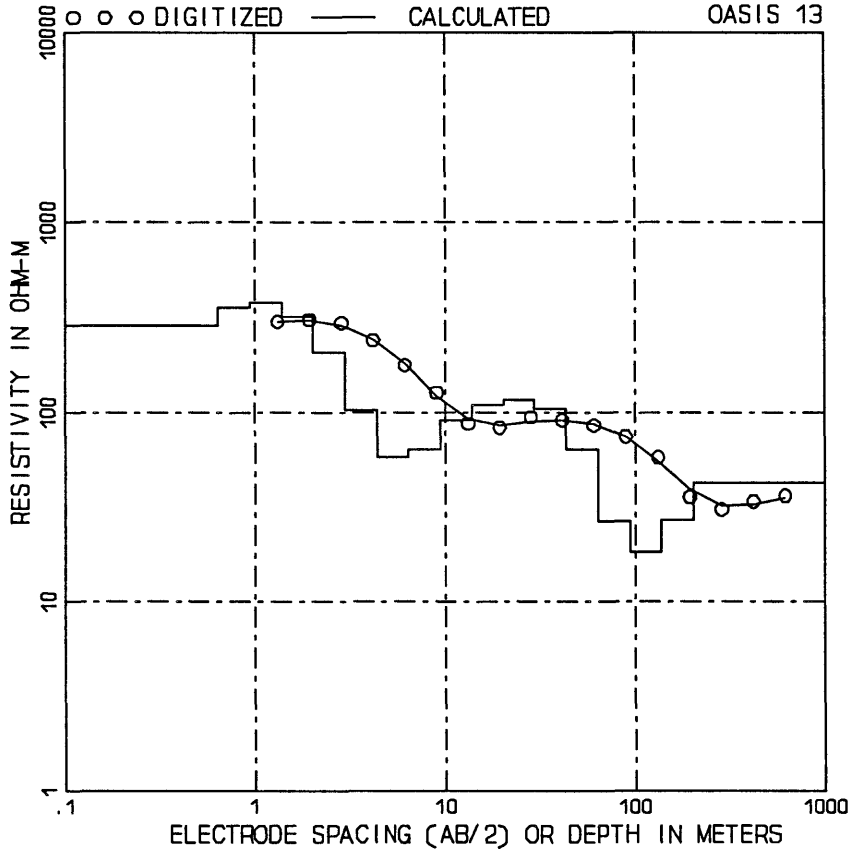




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	364.00	30.48	(100.00)	206.00
1.22	(4.00)	354.00	42.67	(140.00)	150.00
1.83	(6.00)	366.00	60.96	(200.00)	110.00
2.44	(8.00)	378.00	91.44	(300.00)	74.50
3.05	(10.00)	393.00	91.44	(300.00)	80.80
3.05	(10.00)	377.00	121.92	(400.00)	57.80
4.27	(14.00)	424.00	182.88	(600.00)	28.60
6.10	(20.00)	425.00	243.84	(800.00)	26.00
9.14	(30.00)	388.00	304.80	(1000.00)	16.90
12.19	(40.00)	353.00	426.72	(1400.00)	20.70
18.29	(60.00)	285.00	304.80	(1000.00)	21.30
24.38	(80.00)	234.00	426.72	(1400.00)	24.00
30.48	(100.00)	194.00	609.60	(2000.00)	22.80

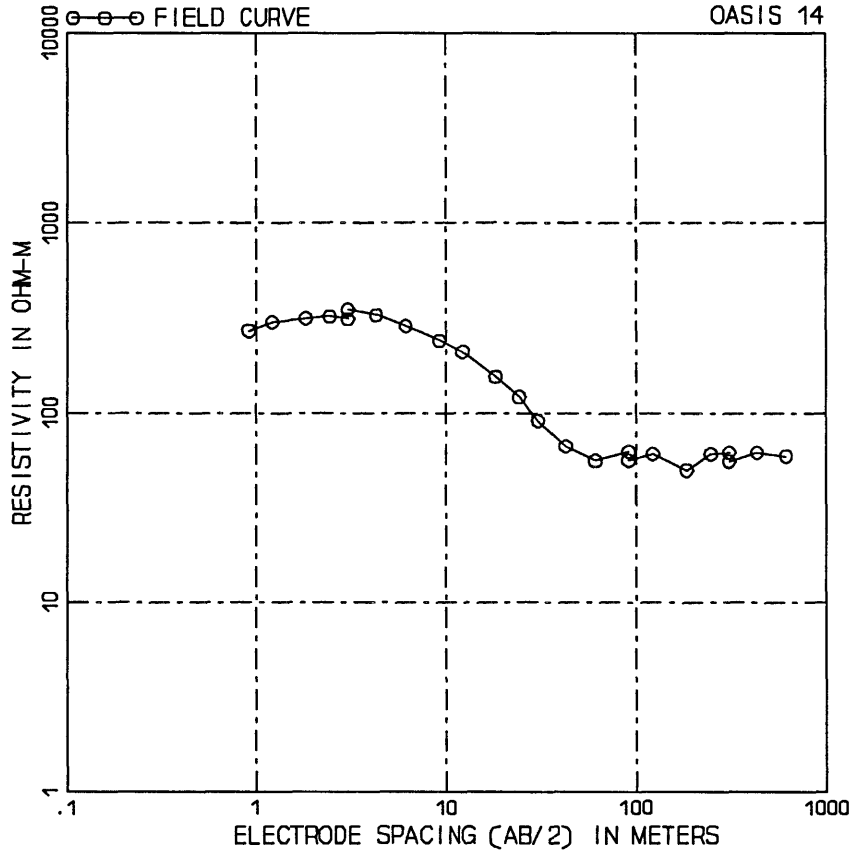
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.71	(2.33)	428.57	15.28	(50.13)	237.37
1.04	(3.42)	449.63	22.43	(73.58)	175.85
1.53	(5.01)	521.91	32.92	(108.00)	148.27
2.24	(7.36)	639.29	48.32	(158.52)	131.71
3.29	(10.80)	710.61	70.92	(232.68)	76.43
4.83	(15.85)	646.92	104.10	(341.53)	22.96
7.09	(23.27)	489.28	152.79	(501.29)	12.22
10.41	(34.15)	339.00	224.27	(735.80)	18.71
			99999.00	(99999.00)	25.90

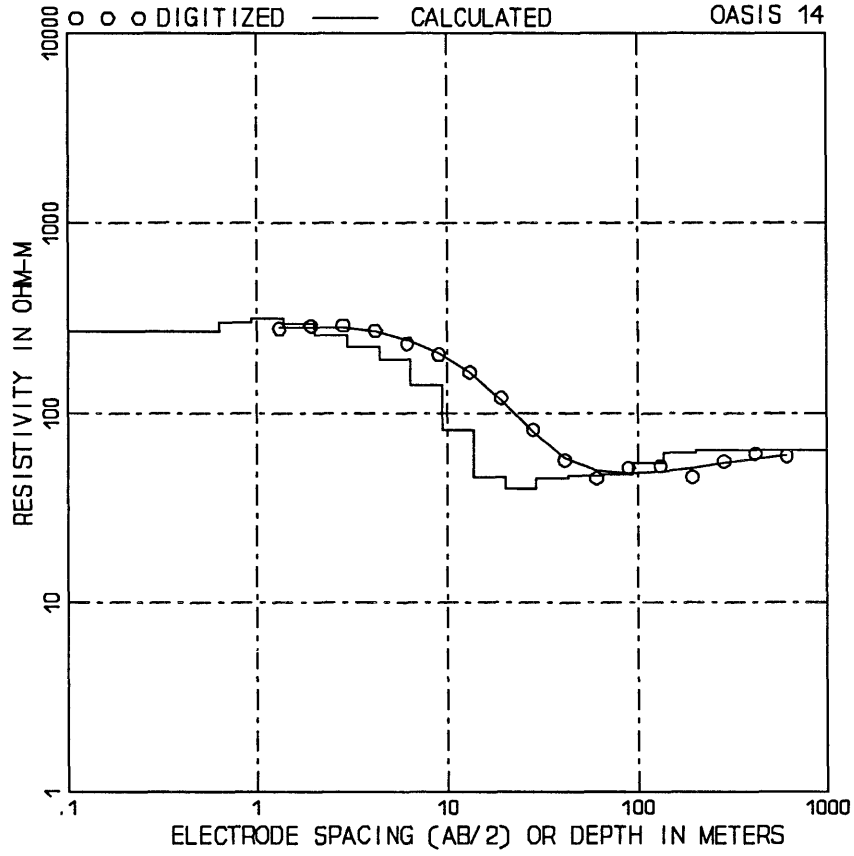




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	232.00	30.48	(100.00)	85.60
1.22	(4.00)	265.00	42.67	(140.00)	81.40
1.83	(6.00)	277.00	60.96	(200.00)	77.00
2.44	(8.00)	277.00	91.44	(300.00)	68.90
3.05	(10.00)	259.00	91.44	(300.00)	68.90
3.05	(10.00)	252.00	121.92	(400.00)	57.50
4.27	(14.00)	207.00	182.88	(600.00)	33.40
6.10	(20.00)	156.00	243.84	(800.00)	30.50
9.14	(30.00)	107.00	304.80	(1000.00)	26.80
12.19	(40.00)	81.40	426.72	(1400.00)	31.20
18.29	(60.00)	72.30	304.80	(1000.00)	31.20
24.38	(80.00)	79.10	426.72	(1400.00)	34.50
30.48	(100.00)	83.60	609.60	(2000.00)	36.10

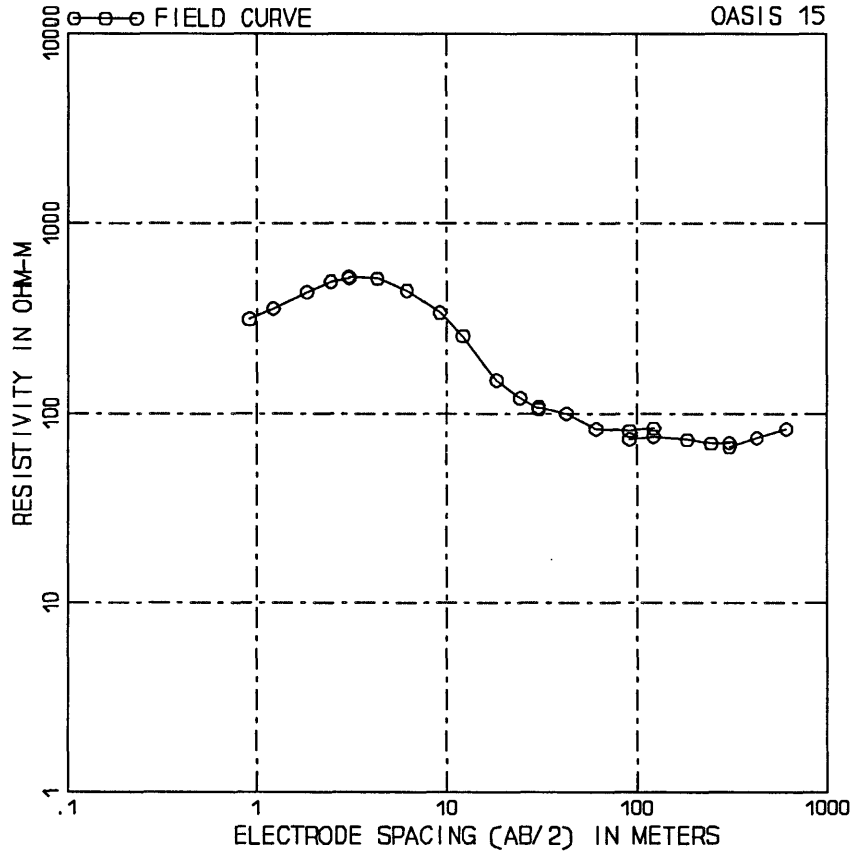
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	283.42	13.75	(45.12)	89.94
0.94	(3.07)	353.42	20.18	(66.22)	108.78
1.38	(4.51)	378.25	29.63	(97.20)	116.39
2.02	(6.62)	318.40	43.49	(142.67)	104.53
2.96	(9.72)	205.69	63.83	(209.41)	62.93
4.35	(14.27)	102.50	93.69	(307.37)	26.44
6.38	(20.94)	57.43	137.51	(451.16)	18.24
9.37	(30.74)	63.64	201.84	(662.22)	26.88
			99999.00	(99999.00)	42.43

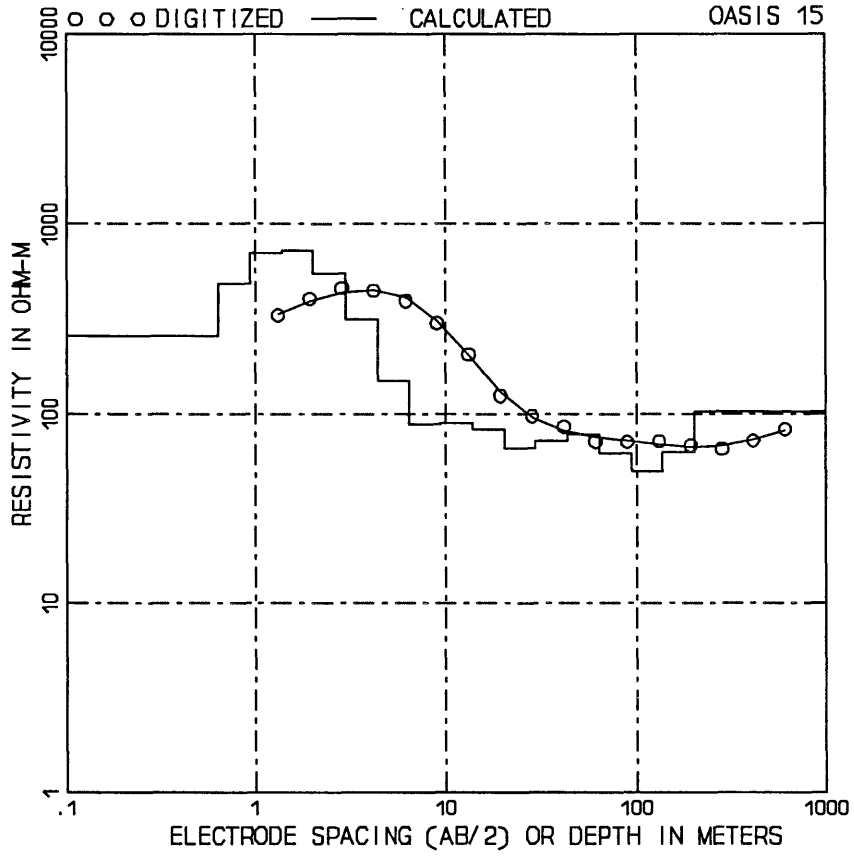




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	270.00	30.48	(100.00)	90.90
1.22	(4.00)	299.00	30.48	(100.00)	91.10
1.83	(6.00)	313.00	42.67	(140.00)	66.70
2.44	(8.00)	321.00	60.96	(200.00)	55.70
3.05	(10.00)	311.00	91.44	(300.00)	62.30
3.05	(10.00)	348.00	91.44	(300.00)	56.10
4.27	(14.00)	326.00	121.92	(400.00)	60.60
6.10	(20.00)	285.00	182.88	(600.00)	49.80
9.14	(30.00)	239.00	243.84	(800.00)	60.50
12.19	(40.00)	210.00	304.80	(1000.00)	61.70
18.29	(60.00)	155.00	304.80	(1000.00)	55.40
24.38	(80.00)	121.00	426.72	(1400.00)	61.50
			609.60	(2000.00)	59.00

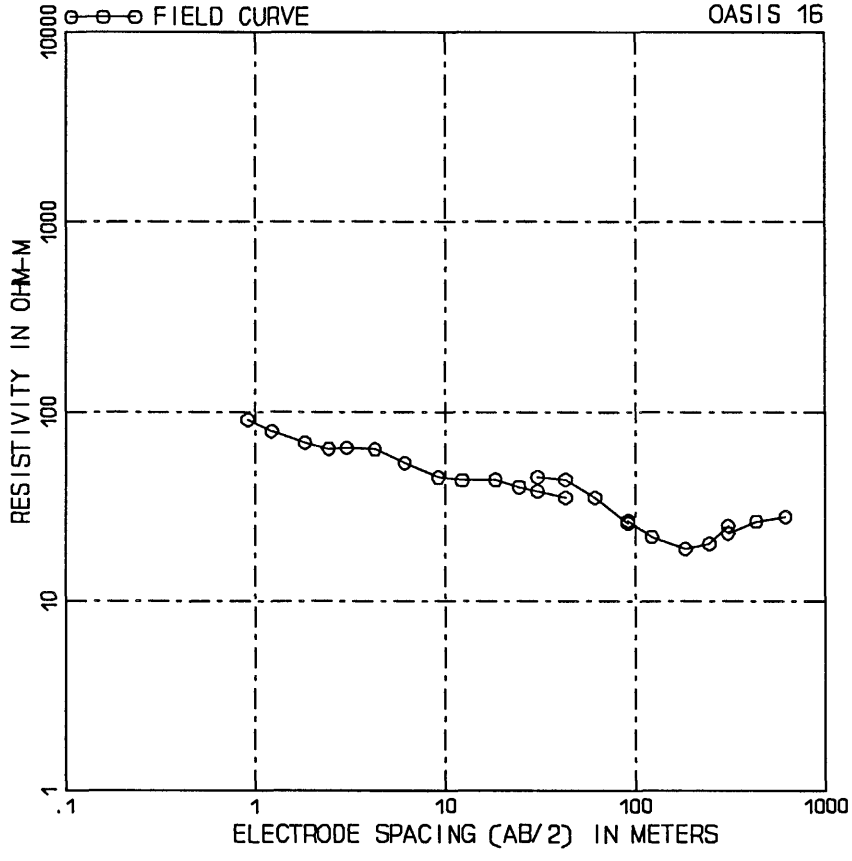
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	269.09	13.75	(45.12)	80.82
0.94	(3.07)	299.75	20.18	(66.22)	45.51
1.38	(4.51)	312.54	29.63	(97.20)	40.04
2.02	(6.62)	293.16	43.49	(142.67)	45.32
2.96	(9.72)	256.65	63.83	(209.41)	46.18
4.35	(14.27)	223.41	93.69	(307.37)	47.24
6.38	(20.94)	189.66	137.51	(451.16)	53.99
9.37	(30.74)	139.69	201.84	(662.22)	61.42
			99999.00	(99999.00)	63.59

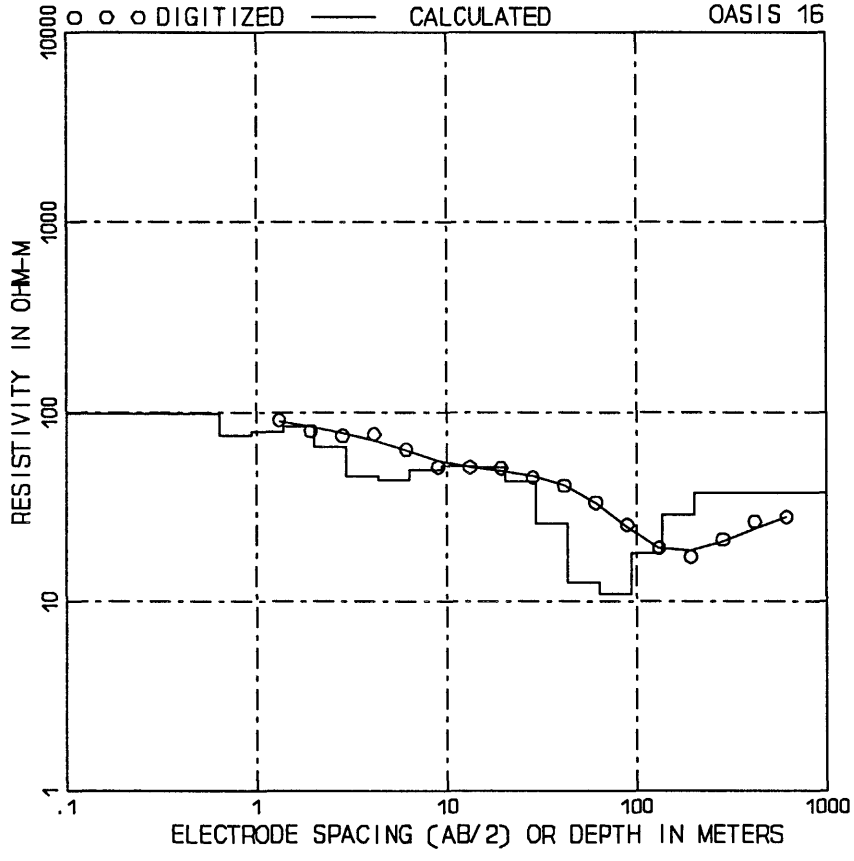




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	312.00	30.48	(100.00)	108.00
1.22	(4.00)	354.00	42.67	(140.00)	99.80
1.83	(6.00)	435.00	60.96	(200.00)	82.70
2.44	(8.00)	494.00	91.44	(300.00)	80.70
3.05	(10.00)	516.00	121.92	(400.00)	83.30
3.05	(10.00)	524.00	91.44	(300.00)	72.90
4.27	(14.00)	511.00	121.92	(400.00)	75.60
6.10	(20.00)	443.00	182.88	(600.00)	72.40
9.14	(30.00)	337.00	243.84	(800.00)	69.10
12.19	(40.00)	254.00	304.80	(1000.00)	69.70
18.29	(60.00)	149.00	304.80	(1000.00)	66.00
24.38	(80.00)	120.00	426.72	(1400.00)	74.00
30.48	(100.00)	105.00	609.60	(2000.00)	82.70

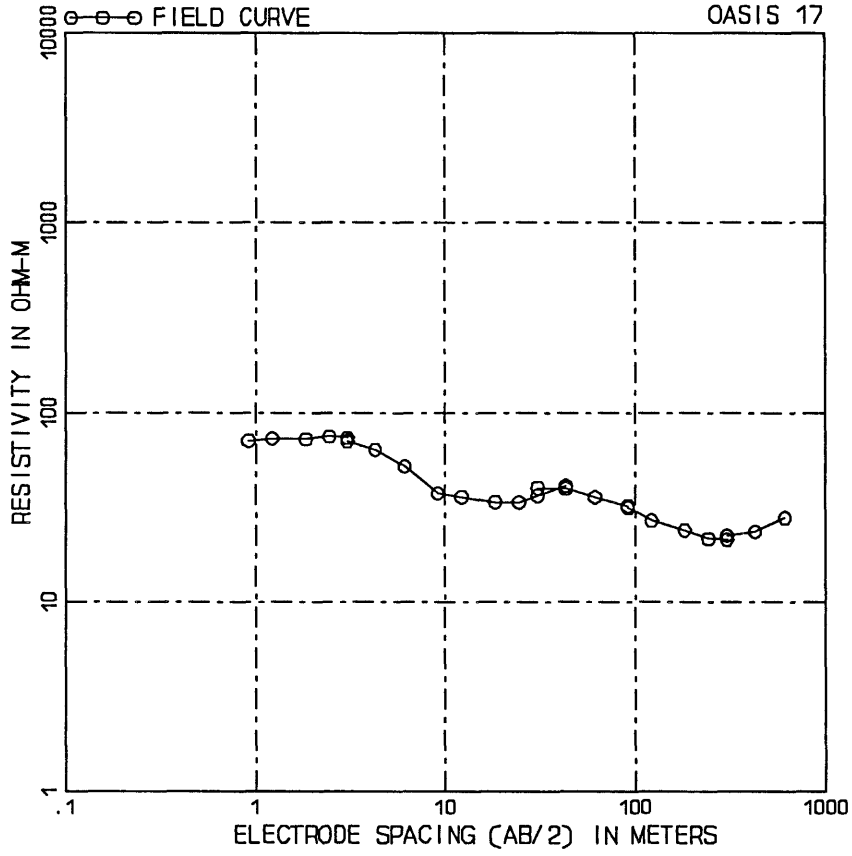
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	255.42	13.75	(45.12)	88.87
0.94	(3.07)	485.38	20.18	(66.22)	82.02
1.38	(4.51)	701.69	29.63	(97.20)	65.93
2.02	(6.62)	724.60	43.49	(142.67)	72.14
2.96	(9.72)	545.12	63.83	(209.41)	78.22
4.35	(14.27)	311.26	93.69	(307.37)	61.55
6.38	(20.94)	149.01	137.51	(451.16)	49.65
9.37	(30.74)	87.81	201.84	(662.22)	61.90
			99999.00	(99999.00)	102.18

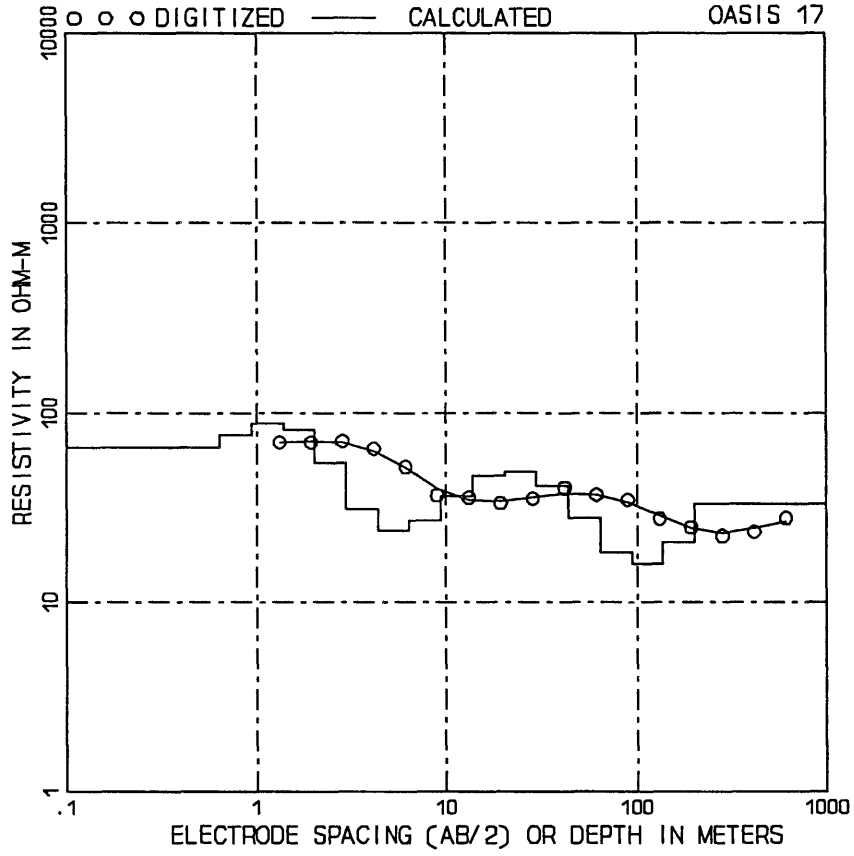




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	90.80	42.67	(140.00)	35.20
1.22	(4.00)	79.10	30.48	(100.00)	45.10
1.83	(6.00)	68.70	42.67	(140.00)	43.80
2.44	(8.00)	63.80	60.96	(200.00)	35.20
3.05	(10.00)	64.20	91.44	(300.00)	25.80
3.05	(10.00)	64.40	91.44	(300.00)	26.60
4.27	(14.00)	63.20	121.92	(400.00)	21.90
6.10	(20.00)	53.70	182.88	(600.00)	18.90
9.14	(30.00)	44.90	243.84	(800.00)	20.10
12.19	(40.00)	43.40	304.80	(1000.00)	25.00
18.29	(60.00)	43.50	304.80	(1000.00)	22.90
24.38	(80.00)	40.10	426.72	(1400.00)	26.40
30.48	(100.00)	37.90	609.60	(2000.00)	27.90

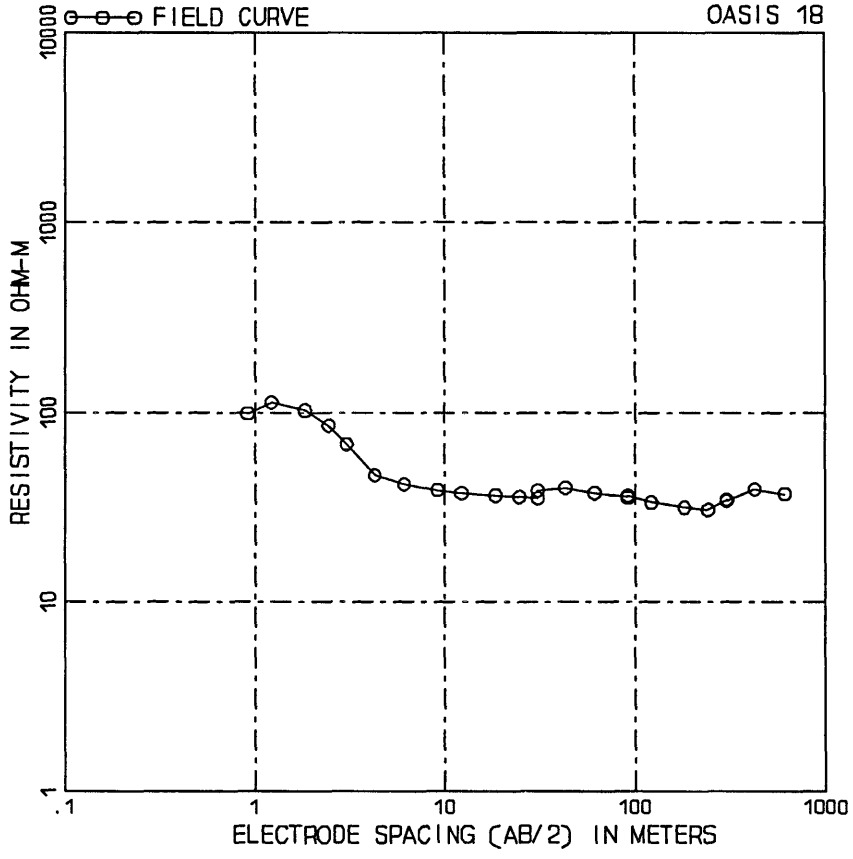
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	97.95	13.75	(45.12)	52.06
0.94	(3.07)	75.04	20.18	(66.22)	50.95
1.38	(4.51)	78.52	29.63	(97.20)	42.91
2.02	(6.62)	84.04	43.49	(142.67)	25.80
2.96	(9.72)	65.27	63.83	(209.41)	12.55
4.35	(14.27)	45.93	93.69	(307.37)	10.95
6.38	(20.94)	43.81	137.51	(451.16)	17.92
9.37	(30.74)	49.39	201.84	(662.22)	28.52
			99999.00	(99999.00)	37.36

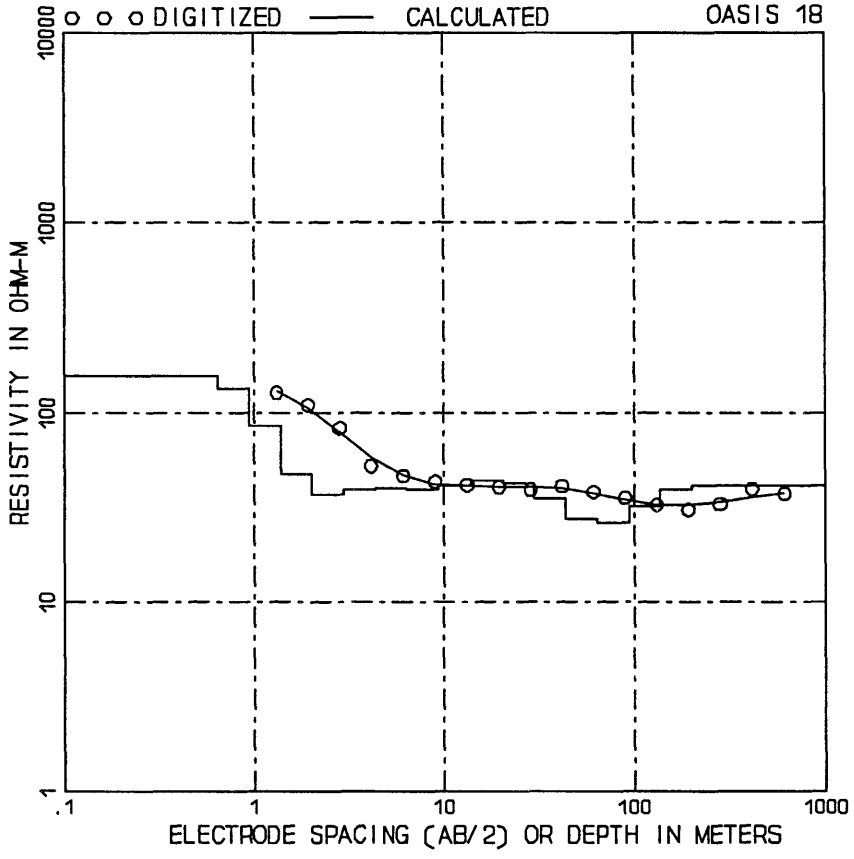




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	71.00	42.67	(140.00)	40.90
1.22	(4.00)	72.80	30.48	(100.00)	40.10
1.83	(6.00)	72.40	42.67	(140.00)	39.60
2.44	(8.00)	74.80	60.96	(200.00)	35.70
3.05	(10.00)	73.50	91.44	(300.00)	32.20
3.05	(10.00)	70.40	91.44	(300.00)	31.40
4.27	(14.00)	63.80	121.92	(400.00)	26.90
6.10	(20.00)	51.80	182.88	(600.00)	24.00
9.14	(30.00)	37.30	243.84	(800.00)	21.60
12.19	(40.00)	35.90	304.80	(1000.00)	21.30
18.29	(60.00)	33.70	304.80	(1000.00)	22.50
24.38	(80.00)	33.50	426.72	(1400.00)	23.50
30.48	(100.00)	36.50	609.60	(2000.00)	27.80

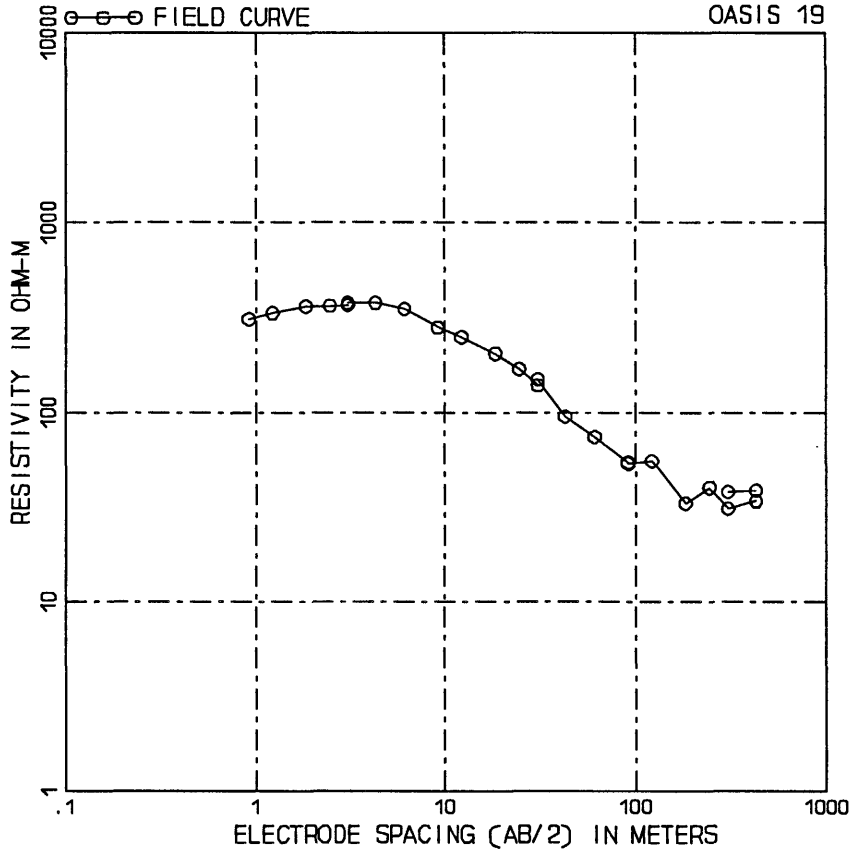
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	65.78	13.75	(45.12)	36.23
0.94	(3.07)	77.03	20.18	(66.22)	46.39
1.38	(4.51)	88.33	29.63	(97.20)	49.01
2.02	(6.62)	81.86	43.49	(142.67)	40.85
2.96	(9.72)	54.22	63.83	(209.41)	27.85
4.35	(14.27)	31.08	93.69	(307.37)	18.45
6.38	(20.94)	23.99	137.51	(451.16)	15.96
9.37	(30.74)	27.05	201.84	(662.22)	20.79
			99999.00	(99999.00)	32.88

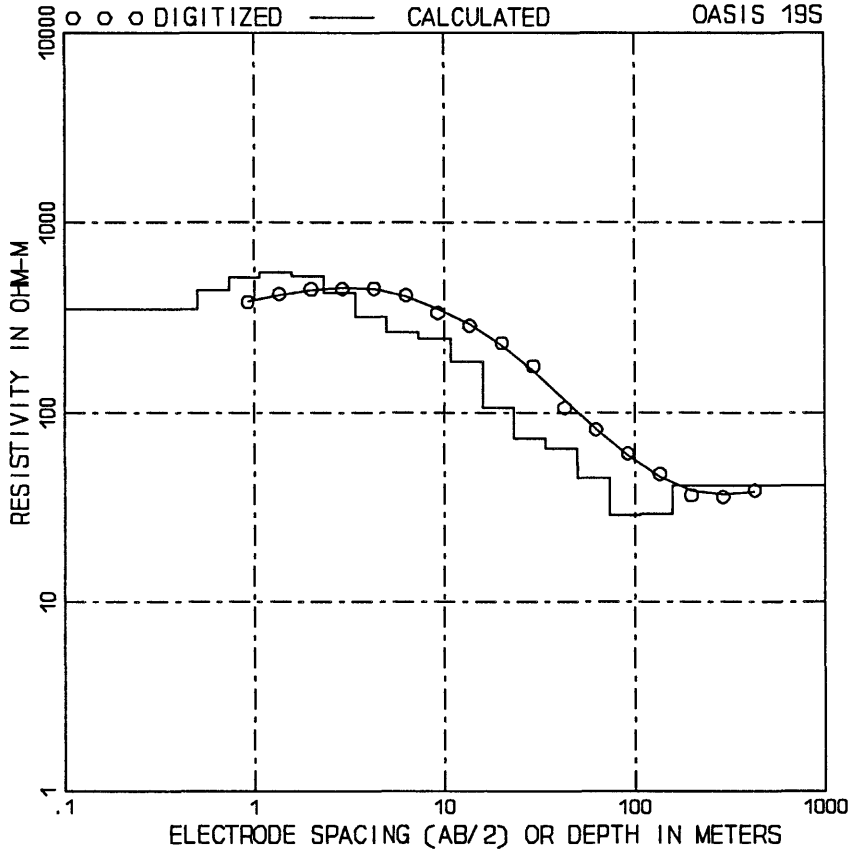




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	98.50	30.48	(100.00)	35.10
1.22	(4.00)	113.00	30.48	(100.00)	38.60
1.83	(6.00)	102.00	42.67	(140.00)	40.00
2.44	(8.00)	85.00	60.96	(200.00)	37.60
3.05	(10.00)	67.80	91.44	(300.00)	35.50
3.05	(10.00)	67.90	91.44	(300.00)	36.20
4.27	(14.00)	46.40	121.92	(400.00)	33.40
6.10	(20.00)	41.70	182.88	(600.00)	31.40
9.14	(30.00)	38.90	243.84	(800.00)	30.60
12.19	(40.00)	37.40	304.80	(1000.00)	34.60
18.29	(60.00)	36.50	304.80	(1000.00)	34.20
24.38	(80.00)	35.80	426.72	(1400.00)	39.30
			609.60	(2000.00)	37.10

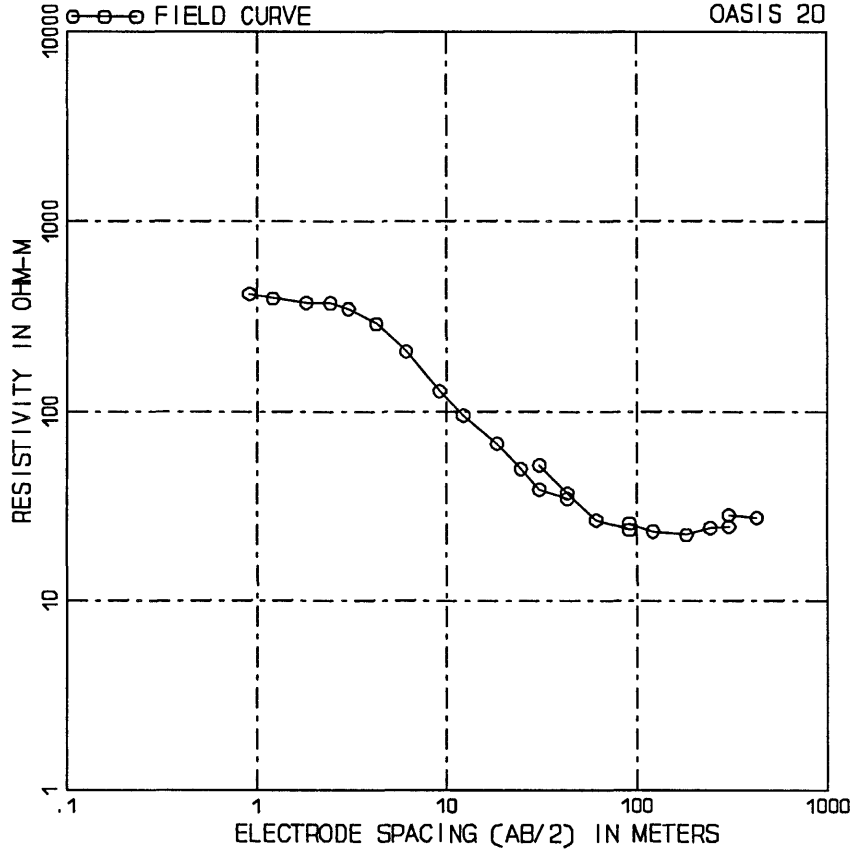
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	154.99	13.75	(45.12)	41.23
0.94	(3.07)	132.99	20.18	(66.22)	43.78
1.38	(4.51)	84.47	29.63	(97.20)	42.03
2.02	(6.62)	46.98	43.49	(142.67)	34.90
2.96	(9.72)	37.07	63.83	(209.41)	27.51
4.35	(14.27)	39.02	93.69	(307.37)	26.19
6.38	(20.94)	39.60	137.51	(451.16)	32.12
9.37	(30.74)	39.24	201.84	(662.22)	39.34
			99999.00	(99999.00)	40.75

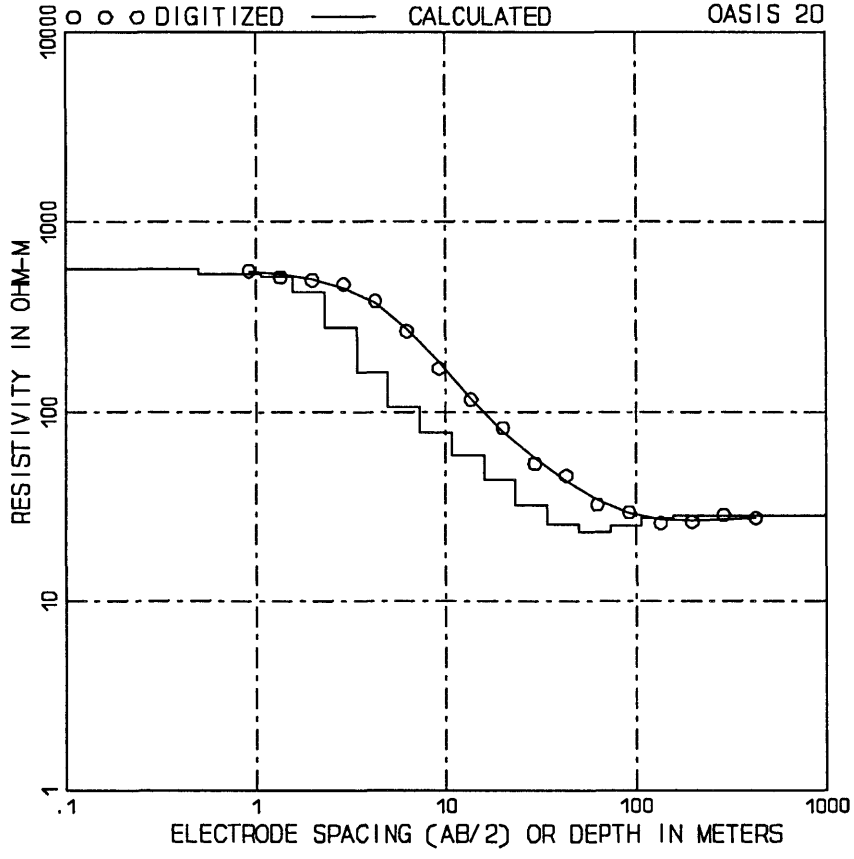




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	308.00	30.48	(100.00)	139.00
1.22	(4.00)	332.00	30.48	(100.00)	149.00
1.83	(6.00)	360.00	42.67	(140.00)	94.80
2.44	(8.00)	363.00	60.96	(200.00)	74.20
3.05	(10.00)	365.00	91.44	(300.00)	54.30
3.05	(10.00)	376.00	91.44	(300.00)	53.30
4.27	(14.00)	376.00	121.92	(400.00)	55.10
6.10	(20.00)	350.00	182.88	(600.00)	33.00
9.14	(30.00)	279.00	243.84	(800.00)	40.00
12.19	(40.00)	249.00	304.80	(1000.00)	31.00
18.29	(60.00)	204.00	426.72	(1400.00)	34.00
24.38	(80.00)	169.00	304.80	(1000.00)	38.00
			426.72	(1400.00)	38.70

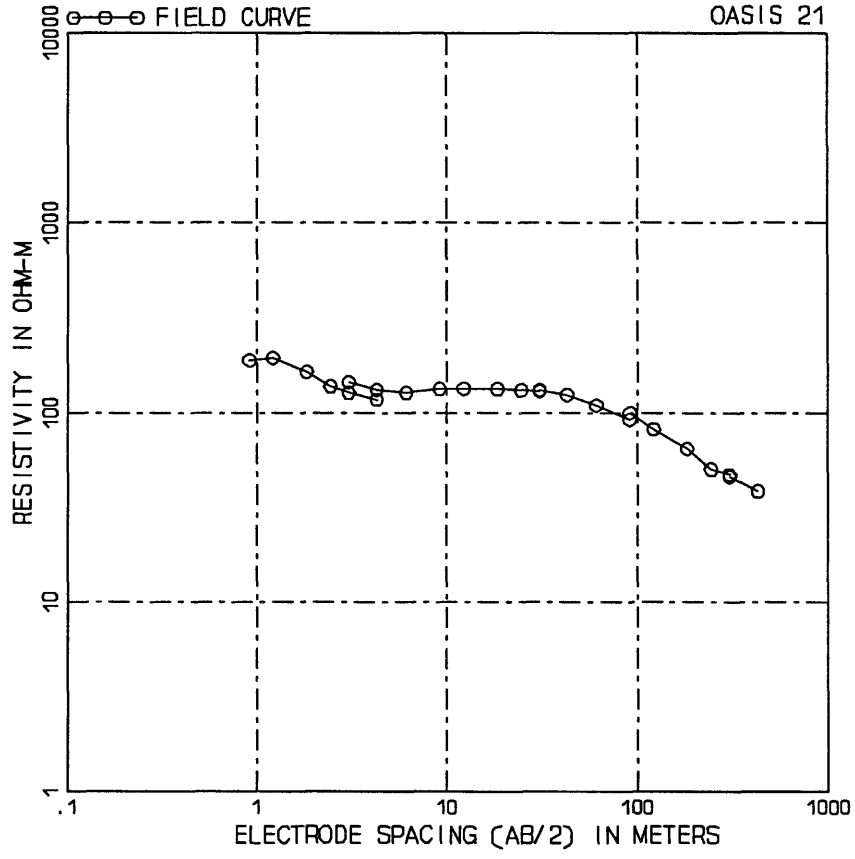
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.50	(1.63)	349.15	10.70	(35.09)	245.49
0.73	(2.39)	438.60	15.70	(51.51)	184.44
1.07	(3.51)	513.96	23.04	(75.60)	105.15
1.57	(5.15)	546.35	33.82	(110.97)	72.96
2.30	(7.56)	521.16	49.64	(162.88)	64.78
3.38	(11.10)	428.38	72.87	(239.07)	45.17
4.96	(16.29)	320.47	106.96	(350.90)	28.92
7.29	(23.91)	265.57	156.99	(515.06)	29.22
			99999.00	(99999.00)	41.25

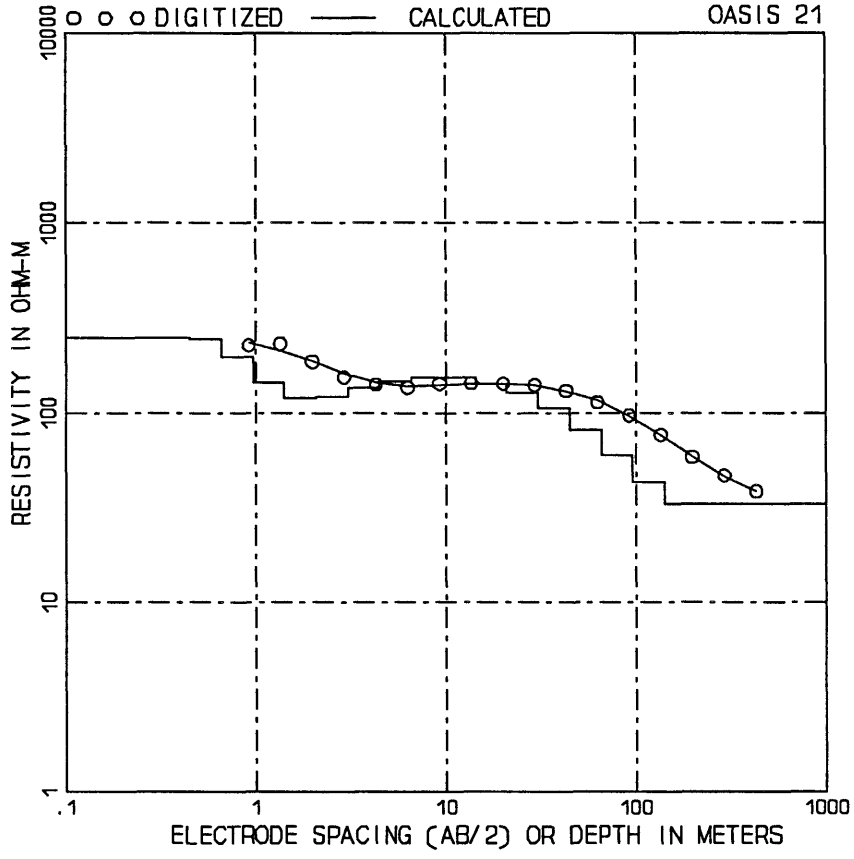




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	415.00	30.48	(100.00)	38.70
1.22	(4.00)	393.00	42.67	(140.00)	34.50
1.83	(6.00)	371.00	30.48	(100.00)	51.80
2.44	(8.00)	370.00	42.67	(140.00)	36.80
3.05	(10.00)	345.00	60.96	(200.00)	26.60
3.05	(10.00)	346.00	91.44	(300.00)	23.70
4.27	(14.00)	288.00	91.44	(300.00)	25.60
6.10	(20.00)	206.00	121.92	(400.00)	23.30
9.14	(30.00)	128.00	182.88	(600.00)	22.30
12.19	(40.00)	95.10	243.84	(800.00)	24.30
18.29	(60.00)	67.30	304.80	(1000.00)	24.60
24.38	(80.00)	49.70	304.80	(1000.00)	28.30
			426.72	(1400.00)	27.40

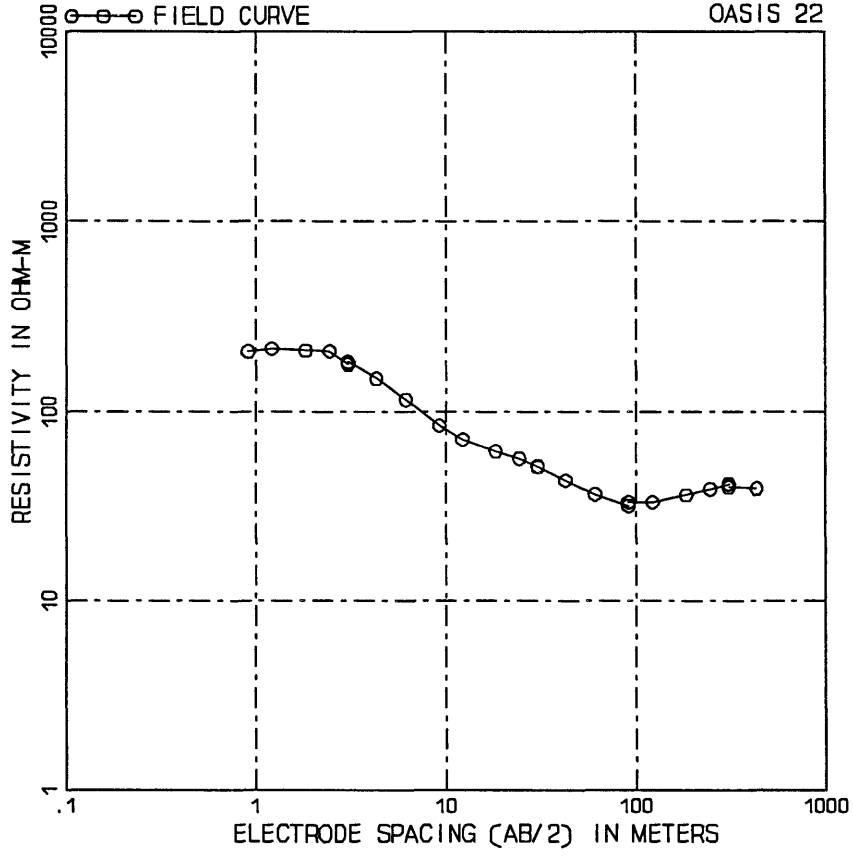
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.50	(1.63)	562.88	10.70	(35.09)	78.03
0.73	(2.39)	534.00	15.70	(51.51)	58.38
1.07	(3.51)	529.47	23.04	(75.60)	43.94
1.57	(5.15)	513.30	33.82	(110.97)	32.29
2.30	(7.56)	424.47	49.64	(162.88)	25.26
3.38	(11.10)	278.51	72.87	(239.07)	23.28
4.96	(16.29)	161.60	106.96	(350.90)	24.98
7.29	(23.91)	105.19	156.99	(515.06)	27.49
			99999.00	(99999.00)	28.33

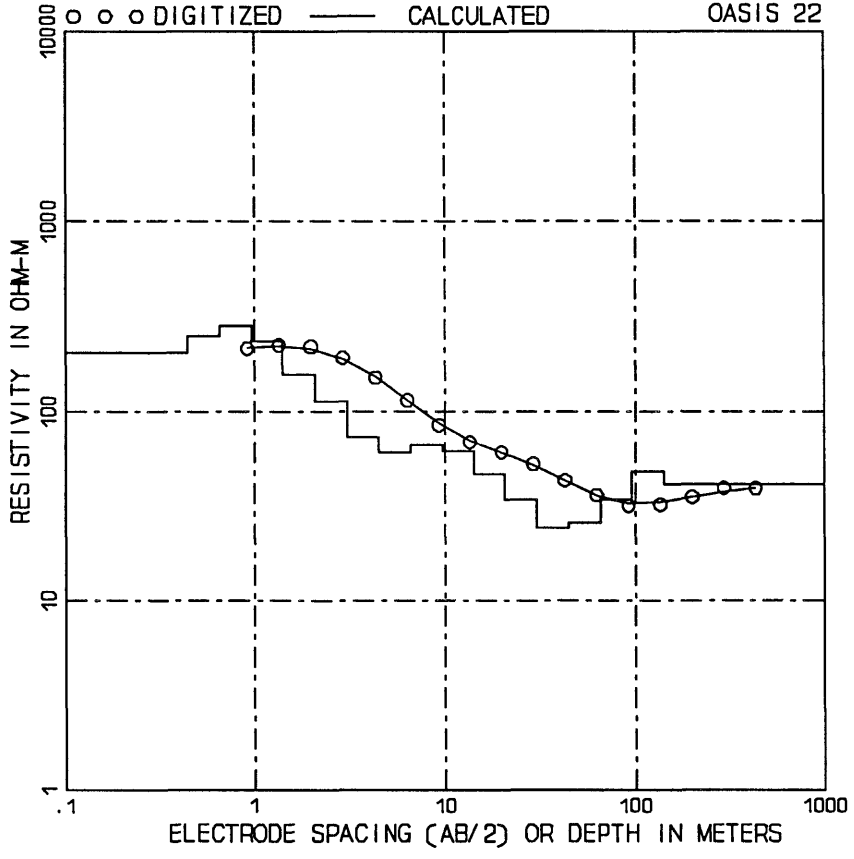




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	188.00	24.38	(80.00)	131.00
1.22	(4.00)	194.00	30.48	(100.00)	130.00
1.83	(6.00)	164.00	30.48	(100.00)	132.00
2.44	(8.00)	137.00	42.67	(140.00)	124.00
3.05	(10.00)	127.00	60.96	(200.00)	109.00
4.27	(14.00)	117.00	91.44	(300.00)	92.40
3.05	(10.00)	144.00	91.44	(300.00)	99.10
4.27	(14.00)	132.00	121.92	(400.00)	81.90
6.10	(20.00)	127.00	182.88	(600.00)	64.50
9.14	(30.00)	133.00	243.84	(800.00)	50.10
12.19	(40.00)	134.00	304.80	(1000.00)	46.90
18.29	(60.00)	133.00	304.80	(1000.00)	46.00
			426.72	(1400.00)	38.40

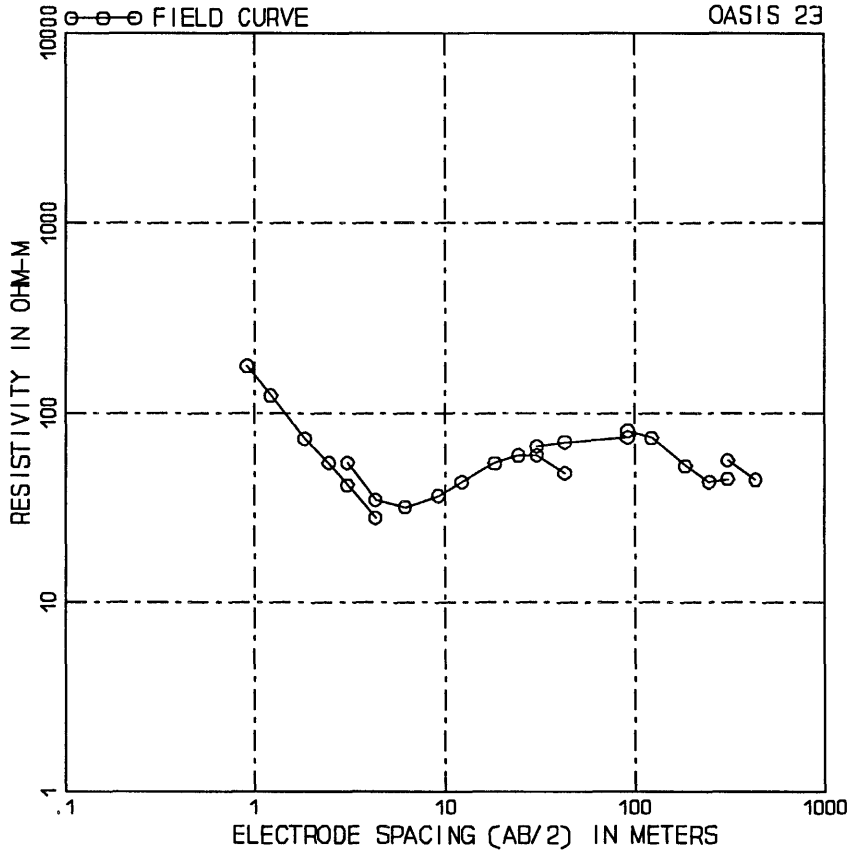
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	249.82	9.63	(31.58)	152.79
0.66	(2.15)	246.02	14.13	(46.36)	152.32
0.96	(3.16)	198.28	20.74	(68.04)	143.06
1.41	(4.64)	144.56	30.44	(99.87)	126.46
2.07	(6.80)	119.75	44.68	(146.59)	105.26
3.04	(9.99)	122.04	65.58	(215.16)	81.59
4.47	(14.66)	135.08	96.26	(315.81)	59.57
6.56	(21.52)	146.51	141.29	(463.55)	43.05
			99999.00	(99999.00)	33.17

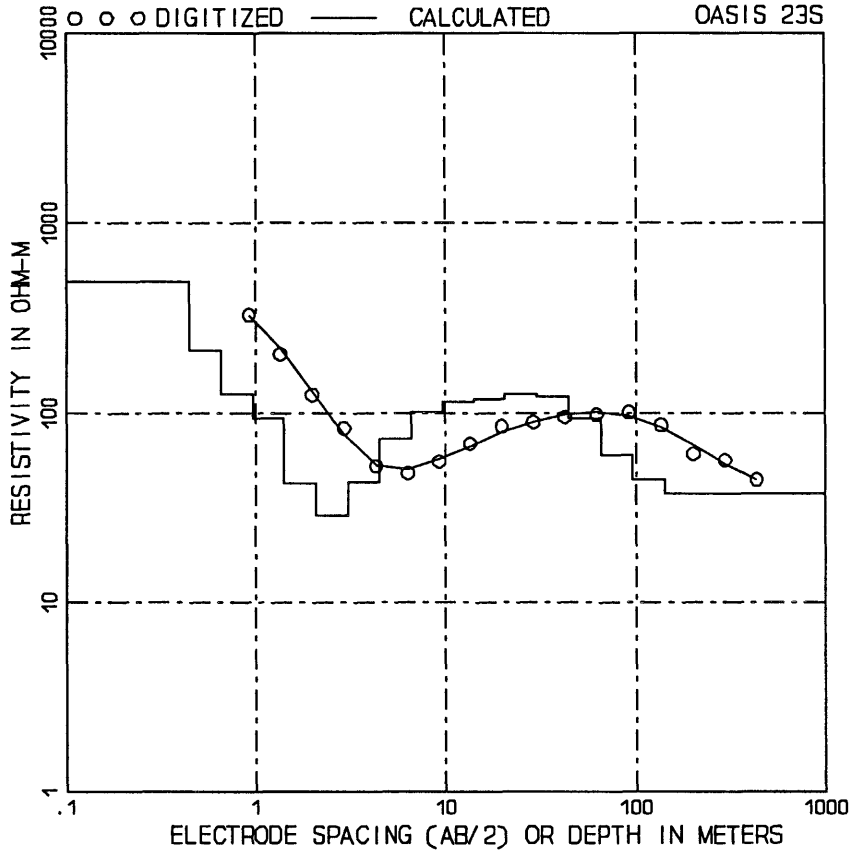




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	205.00	30.48	(100.00)	50.70
1.22	(4.00)	213.00	30.48	(100.00)	51.30
1.83	(6.00)	208.00	42.67	(140.00)	43.10
2.44	(8.00)	206.00	60.96	(200.00)	36.50
3.05	(10.00)	176.00	91.44	(300.00)	31.70
3.05	(10.00)	181.00	91.44	(300.00)	33.10
4.27	(14.00)	148.00	121.92	(400.00)	33.10
6.10	(20.00)	115.00	182.88	(600.00)	36.00
9.14	(30.00)	83.70	243.84	(800.00)	38.80
12.19	(40.00)	70.70	304.80	(1000.00)	41.30
18.29	(60.00)	61.30	304.80	(1000.00)	39.60
24.38	(80.00)	56.30	426.72	(1400.00)	39.10

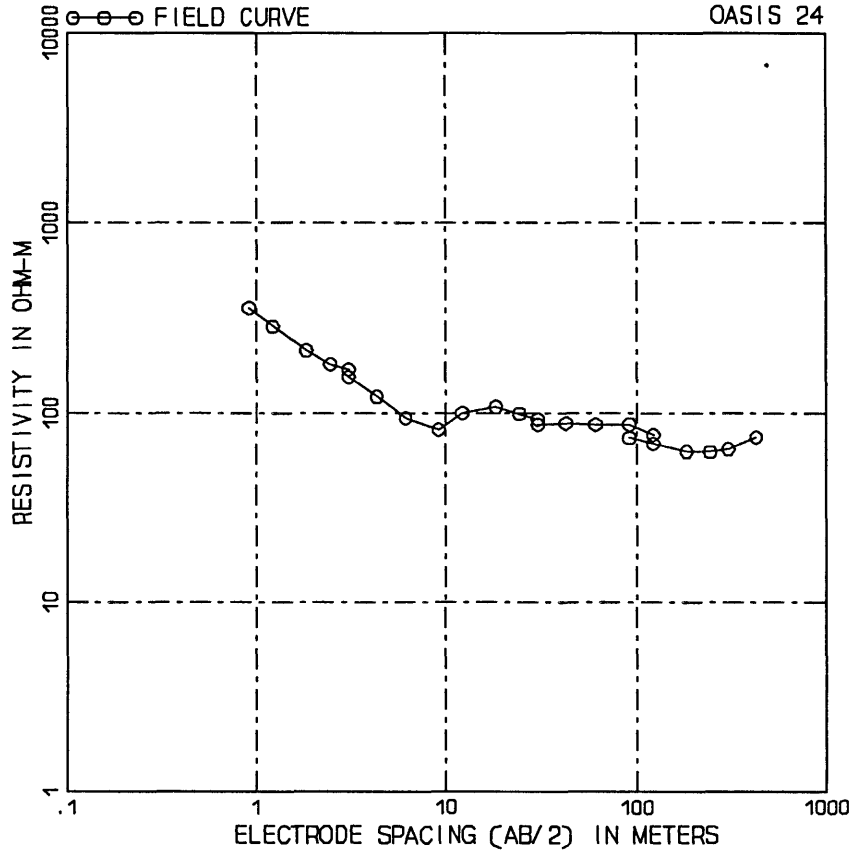
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	201.88	9.63	(31.58)	66.09
0.66	(2.15)	249.27	14.13	(46.36)	61.67
0.96	(3.16)	280.75	20.74	(68.04)	46.38
1.41	(4.64)	233.45	30.44	(99.87)	33.93
2.07	(6.80)	156.04	44.68	(146.59)	24.28
3.04	(9.99)	111.65	65.58	(215.16)	25.73
4.47	(14.66)	72.78	96.26	(315.81)	34.31
6.56	(21.52)	60.83	141.29	(463.55)	48.12
			99999.00	(99999.00)	40.96

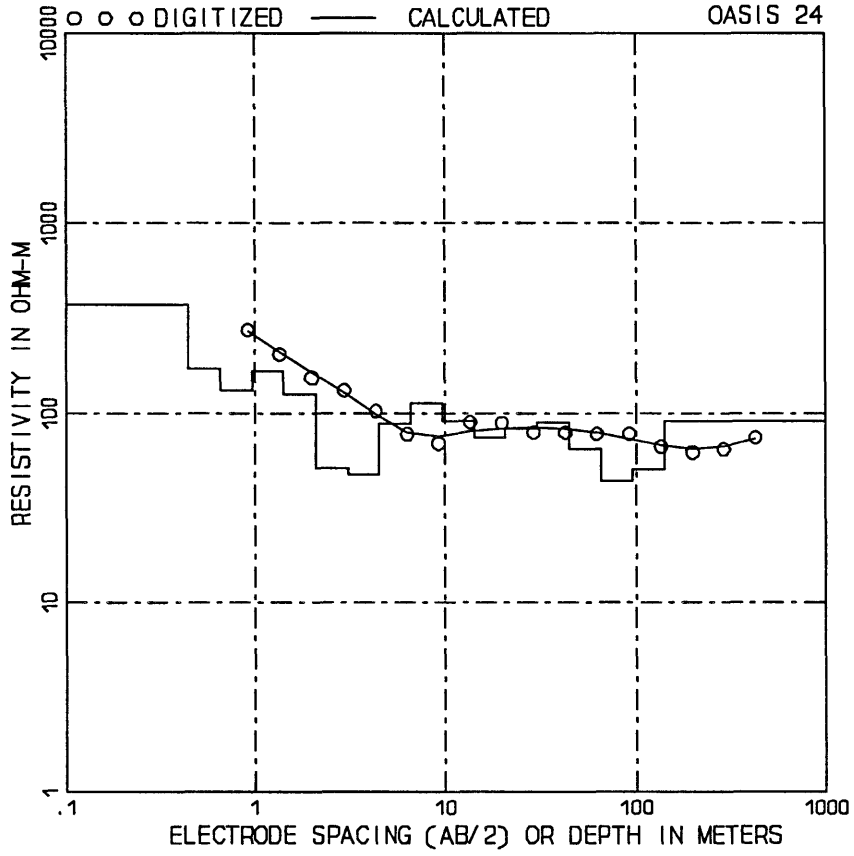




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	176.00	24.38	(80.00)	59.40
1.22	(4.00)	123.00	30.48	(100.00)	59.90
1.83	(6.00)	73.00	42.67	(140.00)	48.10
2.44	(8.00)	54.20	30.48	(100.00)	66.50
3.05	(10.00)	41.40	42.67	(140.00)	70.10
4.27	(14.00)	27.90	91.44	(300.00)	74.20
3.05	(10.00)	54.30	91.44	(300.00)	80.40
4.27	(14.00)	34.70	121.92	(400.00)	73.60
6.10	(20.00)	31.80	182.88	(600.00)	52.20
9.14	(30.00)	36.50	243.84	(800.00)	43.20
12.19	(40.00)	43.00	304.80	(1000.00)	44.70
18.29	(60.00)	54.00	304.80	(1000.00)	55.90
			426.72	(1400.00)	44.20

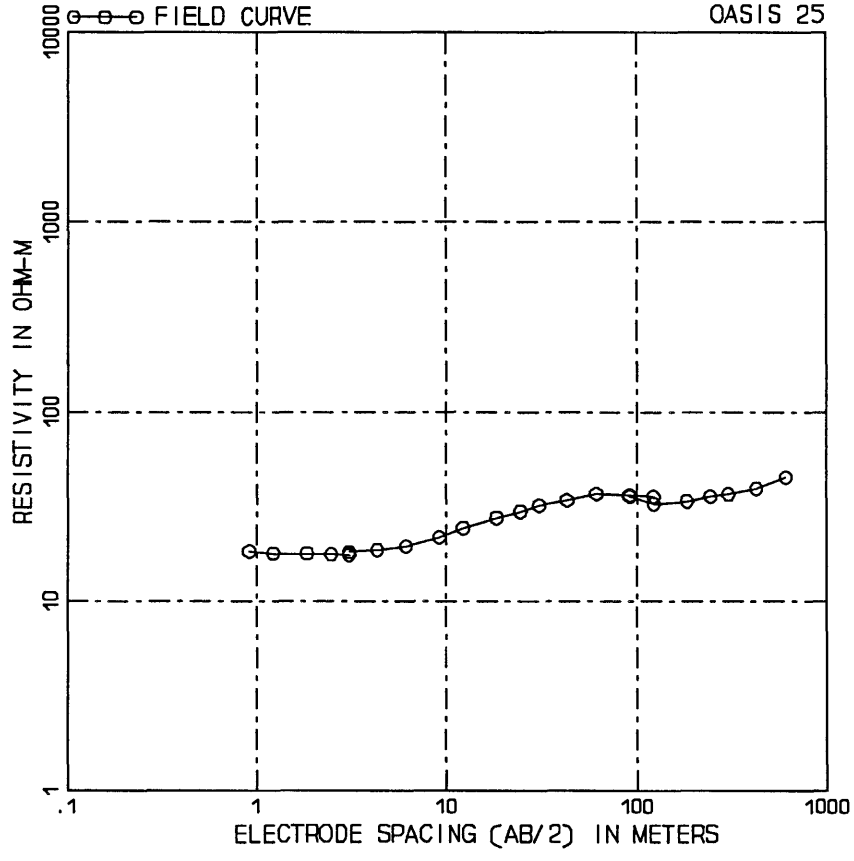
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	492.62	9.63	(31.58)	100.41
0.66	(2.15)	212.15	14.13	(46.36)	113.64
0.96	(3.16)	124.66	20.74	(68.04)	118.70
1.41	(4.64)	92.63	30.44	(99.87)	125.28
2.07	(6.80)	42.53	44.68	(146.59)	122.50
3.04	(9.99)	28.69	65.58	(215.16)	93.29
4.47	(14.66)	43.02	96.26	(315.81)	59.97
6.56	(21.52)	72.56	141.29	(463.55)	44.75
			99999.00	(99999.00)	37.54

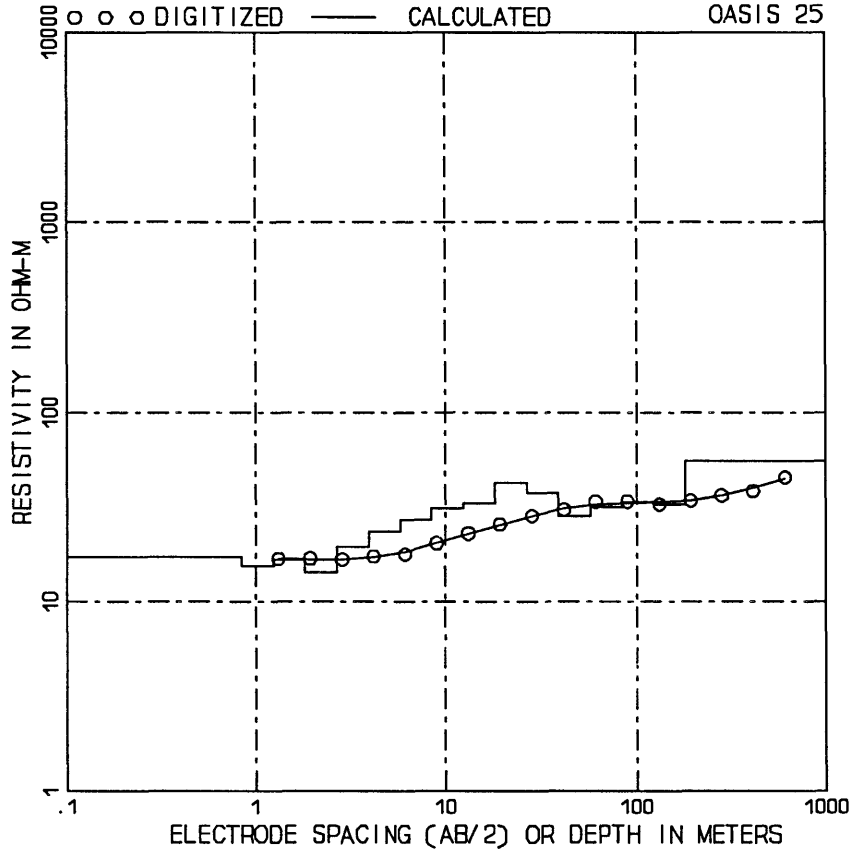




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	356.00	30.48	(100.00)	92.00
1.22	(4.00)	284.00	30.48	(100.00)	86.70
1.83	(6.00)	212.00	42.67	(140.00)	87.60
2.44	(8.00)	179.00	60.96	(200.00)	86.50
3.05	(10.00)	169.00	91.44	(300.00)	86.90
3.05	(10.00)	154.00	121.92	(400.00)	76.40
4.27	(14.00)	121.00	91.44	(300.00)	73.70
6.10	(20.00)	93.40	121.92	(400.00)	68.50
9.14	(30.00)	81.50	182.88	(600.00)	62.20
12.19	(40.00)	99.70	243.84	(800.00)	62.00
18.29	(60.00)	107.00	304.80	(1000.00)	64.10
24.38	(80.00)	98.50	426.72	(1400.00)	74.30

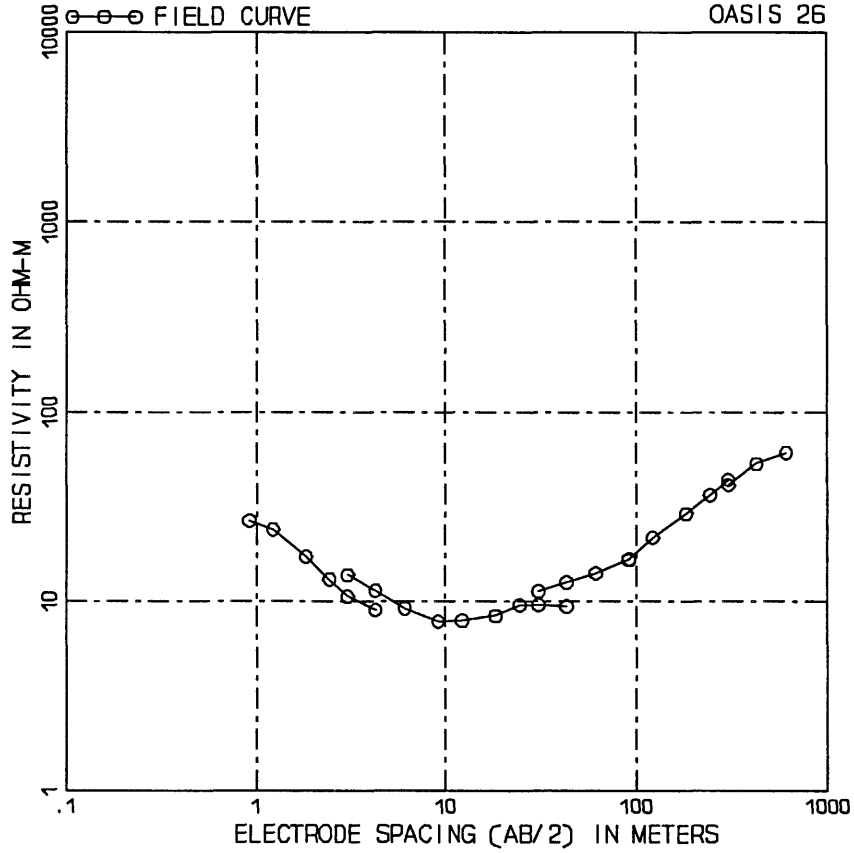
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	374.01	9.63	(31.58)	111.85
0.66	(2.15)	171.09	14.13	(46.36)	89.92
0.96	(3.16)	130.53	20.74	(68.04)	74.17
1.41	(4.64)	165.25	30.44	(99.87)	82.74
2.07	(6.80)	124.73	44.68	(146.59)	89.05
3.04	(9.99)	51.34	65.58	(215.16)	64.39
4.47	(14.66)	47.22	96.26	(315.81)	43.59
6.56	(21.52)	88.36	141.29	(463.55)	50.25
			99999.00	(99999.00)	90.07

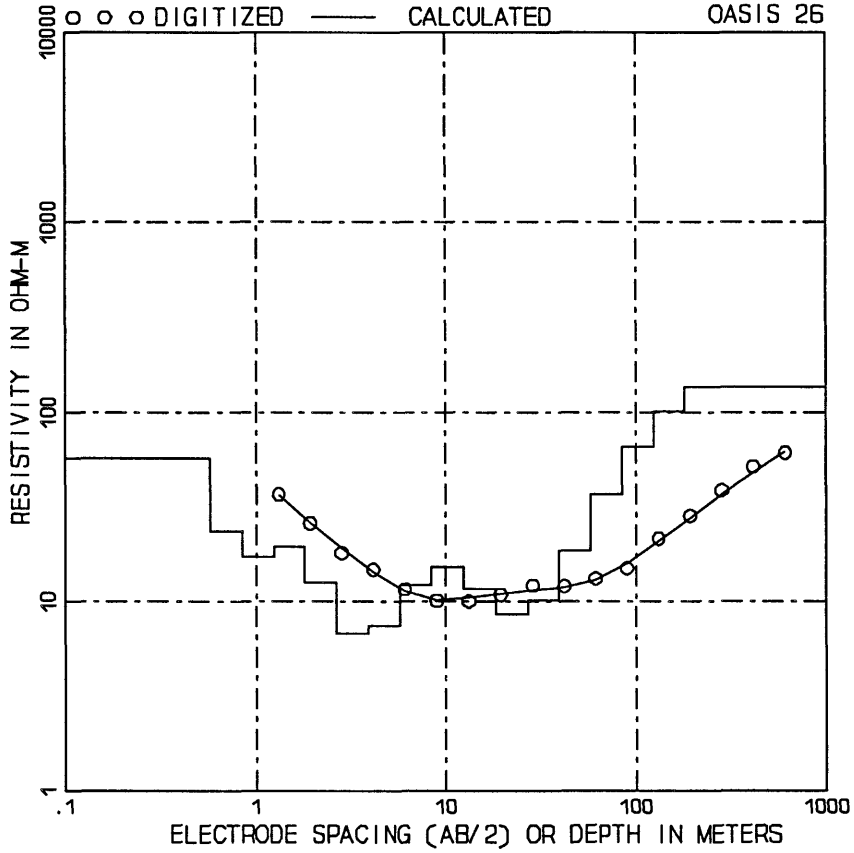




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	18.40	30.48	(100.00)	32.10
1.22	(4.00)	17.90	30.48	(100.00)	32.10
1.83	(6.00)	17.90	42.67	(140.00)	34.20
2.44	(8.00)	17.70	60.96	(200.00)	36.90
3.05	(10.00)	17.60	91.44	(300.00)	36.40
3.05	(10.00)	18.20	121.92	(400.00)	35.80
4.27	(14.00)	18.70	91.44	(300.00)	35.70
6.10	(20.00)	19.50	121.92	(400.00)	32.70
9.14	(30.00)	21.80	182.88	(600.00)	33.80
12.19	(40.00)	24.40	243.84	(800.00)	35.80
18.29	(60.00)	27.60	304.80	(1000.00)	36.70
24.38	(80.00)	29.80	426.72	(1400.00)	39.40
			609.60	(2000.00)	45.20

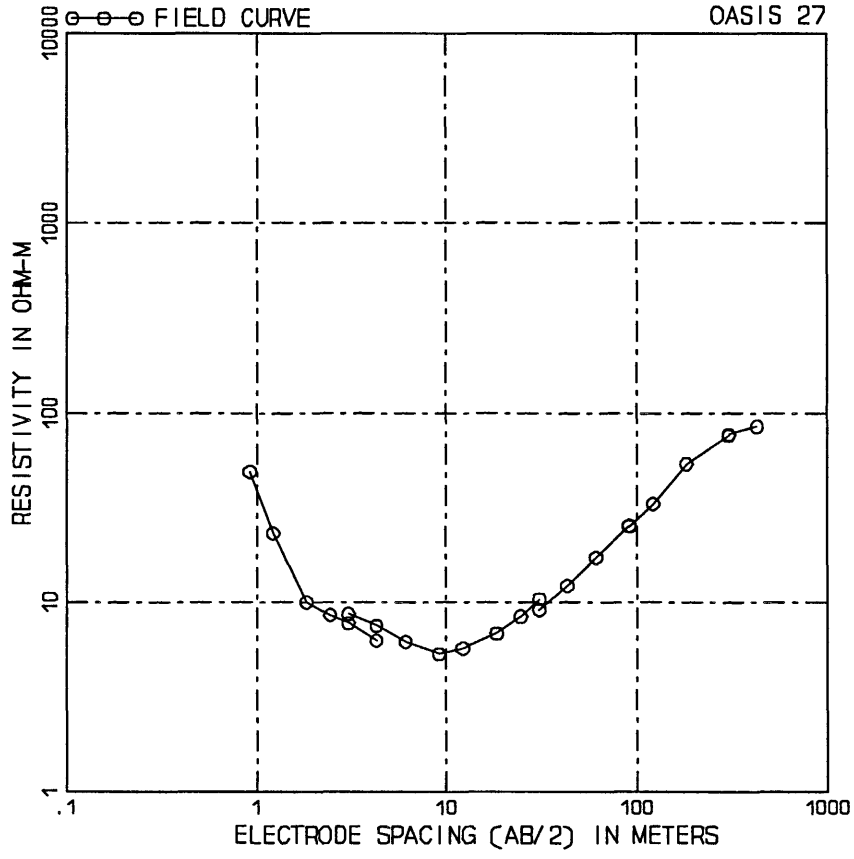
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.57	(1.88)	17.11	12.38	(40.60)	31.20
0.84	(2.77)	17.30	18.17	(59.60)	32.90
1.24	(4.06)	15.55	26.66	(87.48)	42.50
1.82	(5.96)	16.63	39.14	(128.40)	37.62
2.67	(8.75)	14.40	57.45	(188.47)	28.46
3.91	(12.84)	19.61	84.32	(276.64)	31.52
5.74	(18.85)	23.50	123.76	(406.05)	33.44
8.43	(27.66)	26.98	181.66	(595.99)	32.32
			99999.00	(99999.00)	55.13

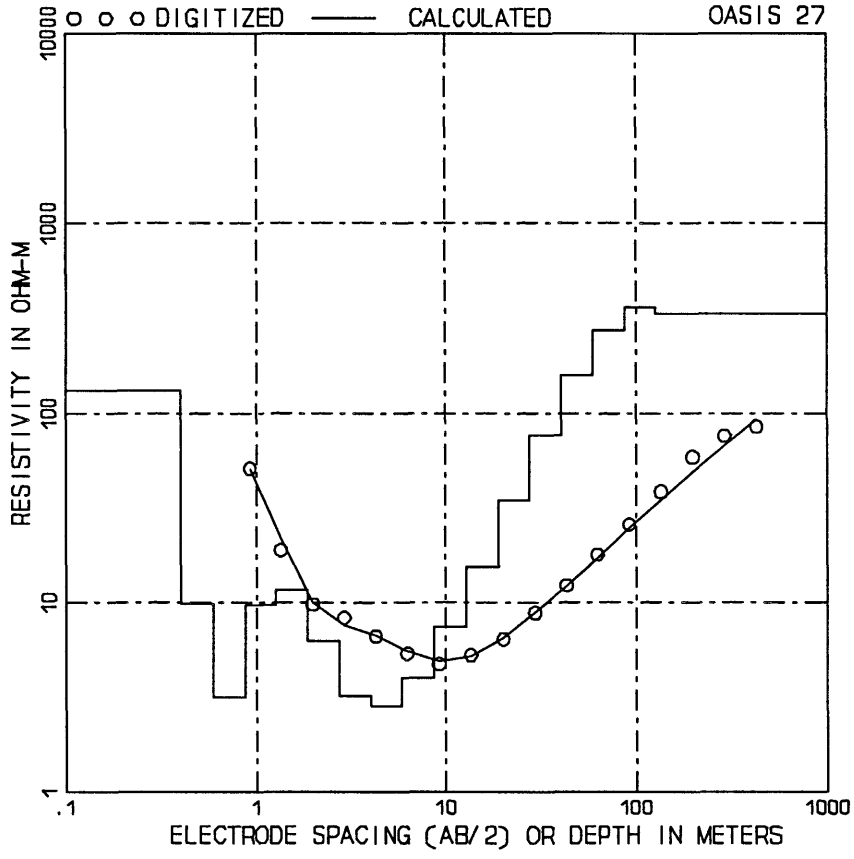




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	26.60	30.48	(100.00)	9.56
1.22	(4.00)	24.00	42.67	(140.00)	9.38
1.83	(6.00)	17.20	30.48	(100.00)	11.30
2.44	(8.00)	13.10	42.67	(140.00)	12.60
3.05	(10.00)	10.60	60.96	(200.00)	14.10
4.27	(14.00)	9.00	91.44	(300.00)	16.60
3.05	(10.00)	13.80	91.44	(300.00)	16.70
4.27	(14.00)	11.40	121.92	(400.00)	21.70
6.10	(20.00)	9.19	182.88	(600.00)	29.00
9.14	(30.00)	7.85	243.84	(800.00)	36.40
12.19	(40.00)	7.91	304.80	(1000.00)	43.90
18.29	(60.00)	8.39	304.80	(1000.00)	41.00
24.38	(80.00)	9.56	426.72	(1400.00)	53.10
			609.60	(2000.00)	60.90

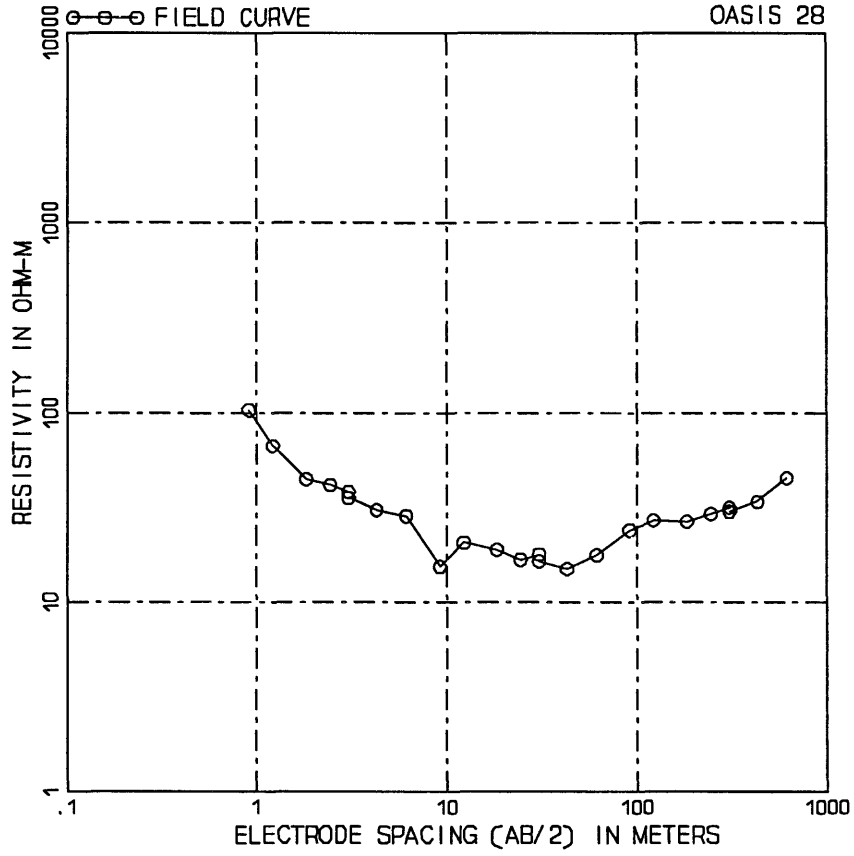
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.57	(1.88)	56.90	12.38	(40.60)	15.17
0.84	(2.77)	23.62	18.17	(59.60)	11.79
1.24	(4.06)	17.30	26.66	(87.48)	8.53
1.82	(5.96)	19.40	39.14	(128.40)	10.15
2.67	(8.75)	12.73	57.45	(188.47)	18.73
3.91	(12.84)	6.82	84.32	(276.64)	36.97
5.74	(18.85)	7.46	123.76	(406.05)	65.87
8.43	(27.66)	12.27	181.66	(595.99)	101.02
			99999.00	(99999.00)	134.52

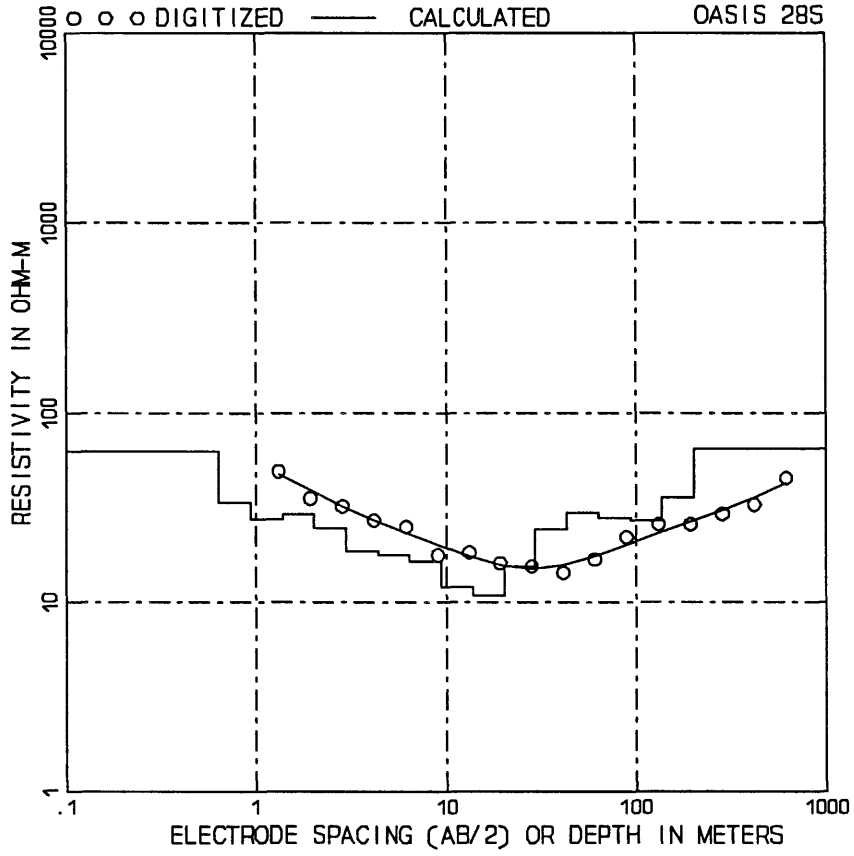




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	48.80	24.38	(80.00)	8.41
1.22	(4.00)	23.20	30.48	(100.00)	10.40
1.83	(6.00)	10.00	30.48	(100.00)	9.15
2.44	(8.00)	8.56	42.67	(140.00)	12.30
3.05	(10.00)	7.76	60.96	(200.00)	17.30
4.27	(14.00)	6.29	91.44	(300.00)	25.50
3.05	(10.00)	8.67	91.44	(300.00)	25.20
4.27	(14.00)	7.52	121.92	(400.00)	33.10
6.10	(20.00)	6.18	182.88	(600.00)	53.80
9.14	(30.00)	5.35	304.80	(1000.00)	75.80
12.19	(40.00)	5.73	304.80	(1000.00)	77.10
18.29	(60.00)	6.86	426.72	(1400.00)	84.70

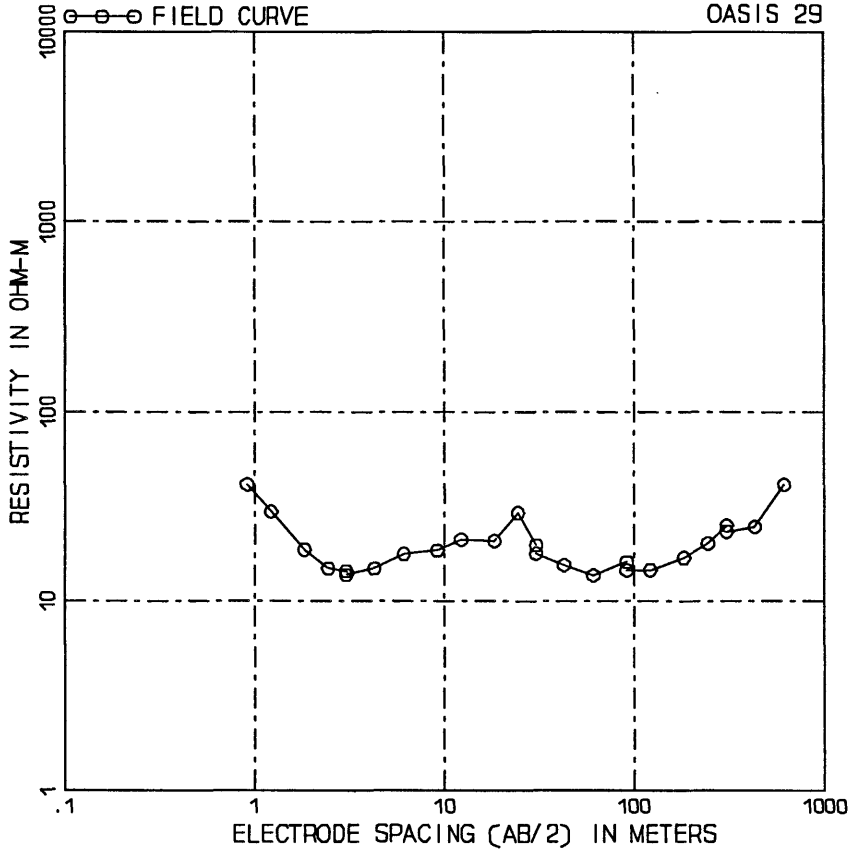
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.40	(1.32)	131.37	8.66	(28.42)	4.02
0.59	(1.94)	9.92	12.72	(41.72)	7.41
0.87	(2.84)	3.20	18.66	(61.24)	15.46
1.27	(4.17)	9.78	27.40	(89.88)	34.37
1.87	(6.12)	11.78	40.21	(131.93)	76.89
2.74	(8.99)	6.24	59.02	(193.65)	158.31
4.02	(13.19)	3.23	86.63	(284.23)	271.72
5.90	(19.36)	2.85	127.16	(417.20)	358.07
			99999.00	(99999.00)	335.33

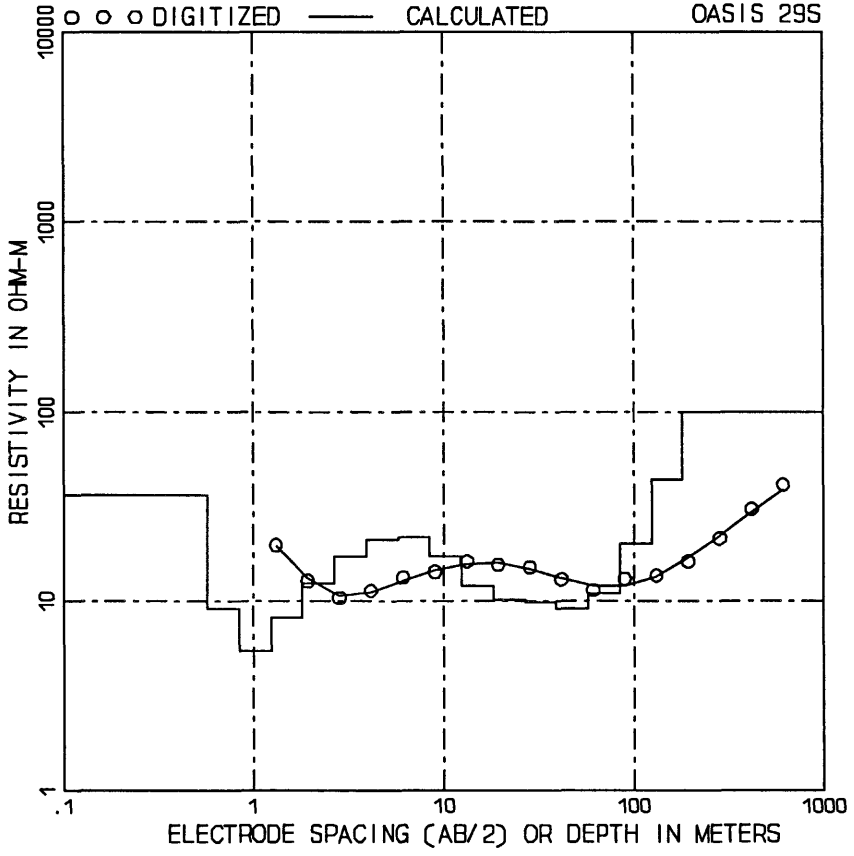




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	103.00	30.48	(100.00)	17.90
1.22	(4.00)	66.60	30.48	(100.00)	16.50
1.83	(6.00)	44.40	42.67	(140.00)	15.00
2.44	(8.00)	41.50	60.96	(200.00)	17.70
3.05	(10.00)	38.20	91.44	(300.00)	24.00
3.05	(10.00)	35.50	91.44	(300.00)	24.00
4.27	(14.00)	30.70	121.92	(400.00)	27.00
6.10	(20.00)	28.50	182.88	(600.00)	26.70
9.14	(30.00)	15.40	243.84	(800.00)	29.30
12.19	(40.00)	20.60	304.80	(1000.00)	31.50
18.29	(60.00)	18.90	304.80	(1000.00)	30.00
24.38	(80.00)	16.80	426.72	(1400.00)	33.90
			609.60	(2000.00)	45.20

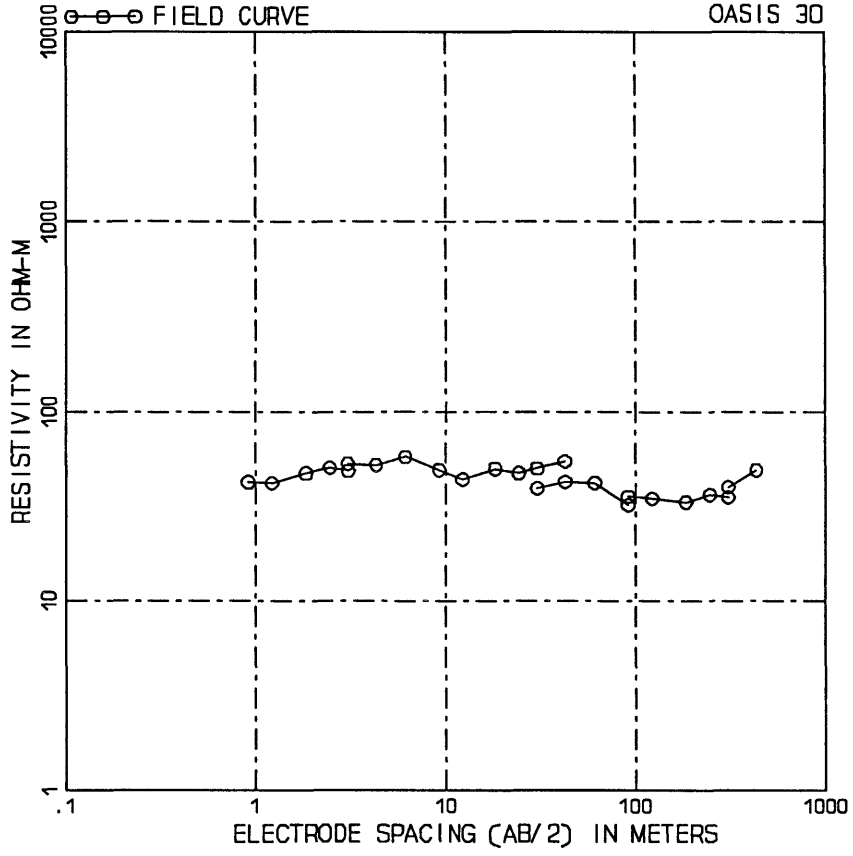
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	62.14	13.75	(45.12)	12.11
0.94	(3.07)	33.41	20.18	(66.22)	10.78
1.38	(4.51)	27.55	29.63	(97.20)	15.49
2.02	(6.62)	29.02	43.49	(142.67)	24.37
2.96	(9.72)	24.43	63.83	(209.41)	29.42
4.35	(14.27)	18.67	93.69	(307.37)	27.83
6.38	(20.94)	17.89	137.51	(451.16)	27.08
9.37	(30.74)	16.51	201.84	(662.22)	35.91
			99999.00	(99999.00)	64.61

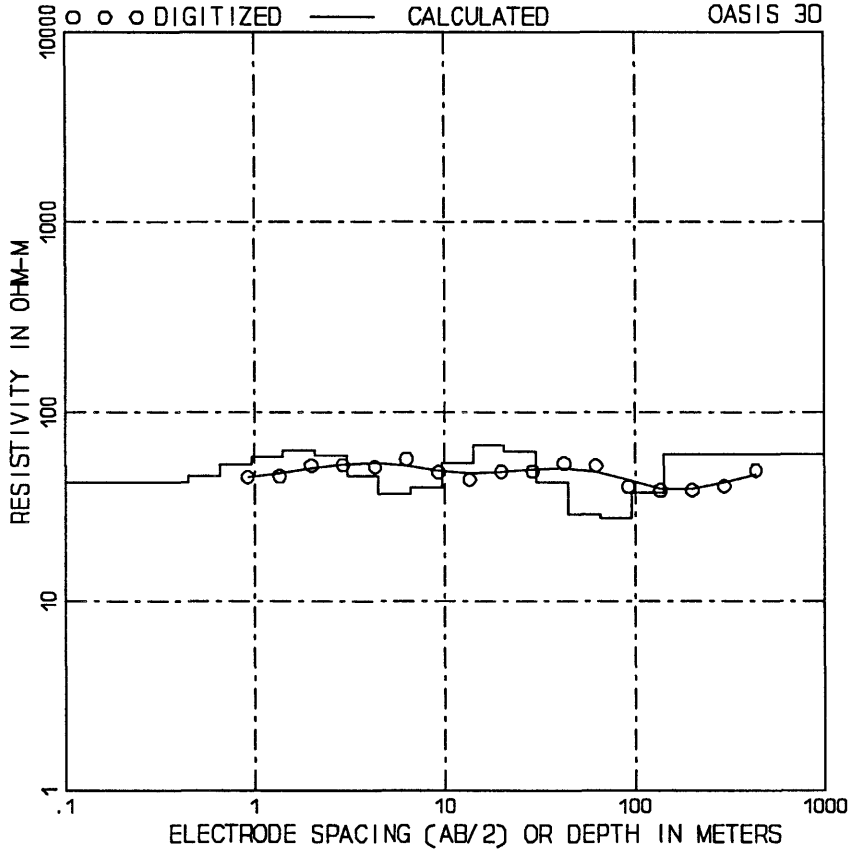




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	41.10	30.48	(100.00)	19.70
1.22	(4.00)	29.60	30.48	(100.00)	17.80
1.83	(6.00)	18.70	42.67	(140.00)	15.50
2.44	(8.00)	14.90	60.96	(200.00)	13.70
3.05	(10.00)	14.40	91.44	(300.00)	16.10
3.05	(10.00)	13.80	91.44	(300.00)	14.50
4.27	(14.00)	14.90	121.92	(400.00)	14.60
6.10	(20.00)	17.70	182.88	(600.00)	16.90
9.14	(30.00)	18.50	243.84	(800.00)	20.10
12.19	(40.00)	21.10	304.80	(1000.00)	25.10
18.29	(60.00)	20.70	304.80	(1000.00)	23.30
24.38	(80.00)	29.10	426.72	(1400.00)	24.60
			609.60	(2000.00)	41.10

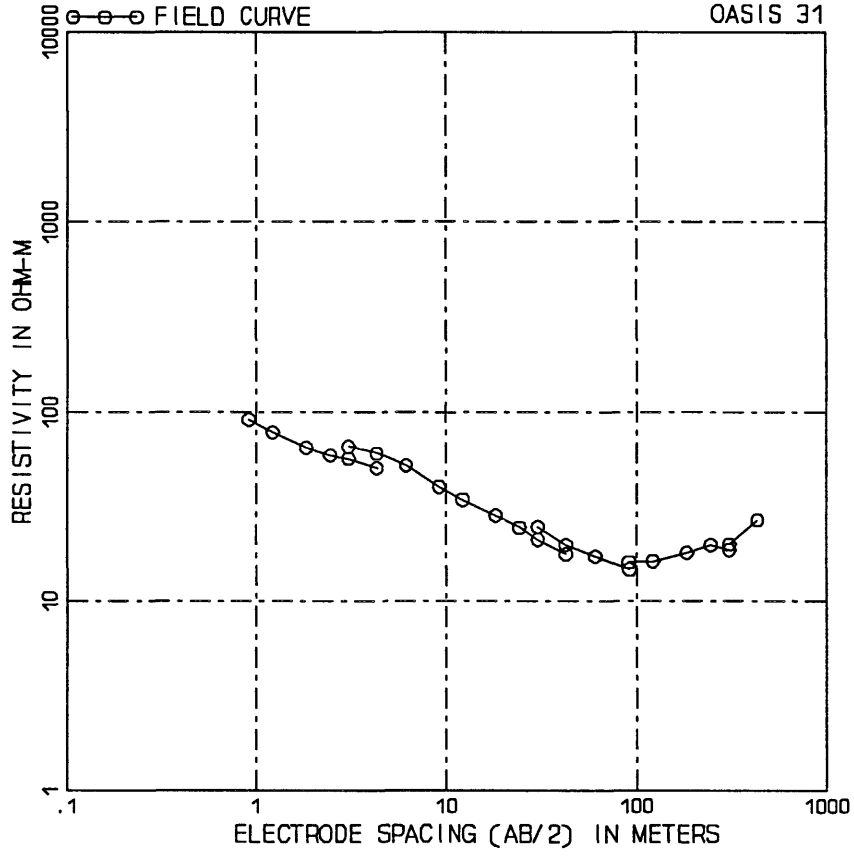
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.57	(1.88)	36.26	12.38	(40.60)	17.37
0.84	(2.77)	9.17	18.17	(59.60)	12.05
1.24	(4.06)	5.50	26.66	(87.48)	10.17
1.82	(5.96)	8.17	39.14	(128.40)	9.94
2.67	(8.75)	12.49	57.45	(188.47)	9.12
3.91	(12.84)	17.14	84.32	(276.64)	11.05
5.74	(18.85)	21.09	123.76	(406.05)	20.16
8.43	(27.66)	21.69	181.66	(595.99)	43.90
			99999.00	(99999.00)	99.83

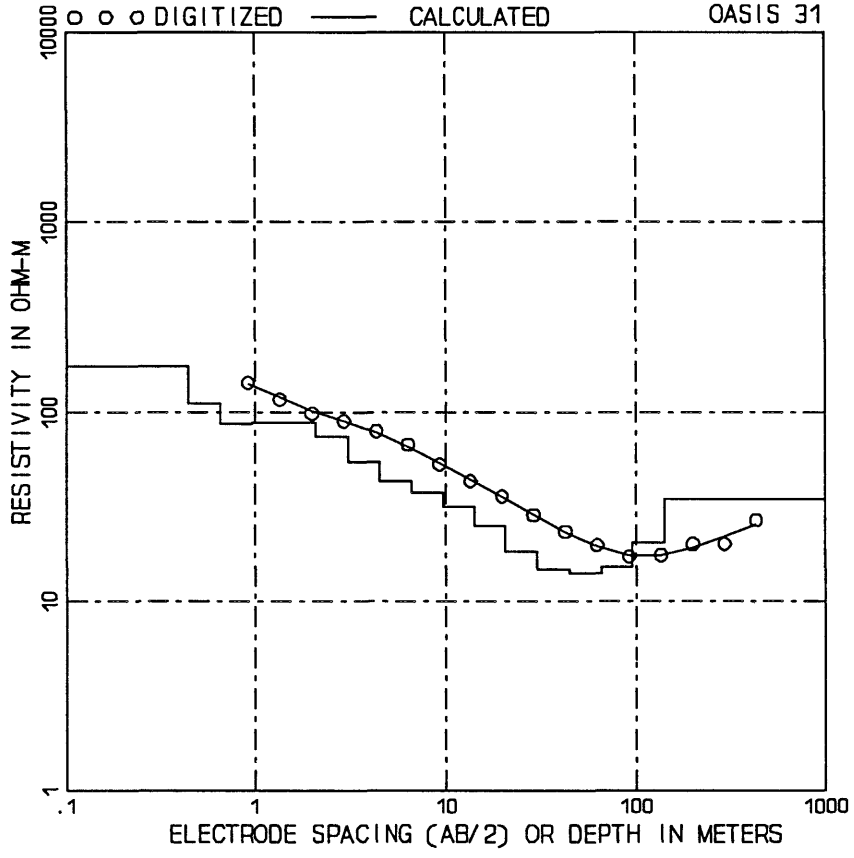




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	42.20	30.48	(100.00)	50.00
1.22	(4.00)	41.80	42.67	(140.00)	54.40
1.83	(6.00)	47.00	30.48	(100.00)	39.20
2.44	(8.00)	50.50	42.67	(140.00)	42.50
3.05	(10.00)	48.40	60.96	(200.00)	42.00
3.05	(10.00)	52.90	91.44	(300.00)	32.10
4.27	(14.00)	52.10	91.44	(300.00)	35.50
6.10	(20.00)	57.40	121.92	(400.00)	34.60
9.14	(30.00)	49.00	182.88	(600.00)	33.20
12.19	(40.00)	43.60	243.84	(800.00)	36.20
18.29	(60.00)	49.80	304.80	(1000.00)	35.20
24.38	(80.00)	47.10	304.80	(1000.00)	39.90
			426.72	(1400.00)	48.90

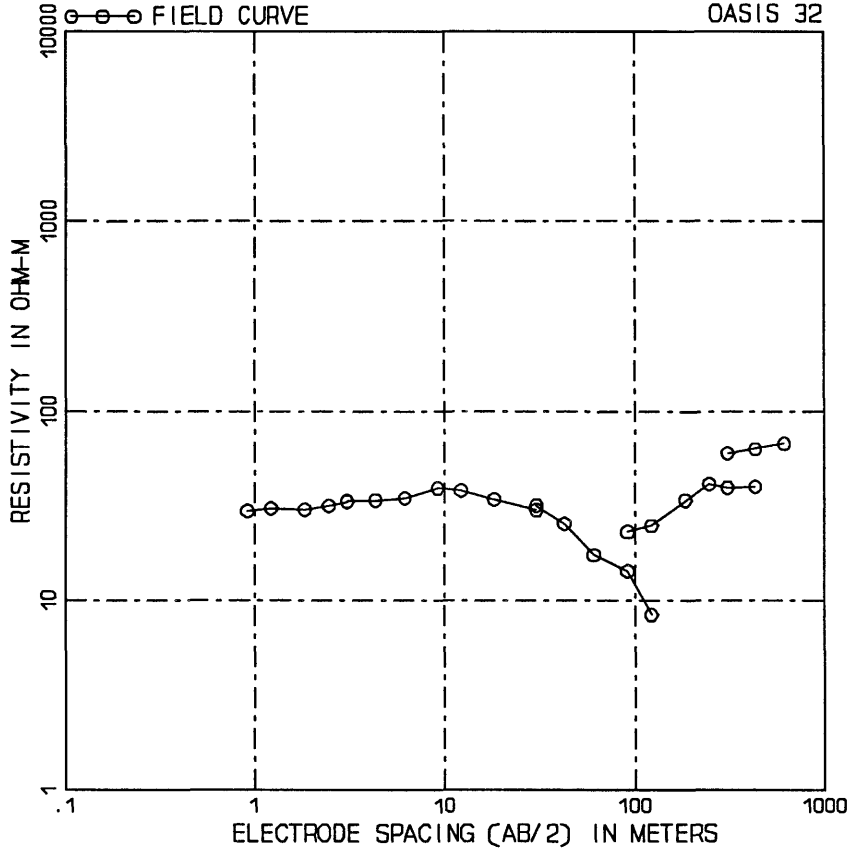
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	42.12	9.63	(31.58)	39.91
0.66	(2.15)	46.01	14.13	(46.36)	53.34
0.96	(3.16)	52.44	20.74	(68.04)	66.67
1.41	(4.64)	58.09	30.44	(99.87)	61.81
2.07	(6.80)	62.22	44.68	(146.59)	42.36
3.04	(9.99)	58.98	65.58	(215.16)	28.89
4.47	(14.66)	46.08	96.26	(315.81)	27.50
6.56	(21.52)	36.98	141.29	(463.55)	37.49
			99999.00	(99999.00)	59.72

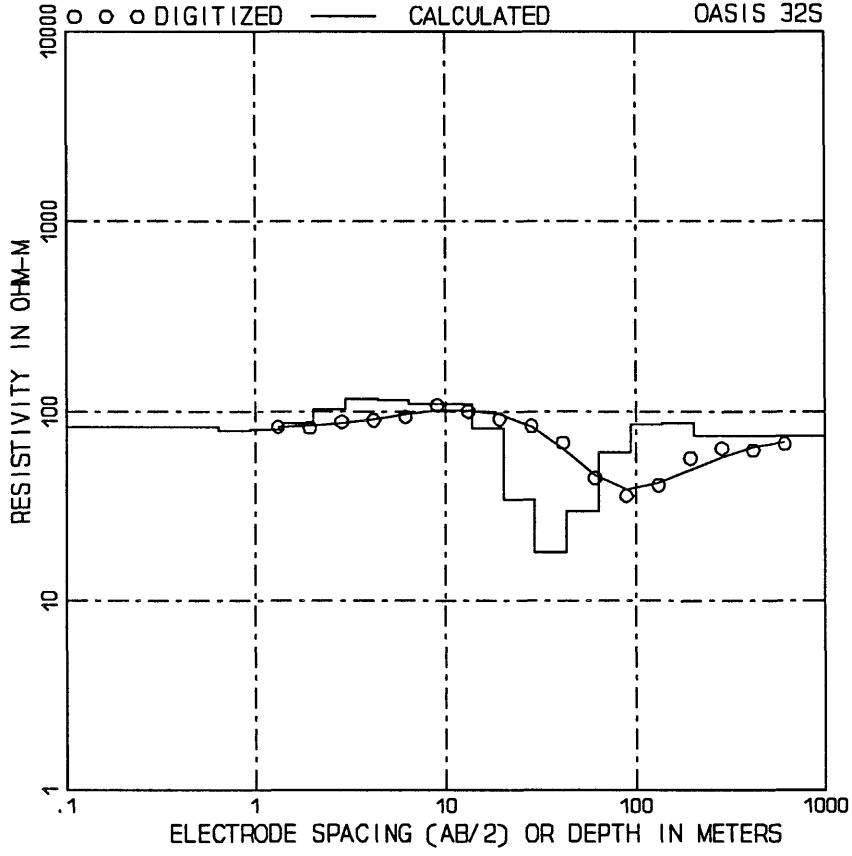




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	90.40	30.48	(100.00)	21.20
1.22	(4.00)	77.80	42.67	(140.00)	17.70
1.83	(6.00)	64.50	30.48	(100.00)	24.60
2.44	(8.00)	58.70	42.67	(140.00)	19.90
3.05	(10.00)	56.40	60.96	(200.00)	17.20
4.27	(14.00)	50.20	91.44	(300.00)	14.70
3.05	(10.00)	65.10	91.44	(300.00)	16.10
4.27	(14.00)	60.10	121.92	(400.00)	16.30
6.10	(20.00)	51.80	182.88	(600.00)	18.00
9.14	(30.00)	40.10	243.84	(800.00)	19.80
12.19	(40.00)	34.30	304.80	(1000.00)	18.70
18.29	(60.00)	28.40	304.80	(1000.00)	20.00
24.38	(80.00)	24.50	426.72	(1400.00)	26.80

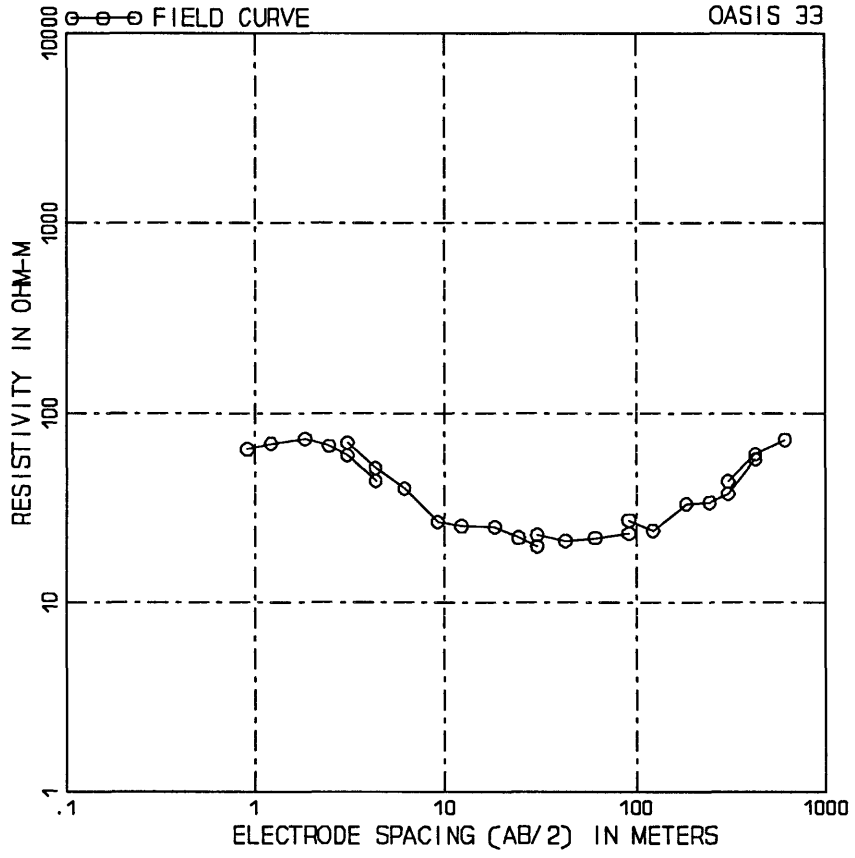
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	172.59	9.63	(31.58)	37.37
0.66	(2.15)	111.20	14.13	(46.36)	31.65
0.96	(3.16)	86.50	20.74	(68.04)	24.93
1.41	(4.64)	87.17	30.44	(99.87)	18.32
2.07	(6.80)	88.12	44.68	(146.59)	14.65
3.04	(9.99)	73.73	65.58	(215.16)	14.06
4.47	(14.66)	54.71	96.26	(315.81)	15.22
6.56	(21.52)	43.31	141.29	(463.55)	20.54
			99999.00	(99999.00)	34.58

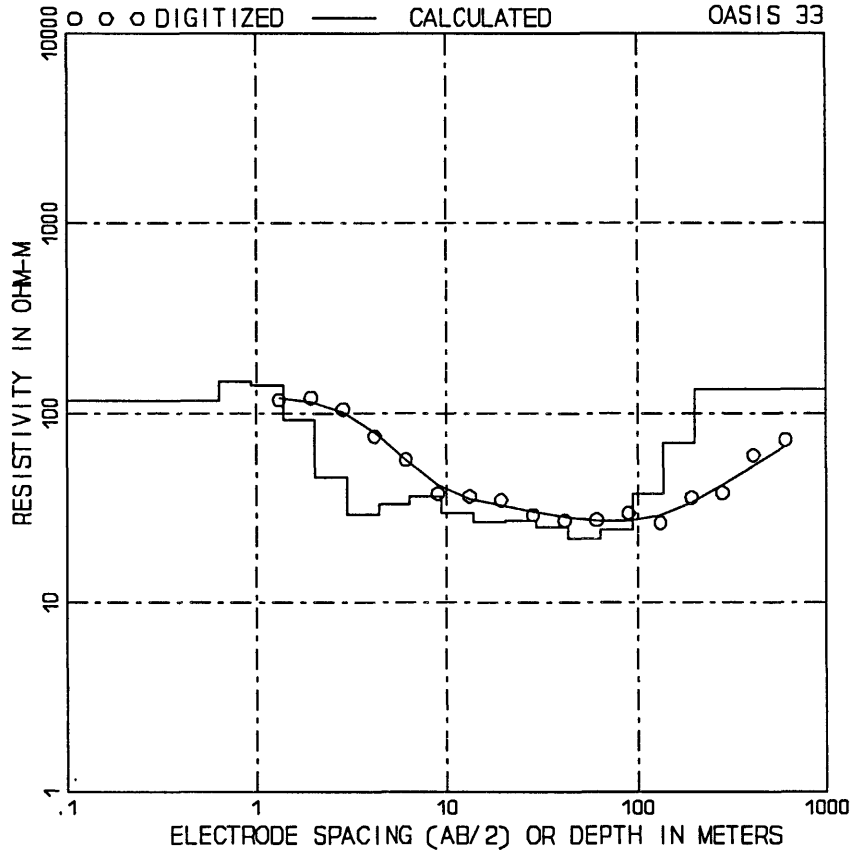




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	29.60	42.67	(140.00)	25.50
1.22	(4.00)	30.60	60.96	(200.00)	17.40
1.83	(6.00)	30.20	91.44	(300.00)	14.30
2.44	(8.00)	31.60	121.92	(400.00)	8.40
3.05	(10.00)	33.20	91.44	(300.00)	23.00
3.05	(10.00)	33.40	121.92	(400.00)	24.80
4.27	(14.00)	33.80	182.88	(600.00)	33.80
6.10	(20.00)	34.80	243.84	(800.00)	41.10
9.14	(30.00)	39.10	304.80	(1000.00)	39.40
12.19	(40.00)	37.90	426.72	(1400.00)	39.90
18.29	(60.00)	34.20	304.80	(1000.00)	59.80
30.48	(100.00)	30.00	426.72	(1400.00)	63.00
30.48	(100.00)	31.70	609.60	(2000.00)	67.20

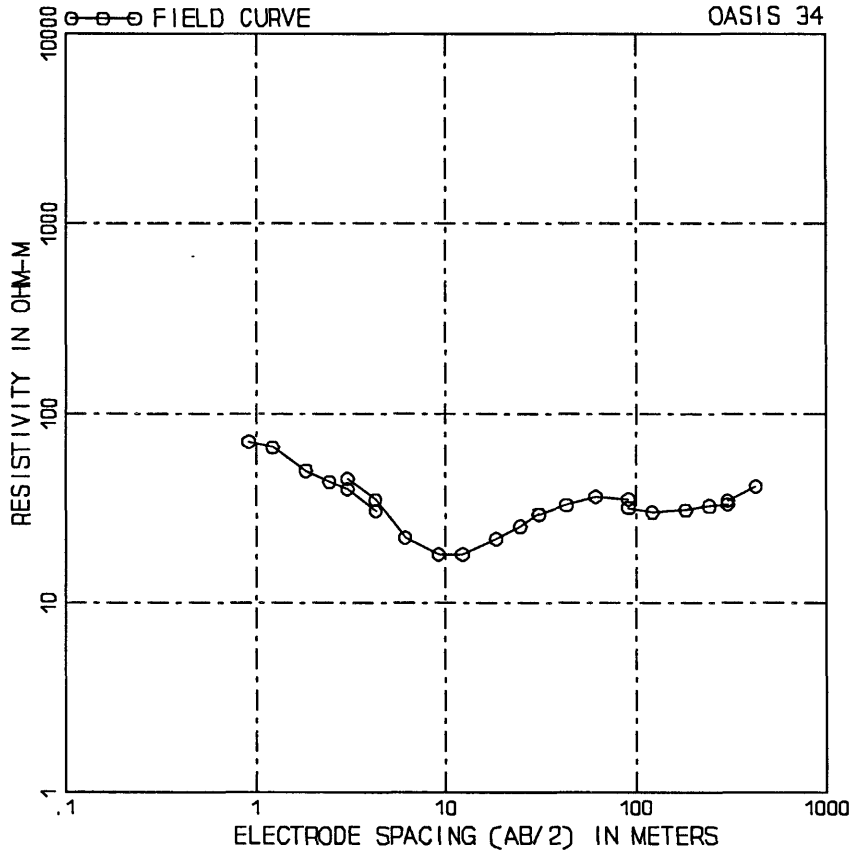
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	82.23	13.75	(45.12)	108.49
0.94	(3.07)	79.34	20.18	(66.22)	81.26
1.38	(4.51)	80.07	29.63	(97.20)	34.09
2.02	(6.62)	86.00	43.49	(142.67)	17.95
2.96	(9.72)	102.25	63.83	(209.41)	29.44
4.35	(14.27)	116.98	93.69	(307.37)	60.15
6.38	(20.94)	114.48	137.51	(451.16)	85.09
9.37	(30.74)	109.30	201.84	(662.22)	86.81
			99999.00	(99999.00)	74.50

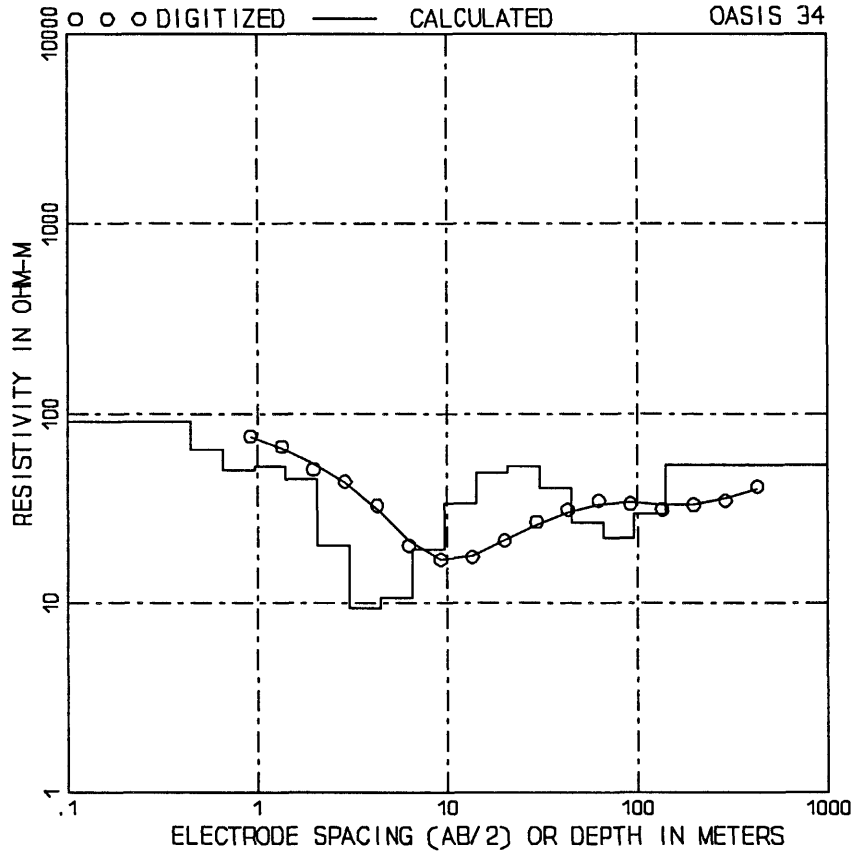




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	64.10	30.48	(100.00)	19.90
1.22	(4.00)	68.80	30.48	(100.00)	22.70
1.83	(6.00)	73.00	42.67	(140.00)	21.20
2.44	(8.00)	67.00	60.96	(200.00)	21.90
3.05	(10.00)	59.50	91.44	(300.00)	23.20
4.27	(14.00)	43.70	91.44	(300.00)	27.20
3.05	(10.00)	69.70	121.92	(400.00)	24.00
4.27	(14.00)	51.10	182.88	(600.00)	33.10
6.10	(20.00)	39.80	243.84	(800.00)	33.70
9.14	(30.00)	26.60	304.80	(1000.00)	37.40
12.19	(40.00)	25.30	426.72	(1400.00)	57.10
18.29	(60.00)	25.00	304.80	(1000.00)	43.50
24.38	(80.00)	22.00	426.72	(1400.00)	60.70
			609.60	(2000.00)	72.20

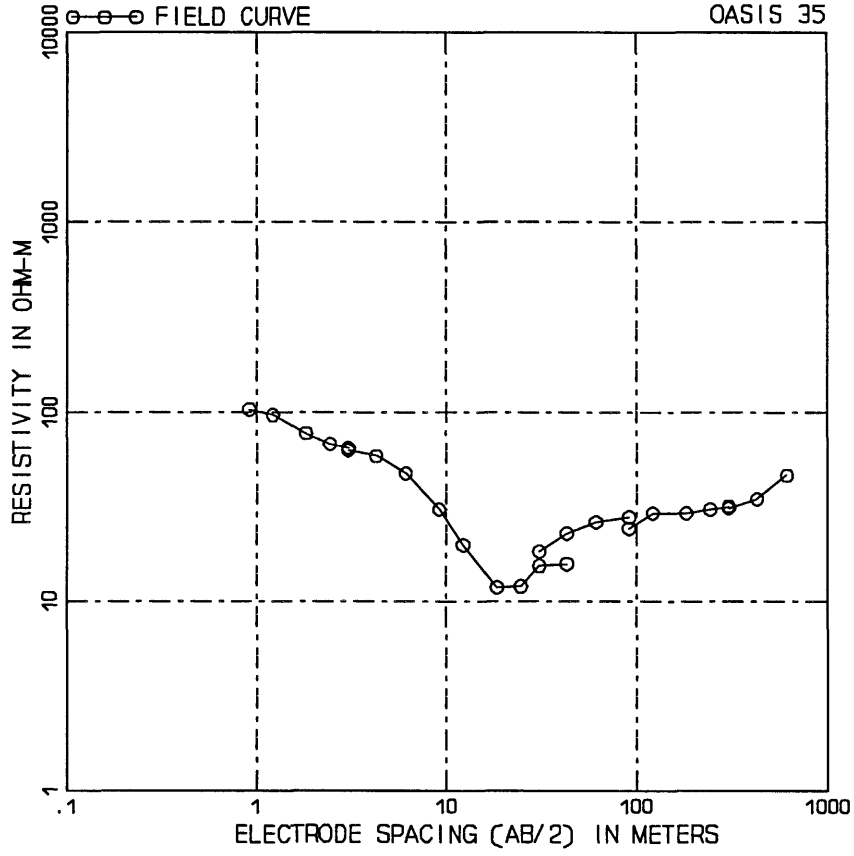
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	116.65	13.75	(45.12)	29.79
0.94	(3.07)	147.21	20.18	(66.22)	26.43
1.38	(4.51)	140.09	29.63	(97.20)	27.18
2.02	(6.62)	92.18	43.49	(142.67)	24.99
2.96	(9.72)	46.12	63.83	(209.41)	21.87
4.35	(14.27)	29.20	93.69	(307.37)	24.40
6.38	(20.94)	33.13	137.51	(451.16)	37.23
9.37	(30.74)	36.10	201.84	(662.22)	69.09
			99999.00	(99999.00)	133.24

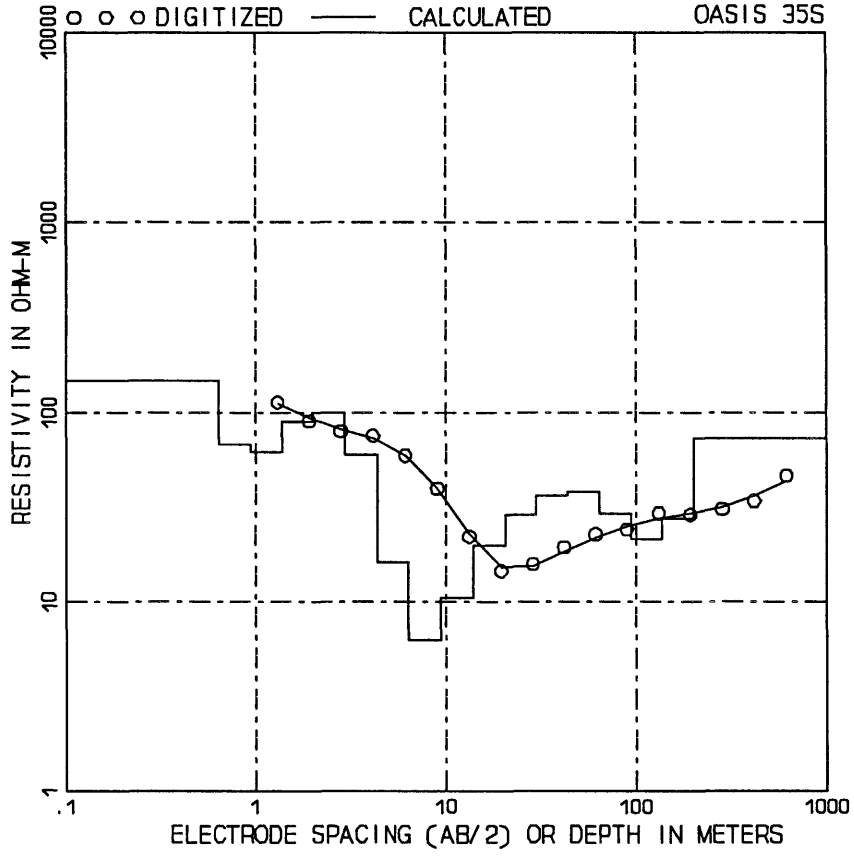




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	70.80	24.38	(80.00)	25.30
1.22	(4.00)	66.00	30.48	(100.00)	29.50
1.83	(6.00)	49.80	30.48	(100.00)	29.20
2.44	(8.00)	43.40	42.67	(140.00)	32.80
3.05	(10.00)	39.90	60.96	(200.00)	36.30
4.27	(14.00)	30.50	91.44	(300.00)	35.30
3.05	(10.00)	45.10	91.44	(300.00)	31.80
4.27	(14.00)	34.90	121.92	(400.00)	30.00
6.10	(20.00)	22.10	182.88	(600.00)	30.90
9.14	(30.00)	18.10	243.84	(800.00)	32.40
12.19	(40.00)	18.10	304.80	(1000.00)	33.10
18.29	(60.00)	21.80	304.80	(1000.00)	34.80
			426.72	(1400.00)	41.10

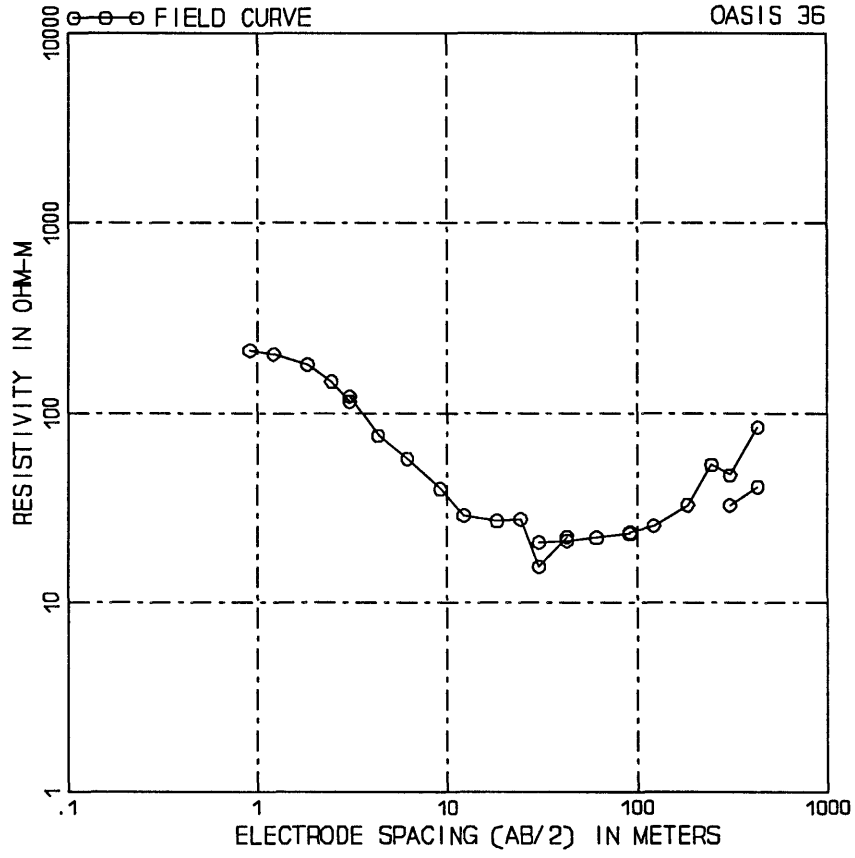
DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	90.39	9.63	(31.58)	19.21
0.66	(2.15)	64.58	14.13	(46.36)	33.76
0.96	(3.16)	50.24	20.74	(68.04)	49.00
1.41	(4.64)	52.68	30.44	(99.87)	52.78
2.07	(6.80)	45.26	44.68	(146.59)	40.64
3.04	(9.99)	20.23	65.58	(215.16)	26.54
4.47	(14.66)	9.43	96.26	(315.81)	21.94
6.56	(21.52)	10.73	141.29	(463.55)	29.58
			99999.00	(99999.00)	53.84

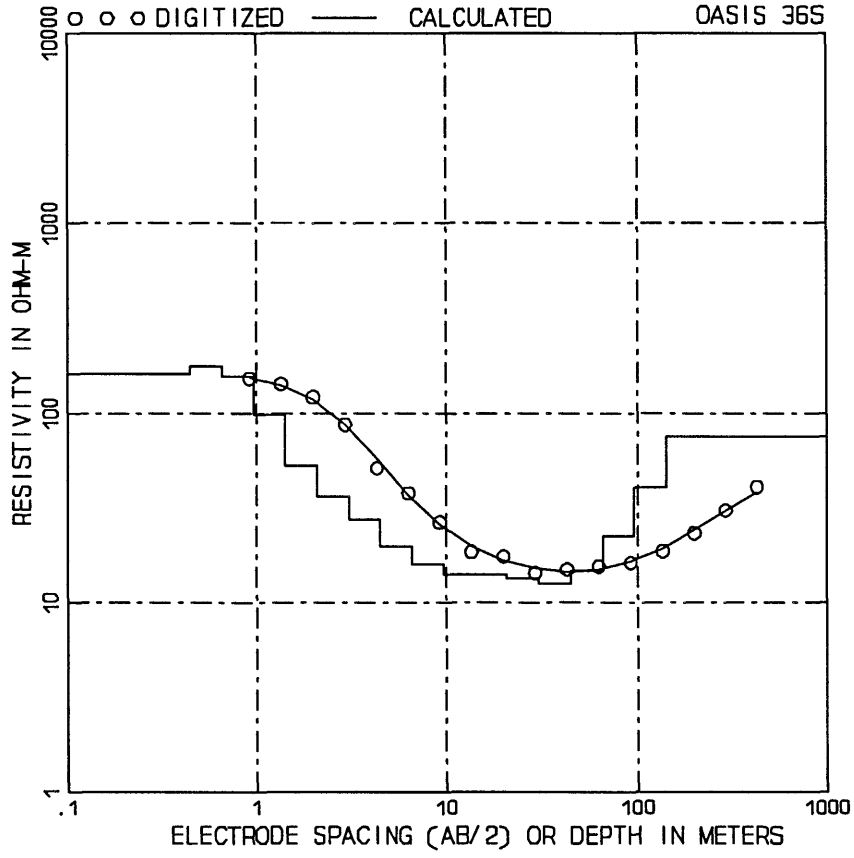




AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	103.00	42.67	(140.00)	15.80
1.22	(4.00)	96.00	30.48	(100.00)	18.40
1.83	(6.00)	77.00	42.67	(140.00)	22.90
2.44	(8.00)	67.70	60.96	(200.00)	26.30
3.05	(10.00)	64.60	91.44	(300.00)	27.80
3.05	(10.00)	62.60	91.44	(300.00)	24.40
4.27	(14.00)	58.30	121.92	(400.00)	29.30
6.10	(20.00)	47.20	182.88	(600.00)	29.20
9.14	(30.00)	30.50	243.84	(800.00)	30.50
12.19	(40.00)	19.90	304.80	(1000.00)	31.80
18.29	(60.00)	11.90	304.80	(1000.00)	31.20
24.38	(80.00)	12.00	426.72	(1400.00)	34.80
30.48	(100.00)	15.40	609.60	(2000.00)	46.20

DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.64	(2.09)	147.18	13.75	(45.12)	10.45
0.94	(3.07)	67.46	20.18	(66.22)	19.91
1.38	(4.51)	61.37	29.63	(97.20)	28.77
2.02	(6.62)	88.65	43.49	(142.67)	36.36
2.96	(9.72)	99.48	63.83	(209.41)	38.20
4.35	(14.27)	59.15	93.69	(307.37)	29.39
6.38	(20.94)	16.23	137.51	(451.16)	21.32
9.37	(30.74)	6.27	201.84	(662.22)	27.36
			99999.00	(99999.00)	73.26





AB/2, m	(ft)	App. Res.	AB/2, m	(ft)	App. Res.
0.91	(3.00)	213.00	42.67	(140.00)	22.20
1.22	(4.00)	203.00	30.48	(100.00)	20.70
1.83	(6.00)	179.00	42.67	(140.00)	21.20
2.44	(8.00)	146.00	60.96	(200.00)	22.00
3.05	(10.00)	115.00	91.44	(300.00)	23.00
3.05	(10.00)	122.00	91.44	(300.00)	23.40
4.27	(14.00)	75.80	121.92	(400.00)	25.50
6.10	(20.00)	57.20	182.88	(600.00)	32.70
9.14	(30.00)	39.60	243.84	(800.00)	53.10
12.19	(40.00)	28.70	304.80	(1000.00)	46.90
18.29	(60.00)	26.90	426.72	(1400.00)	84.00
24.38	(80.00)	27.50	304.80	(1000.00)	32.50
30.48	(100.00)	15.50	426.72	(1400.00)	40.70

DEPTH, m	(ft)	RESIS.	DEPTH, m	(ft)	RESIS.
0.45	(1.47)	160.14	9.63	(31.58)	15.83
0.66	(2.15)	175.38	14.13	(46.36)	14.04
0.96	(3.16)	155.87	20.74	(68.04)	13.99
1.41	(4.64)	97.69	30.44	(99.87)	13.39
2.07	(6.80)	52.22	44.68	(146.59)	12.64
3.04	(9.99)	36.20	65.58	(215.16)	14.69
4.47	(14.66)	27.60	96.26	(315.81)	22.46
6.56	(21.52)	19.82	141.29	(463.55)	40.25
			99999.00	(99999.00)	75.21