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COMMUNITIES BRUSSELS

FEDERAL DEPARTMENT OF WATER
RESOURCES LAGOS

FDWR/EDF WATER RESOURCES PROJECT

GROUNDWATER RESEARCH
DEPARTMENT
National Water Resources Institute
Kaduna

FINAL REPORT
Volume III
Geophysical Data

July 1986

This report consists of three volumes:

Volume I Text and Appendices

Volume II Borehole Completion Reports

Volume III Geophysical Data

VOLUME III
GEOPHYSICAL DATA

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Figure III.1 Location of Geophysical Survey Areas

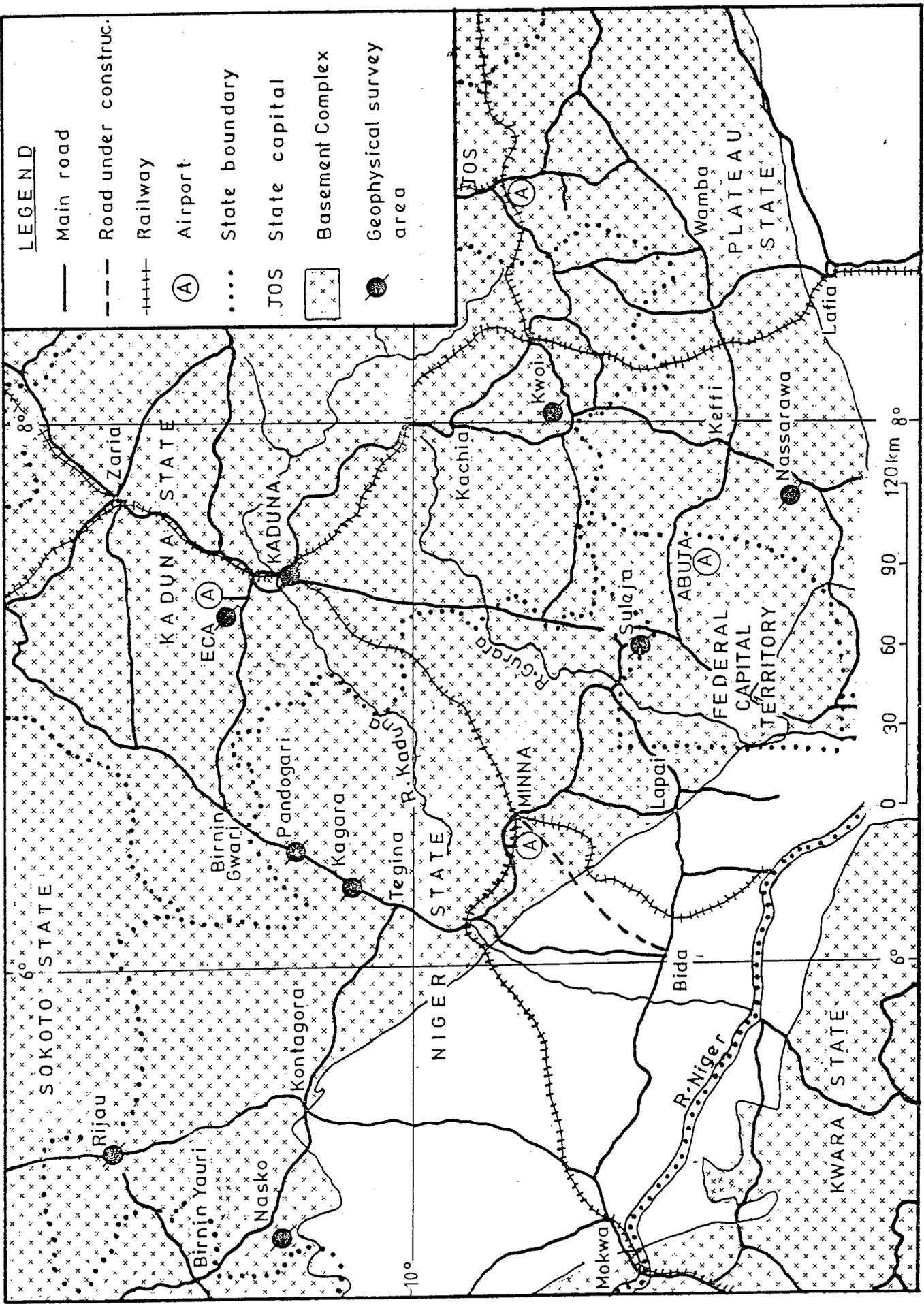
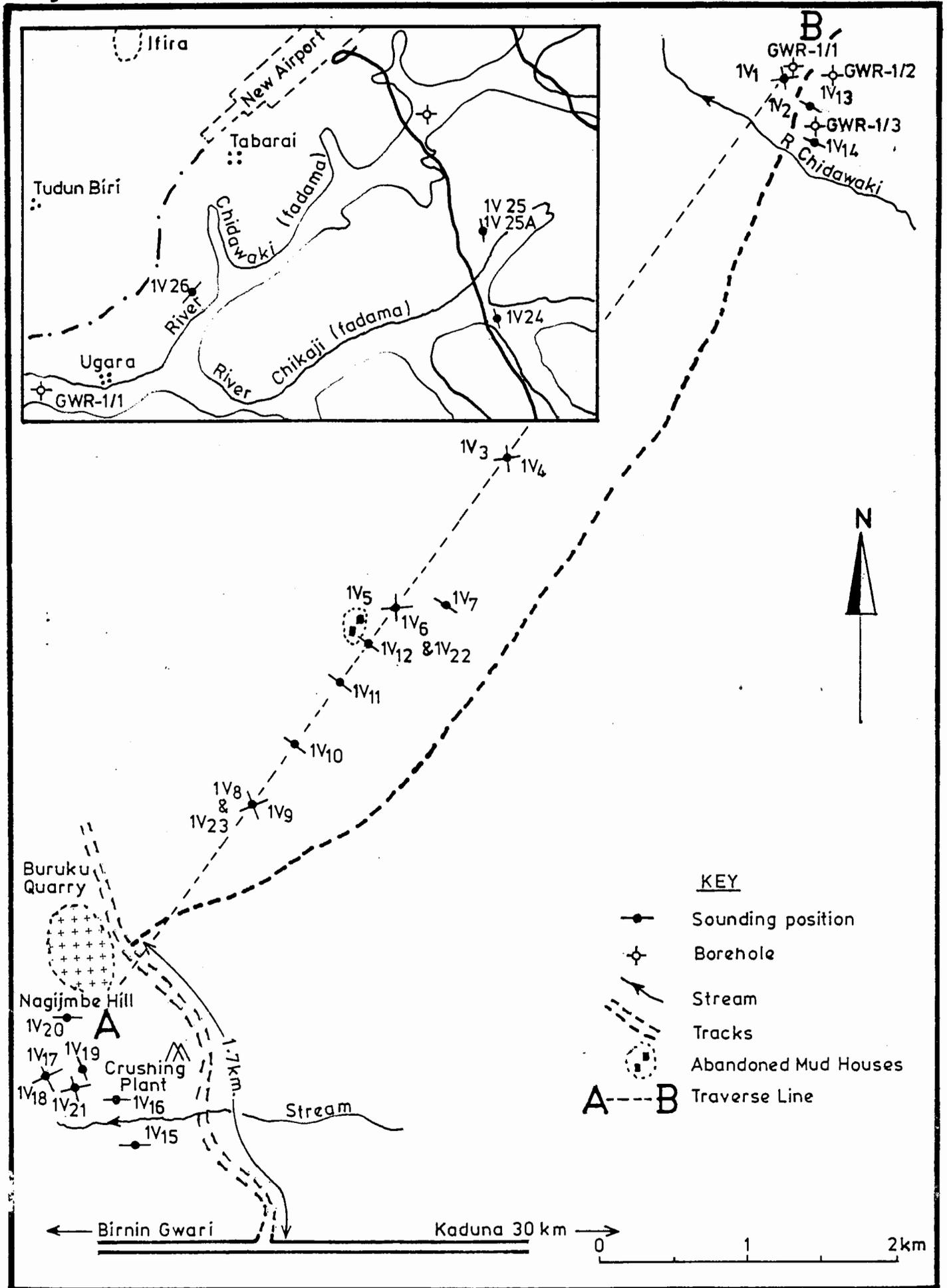
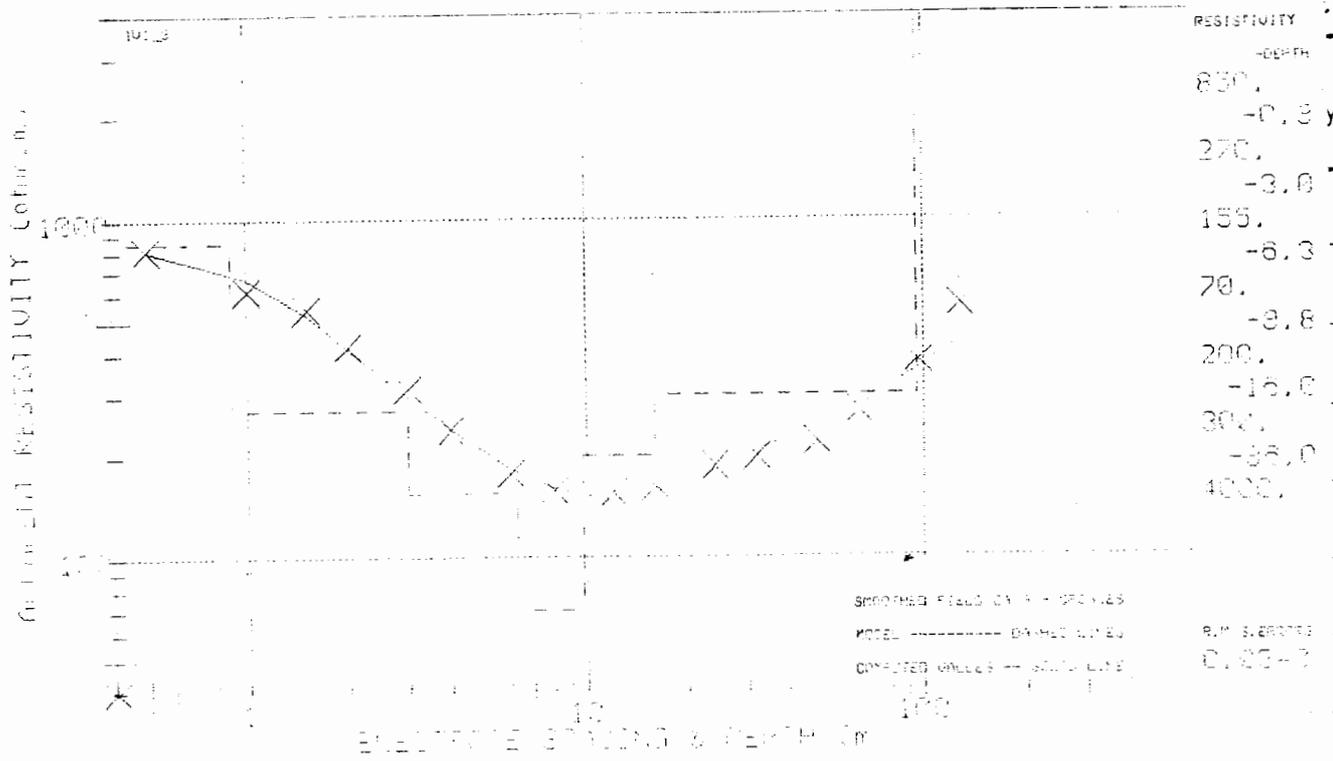


Figure III-2 ECA - Location of Resistivity Soundings



LOCATION *EXPERIMENTAL CATCHMENT AREA.*
site of GWR-1/1.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.298	-68.7	 	0.5	208.8	 	
2	0.016	0.103	-99.942	1	609.8	1.5	537.2
3	-0.266	-0.299	-24.122	2	420.3	3	313.6
4	0.00	-10.347	-25.818	4	235.6	6	176.0
5	-0.376	-4.173	-35.152	8	156.6	12	154.7
6	-3.170	12.332	-14.856	16	160.6	24	185.7
7	-0.774	33.673	-3.901	32	197.0	48	276.6
8	1.728	20.586	-15.319	64	267.6	96	374.9
9	0.078	-136.209	66.061	128	553.7	192	3698.5
10			 	256	6186.4	384	
R. m. s. errors	1.320	28.650	43.00	512		 	



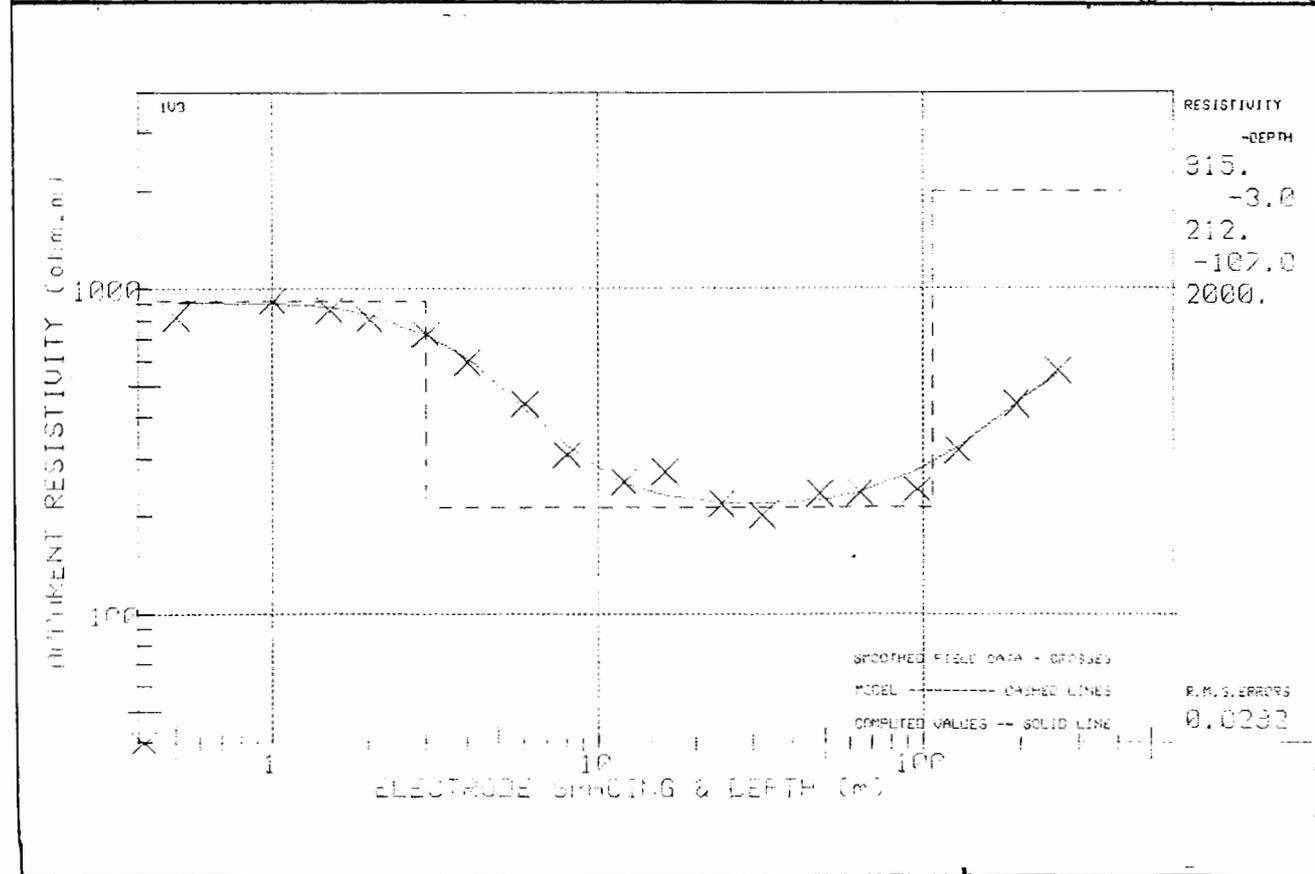
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V3**

LOCATION EXPERIMENTAL CATCHMENT AREA.
625 m. from GWR-1/1 (along traverse towards Najjim be Hill).

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.029	-3.831	24.387	0.5	820	0.5	820
2	-0.375	-11.813	24.387	1	914.8	1.5	857.2
3	-0.145	-12.334	-39.713	2	804.9	3	727.8
4	1.276	-17.797	-17.741	4	593.1	6	439.8
5	-2.000	-27.451	-62.824	8	307.6	12	253.8
6	-6.188	-76.900	97.906	16	273.7	24	216.3
7	-0.286	47.887	48.720	32	199.9	48	233.6
8	-0.323	41.373	53.173	64	234.2	96	239.4
9	-2.504	29.658	-25.302	128	317.3	192	438.3
10				256	554.6	384	
R. m. s. errors	2.370	36.780	52.273	512			



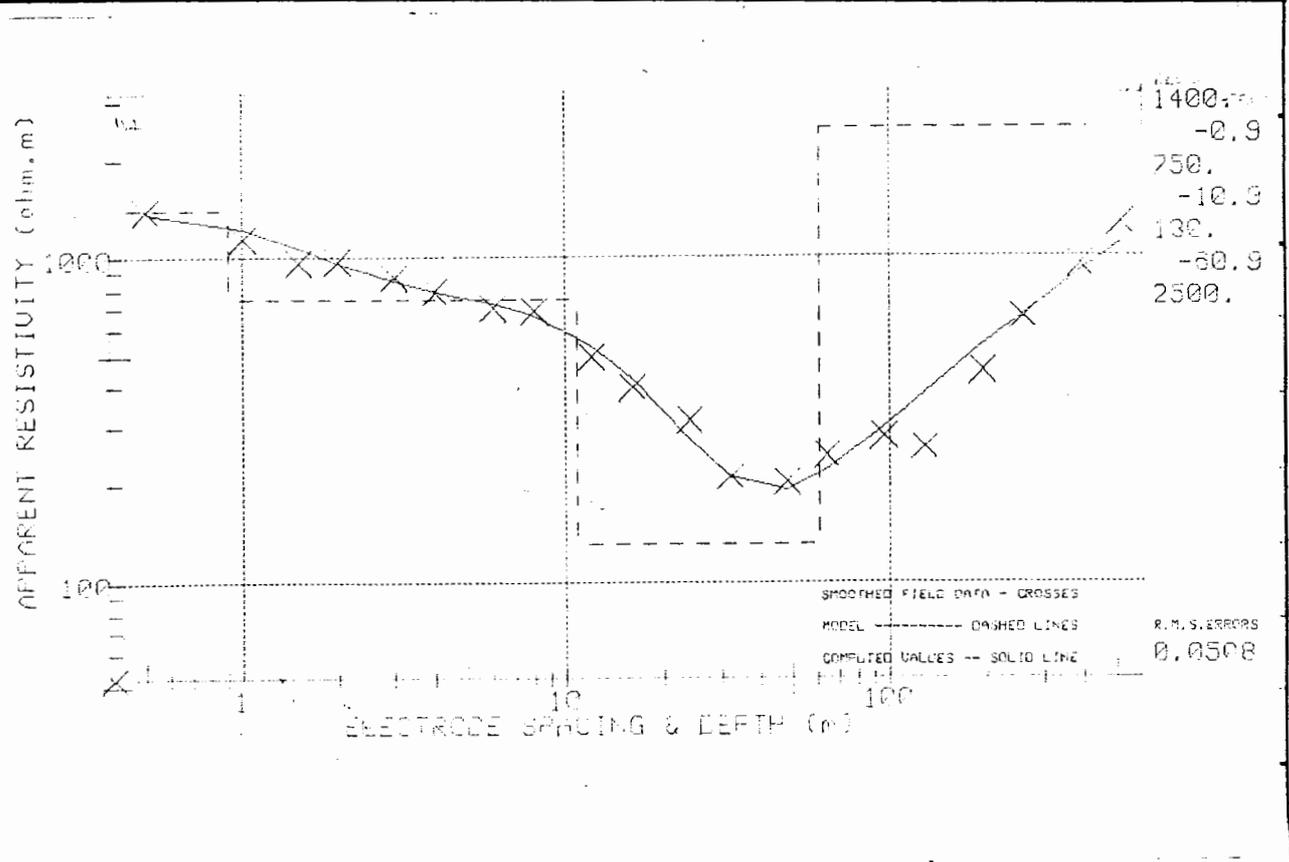
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V4**

LOCATION **EXPERIMENTAL CATCHMENT AREA.**
625m. from GWR-1/1 (along traverse towards Najjimbe Hill)

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.22	-0.68	 	0.5	1387	 	
2	0.03	-6.14	-19.62	1	1136	1.5	964
3	0.07	2.84	14.01	2	973	3	871
4	0.05	0.64	1.70	4	789	6	704
5	-0.06	-12.29	55.97	8	687	12	493
6	-0.43	-19.29	-110.39	16	396	24	314
7	-0.10	-44.52	19.47	32	210	48	203
8	-0.79	-31.35	-30.29	64	244	96	280
9	0.20	45.94	8.86	128	259	192	444
10			 	256	656	384	941
R. m. s. errors	0.32	25.04	46.47	512	1262	 	



COMMENTS

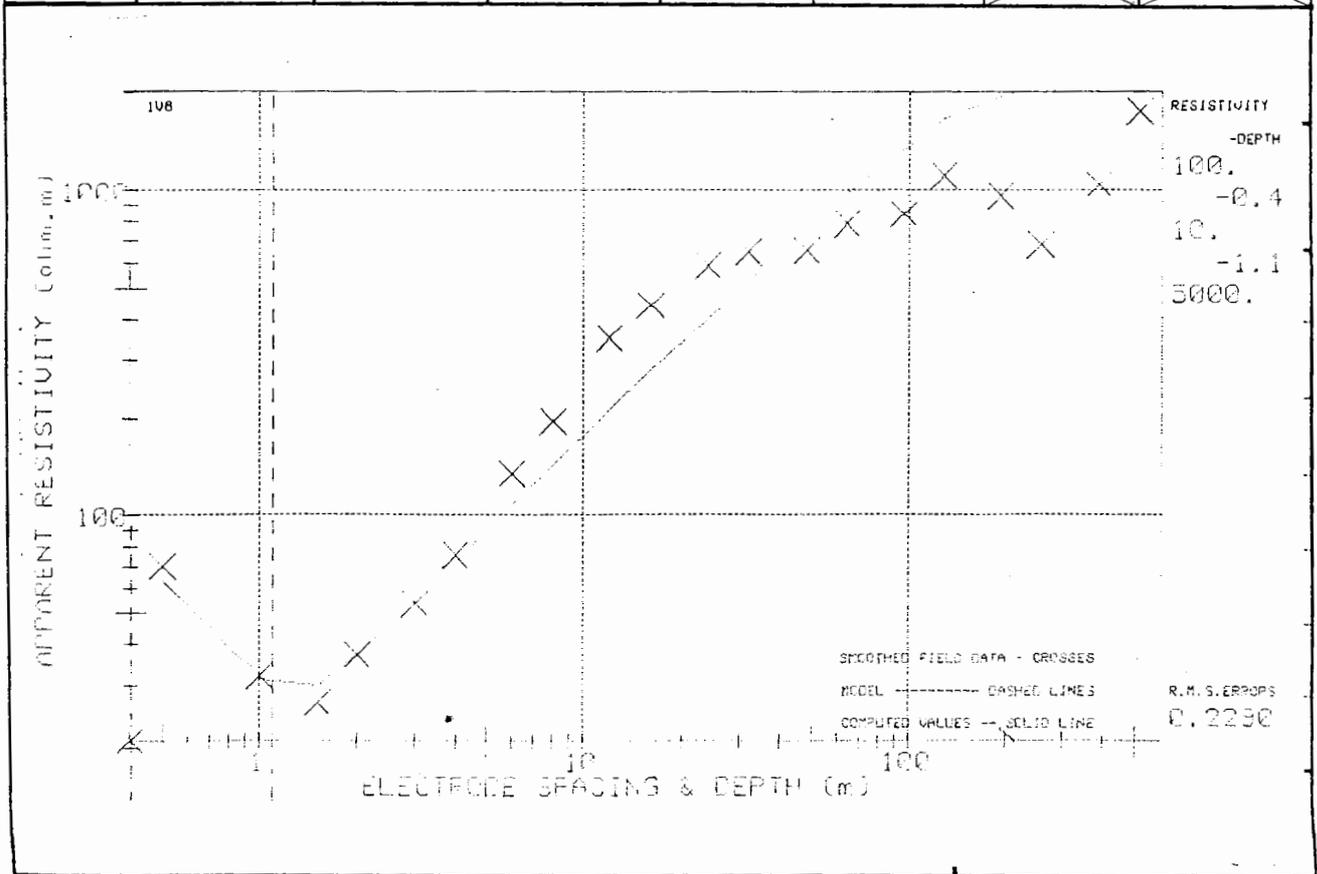
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

Data Reduction & Interpretation

No. **1V6**

LOCATION **EXPERIMENTAL CATCHMENT AREA.**
875 m. from GWR-1/2 [along traverse towards N/be Hill]

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	3.67	29.94	147.24	0.5	69.7	1.5	26.4
2	-2.53	51.78	147.24	1	31.8	1.5	26.4
3	0.57	-2.73	51.07	2	36.8	3	53.2
4	-1.39	0.33	-15.35	4	75.5	6	133.9
5	0.05	-31.01	7.41	8	194.5	12	351
6	0.05	-39.46	28.29	16	443	24	586
7	1.55	6.25	41.79	32	643	48	650
8	-2.71	-17.72	38.45	64	783	96	839
9	9.56	-98.18	34.55	128	1106	192	959
10	1.42	-16.84	-254.15	256	678	384	1033
R. m. s. errors	3.54	40.47	102.41	512	1740	384	1033



COMMENTS

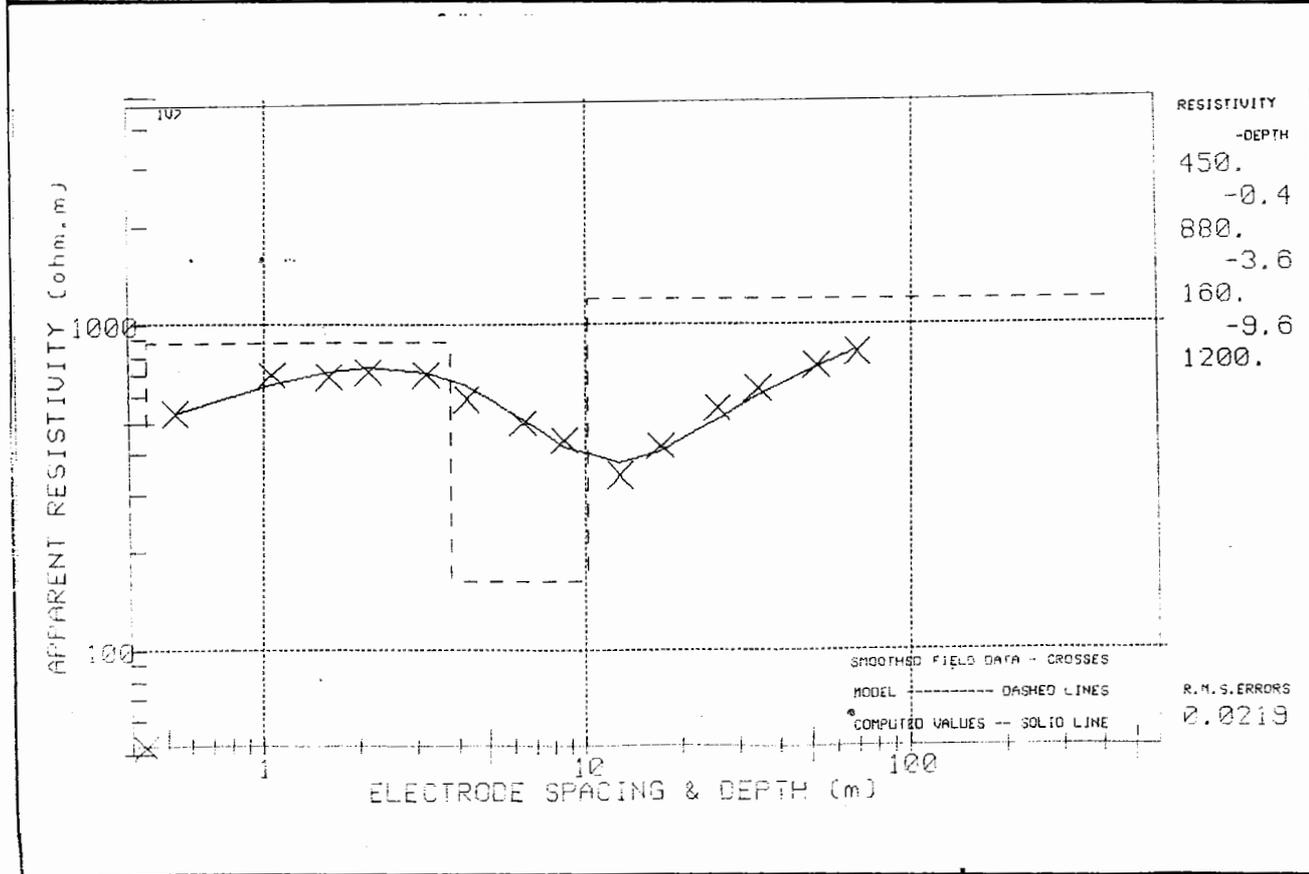
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

Data Reduction & Interpretation

No. **1V7**

LOCATION EXPERIMENTAL CATCHMENT AREA-
8m. EAST of 1V5/6

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.18	-8.30	 	0.5	534	 	
2	0.49	8.80	36.27	1	707	1.5	694
3	-0.46	17.19	-39.01	2	716	3	701
4	-0.23	-8.14	-2.28	4	587	6	496
5	-0.02	13.13	81.05	8	436	12	342
6	-0.17	13.43	-4.03	16	419	24	550
7	-0.18	7.31	16.35	32	632	48	749
8				64	821	96	
9				128		192	
10				256		384	
R. m. s. errors	0.29	11.43	40.20	512			



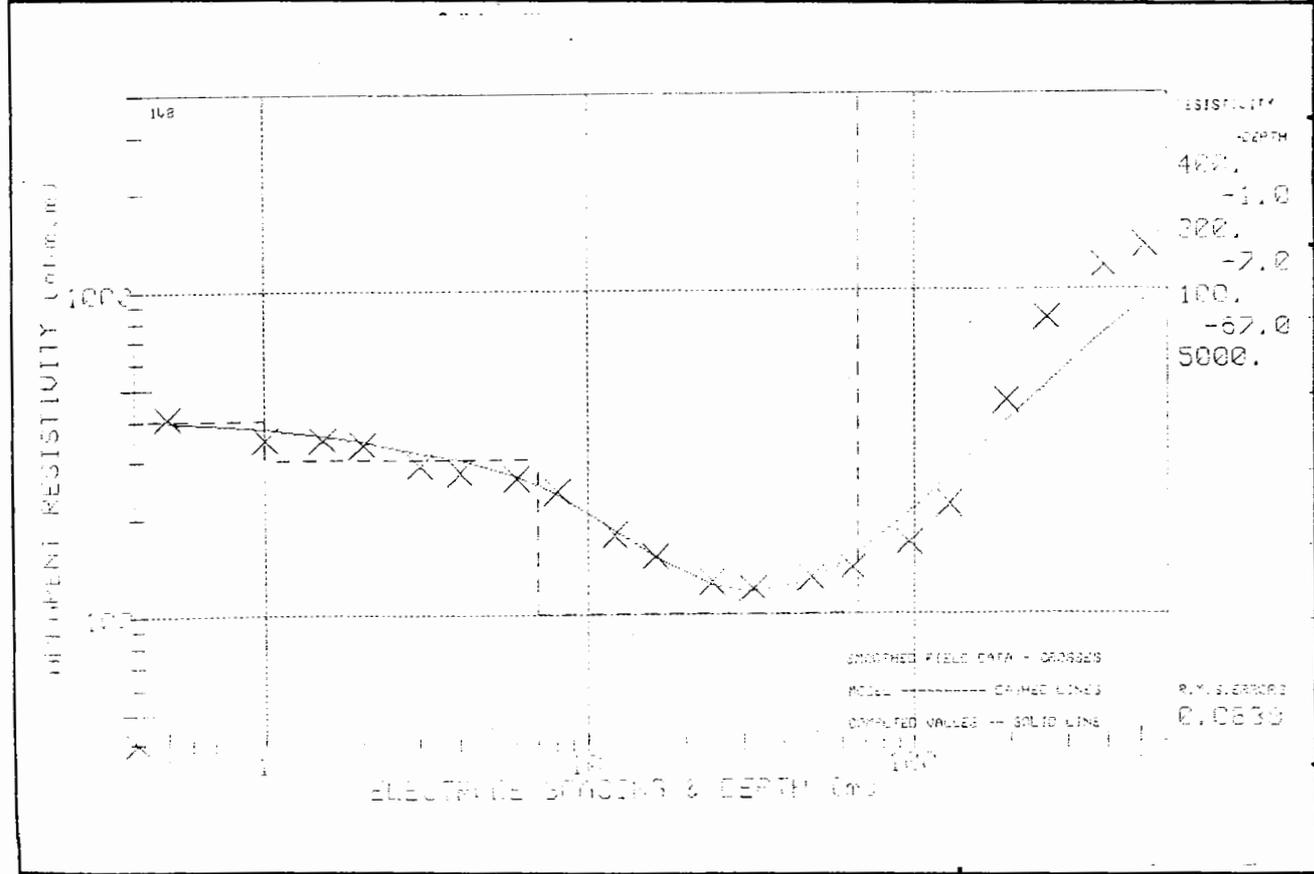
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V8**

LOCATION EXPERIMENTAL CATCHMENT AREA
1200 m. from GWR-1/1 towards Nagjimbé Hill

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.17	70.0	27.26	0.5	409	1.5	345
2	0.63	5.96	27.26	1	348	1.5	345
3	-1.29	34.72	53.64	2	333	3	287
4	-0.22	19.47	-23.42	4	272	6	262
5	-0.21	20.86	56.94	8	239	12	176.3
6	-0.05	9.73	-46.41	16	150.9	24	125.6
7	-2.35	14.43	72.02	32	119.8	48	130.2
8	-1.03	22.61	2.59	64	138.7	96	166.3
9	1.24	2.23	-0.02	128	216	192	454
10	-2.67	27.44	41.33	256	815	384	117.5
R. m. s. errors	1.32	29.26	42.77	512	1351	512	1351



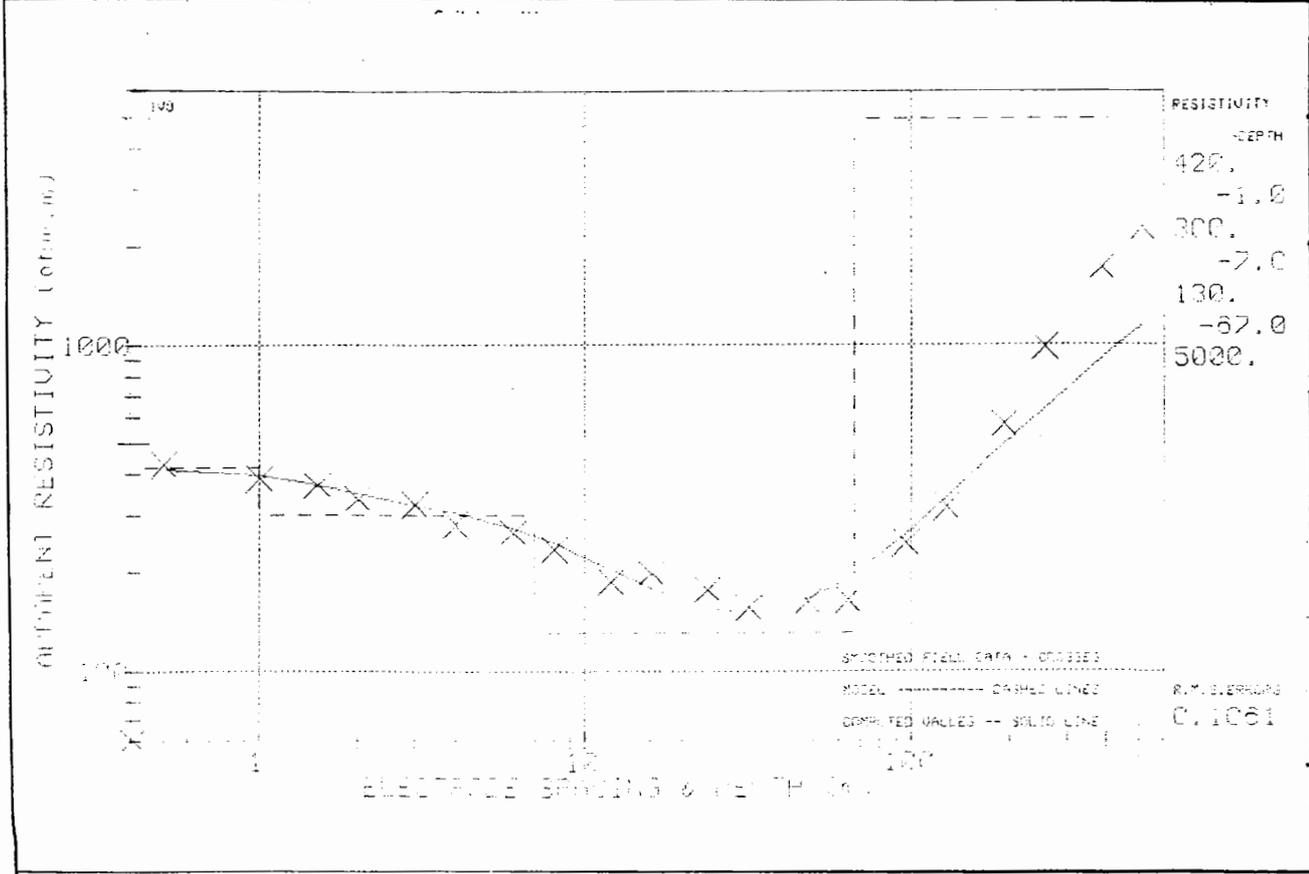
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V9**

LOCATION EXPERIMENTAL CATCHMENT AREA.
1200m. from GWR-1/1 towards Ngjimbé Hill

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.05	-7.52	 	0.5	426	 	
2	-0.10	-28.34	-33.52	1	383.6	1.5	367.6
3	0.14	-11.68	-59.75	2	333.6	3	321.3
4	-0.29	-15.52	-19.06	4	281.7	6	265.2
5	-0.10	-18.65	29.62	8	234.5	12	185.9
6	-0.17	-28.25	-11.81	16	198.2	24	176.2
7	0.38	-24.74	-91.73	32	154.4	48	161.6
8	-2.91	-0.49	-54.10	64	162.9	96	245.2
9	-0.50	-2.04	21.49	128	315.3	192	566.9
10	0.67	70.40	3.28	256	975.6	384	1729.4
R. m.s. errors	0.97	28.21	44.66	512	2282.2	 	



COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

Data Reduction & Interpretation

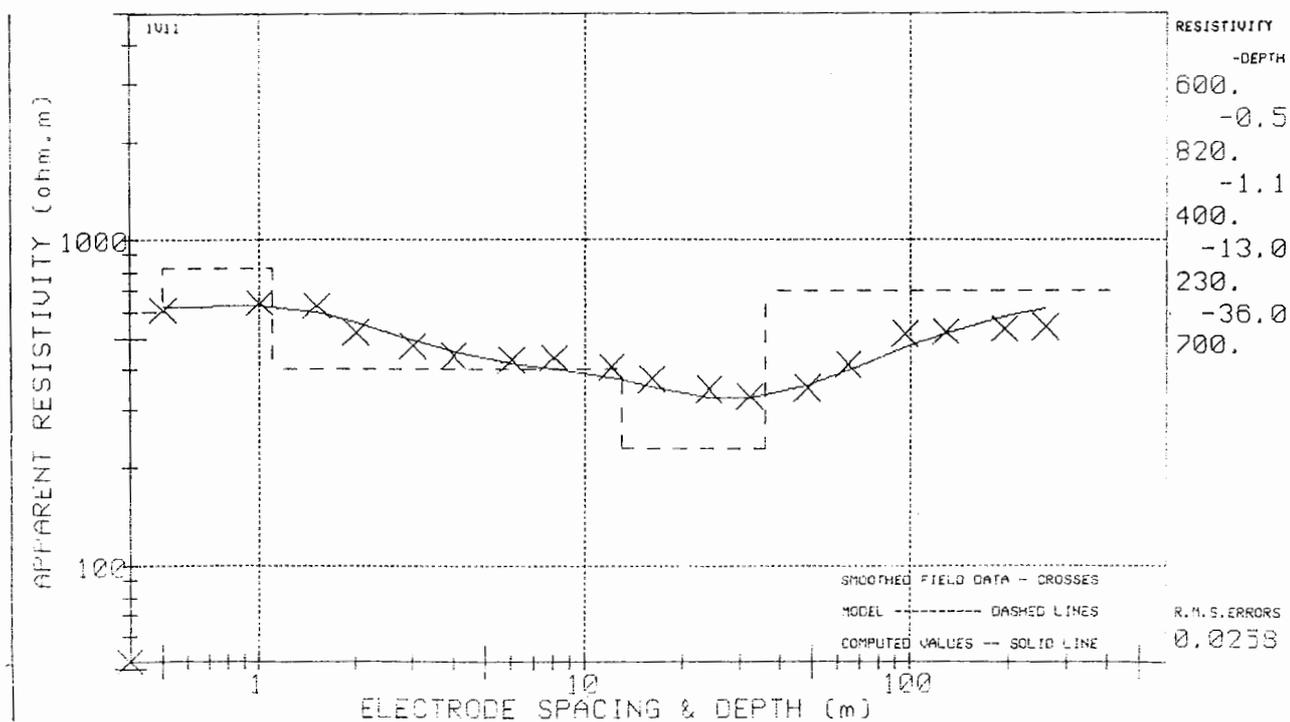
No.

1V11

LOCATION *EXPERIMENTAL CATCHMENT AREA.*

1000 m. from GWR-1/1 towards Nagjimbe Hill

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.057	23.884	 	0.5	609.0	 	
2	0.096	-11.431	-48.952	1	643.1	1.5	628.2
3	0.098	-23.245	-25.478	2	519.0	3	470.7
4	-0.250	21.041	26.548	4	439.6	6	424.1
5	-0.103	-5.581	0.400	8	432.3	12	402.5
6	0.108	6.242	-27.779	16	370.5	24	344.2
7	-0.262	20.821	18.267	32	328.3	48	349.5
8	0.070	-17.595	-8.335	64	411.4	96	512.8
9	0.180	-44.376	11.723	128	522.0	192	532.8
10			 	256	539.6	384	
R. m. s. errors	0.109	22.278	25.156	512		 	



COMMENTS

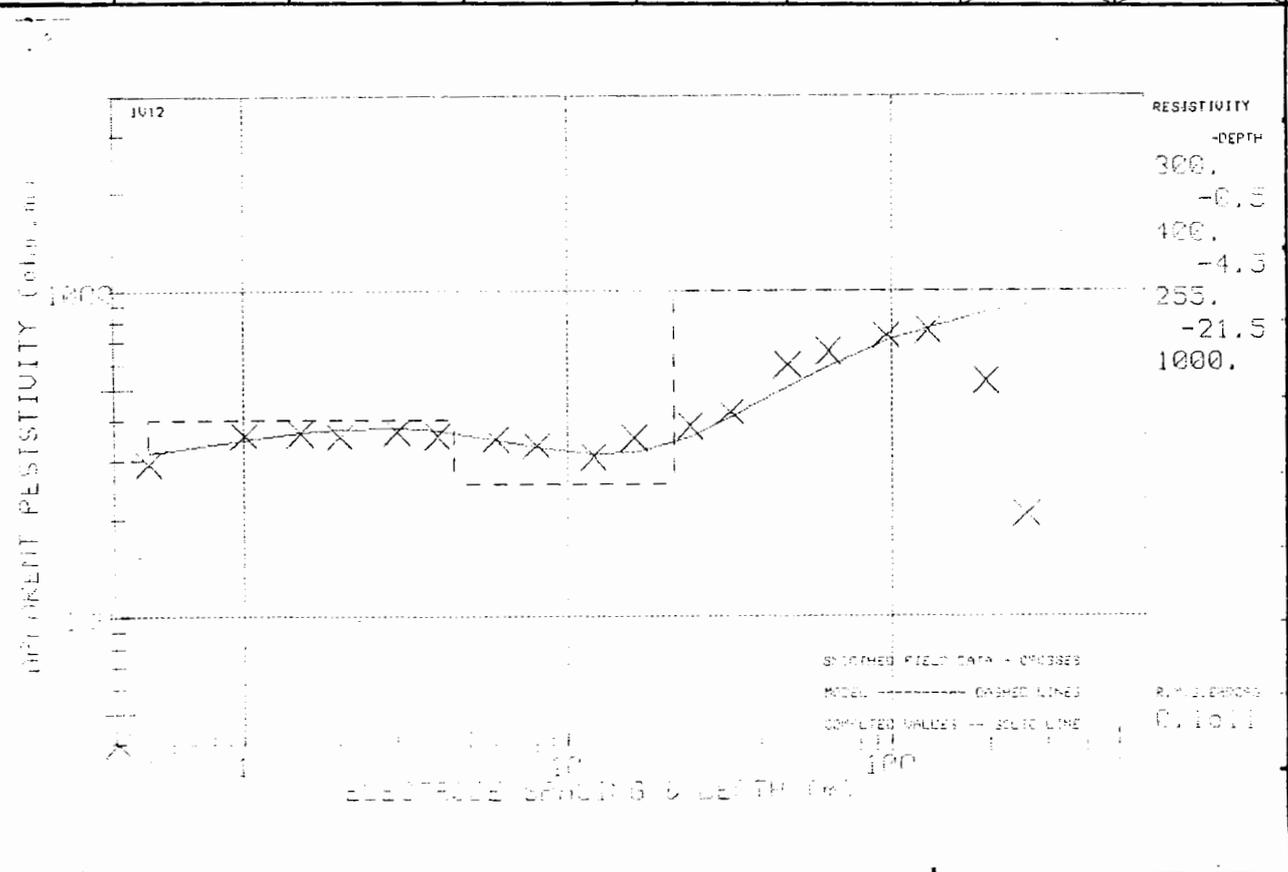
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No.

1V12

LOCATION EXPERIMENTAL CATCHMENT AREA.
937.5 m. from GWR-1/1 towards Nagjimbé Hill

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.061	-51.453	 	0.5	291.9	 	
2	0.062	-22.339	-7.080	1	357.2	1.5	362.7
3	-0.247	-12.478	-37.424	2	352.5	3	366.4
4	-0.005	-36.184	17.906	4	355.6	6	346.2
5	0.036	-7.587	12.912	8	331.2	12	305.8
6	-0.150	-39.542	26.566	16	350.9	24	380.6
7	0.067	-28.053	-60.888	32	421.4	48	592.7
8	-0.884	-22.305	22.563	64	649	96	726.7
9	-0.678	-26.560	23.566	128	754	192	529.3
10			 	256	206.2	384	
R. m.s. errors	0.386	30.226	30.446	512			



COMMENTS

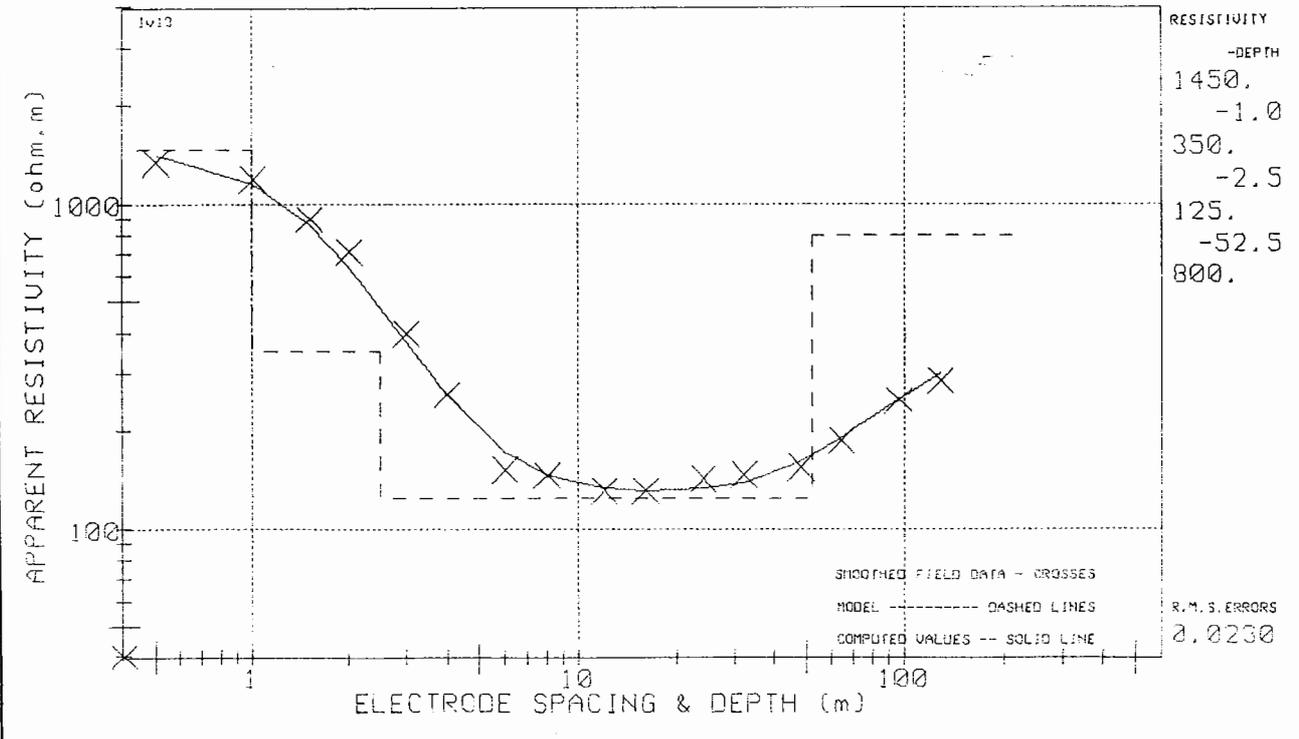
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

Data Reduction & Interpretation

No. **1V 13**

LOCATION **EXPERIMENTAL CATCHMENT AREA.**
566 m. from GWR-1/1 SW. of GWR-1/3.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.108	34.597	 	0.5	1325.8	 	
2	-0.097	12.497	1.859	1	1181.6	1.5	894.3
3	-0.016	-6.946	15.059	2	705.6	3	397.6
4	-0.307	-6.735	58.121	4	257.5	6	152.0
5	-0.802	-6.186	80.149	8	146.3	12	131.6
6	-0.273	0.766	-37.125	16	131.2	24	143.1
7	0.220	-21.282	-28.124	32	147.4	48	154.7
8	-4.487	-14.024	-13.958	64	186.4	96	247.5
9				128	283.4	192	
10			 	256		384	
R. m.s. errors	1.621	16.337	42.082	512		 	



COMMENTS

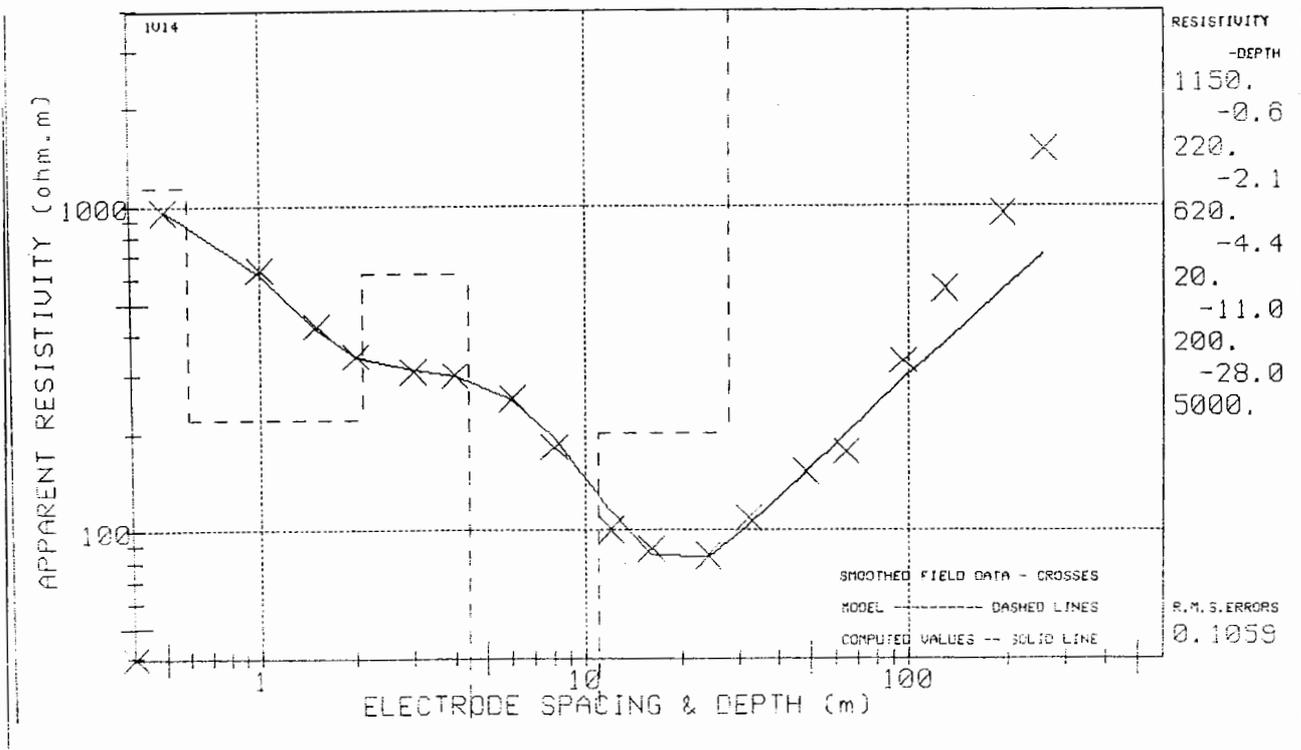
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

Data Reduction & Interpretation

No. **1V14**

LOCATION EXPERIMENTAL CATCHMENT AREA.
Site of GWR-1/B.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.256	-1.307	 	0.5	961.3	 	
2	-0.032	-8.135	-17.993	1	633.4	1.5	426.8
3	0.337	0.368	-50.872	2	341.2	3	306.3
4	-0.074	9.187	-6.302	4	298.2	6	254.3
5	-0.314	14.485	-7.516	8	180.5	12	99.8
6	0.611	-6.178	53.308	16	87.9	24	83.9
7	-1.973	-46.353	-1.760	32	105.9	48	151.5
8	0.534	-39.540	-32.566	64	174.9	96	331.6
9	-1.459	-134.535	37.783	128	557.7	192	948.5
10			 	256	1496.1	384	
R. m. s. errors	0.880	49.679	32.961	512			



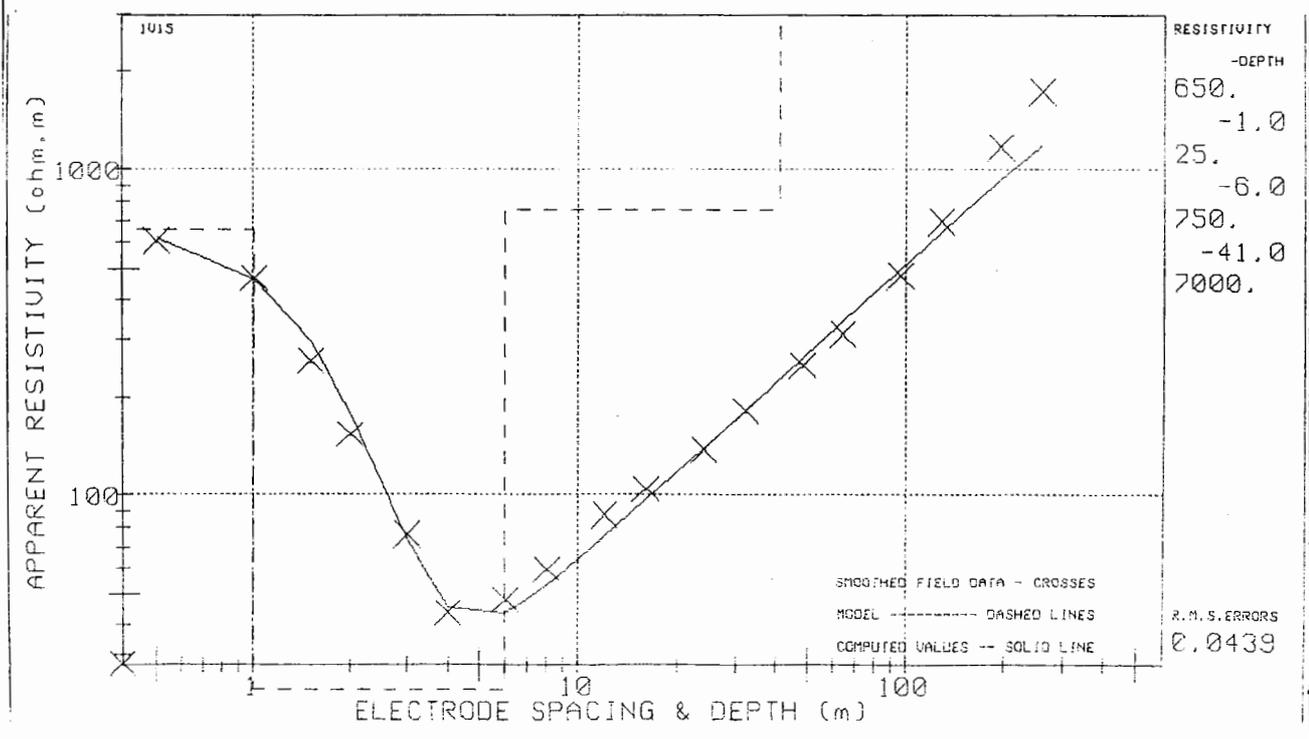
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V15**

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.325	-27.414	33.190	0.5	605.1	0.5	605.1
2	0.056	-5.128	33.190	1	465.6	1.5	255.9
3	-0.022	32.311	-90.169	2	153.6	3	75.9
4	-0.633	-5.399	-50.192	4	43.3	6	47.6
5	-2.572	-8.326	8.184	8	59.2	12	87.0
6	-0.123	-12.819	-1.036	16	104.3	24	137.3
7	-0.215	-24.834	-9.437	32	181.4	48	248.0
8	0.681	-2.460	-6.043	64	310.6	96	474.0
9	-1.100	-7.338	-13.638	128	690.4	192	1176.8
10				256	1736.6	384	
R. m. s. errors	0.702	17.516	38.941	512			



COMMENTS

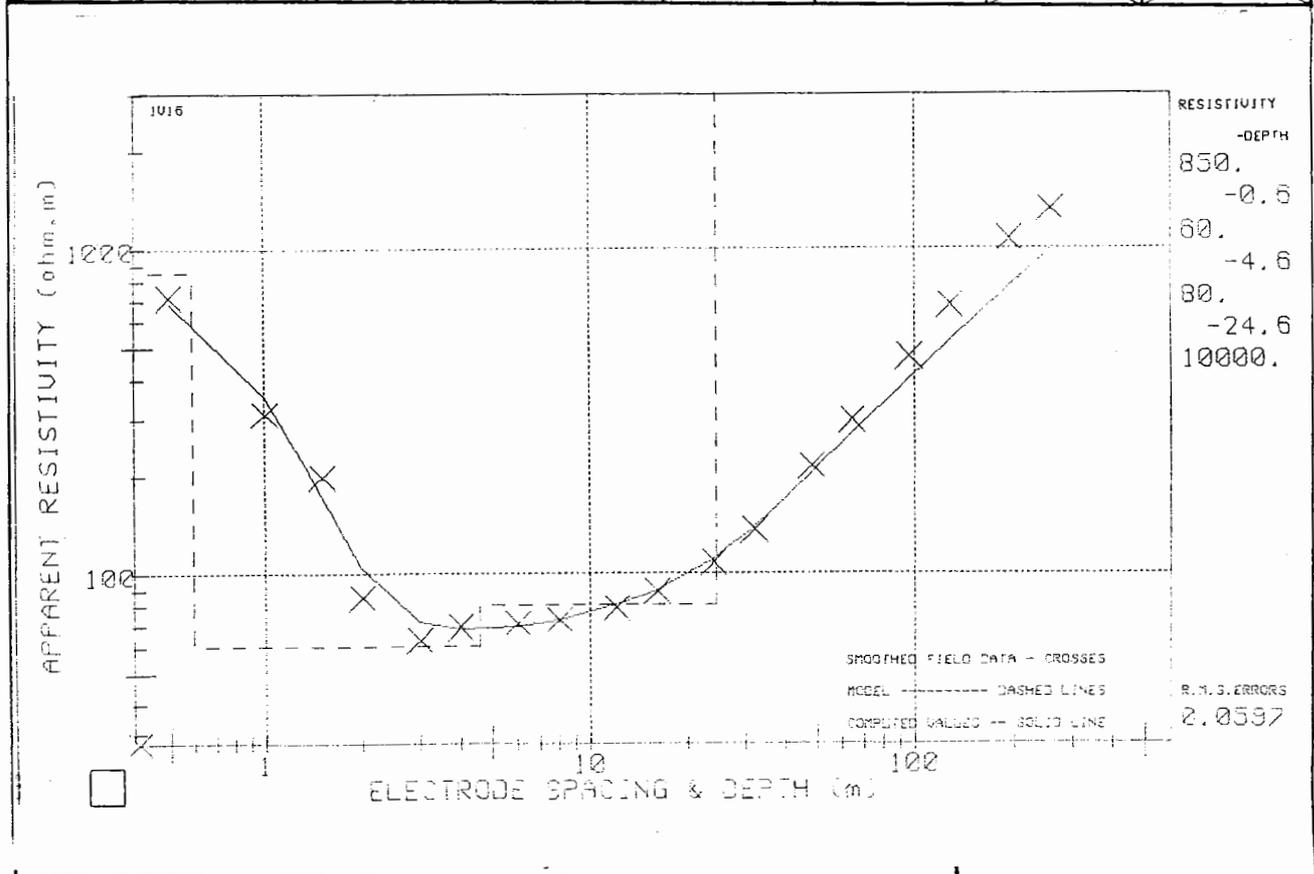
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No.

1V16

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.307	3.091	200.053	0.5	711.6	0.5	711.6
2	0.111	15.193	38.044	1	310.1	1.5	197.3
3	0.039	26.528	62.257	2	84.3	3	62.3
4	-1.123	4.428	-15.194	4	68.1	6	70.1
5	-0.157	-0.843	14.445	8	71.6	12	77.9
6	-0.536	-5.511	-12.156	16	87.6	24	108.0
7	-1.221	-11.521	8.496	32	136.1	48	212.7
8	0.791	-24.523	-16.232	64	245.2	96	461.9
9	-0.298	-11.892		128	669.5	192	1072.0
10				256	1311.4	384	
R. m. s. errors	0.379	14.416	76.049	512			



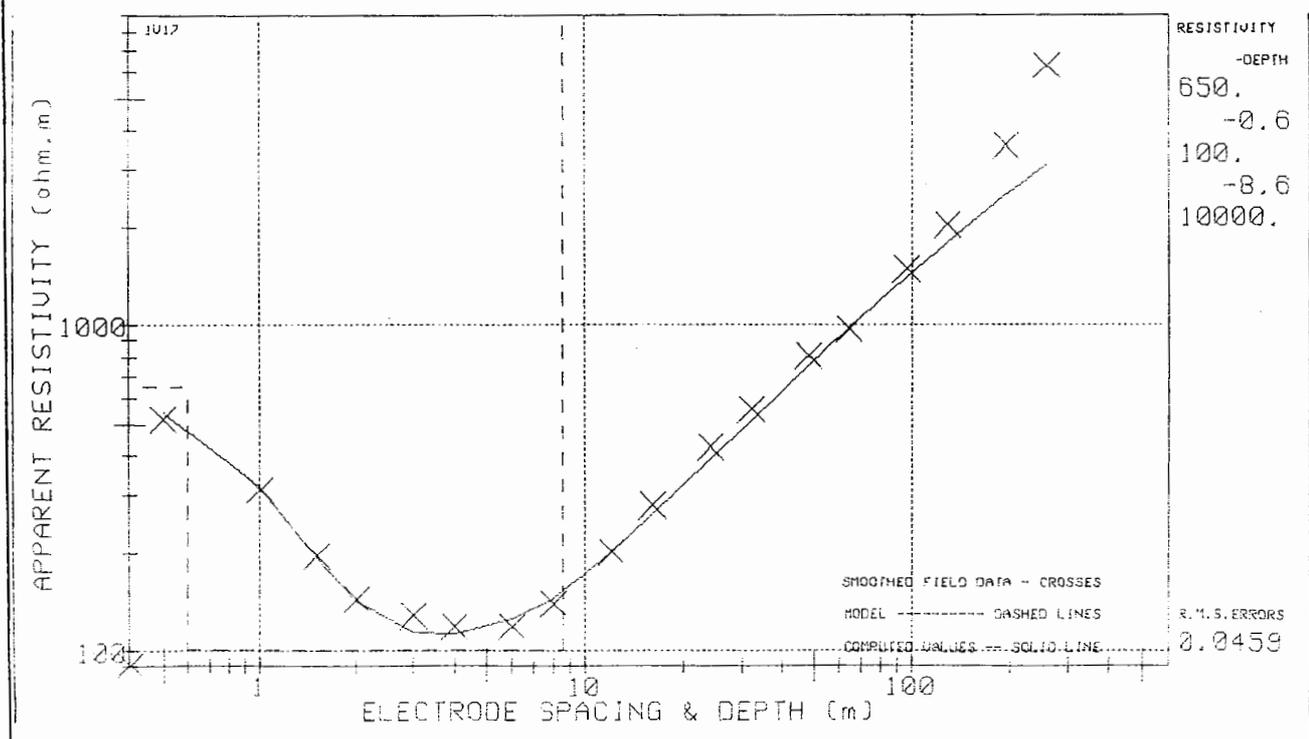
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V17**

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.000	16.371	 	0.5	513.7	 	
2	0.066	20.662	48.245	1	313.2	1.5	196.9
3	-0.037	-22.962	-57.218	2	143.4	3	127.6
4	-0.015	-11.915	69.016	4	118.1	6	118.3
5	-0.423	24.638	-8.661	8	138.7	12	201.7
6	-0.065	-17.266	22.167	16	279.5	24	420.2
7	0.000	0.725	-18.737	32	554.9	48	802.1
8	-0.540	-25.364	-18.919	64	967.1	96	1499.3
9	0.022	-11.858	34.681	128	2034.7	192	3566.1
10			 	256	6242.6	384	
R. m. s. errors	0.237	18.420	40.067	512			



COMMENTS

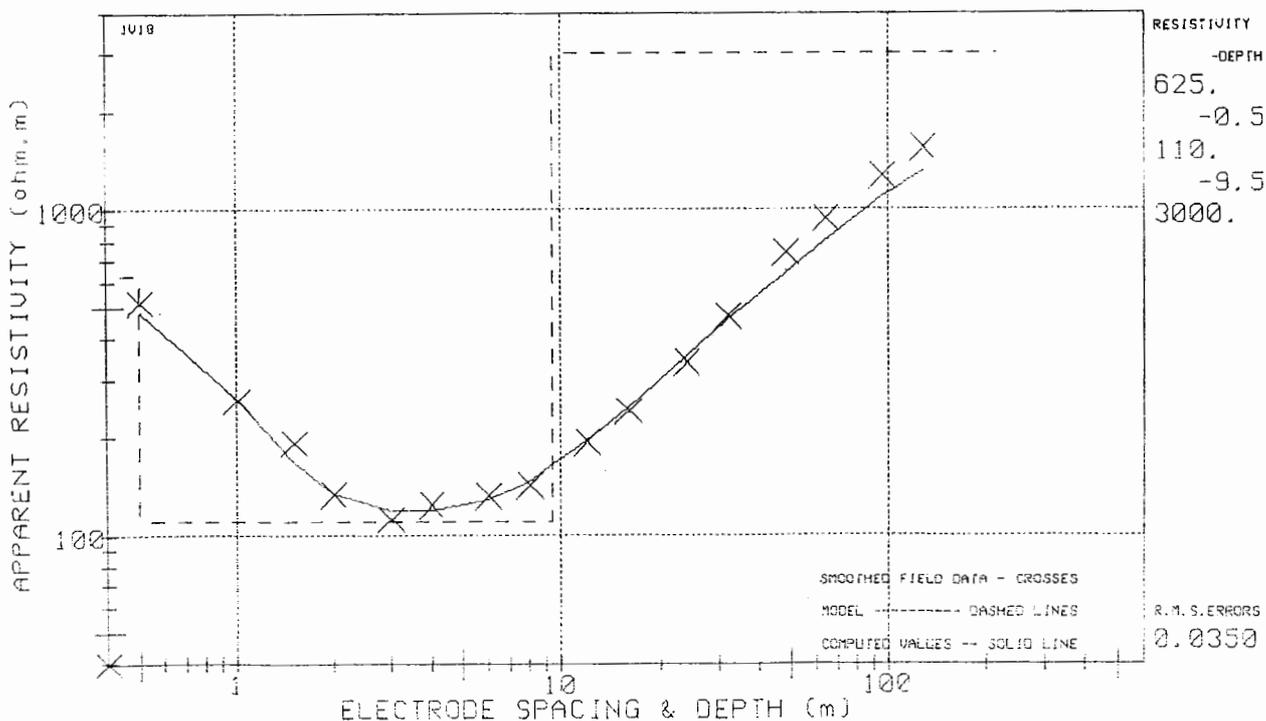
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No.

1V 18

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.053	9.280	 	0.5	514.6	 	
2	0.214	-29.060	-169.314	1	257.3	1.5	189.9
3	-0.037	22.154	126.662	2	132.7	3	111.6
4	0.00	38.047	6.505	4	123.5	6	131.2
5	-0.050	50.089	-39.609	8	141.5	12	191.5
6	-0.076	1.681	21.507	16	239.3	24	337.6
7	-0.082	-18.575	-21.689	32	465.5	48	733.1
8	-0.484	-4.310	7.447	64	932.0	96	1253.0
9				128	1531.4	192	
10				256		384	
R. m.s. errors	0.193	26.797	82.211	512			



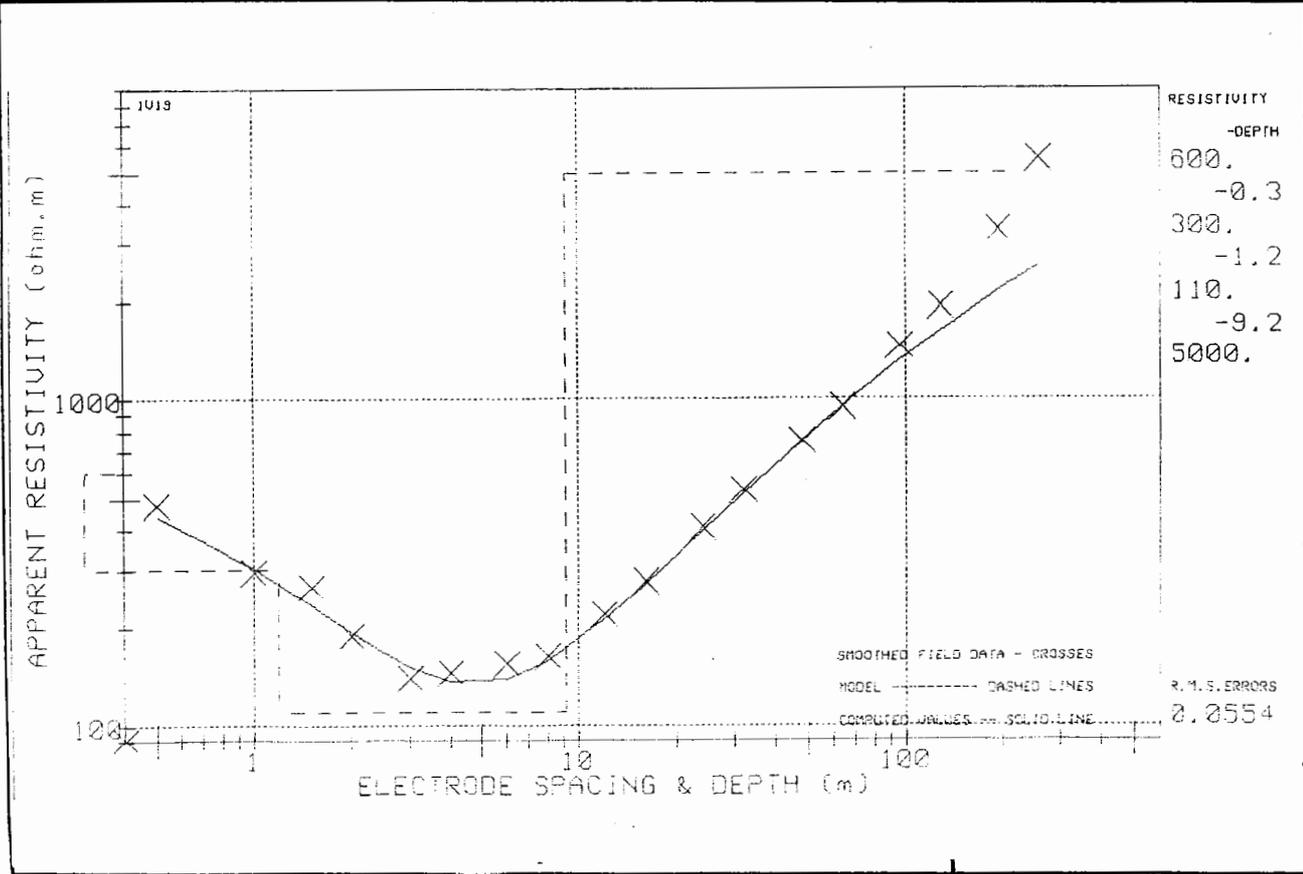
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V19**

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.01	8.33	 	0.5	471	 	
2	0.17	9.61	-83.76	1	294	1.5	267
3	0.01	36.16	152.12	2	188.7	3	139
4	-0.04	-9.57	-1.16	4	144.4	6	154.2
5	-0.06	-10.23	-31.07	8	162.1	12	219
6	0.00	-21.82	0.10	16	276	24	405
7	0.22	4.56	-0.38	32	529	48	745
8	0.03	15.78	-12.94	64	943	96	1454
9	-0.22	19.01	24.34	128	1946	192	3312
10			 	256	5486	384	
R. m. s. errors	0.12	17.55	63.13	512		 	



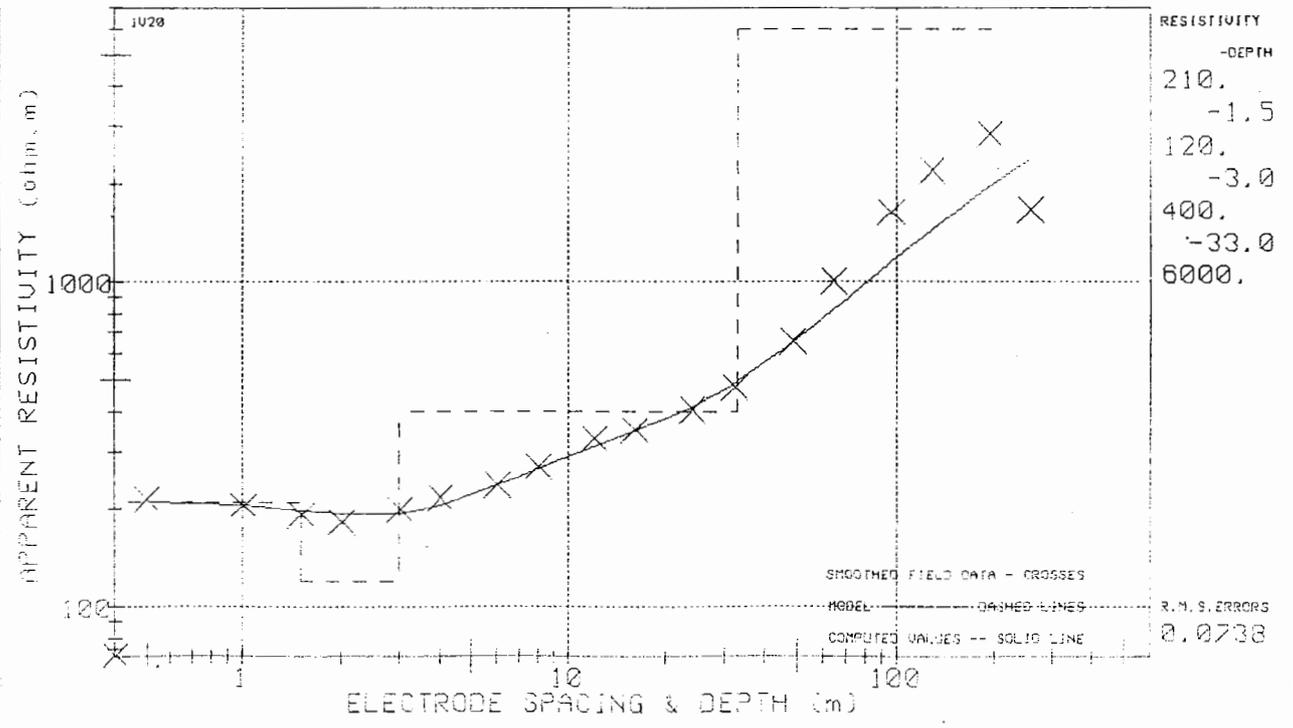
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V20**

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.08	-4.41	53.08	0.5	214	1.5	190.9
2	-0.07	-23.11	-41.72	1	204	1.5	190.9
3	0.01	-10.31	16.88	2	181.5	3	187.9
4	-0.07	-14.85	-19.47	4	215	6	237
5	0.01	0.19	7.56	8	270	12	330
6	-0.016	11.73	45.03	16	351	24	405
7	-0.03	8.14	15.01	32	469	48	656
8	-0.14	-17.17	-22.56	64	1007	96	1635
9	0.15	-22.95		128	2208	192	2845
10				256	1665	384	
R. m. s. errors	0.10	14.55	31.70	512			



COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)

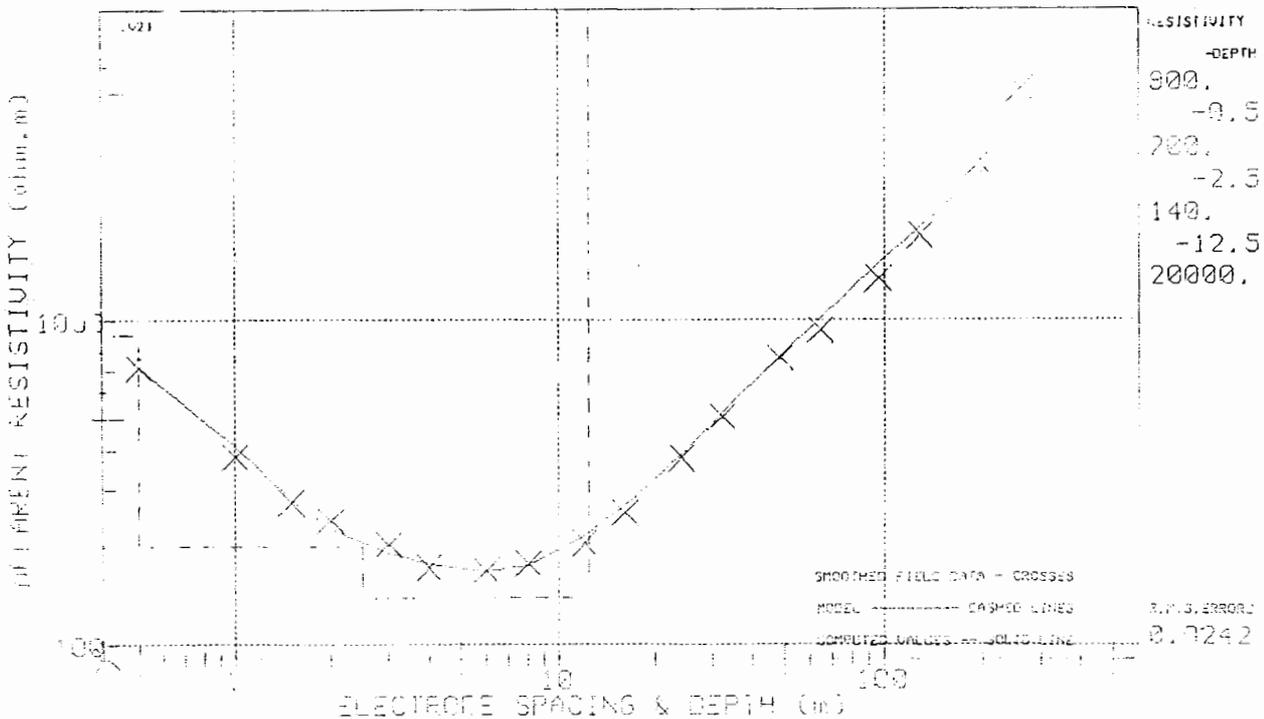
Data Reduction & Interpretation

No.

1V21

LOCATION EXPERIMENTAL CATCHMENT AREA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.075	21.634	 	0.5	711.6	 	
2	0.233	41.653	98.627	1	380.1	1.5	274.3
3	0.206	23.091	5.333	2	241.1	3	204.5
4	-0.011	20.930	-26.139	4	172.4	6	169.3
5	0.115	19.774	18.671	8	177.9	12	205.3
6	-0.146	3.150	-15.974	16	255.3	24	375.0
7	-0.130	23.293	-0.983	32	500.6	48	759.8
8	0.378	1.732	8.425	64	928.9	96	1328.6
9	-0.067	-8.889	20.350	128	1809.6	192	3050.8
10			 	256	5078.7	384	
R. m.s. errors	0.183	21.602	37.962	512		 	



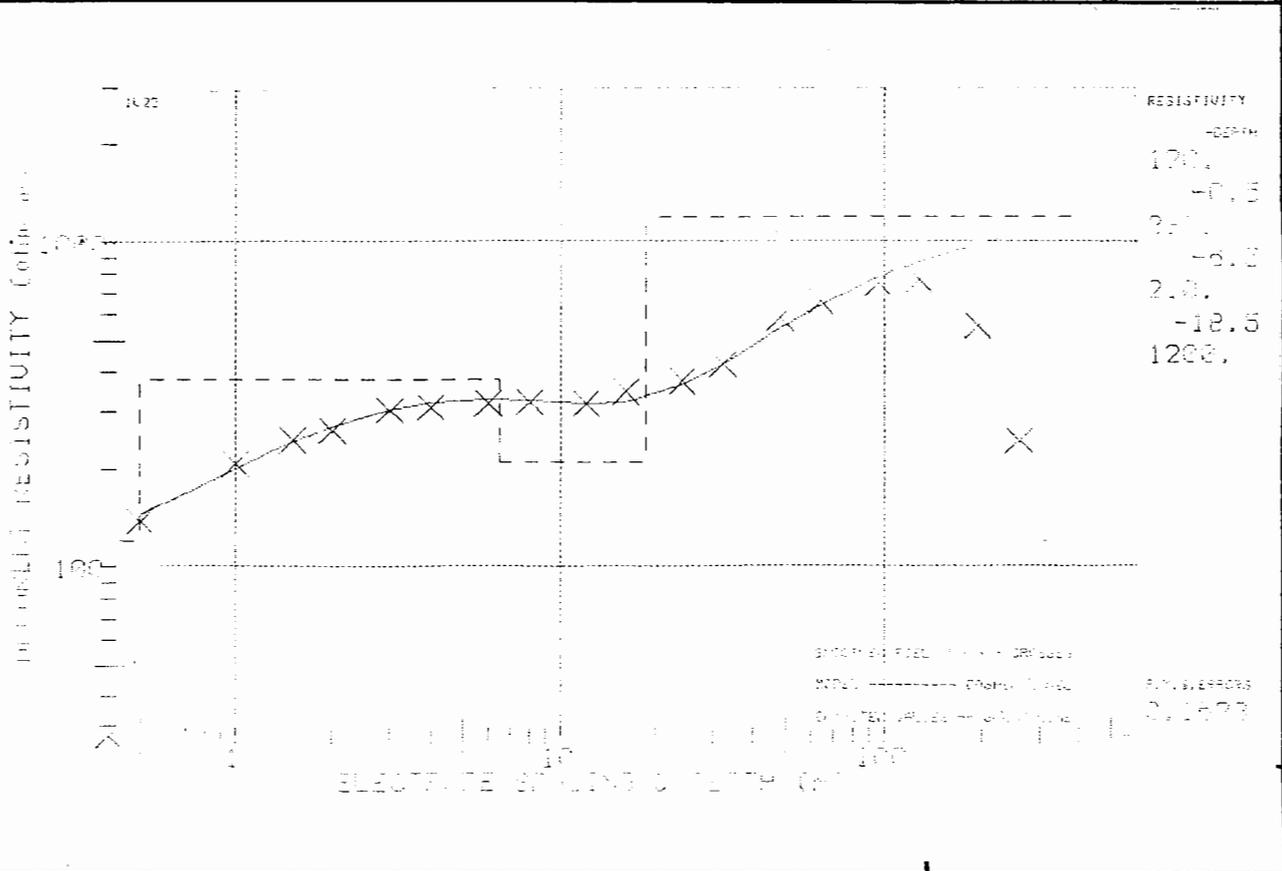
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. 1V22

LOCATION EXPERIMENTAL CATCHMENT AREA.
AT POSITION OF 1V22.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.14	-33.37	 	0.5	138.4	 	
2	0.16	-26.85	-6.23	1	208.0	1.5	244.0
3	0.00	-13.36	-21.94	2	262.0	3	303.0
4	0.05	-27.16	19.09	4	310.0	6	318.0
5	0.03	-3.93	-0.67	8	319.0	12	316.0
6	-0.06	-39.77	32.31	16	346.0	24	372.0
7	0.07	-26.88	-43.33	32	422.0	48	583.0
8	-0.14	-22.87	18.06	64	651.0	96	740.0
9	0.00	-25.91	17.37	128	760.0	192	551.0
10			 	256	243.0	384	
R. m.s. errors	0.09	26.38	23.54	512		 	



COMMENTS

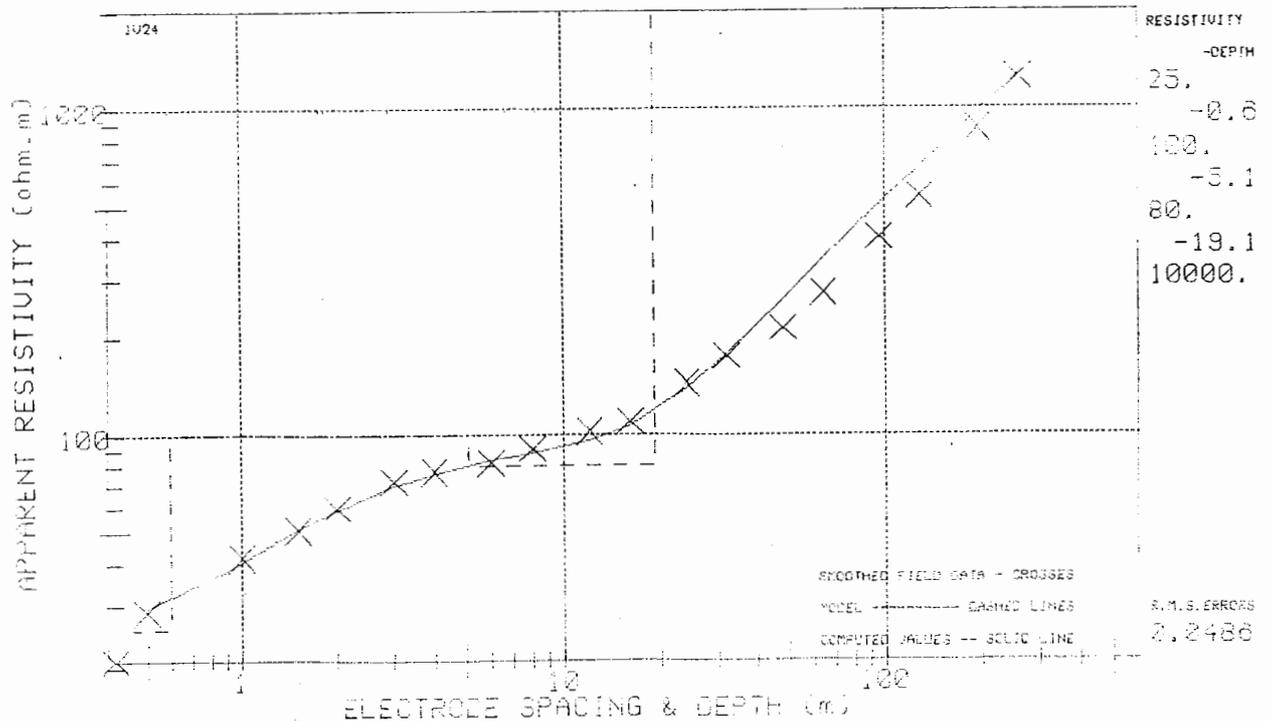
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No.

1V24

LOCATION ON NEW AIRPORT ROAD BY RIVER CHIDAWAKI (KADUNA STATE)

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-3.01	11.83	25.77	0.5	28.4	0.5	28.4
2	-0.05	10.21	25.77	1	41.8	1.5	50.5
3	-0.08	-2.32	-7.19	2	59.5	3	71.7
4	0.07	1.64	14.06	4	76.8	6	81.7
5	-0.12	7.40	1.32	8	90.3	12	101.5
6	-0.07	-37.60	-9.14	16	109.1	24	142
7	-0.08	-19.07	44.76	32	172.9	48	211
8	-0.01	-18.26	-23.69	64	271	96	399
9	-0.10	-18.75	-2.46	128	536	192	862
10	—	—	—	256	1242	384	—
R. m.s. errors	1.01	17.54	21.12	512	—	—	—



COMMENTS

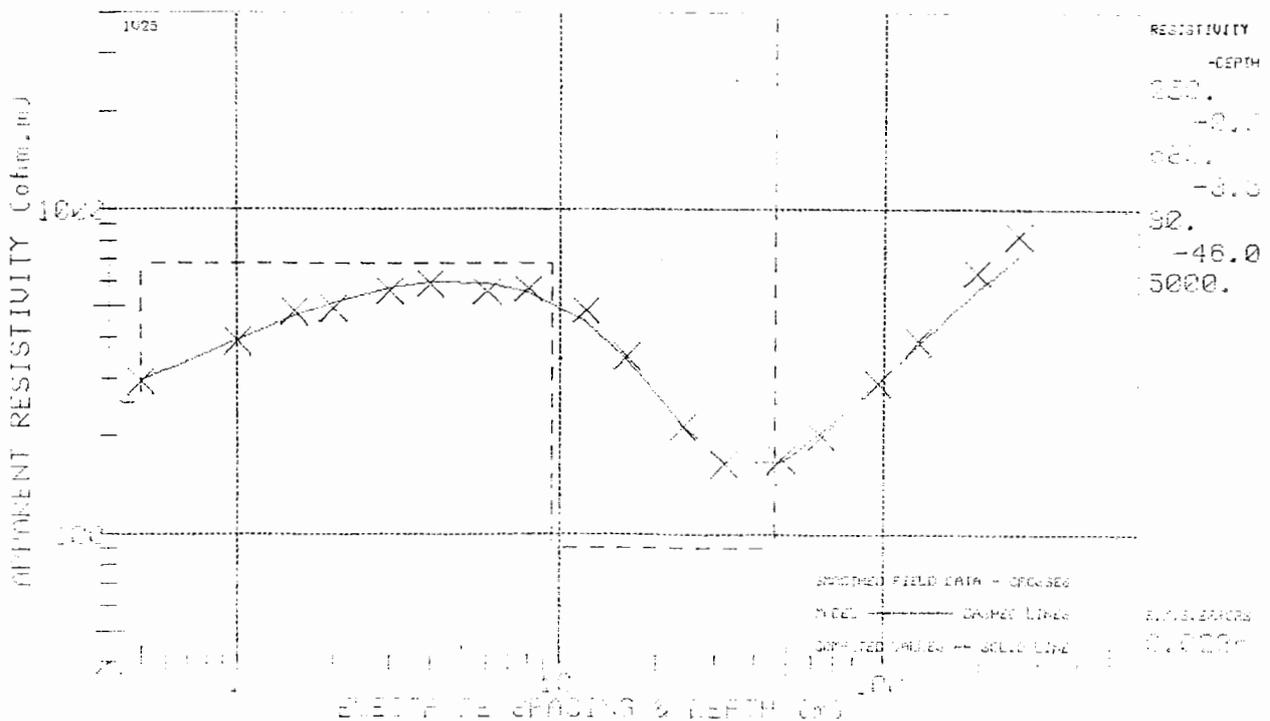
VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No.

1V25

LOCATION ALONG AIRPORT ROAD NEAR TUNGA VILLAGE

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.03	10.04	-41.00	0.5	294		
2	0.05	9.66	-4.71	1	390	1.5	480
3	-0.14	16.41	37.61	2	490	3	555
4	-0.14	7.73	-22.24	4	586	6	552
5	-0.19	10.75	24.66	8	566	12	482
6	0.10	29.56	-19.59	16	350	24	213
7	-0.12	52.92	-45.80	32	163.8	48	169.1
8	0.14	50.86	-38.19	64	198.4	96	291
9	-0.08	29.58		120	389	192	633
10	—			256	827	384	—
R. m. s. errors	0.12	29.39	31.94	512	—		



COMMENTS

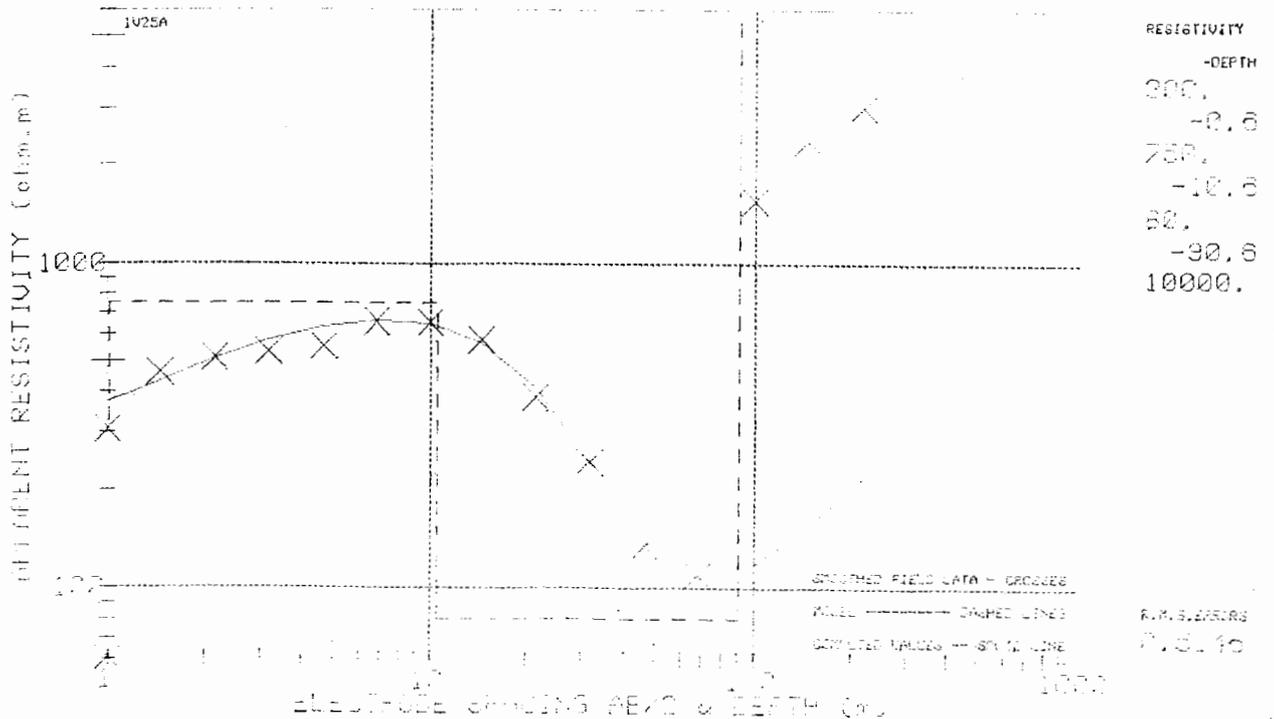
VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No.

1V25A

LOCATION SAME POSITION AS IV25

Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1.00	306.		306	100.00	1462		1554
1.45	458		458	100.00	158.9		
2.15	511		511	145.00	242	9.784	2363
3.15	532		532	215.00	308		3013
4.65	553		553	—	—	—	—
6.80	658		658				
6.80	586		—				
10.00	581	1.122	652				
14.50	514		577				
21.50	343		385				
31.50	218		244				
31.50	230						
46.50	126.1	1.063	134.				
68.00	102.6		109				

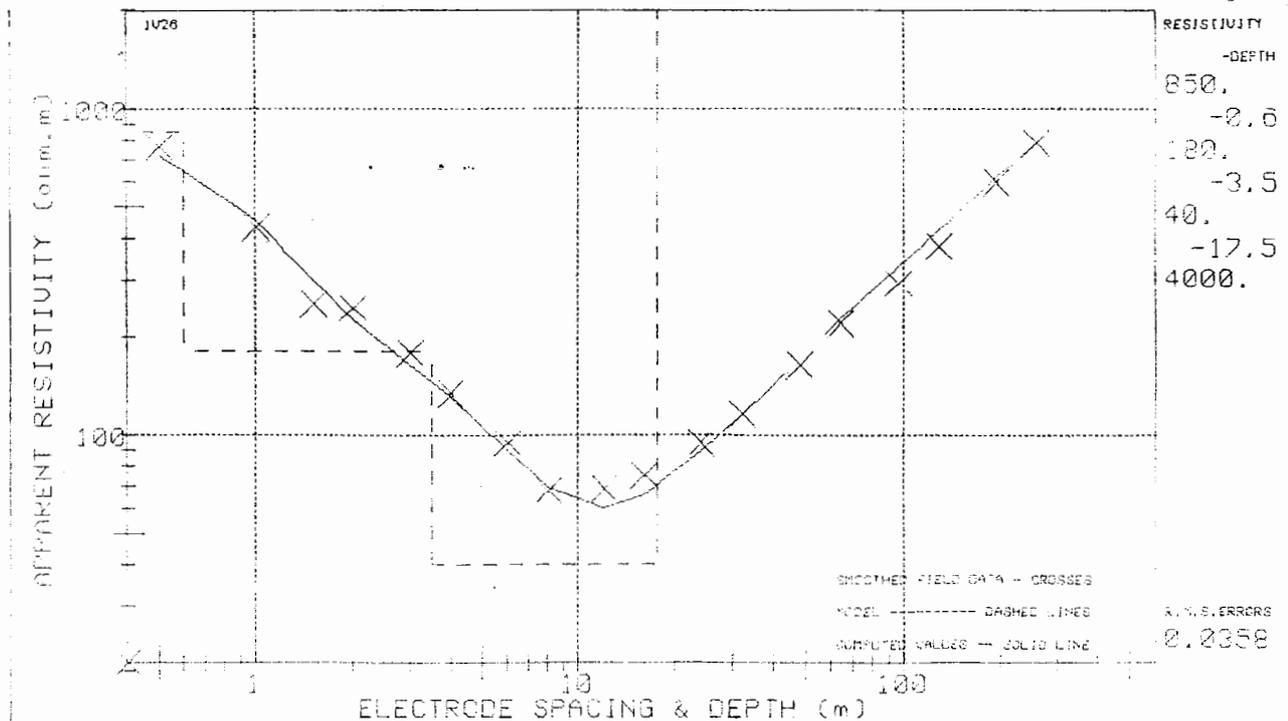


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **1V26**

LOCATION ABOUT 80 m NORTH OF RIVER CHIDAWAKI & CHIKAJI CONFLUENCE BURUKU.							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.18	3.70	73.00	0.5	765	 	
2	0.06	-20.83	1.28	1	431	1.5	251
3	0.05	32.02	-20.70	2	244	3	177.1
4	-0.29	-10.15	-10.90	4	133.7	6	94.2
5	-1.12	1.94	20.09	8	67.2	12	67.9
6	-1.84	1.62	8.79	16	74.7	24	93.8
7	-1.57	-2.44	8.34	32	115.4	48	163.3
8	-0.95	7.16	-34.22	64	219	96	292
9	-0.41	1.48	 	128	379	192	591
10	—	—	 	256	785	384	—
R. m. s. errors	0.96	13.51	30.82	512	—	 	



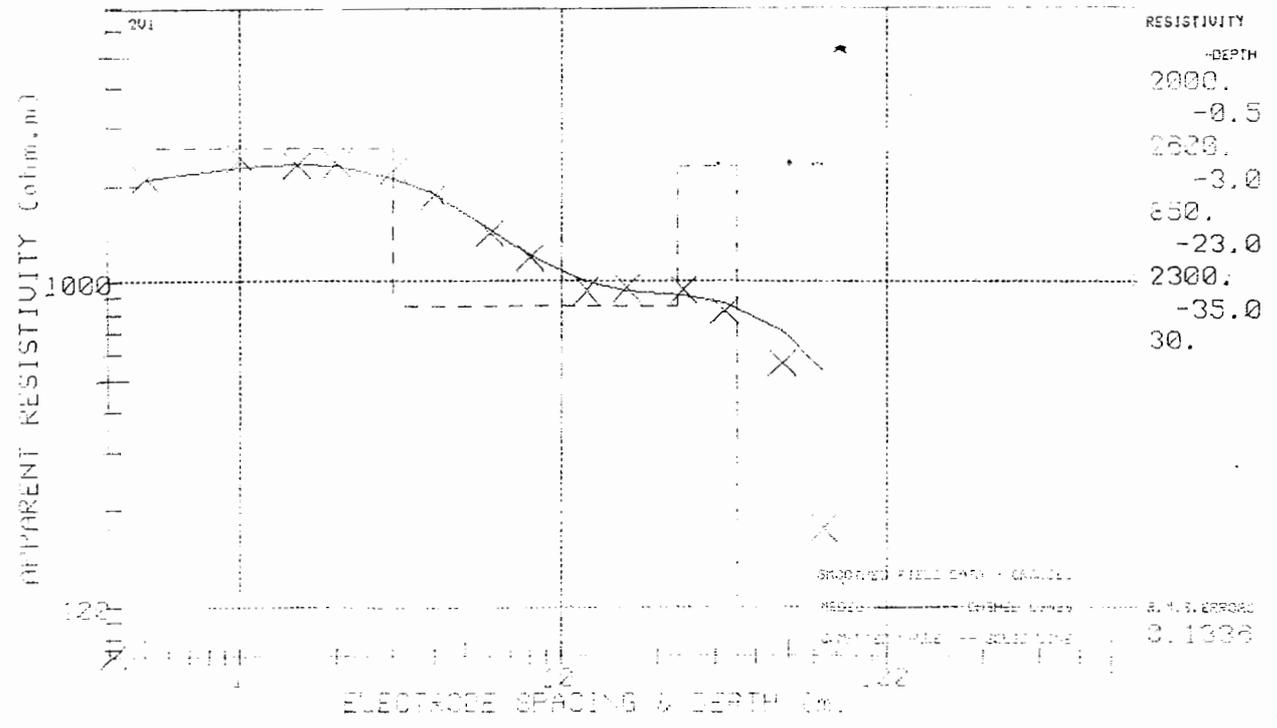
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **2V1**

LOCATION G.G.S.S. KW01

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.38	6.43	17.65	0.5	2100	 	
2	0.15	2.59	17.65	1	2425	1.5	2306
3	0.07	-7.07	-37.45	2	2329	3	2235
4	0.08	-4.16	1.46	4	1874	6	1428
5	0.11	10.92	-4.90	8	1196	12	945
6	-0.04	-7.20	-25.53	16	964	24	947
7	-0.15	-6.37	-15.82	32	820	48	564
8	-	-	-	64	174.4	96	-
9	-	-	-	128	-	192	-
10	-	-	-	256	-	384	-
R. m.s. errors	0.17	6.84	20.99	512	-	 	



COMMENTS

Figure III. 3 Nassarawa-Location of Resistivity Soundings

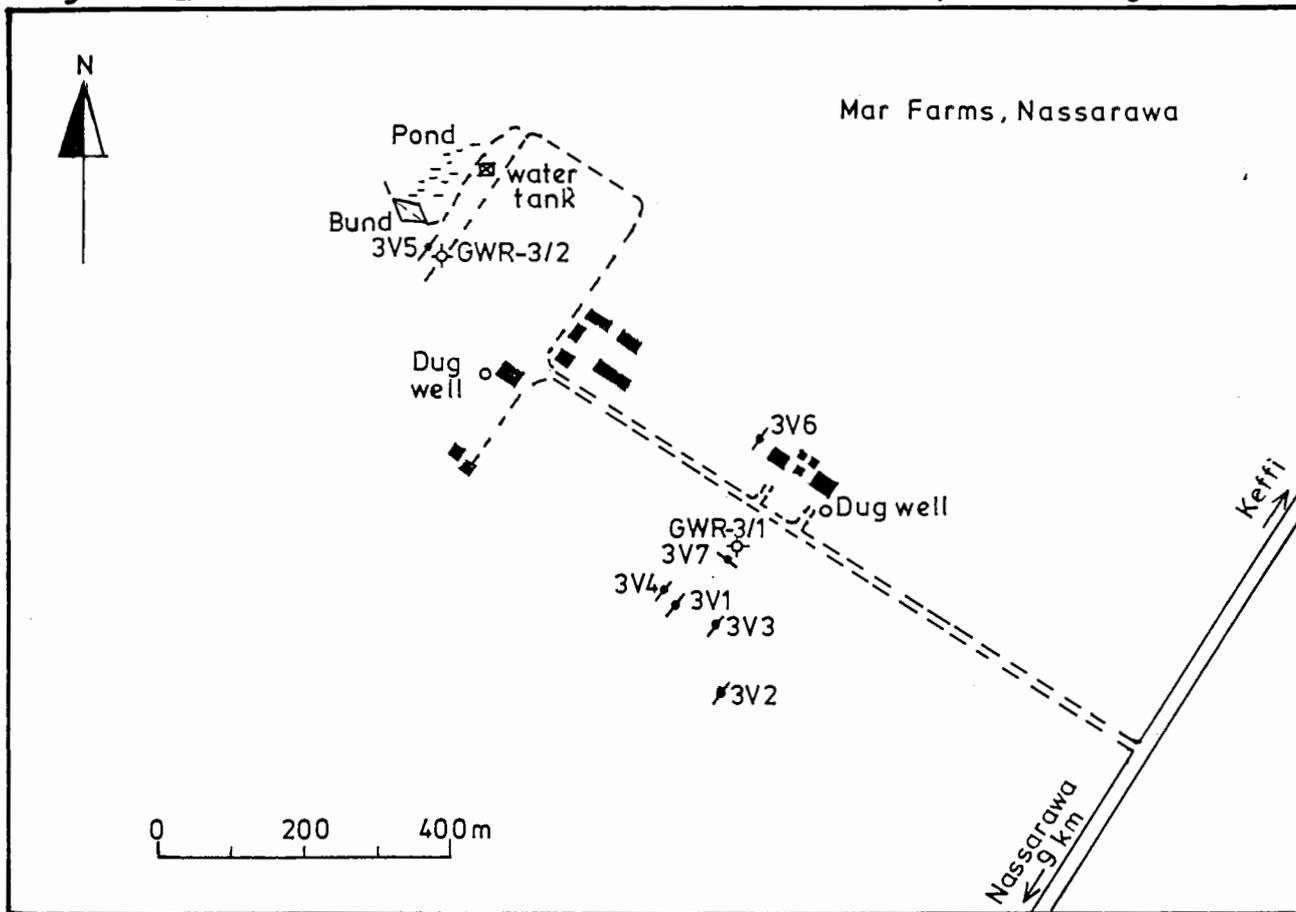


Figure III. 4 Suleja - Location of Geophysical Stations

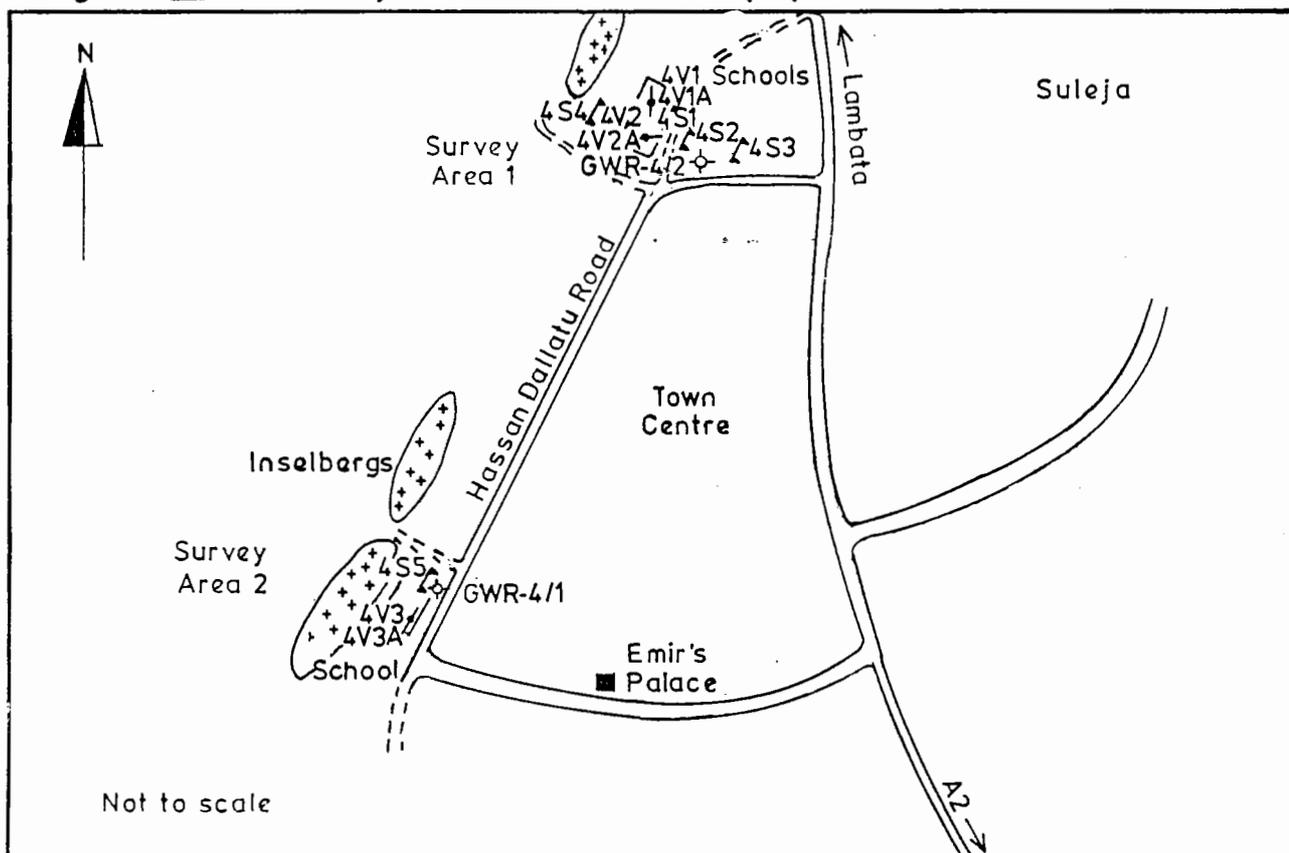


Figure III-5 Nassarawa-Apparent Resistivity Contours

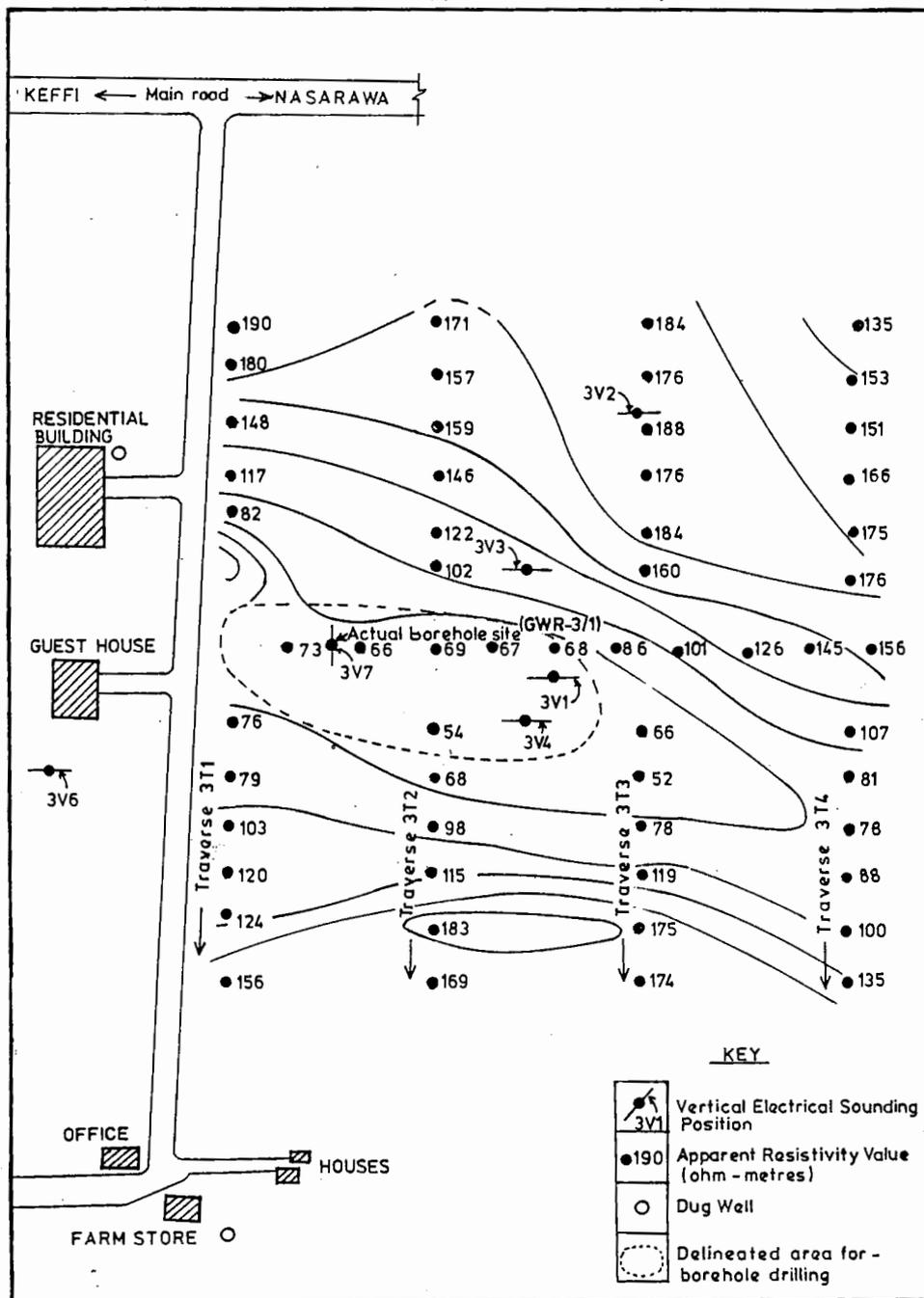


Figure III-6 Nassarawa - Resistivity Profiles

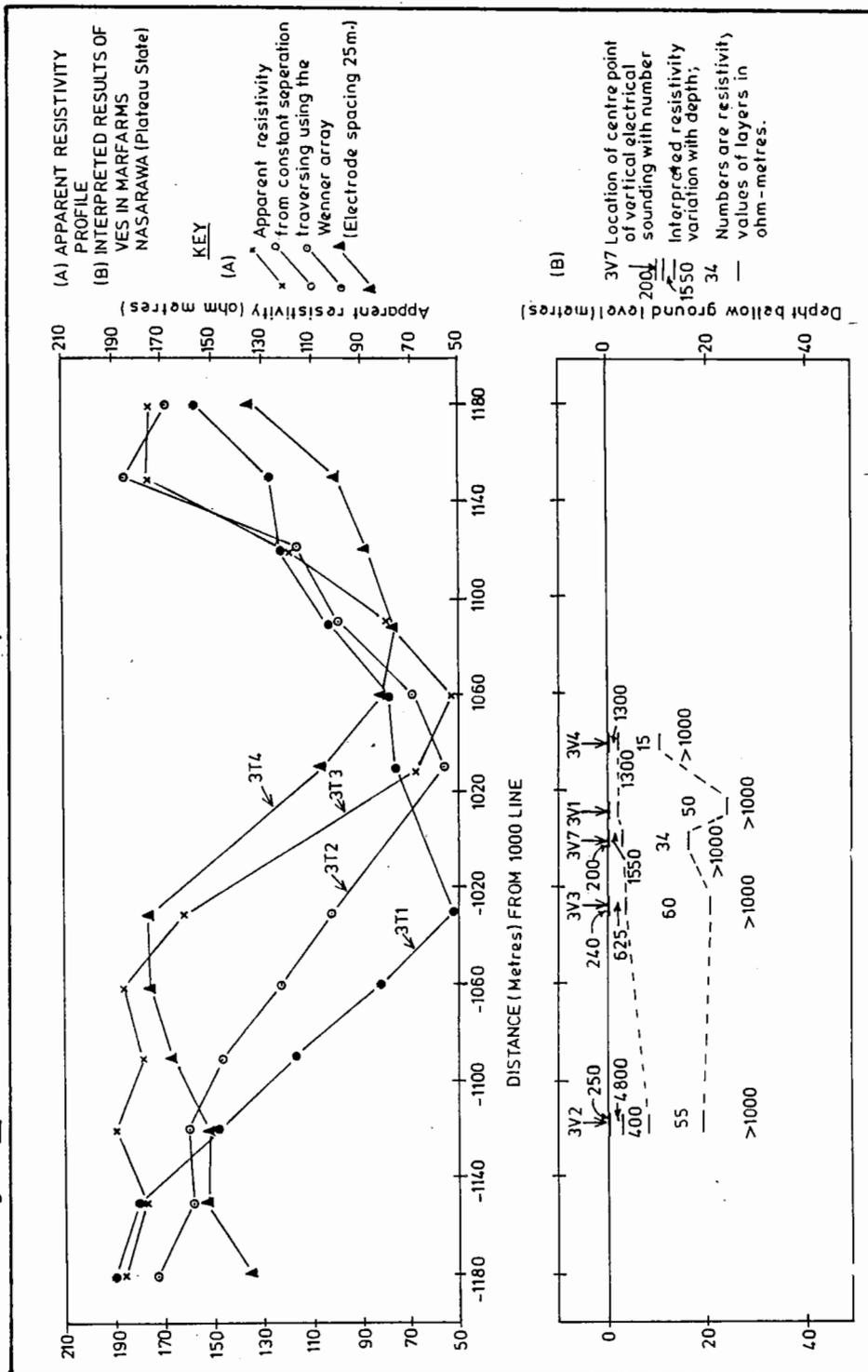
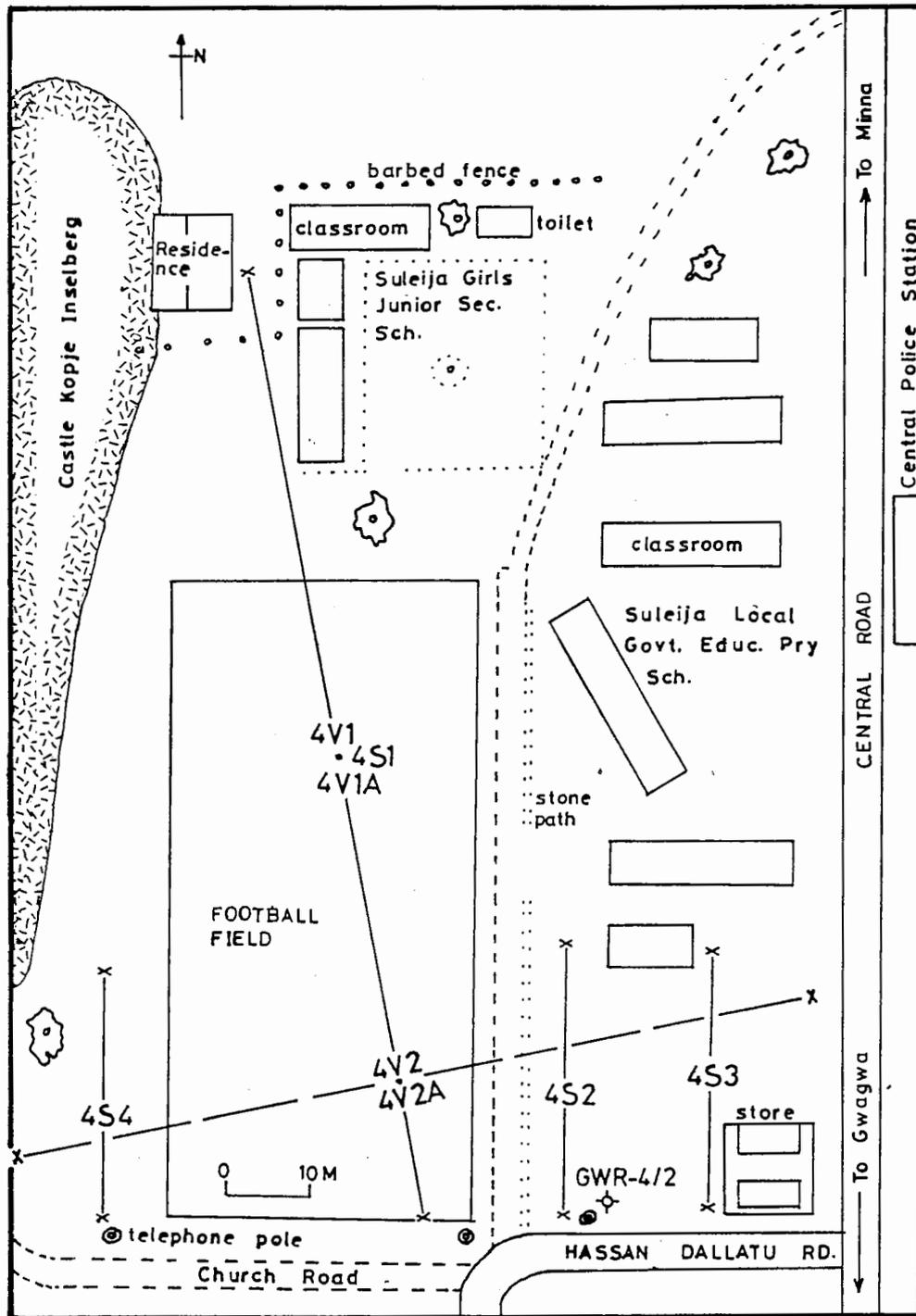


Figure III.7 Survey area 1, showing orientation of resistivity soundings & seismic refraction survey (Suleja)

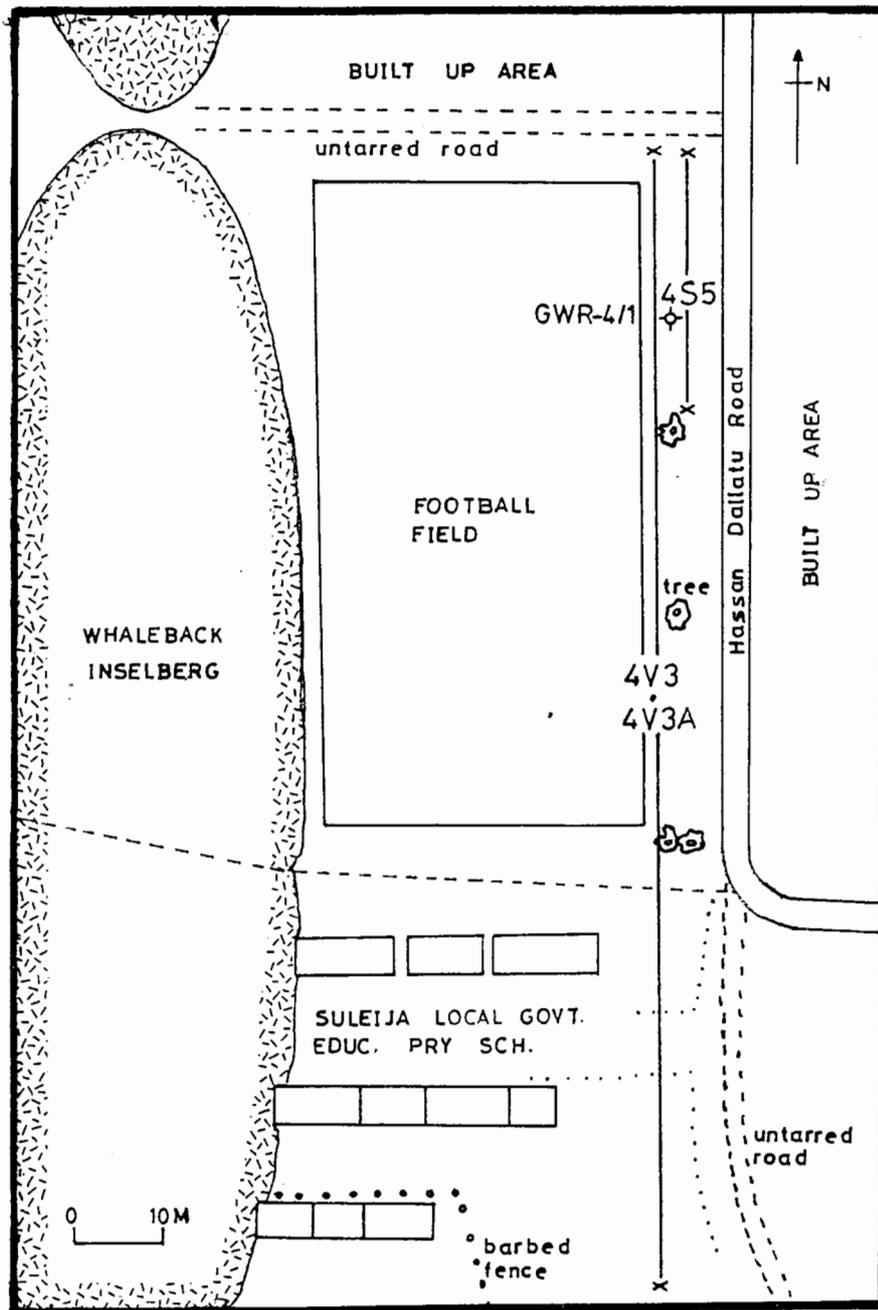


4V1, 4V2 Resistivity soundings using Offset Wenner array

4V1A, 4V2A Resistivity soundings using Schlumberger array

4S1-4S4 Seismic Refraction survey

Figure III-8 Survey area 2, showing orientation of resistivity soundings & seismic refraction survey (Suleja)



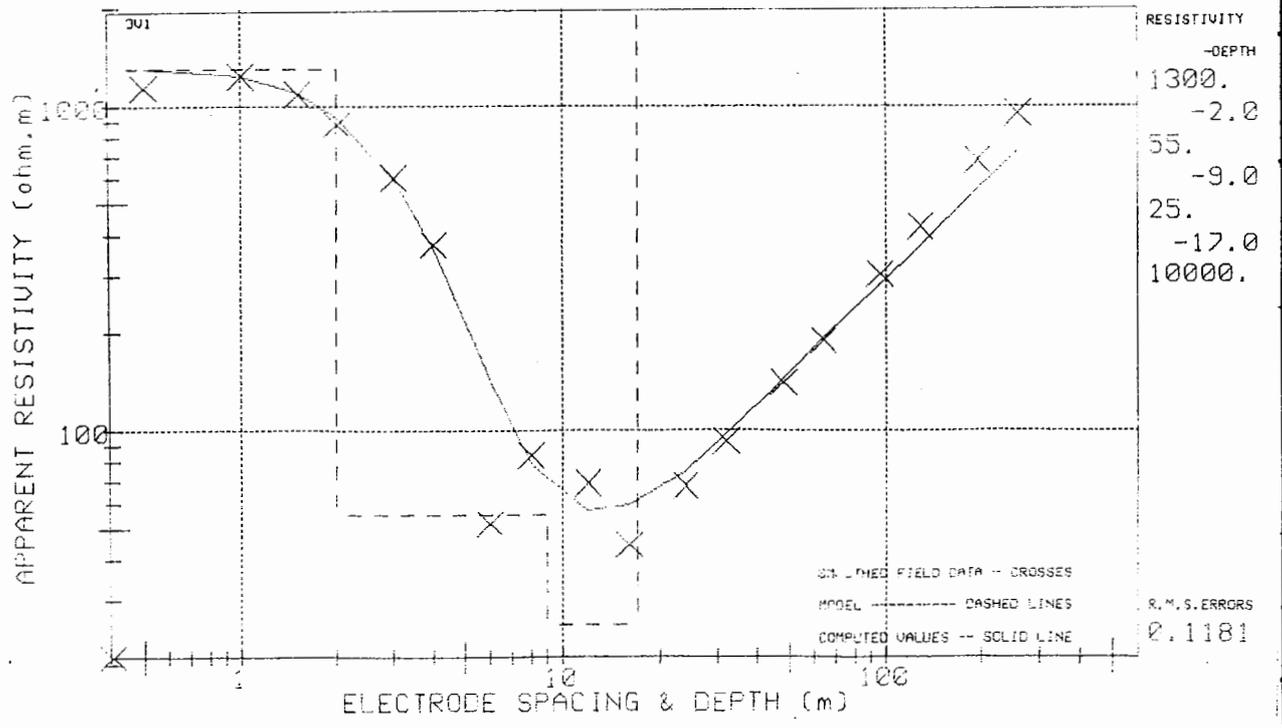
- 4V3 Resistivity sounding using Offset Wenner array
- 4V3A Resistivity sounding using Schlumberger array
- 4S1 Seismic Refraction survey

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V1**

LOCATION AT 140m. FROM THE ROAD, OFF TCL BY +12.5 m.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.83	-1.10	 	0.5	1137	 	
2	0.12	-7.02	-9.60	1	1226	1.5	1086
3	0.00	3.30	-51.96	2	877	3	598
4	0.06	-31.79	222.74	4	375	6	51.9
5	0.35	-42.64	-400.41	8	83.7	12	68.3
6	0.70	3.84	-280.26	16	44.4	24	67.0
7	-1.36	-13.63	10.87	32	91.5	48	140.4
8	-0.26	-14.13	-4.60	64	187.8	96	302
9	0.00	-24.41	5.75	128	425	192	677
10	—	—	—	256	944	384	—
R. m. s. errors	0.60	20.78	190.87	512	—	 	



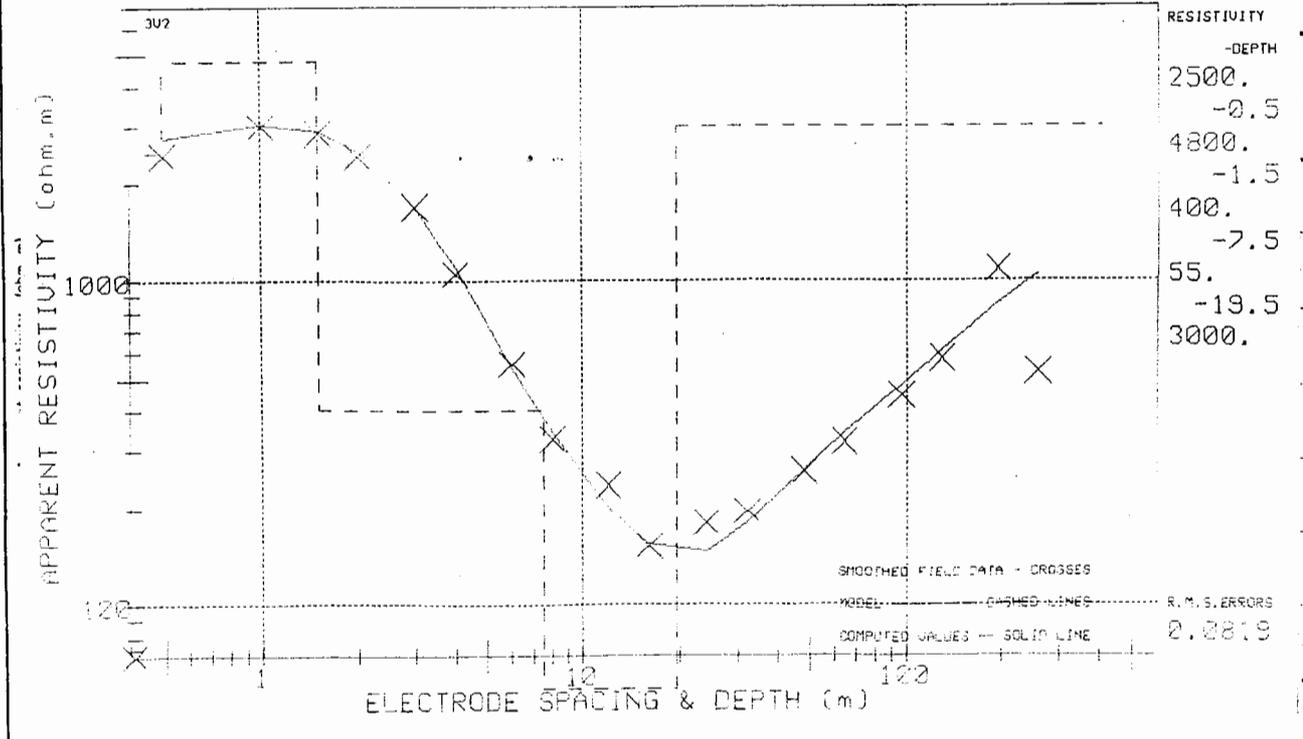
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V2**

LOCATION **AT-1115 m ON 3T3 AT MARFARMS NASSARAWA (PLATEAU STATE)**

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.01	2.57	 	0.5	2444	 	
2	0.18	-16.77	-4.38	1	2997	1.5	2864
3	-0.18	23.66	-11.33	2	2427	3	1696
4	-0.06	-12.66	29.94	4	1052	6	557
5	0.04	41.98	67.86	8	324	12	235
6	-0.76	9.08	-191.26	16	151.7	24	179.6
7	-0.21	8.95	-30.26	32	195.5	48	258
8	-2.83	-5.43	2.69	64	318	96	444
9	0.27	10.01	1.46	128	578	192	844
10	-	-	 	256	1147	384	-
R. m.s. errors	0.70	18.45	73.45	512	-	 	



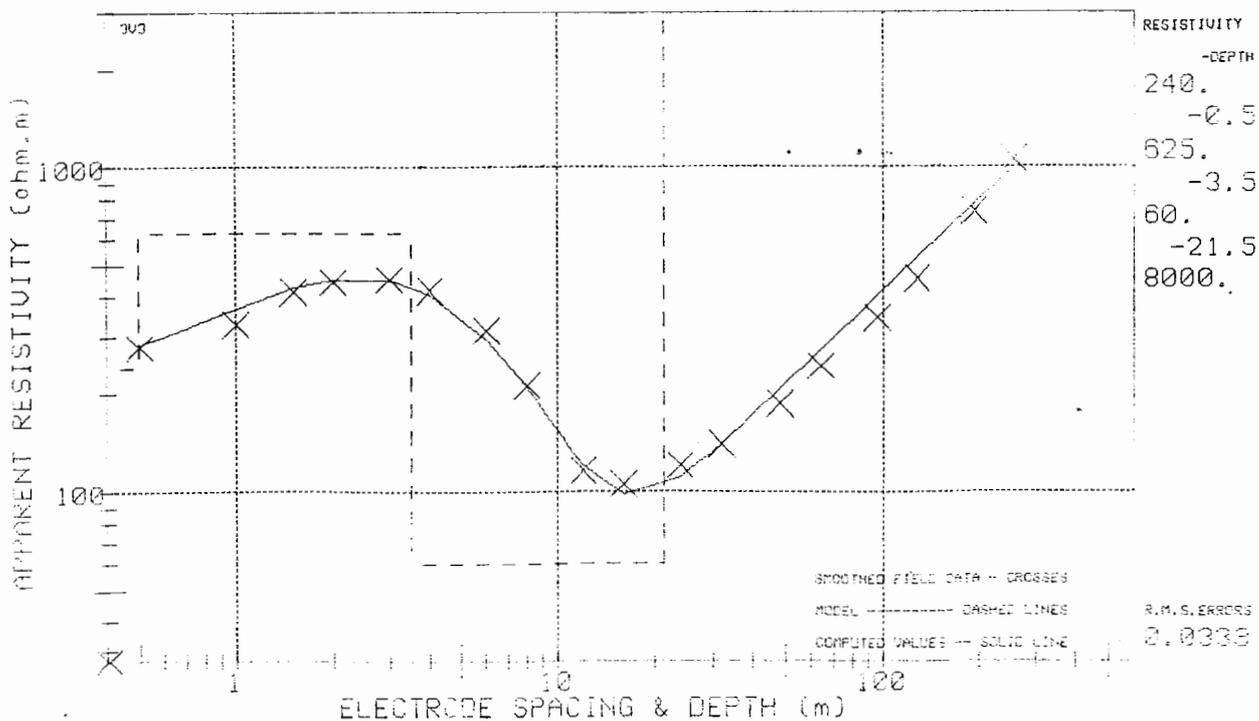
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V3**

LOCATION **AT-1027.5 BY 118 m. BETWEEN 3T24,3T3 MARFARMS NASSARAWA (Plateau State)**

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.01	-6.30	55.20	0.5	279	0.5	279
2	-0.03	-6.74	10.31	1	327	1.5	414
3	-0.30	-12.54	-5.02	2	441	3	452
4	0.04	-33.36	62.90	4	418	6	314
5	-0.08	-32.18	-0.91	8	211	12	116.6
6	-0.54	12.59	-0.85	16	106.2	24	120.6
7	0.00	15.63	1.40	32	140.2	48	186.9
8	0.30	32.87	-18.77	64	243	96	346
9	-0.11	21.28		128	454	192	735
10	—	—		256	1060	384	—
R. m. s. errors	0.23	21.92	30.60	512	—		



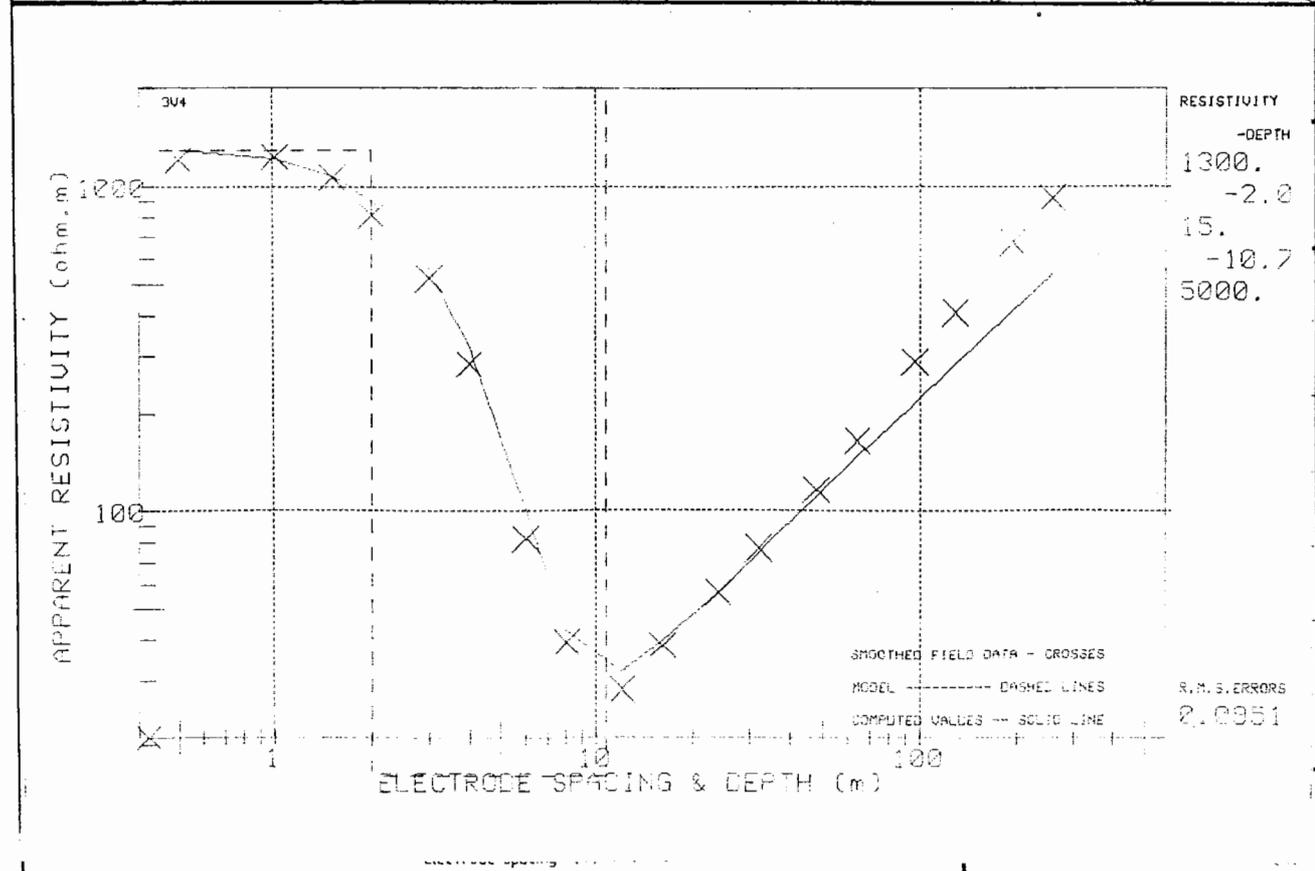
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V4**

LOCATION **AT +1027.5 m by 120 m between 3T2 & 3T3, Marfarms Nassarawa**
Plateau State

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.13	20.21	 	0.5	1213	 	
2	0.32	0.76	-8.60	1	1234	1.5	1064
3	0.16	-1.40	-46.11	2	807	3	521
4	-0.08	14.03	75.10	4	283	6	82.1
5	0.50	-7.28	19.57	8	39.4	12	28.2
6	1.46	0.52	9.77	16	38.3	24	56.0
7	0.15	-2.62	-4.59	32	76.6	48	116.3
8	-0.97	14.86	-23.99	64	165.1	96	288
9	-0.71	9.22	-7.23	128	410	192	671
10	-	-	-	256	919	384	-
R. m. s. errors	0.47	10.40	33.48	512	-	 	



RESISTIVITY
-DEPTH
1300.
-2.0
15.
-10.7
5000.
R. M. S. ERRORS
2.0951

SMOOTHED FIELD DATA - CROSSES
MODEL - DASHED LINES
COMPUTED VALUES - SOLID LINE

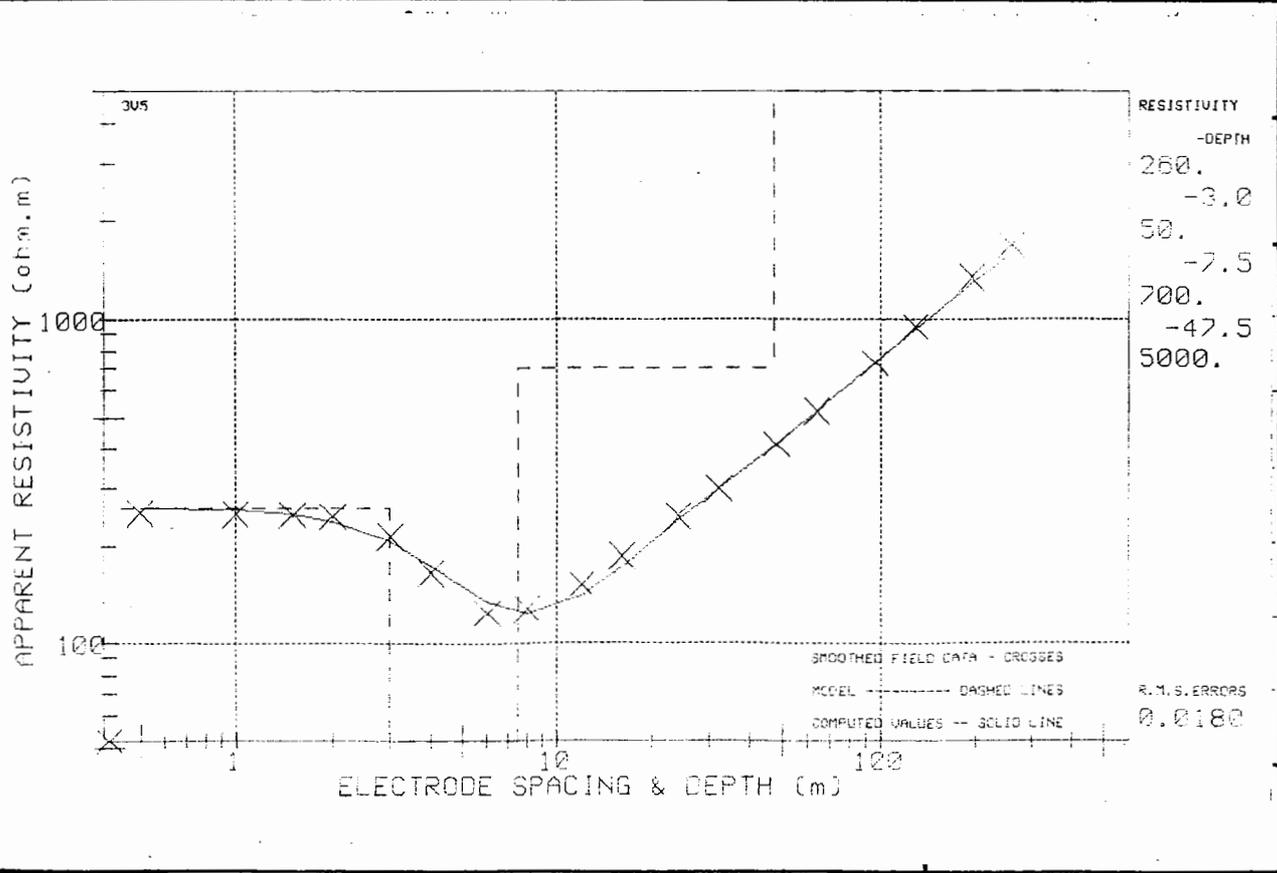
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V5**

LOCATION **BY THE FISH POND**

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.00	2.87	0.13	0.5	252	0.5	252
2	-0.00	6.29	0.13	1	250	1.5	248
3	-0.23	6.21	-7.21	2	245	3	213
4	0.09	5.90	3.90	4	166.3	6	124.5
5	0.11	-11.44	12.56	8	127.4	12	151.8
6	0.36	-16.68	0.66	16	185.6	24	244
7	-0.54	-11.92	-6.19	32	299	48	410
8	0.15	-12.80	4.02	64	519	96	728
9	0.17	-5.18	-1.22	128	947	192	1346
10	—			256	1685	384	—
R. m. s. errors	0.25	9.79	5.93	512	—		



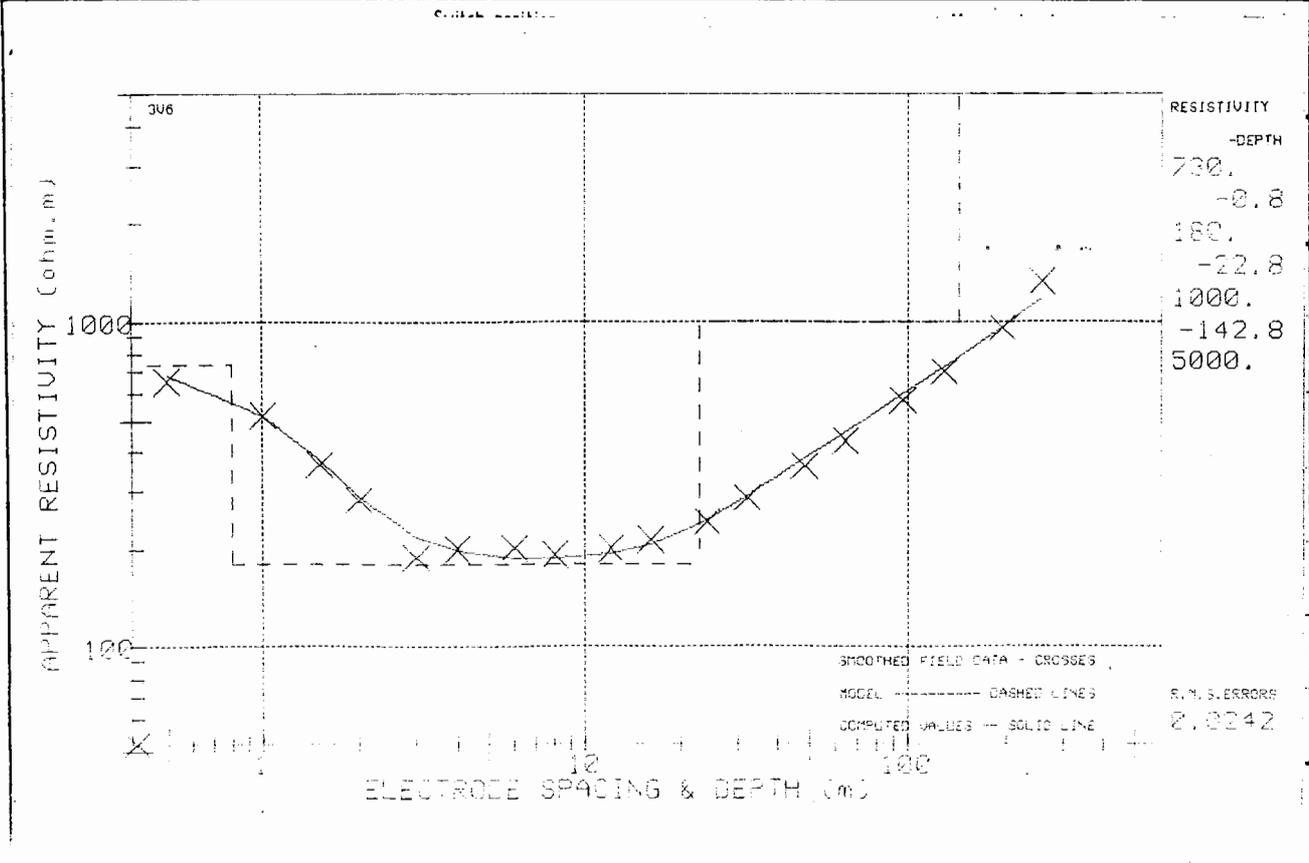
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V6**

LOCATION AT THE BACK OF THE GUEST HOUSE

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.00	24.47	 	0.5	652	 	
2	0.04	17.42	-8.96	1	512	1.5	361
3	-0.04	5.36	73.94	2	281	3	189.1
4	-0.01	14.81	22.33	4	200	6	202
5	-0.20	5.76	0.02	8	192	12	200
6	0.03	15.25	17.30	16	213	24	241
7	0.05	11.61	9.13	32	284	48	357
8	-0.07	13.61	5.68	64	423	96	574
9	1.19	0.46	17.23	128	700	192	958
10	—	—	 	256	1327	384	—
R. m. s. errors	0.40	13.89	29.07	512	—	 	



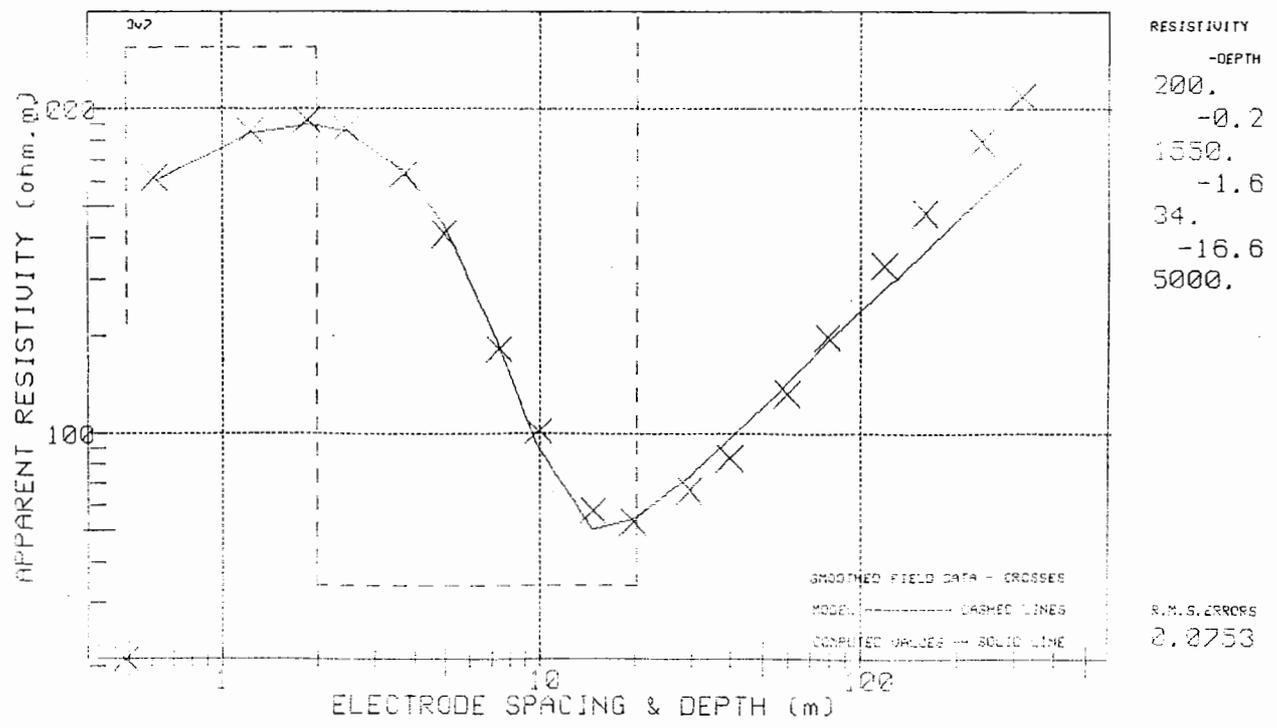
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **3V7**

LOCATION **AT THE BOREHOLE POSITION**

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.05	15.83	 	0.5	611	 	
2	-0.07	-4.65	-32.02	1	852	1.5	922
3	0.06	4.06	-7.49	2	867	3	625
4	0.05	-17.72	-43.80	4	410	6	180.5
5	-0.11	-6.55	108.01	8	101.2	12	57.5
6	-0.11	7.58	-110.09	16	53.1	24	66.5
7	0.18	8.17	9.80	32	83.6	48	132.5
8	0.69	12.84	8.02	64	197.2	96	329
9	-0.23	10.87	-16.60	128	474	192	792
10	—	—	—	256	1090	384	—
R. m. s. errors	0.26	10.82	58.33	512	—	 	



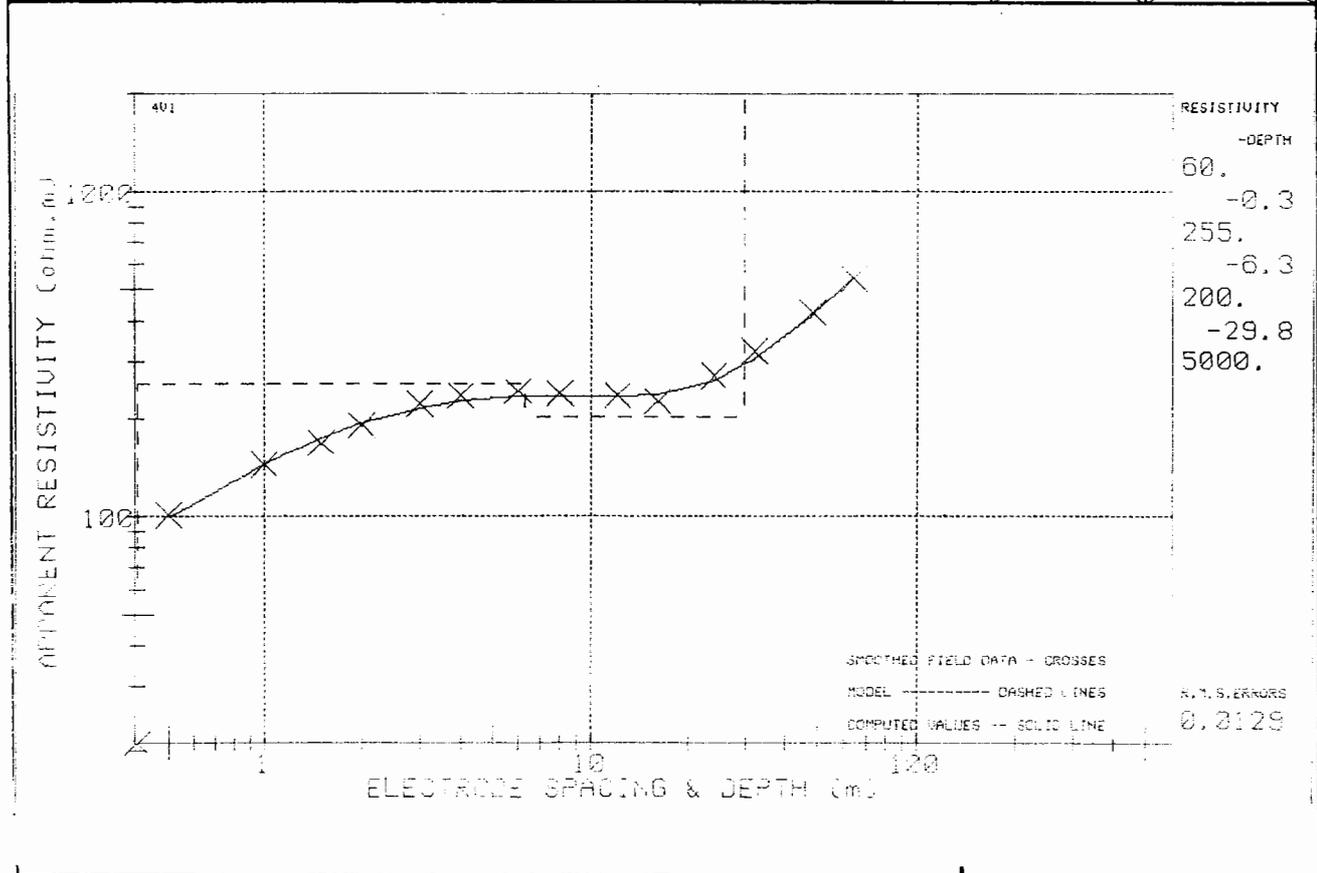
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **4V1**

LOCATION Govt. Girls Junior Sec. Sch. / Suleija Local Educ. Pry. Sch.
Anguwan Waje

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.13	-8.72	5.67	0.5	100.8	0.5	100.8
2	0.21	-17.79	5.67	1	144.8	1.5	167.2
3	-0.31	7.42	-20.39	2	189.6	3	221
4	-0.02	19.41	-2.72	4	234	6	241
5	0.00	3.17	-20.11	8	238	12	234
6	0.00	6.28	-26.01	16	224	24	269
7	-0.08	2.37	13.91	32	332	48	425
8				64	536	96	
9				128		192	
10				256		384	
R. m. s. errors	0.15	11.21	16.98	512			



COMMENTS

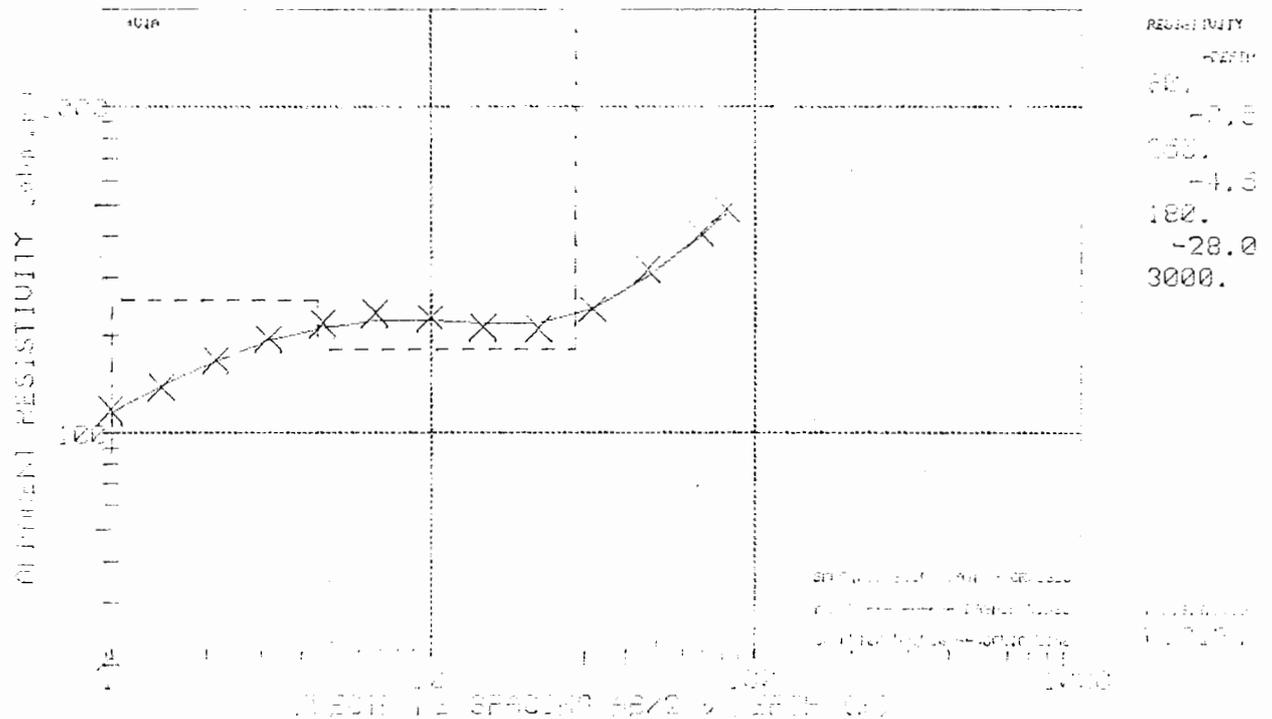
VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No.

4V1A

LOCATION Govt. Girls Junior Sec. Sch. / Suleija Local Educ. Pry. Sch.
Anguwan Waje.

Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1	116.4		116.4	81.5	495		485
1.45	136.7		136.7				
2.15	165.6		165.6				
3.15	194.0		194.0				
4.65	216		216				
6.80	233		233				
6.80	242						
10	233	0.962	225				
14.5	218		210				
21.5	215		207				
31.5	248		238				
31.5	243						
46.5	322	0.980	316				
68	417		408				



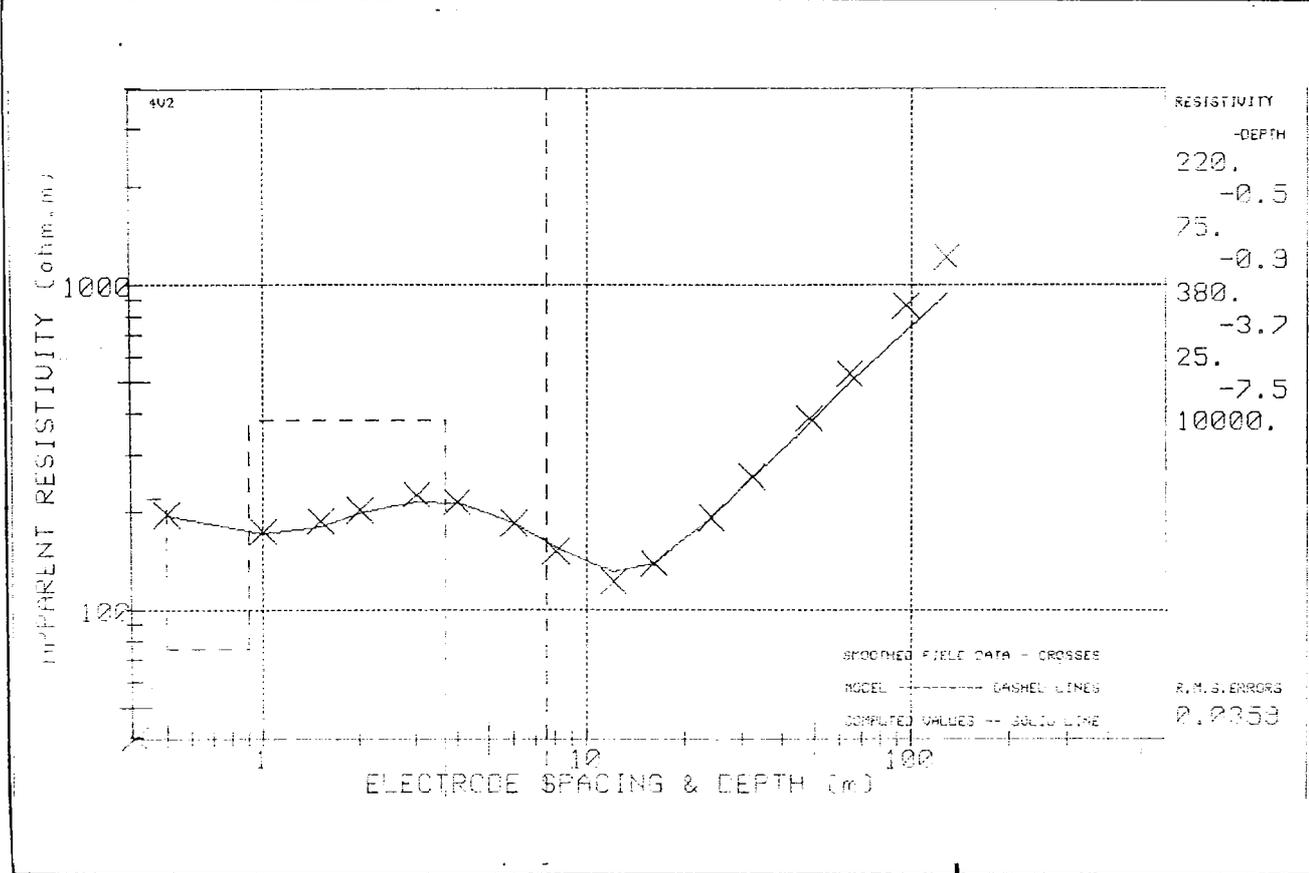
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **4V2**

LOCATION Govt. Girls Junior Sec. Sch. / Suleija Local Educ. Pry. Sch.
Anguwan Waje.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.04	7.54	 	0.5	195.9	 	
2	-0.11	6.17	2.46	1	173.1	1.5	185.9
3	0.02	14.49	-20.98	2	202	3	225
4	0.04	8.36	-13.40	4	214	6	184.0
5	-0.21	-4.99	9.03	8	151.0	12	122.5
6	-1.17	-22.46	-7.41	16	138.7	24	190.7
7	-0.05	-37.55	-4.74	32	256	48	387
8	-0.92	-39.33	-12.99	64	530	96	869
9				128	1212	192	
10			 	256		384	
R. m.s. errors	0.53	21.97	11.67	512		 	



COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)

Data Reduction & Interpretation

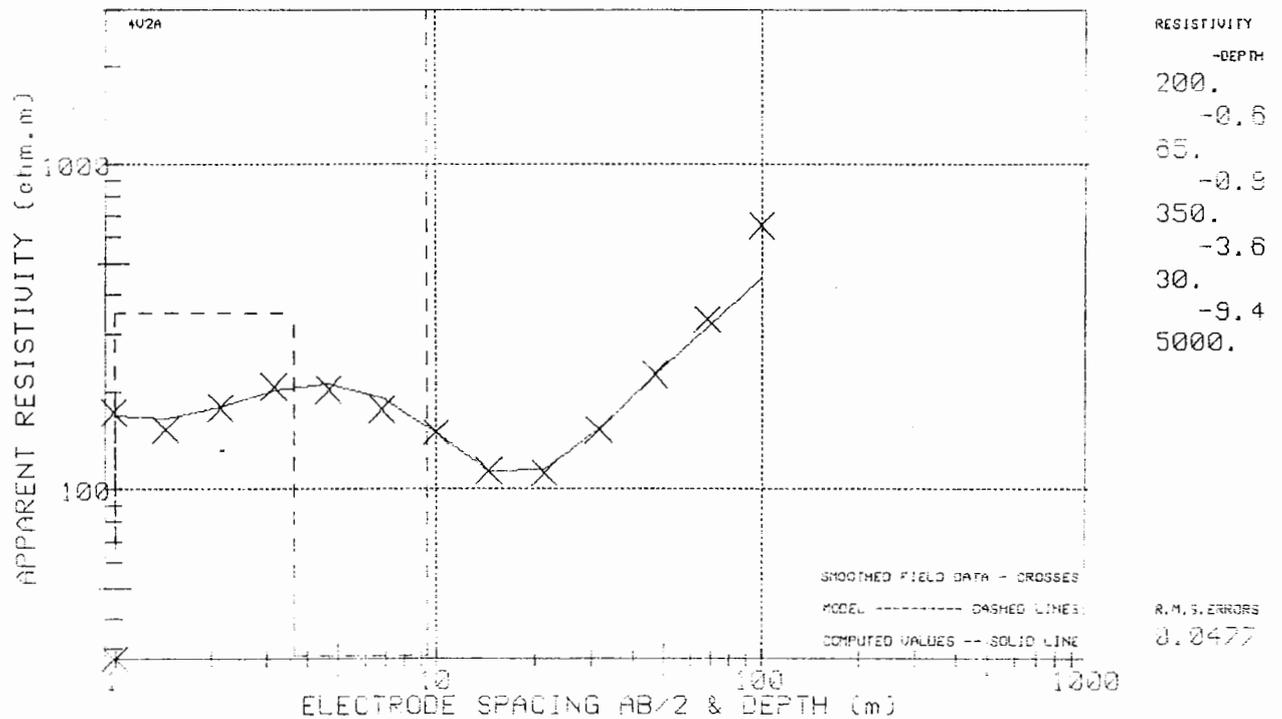
No.

4V2A

LOCATION Govt. Girls Junior Sec. Sch. / Suleija Local Educ. Pry Sch.

Anquwan Waje

Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1	172.7		172.7	100	701		647
1.45	152.6		152.6				
2.15	179.2		179.2				
3.15	206		206				
4.65	203		203				
6.8	176.3		176.3				
6.8	186.0						
10	158.8	0.948	150.5				
14.5	120		113.7				
21.5	118.1		112				
31.5	160.9		152.5				
31.5	165.4						
46.5	243	0.922	224				
68	361		333				



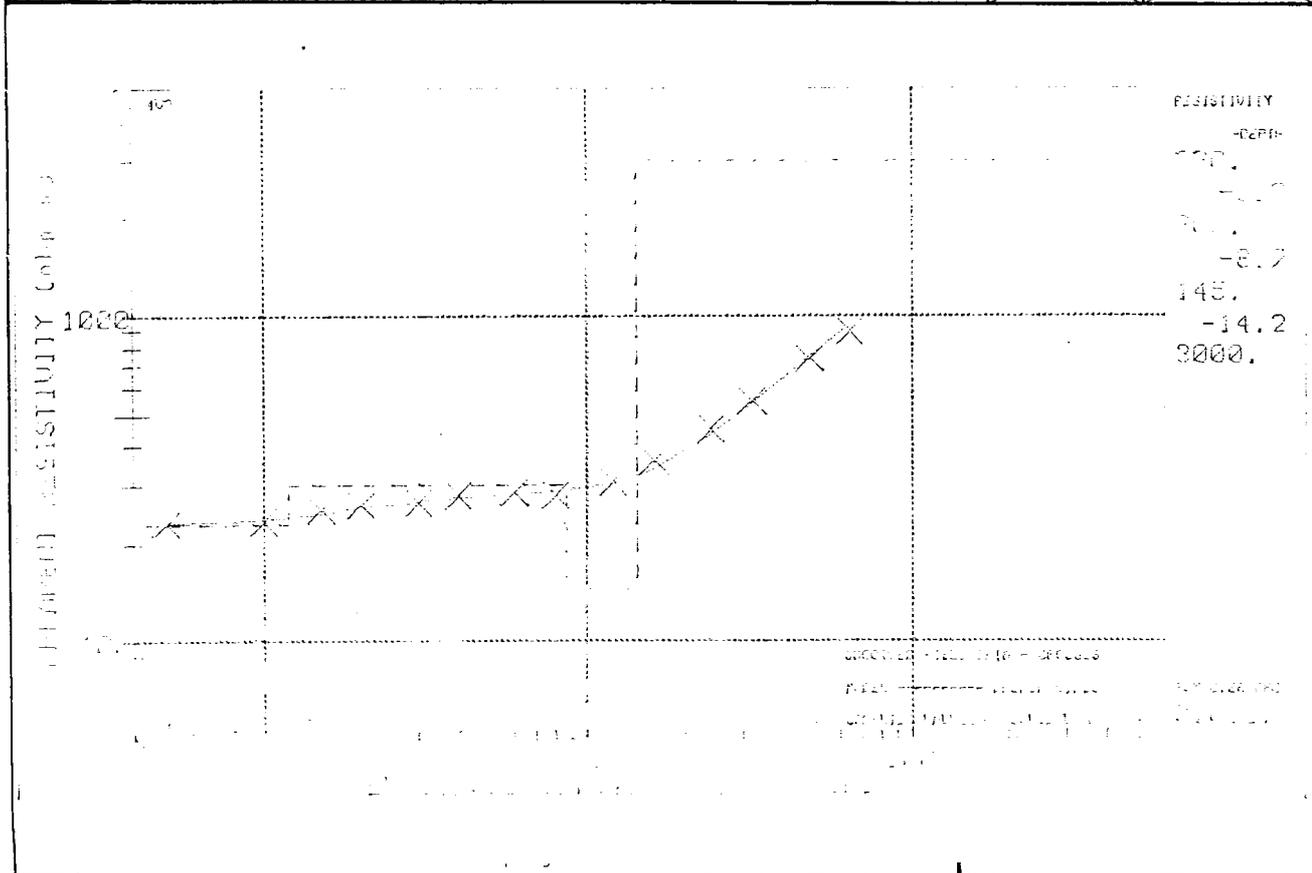
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **4V3**

LOCATION Suleija Local Govt. Educ. Pry Sch. Anguwan Iya

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	3.63	26.86	 	0.5	230	 	
2	- 0.12	2.42	-38.26	1	234	1.5	253
3	- 0.04	1.92	29.59	2	261	3	266
4	- 0.01	- 4.22	- 5.88	4	280	6	285
5	0.11	10.81	9.76	8	279	12	307
6	0.09	8.43	19.45	16	358	24	449
7	- 0.07	- 9.52	-10.80	32	549	48	736
8				64	892	96	
9				128		192	
10				256		384	
R. m. s. errors	0.94	12.11	22.23	512			



COMMENTS

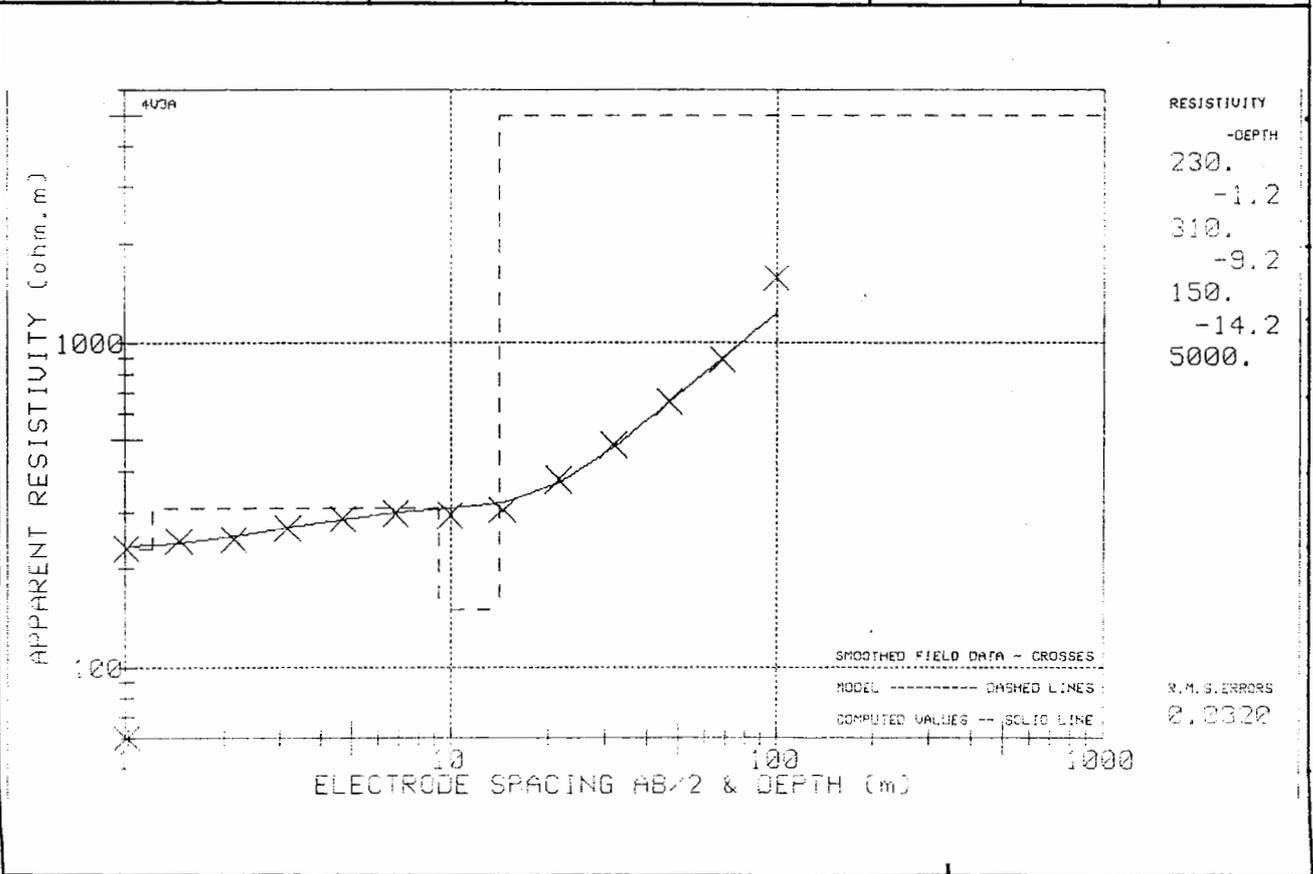
VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No.

4V3A

LOCATION Suleija Local Govt. Educ. Pry Sch. Anguwan Iya.

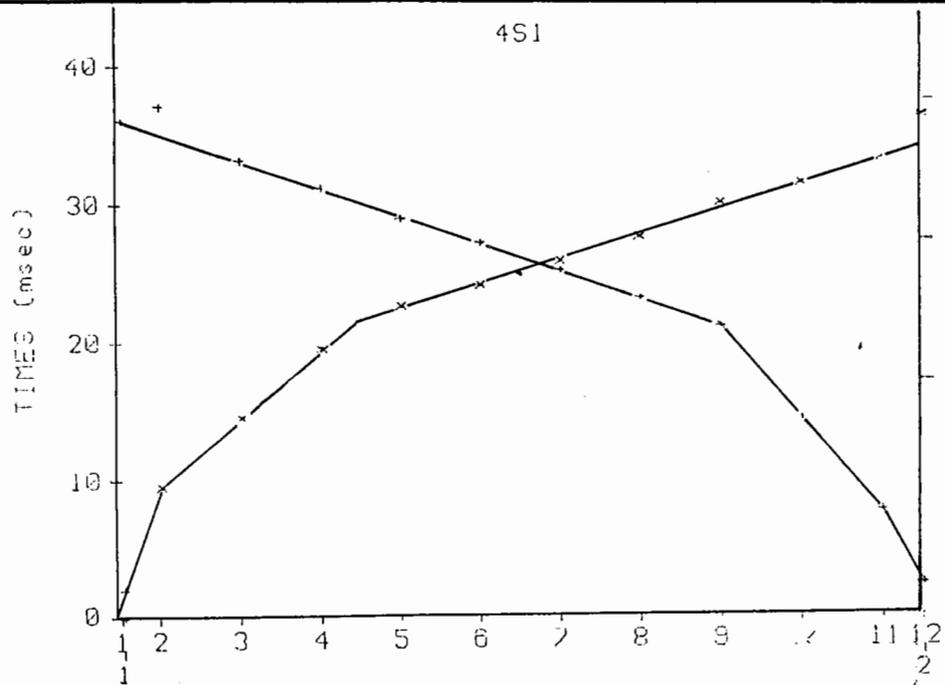
Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1	231		231	100	1453		1573
1.45	244		244				
2.15	247		247				
3.15	267		267				
4.65	286		286				
6.8	296		296				
6.8	295						
10	292	1.004	293				
14.5	303		304				
21.5	376		377				
31.5	478		480				
31.5	444						
46.5	604	1.083	654				
68	816		884				



COMMENTS

4S1

G.	TIMES	
1	2.0	36.0
2	9.5	37.0
3	14.5	33.0
4	19.5	31.0
5	27.5	28.8
6	24.0	27.0
7	26.7	25.0
8	27.4	23.0
9	29.8	21.0
10	31.2	14.2
11	33.0	7.5
12	35.0	2.2



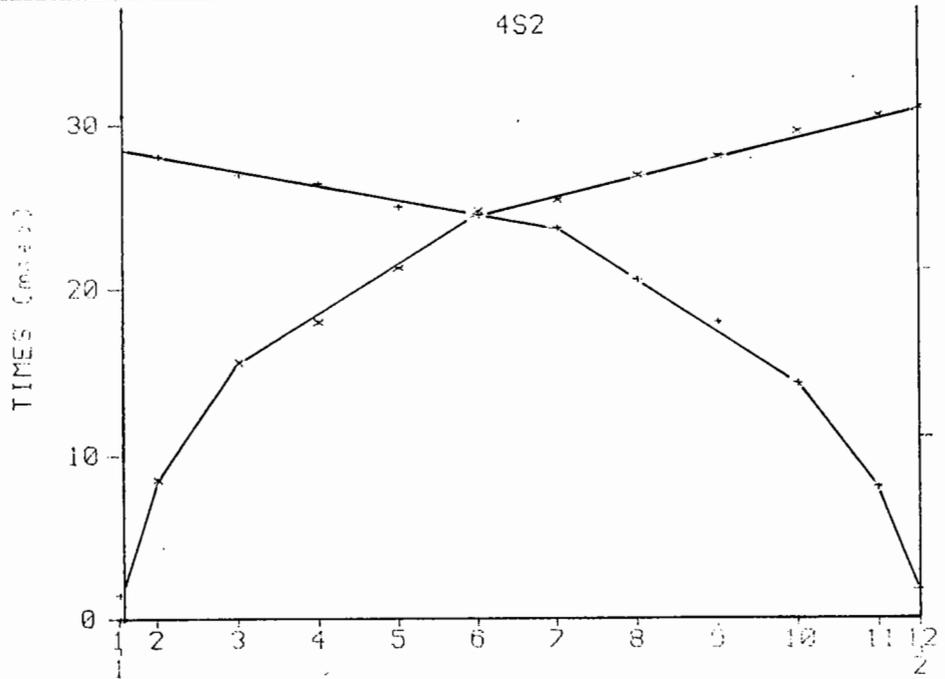
4S1	SP	
X	0.0	10.0

G	1	2	3	4	5	6
X	0.0	2.0	6.0	10.0	14.0	18.0
G	7	8	9	10	11	12
X	2.0	26.0	30.0	34.0	38.0	40.0

4S1		4S1		average
1	depth(m)	2	depth (m)	depth (m)
U1	235	296	0.7	0.8
T1	7.0	4.1	0.7	0.8
U2	800	593		
T2	16.1	15.5	4.6	4.3
U3	2240	1897		

4S2

G.	TIMES	
1	1.5	30.5
2	8.5	28.0
3	10.5	27.0
4	18.0	26.4
5	21.2	25.0
6	24.7	14.5
7	25.5	23.7
8	27.0	20.5
9	28.0	18.0
10	23.5	14.2
11	30.5	8.0
12	31.0	1.8



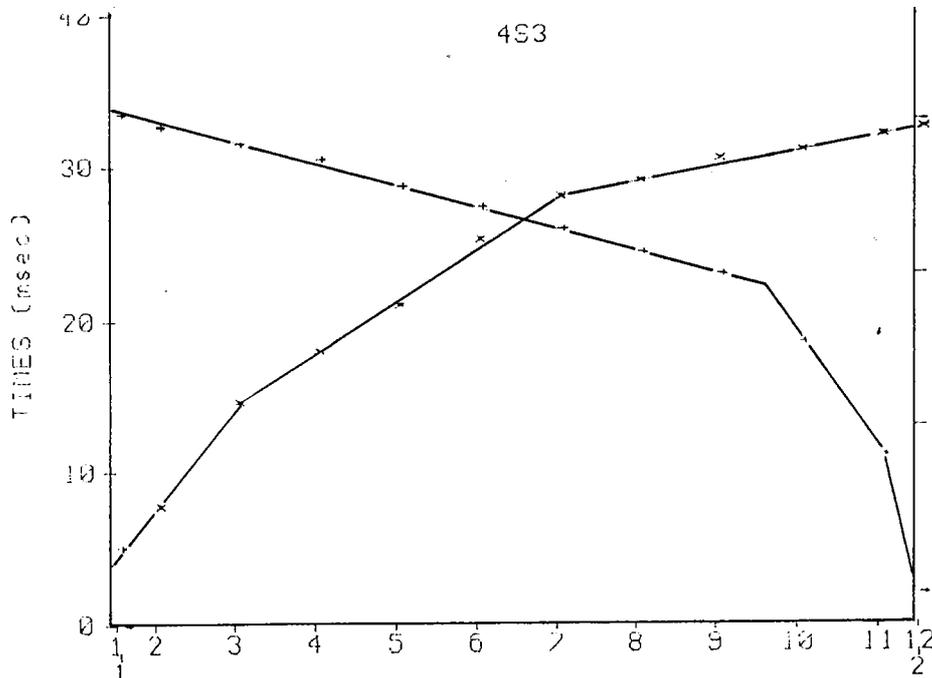
4S2	SP	
X	0.0	30.0

G	1	2	3	4	5	6
X	0.0	1.5	4.5	7.5	10.5	13.5
G	7	8	9	10	11	12
X	16.5	19.5	22.5	25.5	28.5	30.0

4S2		4S2		average
1	depth (m)	2	depth (m)	depth (m)
U1	194	211	0.7	0.6
T1	5.0	5.0	0.7	0.6
U2	429	600		
T2	10.5	10.0	2.0	2.0
U3	965	1050		
T3	19.3	16.4	5.7	6.05
U4	2554	2700		

453

G.	TIMES	
1	5.0	33.5
2	7.8	32.7
3	14.7	31.5
4	18.0	30.5
5	21.0	28.7
6	25.3	27.3
7	28.0	26.0
8	29.0	24.5
9	30.5	23.0
10	31.0	18.5
11	32.0	11.0
12	32.5	2.0



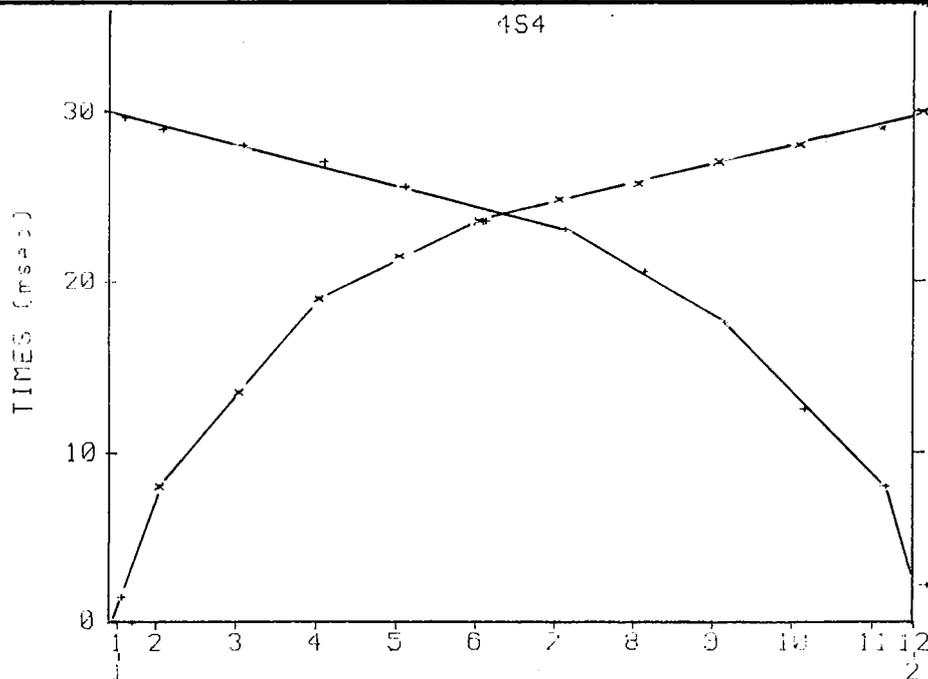
453

SP	1	2
X	0.0	30.0

		453						453			average depth (m)		
G	X	1	2	3	4	5	6	U1	depth (m)	2	depth (m)		
								306		150			
		0.0	1.5	4.5	7.5	10.5	13.5	T1	9.5	1.7	8.5	0.7	1.2
								U2	885		500		
								T2	22.7	5.6	19.7	4.3	4.95
								U3	3042		2152		

454

G.	TIMES	
1	1.5	29.7
2	8.0	29.0
3	13.5	28.0
4	19.0	27.0
5	21.5	25.5
6	23.5	23.5
7	24.7	23.0
8	25.7	20.5
9	27.0	17.5
10	28.0	12.5
11	29.0	8.0
12	30.0	2.2



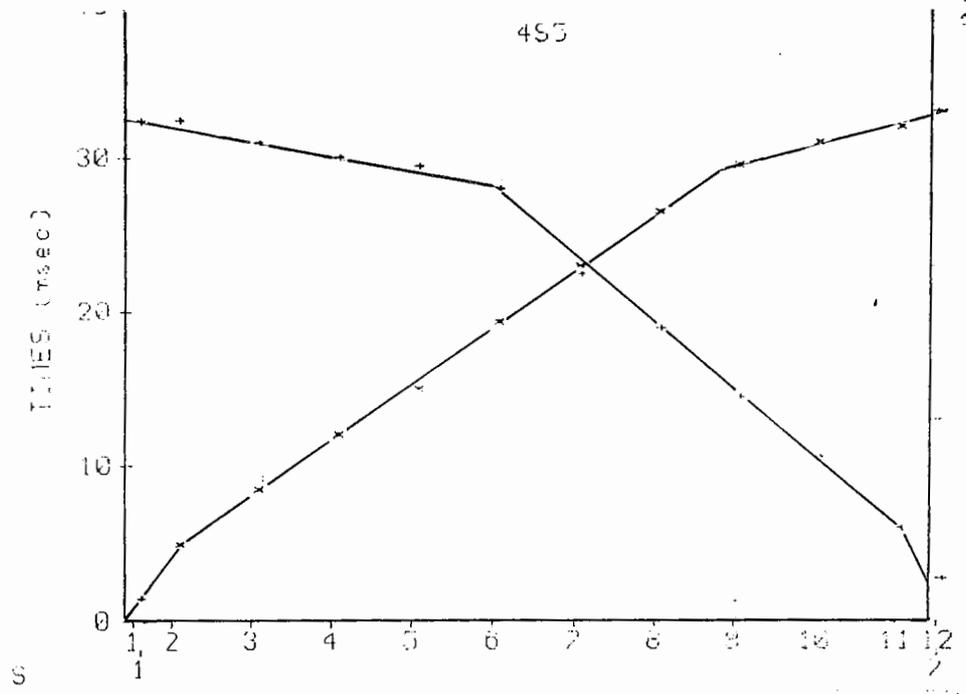
454

SP	1	2
X	0.0	30.0

		454						454			average depth (m)		
G	X	1	2	3	4	5	6	U1	depth (m)	2	depth (m)		
								207		206			
		0.0	1.5	4.5	7.5	10.5	13.5	T1	5.2	0.6	5.5	0.6	0.6
								U2	545		632		
								T2	13.5	3.3	10.7	2.2	2.75
								U3	1333		1041		
								T3	18.4	6.0	17.1	6.2	6.1
								U4	2625		2363		

4S5

G.	TIMES
1	1.5 32.5
2	5.0 32.5
3	8.5 31.0
4	12.0 30.0
5	15.0 29.5
6	18.3 28.0
7	23.0 22.5
8	26.5 18.9
9	29.5 14.5
10	31.0 10.5
11	32.0 6.0
12	33.0 2.7



4S5						4S5				
SP	1	2				1	depth (m)	2	depth (m)	average depth (m)
X	0.0	30.0				U1	353	234		
G	1	2	3	4	5	6	T1	3.1	0.6	0.6
X	0.0	1.5	4.5	7.5	10.5	13.5	U2	843	699	
G	7	8	9	10	11	12	T2	19.5	7.0	7.5
X	16.5	19.5	22.5	25.5	28.5	30.0	U3	2241	2984	8.0

Figure III-9 Niger State - Location of Geophysical Survey Areas

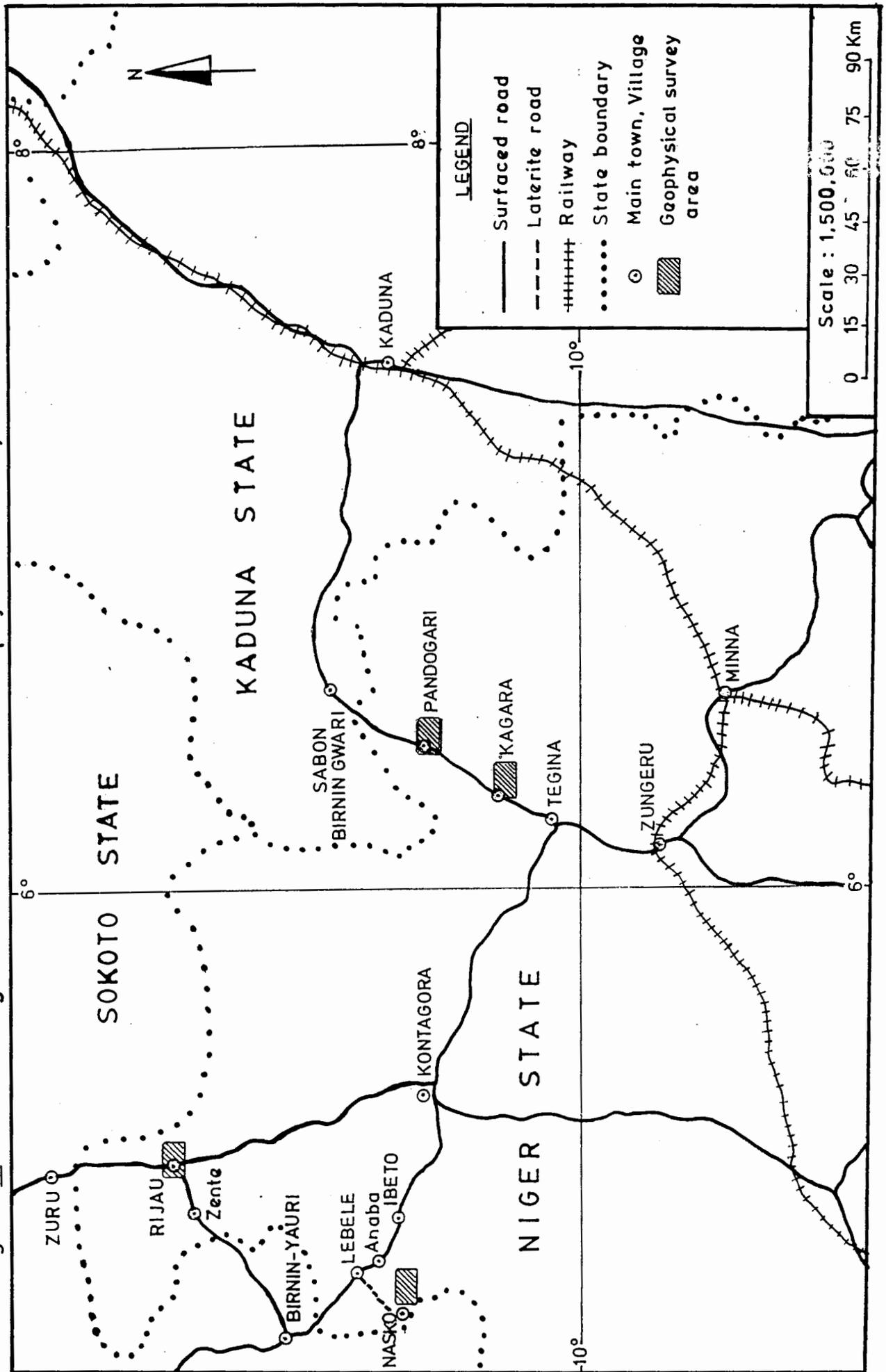


Figure III.10 Pandogari-Location of Geophysical Stations

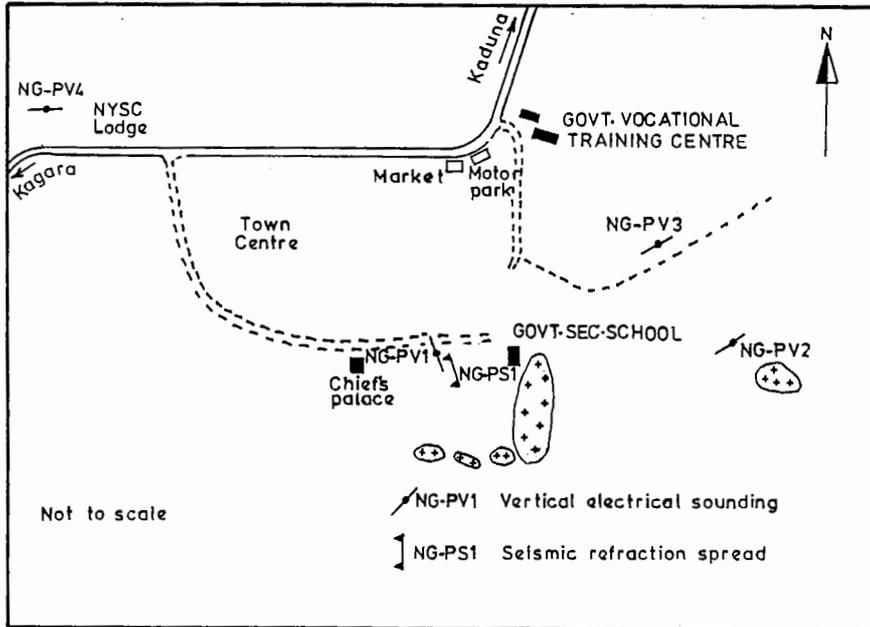
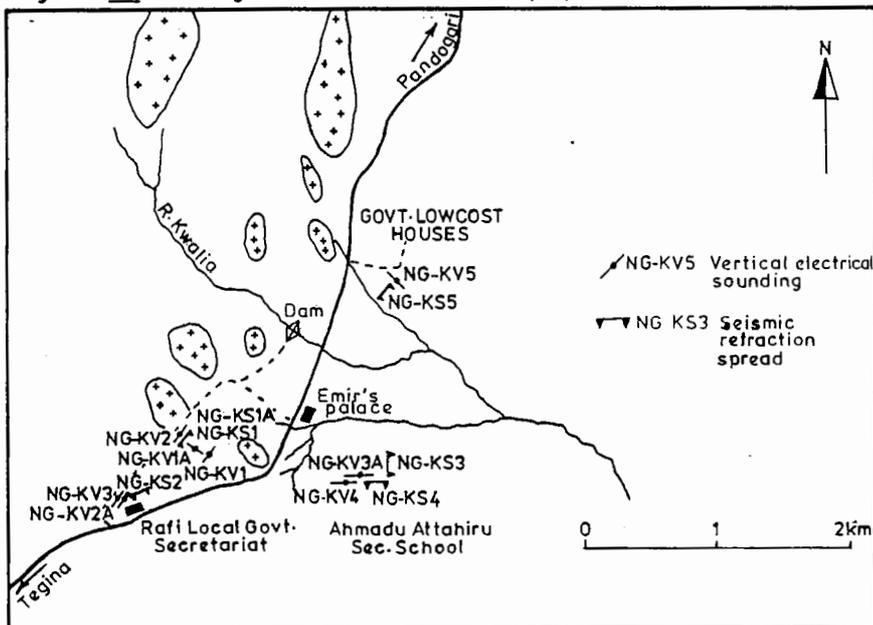


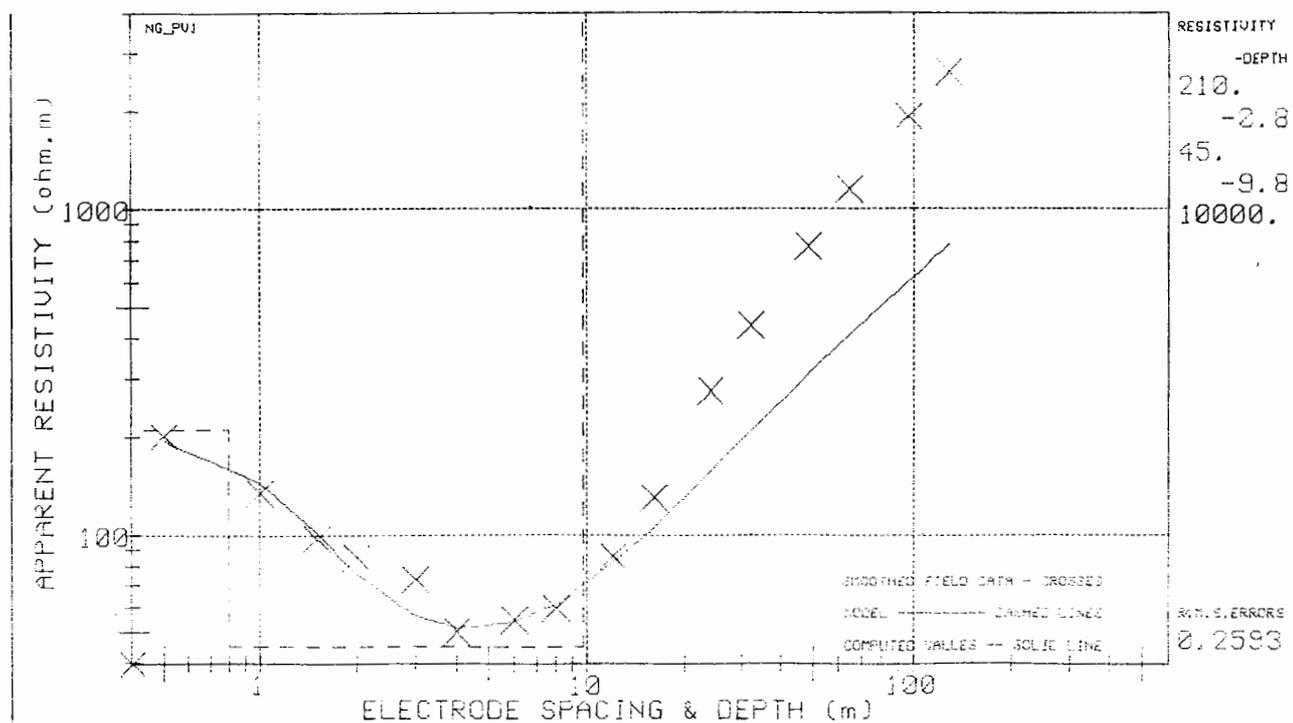
Figure III.11 Kagara-Location of Geophysical Stations



VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-PV1

LOCATION Behind Chief palace, Padongari . Niger state							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.26	-26.16		0.5	201		
2	-0.06	45.61	121.83	1	134.1	1.5	97.2
3	0.01	49.85	-149.45	2	85.2	3	72.9
4	-1.33	7.94	-155.2	4	50.0	6	54.3
5	1.25	16.91	-7.36	8	59.1	12	85.8
6	-1.46	13.89	-16.34	16	129.5	24	277.0
7	-0.81	67.89	37.06	32	438.0	48	769.0
8	-3.16	73.70	-3.80	64	1143.0	96	1926
9	-	-	-	128	2617	192	
10	-	-		256		384	
R. m.s. errors	1.42	44.49	94.85	512			

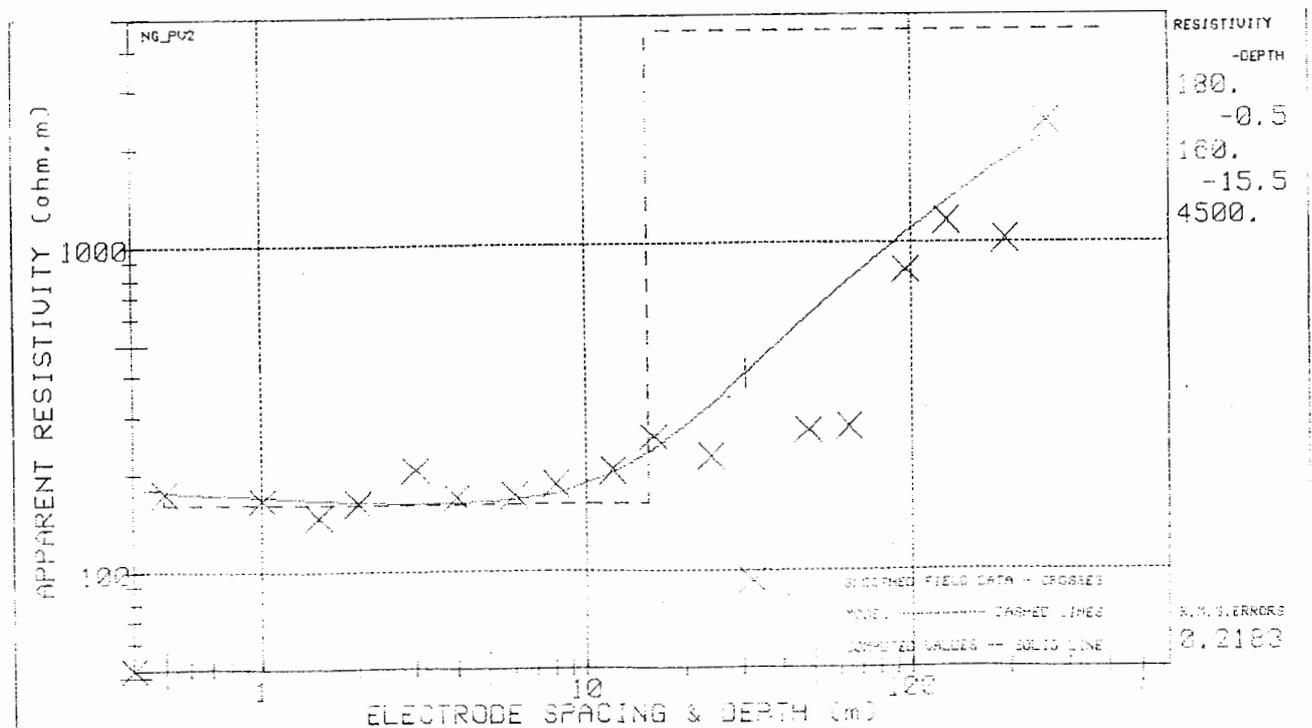


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-PV2

LOCATION Government Vocational Training Center, Padongari, Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.49	20.34	-64.87	0.5	174.5		
2	7.59	15.62	0.90	1	164.9	1.5	146.9
3	-0.02	6.28	30.35	2	162.0	3	205
4	-0.05	-10.15	-6.72	4	168.4	6	170.6
5	5.70	-19.18	18.95	8	183.5	12	203
6	2.96	-27.45	-440.68	16	256	24	223
7	-6.56	-81.13	-587.75	32	92.7	48	267
8	-27.17	69.01	-73.05	64	274	96	826
9	3.81	-18.83		128	1158	192	1025
10	—	—		256	2354	384	—
R. m.s. errors	7.26	38.90	262.32	512	—		

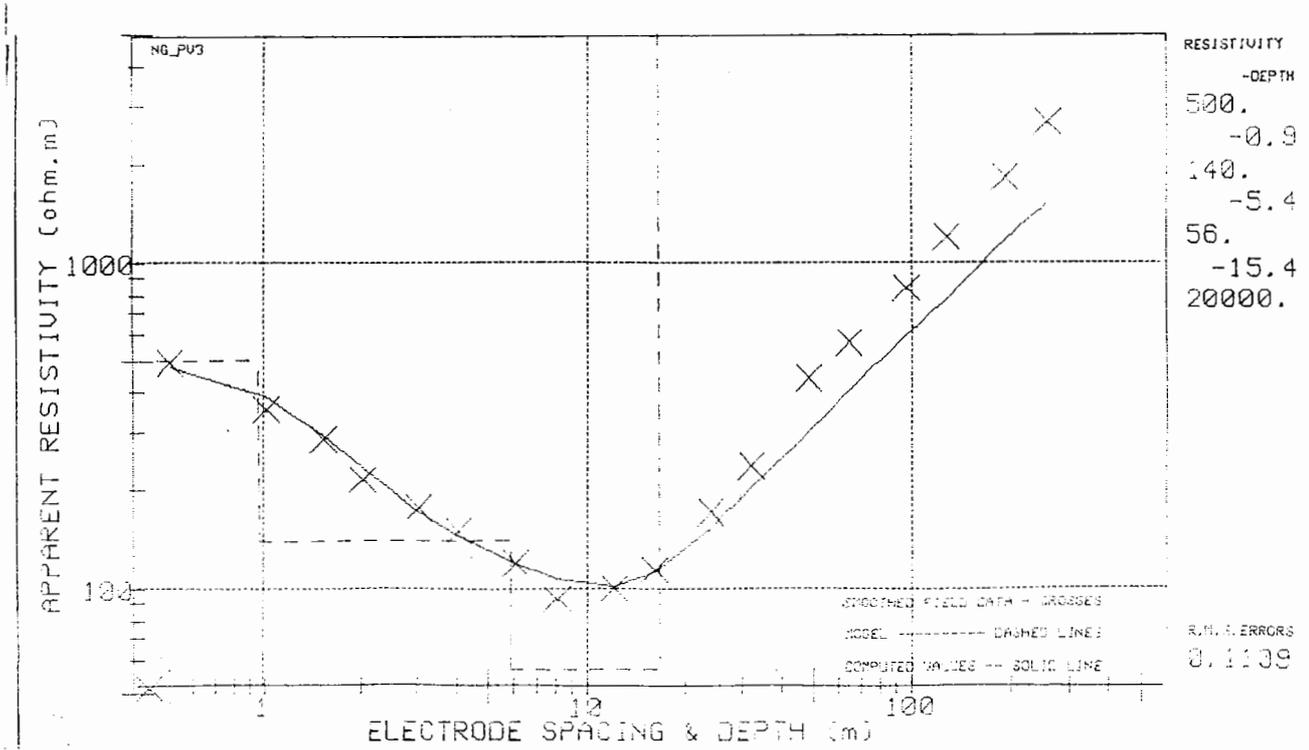


COMMENTS the presence of a closely stream could be attributed to the high lateral variation observed in the scattered points.

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-PV3

LOCATION Near the Dinning hall G.V.I.C., Padongari .							
Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.29	3.32	-68.57	0.5	493		
2	0.14	18.28	-32.76	1	354	1.5	286
3	-0.36	-37.37	-55.61	2	214	3	176.6
4	-0.51	-46.44	-97.79	4	149.9	6	120.1
5	-0.57	-47.09	-50.90	8	92.8	12	100
6	-0.17	-29.15	-10.66	16	114.2	24	170.9
7	0.16	-16.37	36.10	32	236	48	438
8	-1.12	-0.29	23.65	64	563	96	835
9	0.05	35.41	-	128	1192	192	1824
10	-	-		256	2696	304	-
R. m.s. errors	0.49	30.71	53.62	512	-		

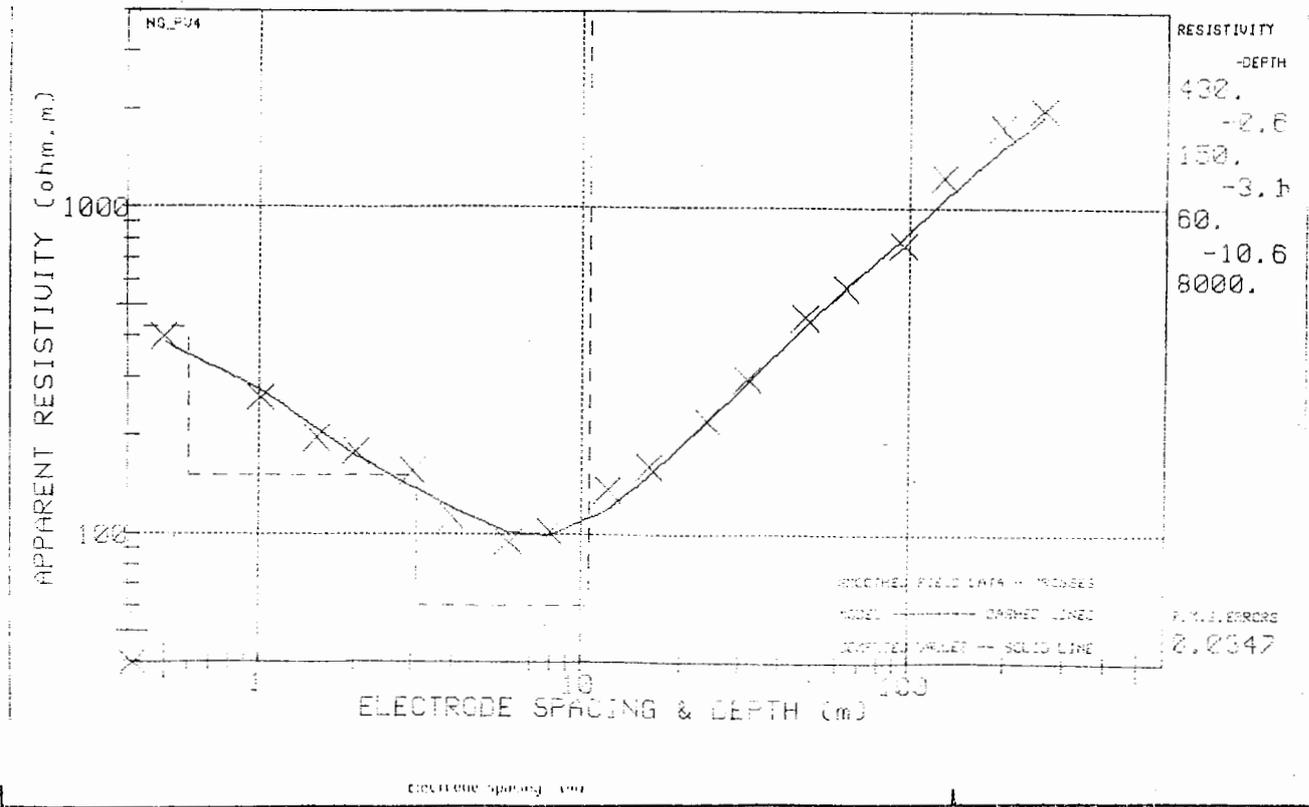


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-PV4**

LOCATION 150M western side of N.Y.S.C lodge, Padongari.							
Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.76	-17.57		0.5	399		
2	-0.24	18.58	101.29	1	260	1.5	195.3
3	-0.40	2.97	-47.03	2	177.6	3	155.3
4	0.66	-1.34	-3.24	4	112.3	6	94.4
5	-5.15	5.08	-32.32	8	101.0	12	135.9
6	-0.12	3.97	6.81	16	159.7	24	222.0
7	-6.02	-14.57	4.17	32	298.0	48	461.0
8	2.55	-31.65	23.74	64	567	96	772
9	0.48	-76.35	-15.52	128	1240	192	1778
10	—	—	—	256	2006	384	—
R. m.s. errors	1.98	29.34	42.42	512	—		



COMMENTS

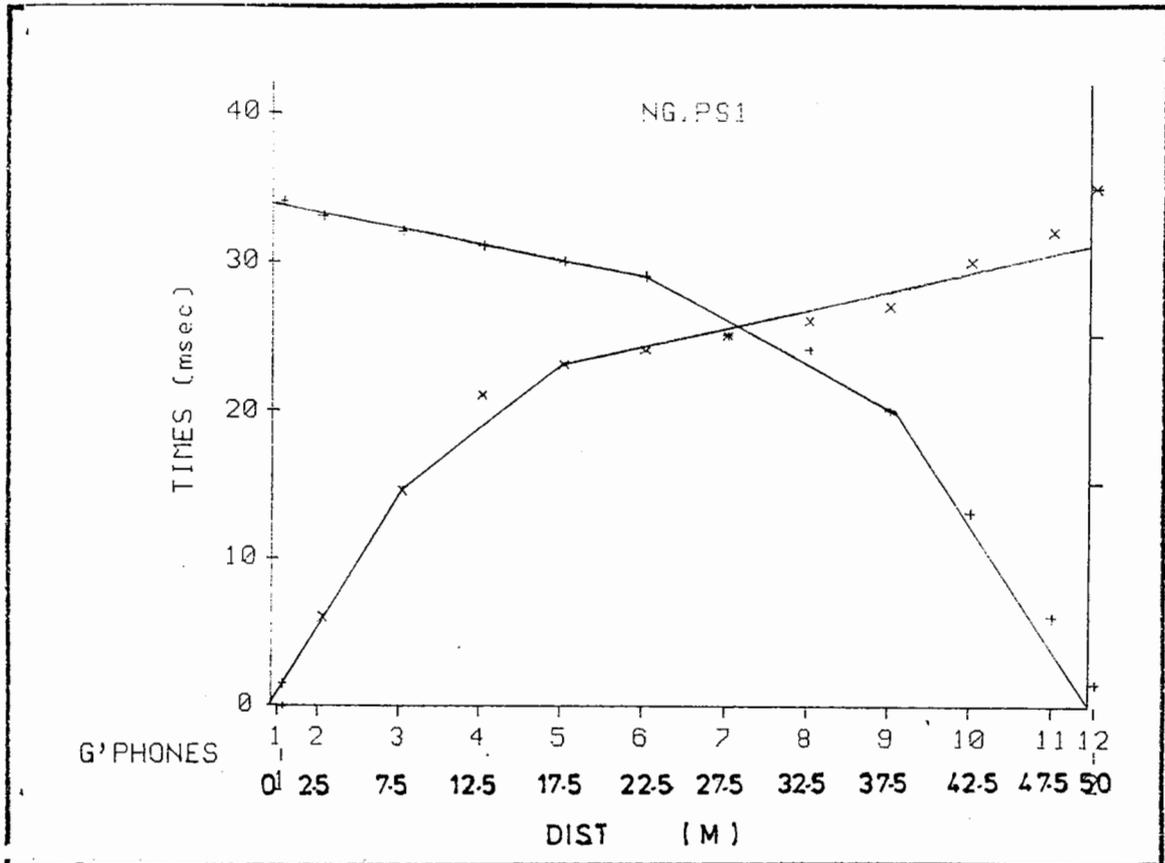
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG.PS1

Location: behind Chief palace Padongari
Niger state



SHOT POINT 1 2

Velocity & Int. Time	depth	depth	avg. depth(m)		
V1	545	2.6	638	4.8	3.7
Ti1	8.9		13.3		
V2	1176	7.5	1786	11.2	9.35
Ti2	15.9		23		
V3	2917		4679		

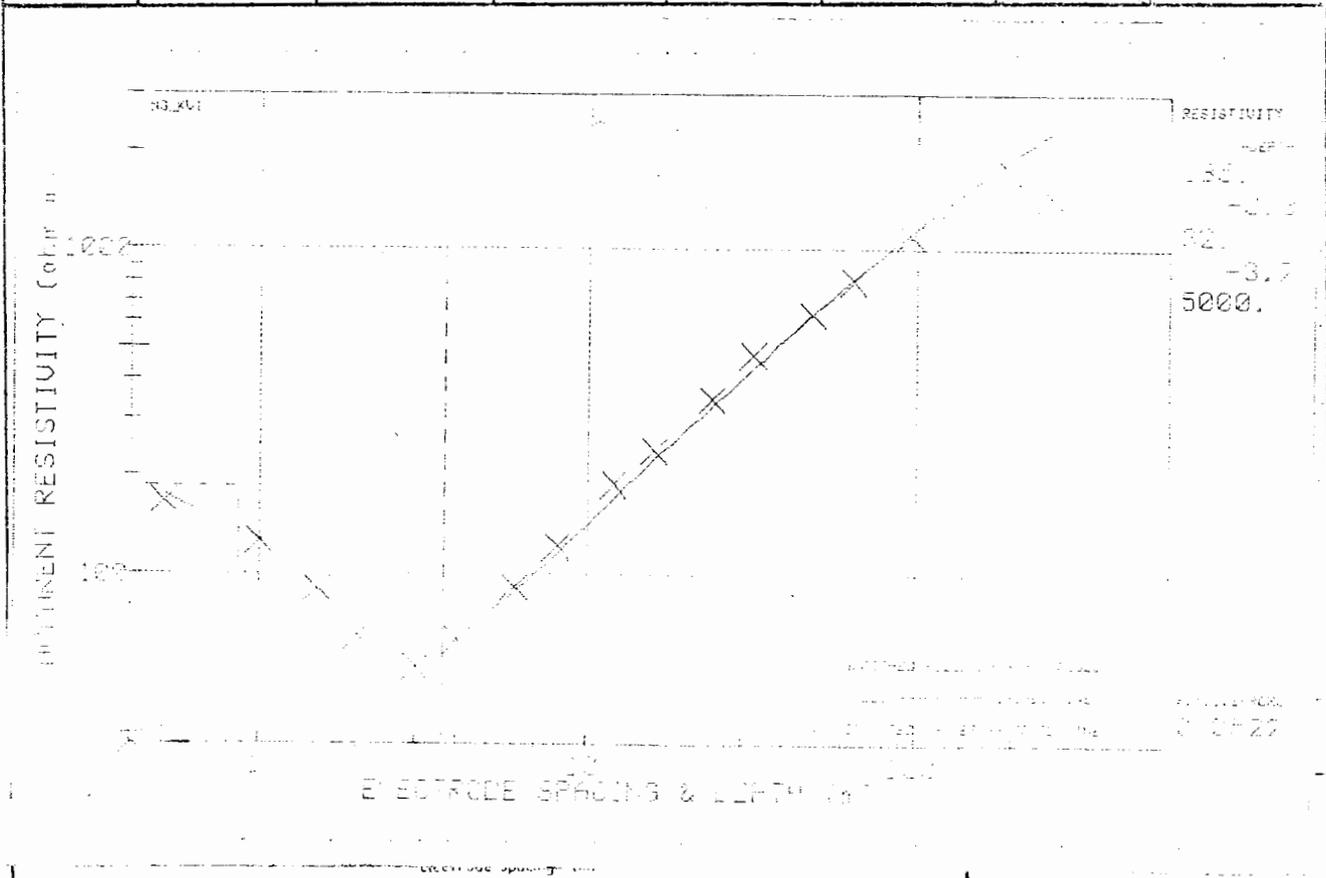
Comment :

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-KV1**

LOCATION **Maternity Center, 150M off Post office Road. Kagara .**
Niger State

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.34	1.13	-22.51	0.5	166.8	0.5	166.8
2	0.00	0.00	-20.27	1	126.3	1.5	90.1
3	0.28	-6.40	15.16	2	64.8	3	52.0
4	-0.20	28.11	-7.95	4	62.6	6	91.0
5	-0.05	7.44	14.43	8	121.6	12	188.9
6	-0.03	43.49	5.76	16	239.0	24	348.0
7	-0.37	43.35	-31.65	32	473.0	48	630.0
8	-0.13	33.45	-20.93	64	796.0	96	1098.0
9	-0.58	18.68		128	1369.0	192	1716.0
10	—	—		256	1453.0	384	—
R. m. s. errors	0.29	26.09	19.01	512	—		

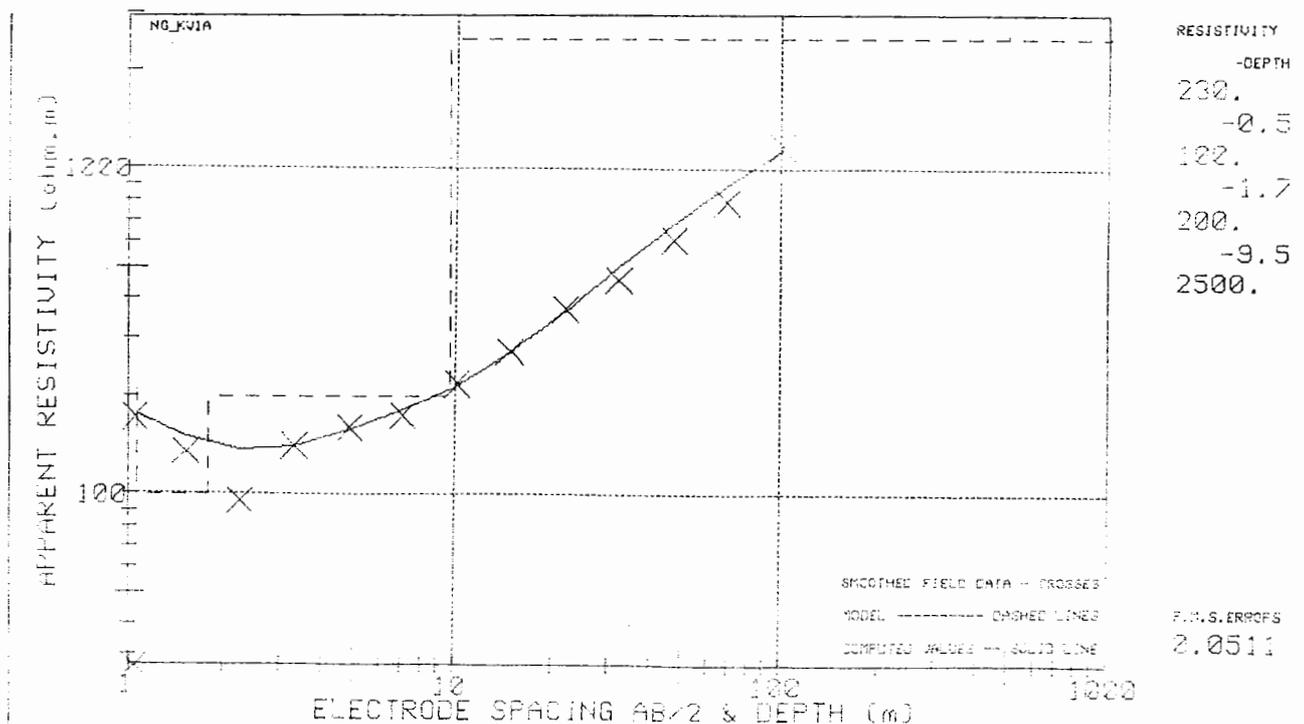


COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No. NG-KV1A

LOCATION <u>Maternity Clinic, Post office rd, 76M from the road</u>							
Kagara,				Niger state			
Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1	173.4		173.4	100	1193		1167
1.45	135.4		135.4	100	1026		-
2.15	95.7		95.7				
3.15	140.5		140.5				
4.65	159.0		159.0				
6.8	173.8		173.8				
6.8	156.8		—				
10.0	196.4	1.108	218				
14.5	246.0		273				
21.5	332		368				
31.5	409		453				
31.5	463		—				
46.5	618	0.978	604				
68.0	804		786				



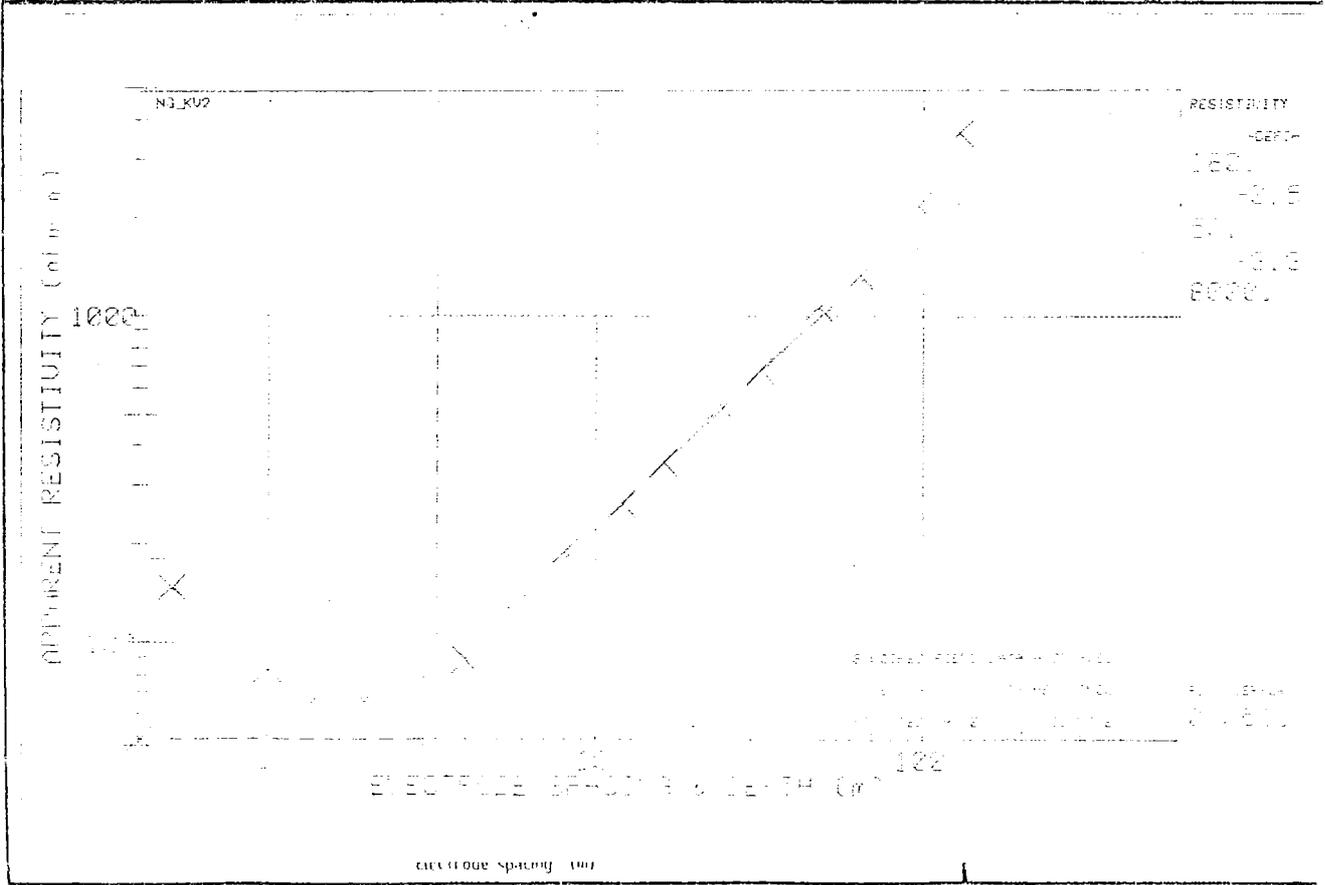
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-KV2

LOCATION 14M from Post office road. opposite Maternity Clinic.
Kagara. Niger state

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.55	9.85	-88.04	0.5	146.7		
2	0.05	34.07	-52.28	1	82.6	1.5	71.9
3	-0.00	19.11	-51.56	2	66.4	3	78.1
4	1.49	15.86	27.64	4	88.7	6	139.5
5	-0.49	64.91	-44.60	8	191.3	12	267.
6	-0.18	60.45	-29.12	16	356	24	535
7	-0.20	67.06	6.03	32	687	48	1064
8	0.28	-31.33	—	64	1335	96	2178
9	—	—	—	128	3648	192	—
10	—	—		256	—	384	—
R. m.s. errors	0.42	43.62	48.96	512	—		



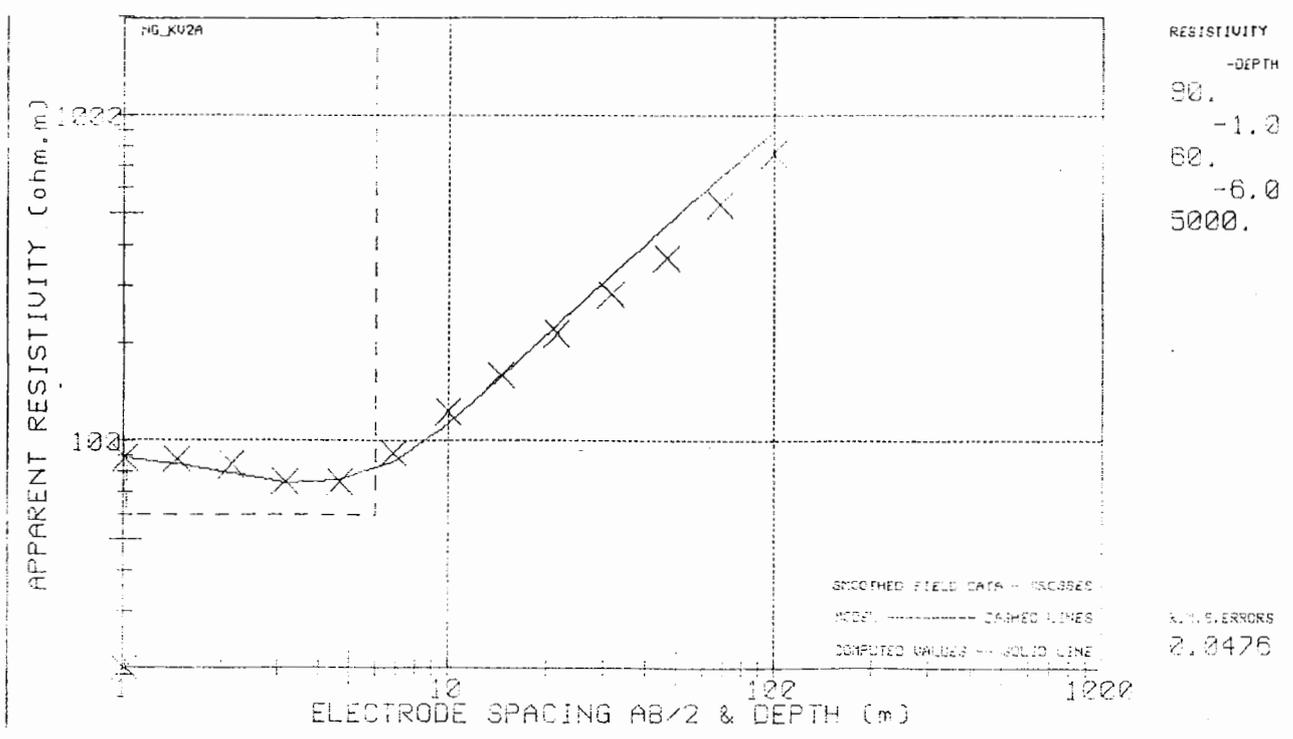
COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No. **NG-KV2A**

LOCATION: **Rafi L G A Secretariat, Kagara, Niger state**

Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m)		
	measured	ratio	adjusted		measured	ratio	adjusted
1	88.1		88.1	100	738		761
1.45	87.5		87.5	100	716		—
2.15	84.2		84.2				
3.15	74.7		74.7				
4.65	74.8		74.8				
6.80	91.1		91.1				
6.80	92.9		—				
10.00	125.4	0.980	122.9				
14.5	162.4		159.2				
21.5	216		212				
31.5	286		281				
31.5	272		—				
46.5	355	1.031	366				
68.0	514		530				

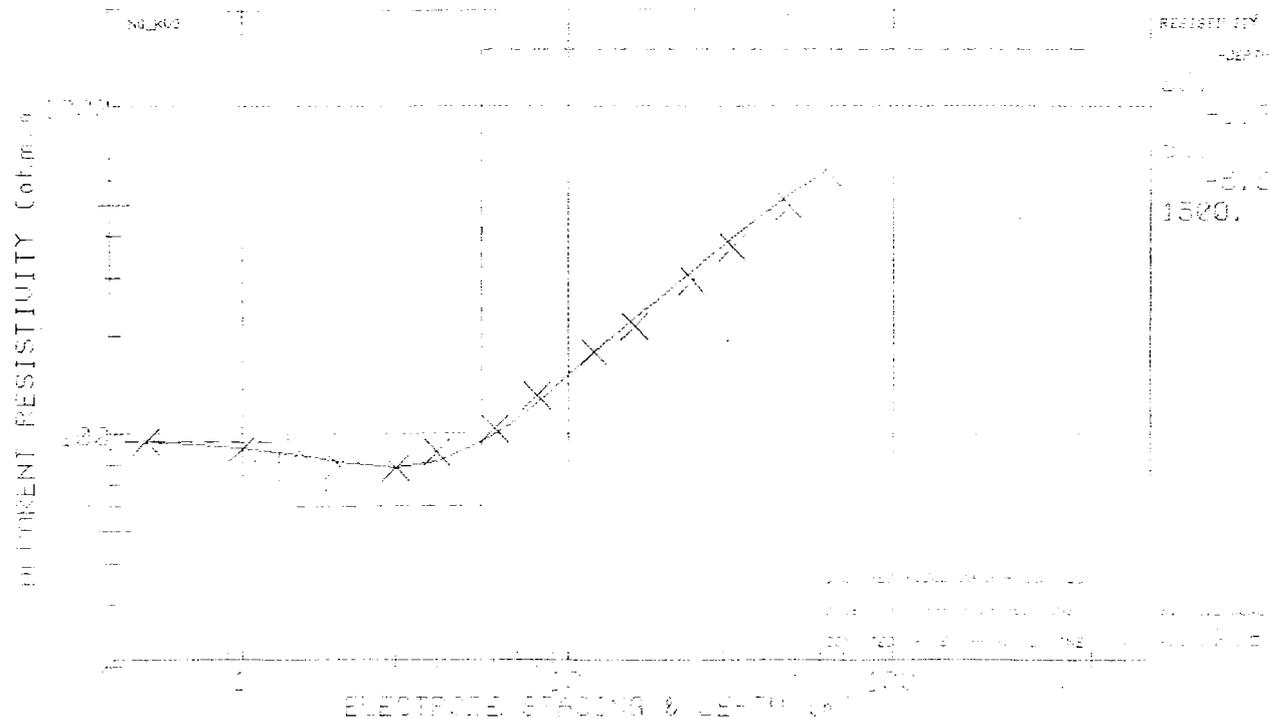


COMMENTS:

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-KV3**

LOCATION Rafi LGA Secretariat. Kagara.							
Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.00	6.00	-14.53	0.5	94.2		
2	-0.03	3.07	-1.35	1	90.0	1.5	87.7
3	0.35	0.63	38.55	2	79.5	3	78.1
4	-1.43	4.62	-17.08	4	87.0	6	102.7
5	-0.10	13.23	4.22	8	129.2	12	176.4
6	-0.35	7.13	12.94	16	212	24	292
7	-0.04	16.71	—	32	369	48	495
8	—	—	—	64	613	96	—
9	—	—	—	128	—	192	—
10	—	—	—	256	—	304	—
R. m. s. errors	0.31	9.04	19.04	512	—		

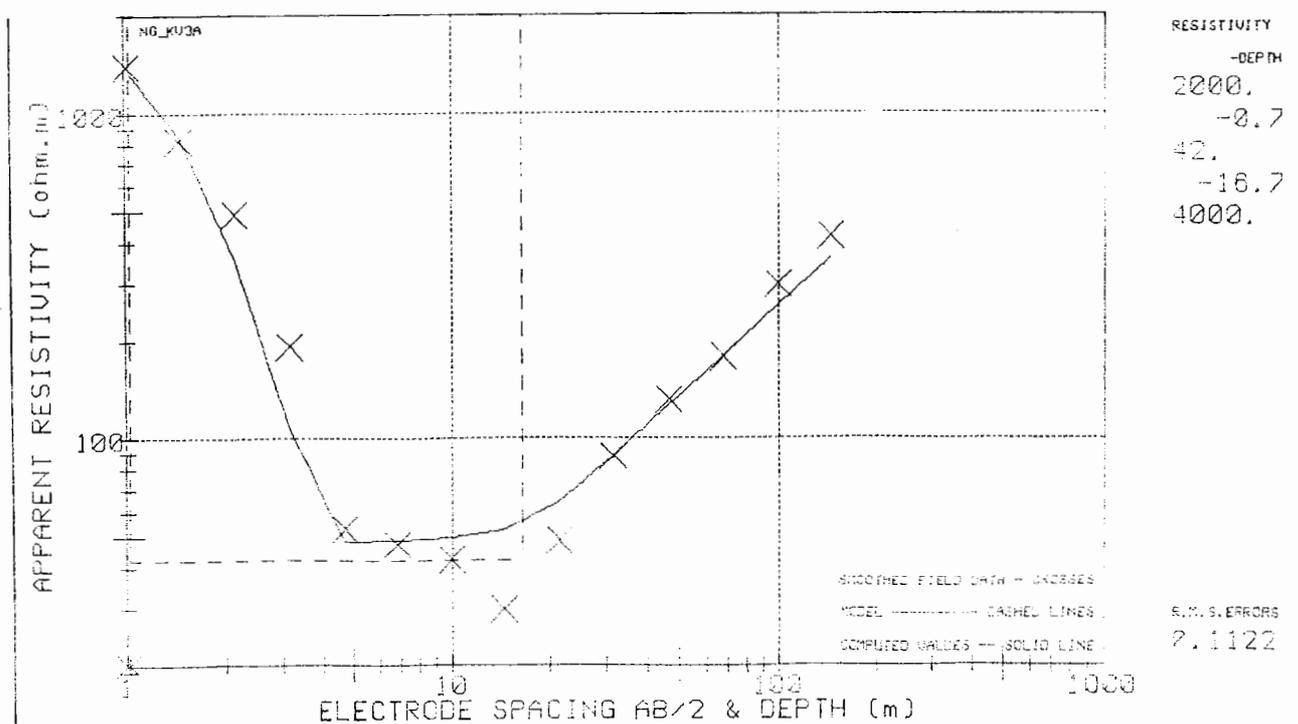


COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No. NG-KV3A

LOCATION: Ahmadu Aftahiru Secondary School, Kagara, Niger State							
Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1.0	1385		1385	100.00	211		296
1.45	818		818	100.00	282		—
2.15	487		487	145.0	400	1.049	419
3.15	190.9		190.9				
4.65	52.5		52.5				
6.8	47.2		47.2				
6.8	42.9		—				
10.0	38.5	1.100	42.3				
21.5	26.9		29.6				
21.5	44.1		48.5				
31.5	79.5		87.4				
31.5	62.3		—				
46.5	93.0	1.404	130.5				
68.0	126.7		177.8				

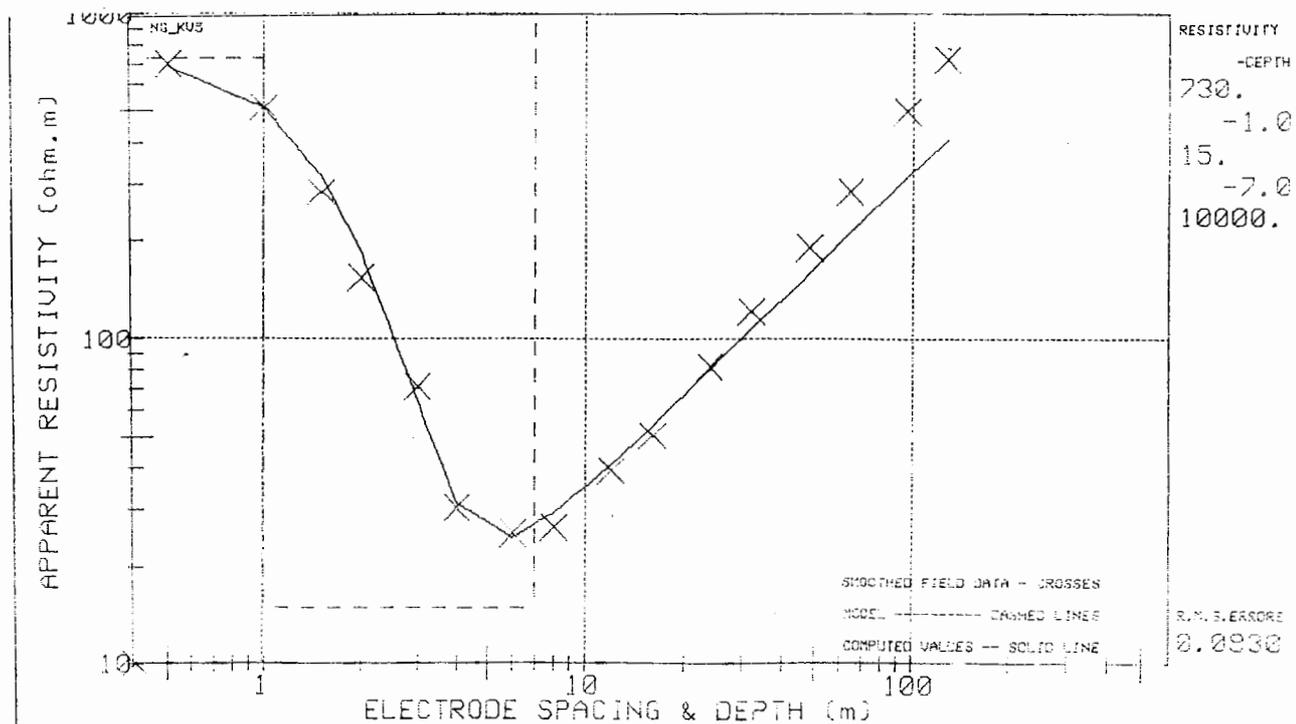


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-KV5

LOCATION Low Cost Housing Estate, Kagara, Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.32	7.21	12.93	0.5	697	 	
2	-0.35	-6.76	12.93	1	511	1.5	282
3	0.57	-3.25	-133.83	2	154.6	3	70.8
4	-0.23	8.09	167.67	4	30.1	6	25.3
5	-1.34	-8.41	-33.35	8	26.3	12	39.4
6	-0.13	-17.89	35.04	16	50.6	24	81.3
7	-0.68	-10.61	23.87	32	121.2	48	190.5
8	-1.09	2.55	-14.89	64	284	96	499
9	-	-	-	128	723	192	-
10	-	-	 	256	-	384	-
R. m.s. errors	0.32	9.24	83.94	512	-	 	



COMMENTS

SEISMIC REFRACTION SURVEY

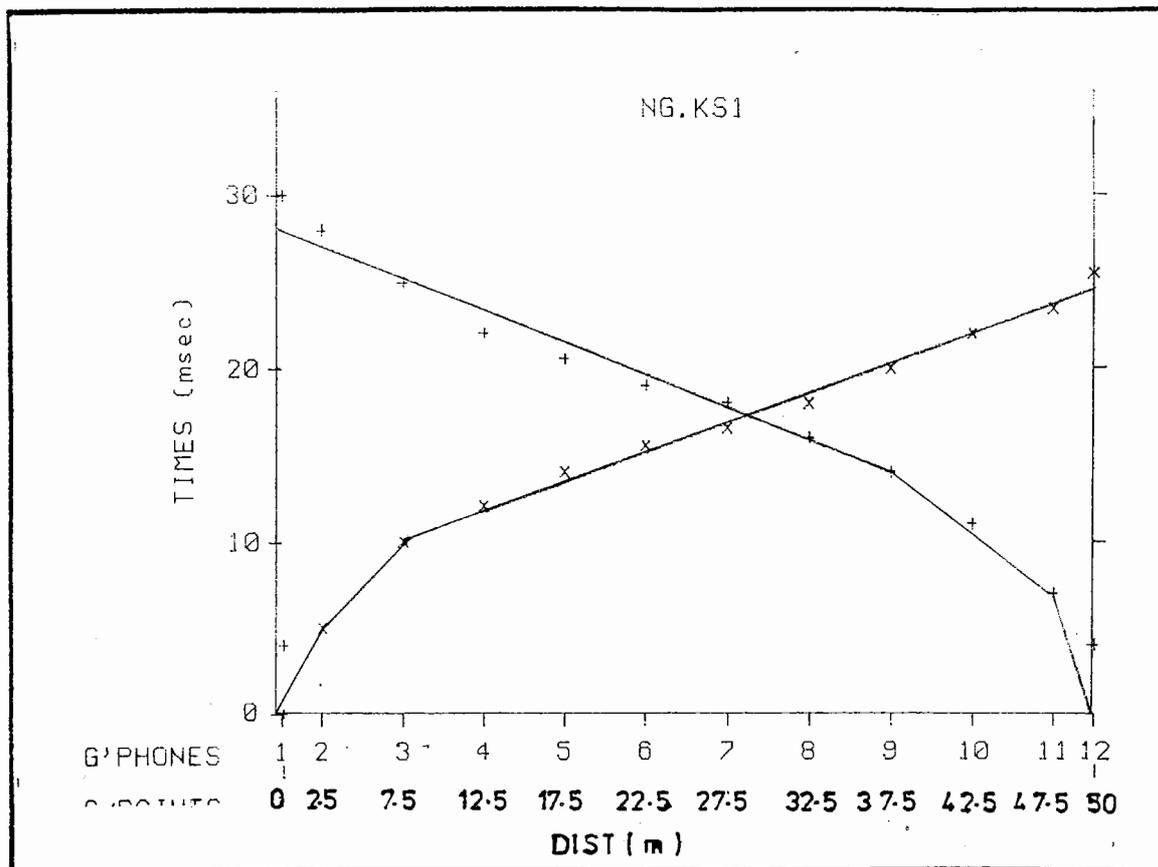
Data Computation & Interpretation

No.

NG-KS1

Location: OPPOSITE MATERNITY CLINIC KAGARA

NIGER STATE



SHOT POINT 1 2

Velocity & Int. Time depth depth avg. depth (m)

V1	625	0.9	417	1.2	1.05
Ti1	2.5		5.4		
V2	1000	4.0	1429	3.0	3.5
Ti2	7.5		8.5		
V3	2928		2494		

Comment :

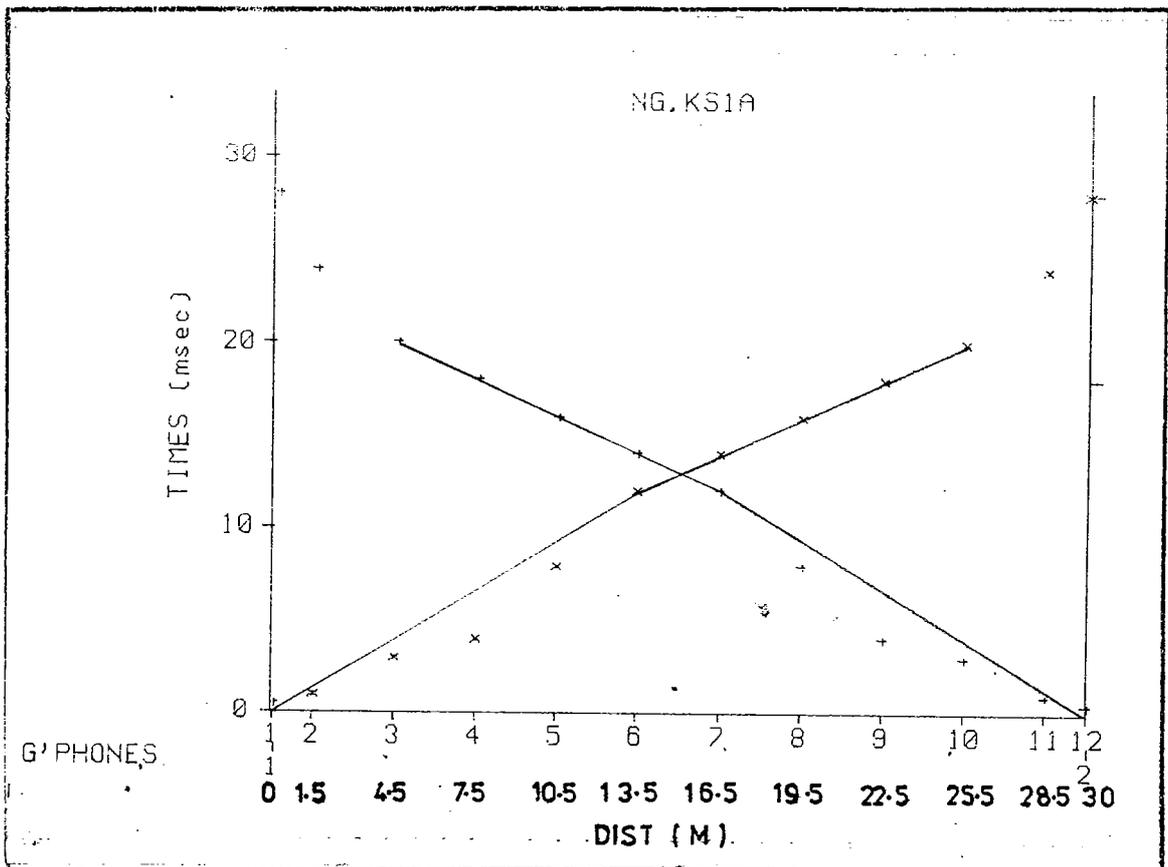
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG-KS1A

Location: opposite maternity clinic Kagara
Niger state



SHOT POINT

1

2

Velocity &
Int. Time

depth

depth

avg.
depth (m)

V1	1232	3.2	1232	3.2	3.2
T11	3.0		3.0		
V2	1500		1500		
T12					
V3					

Comment :

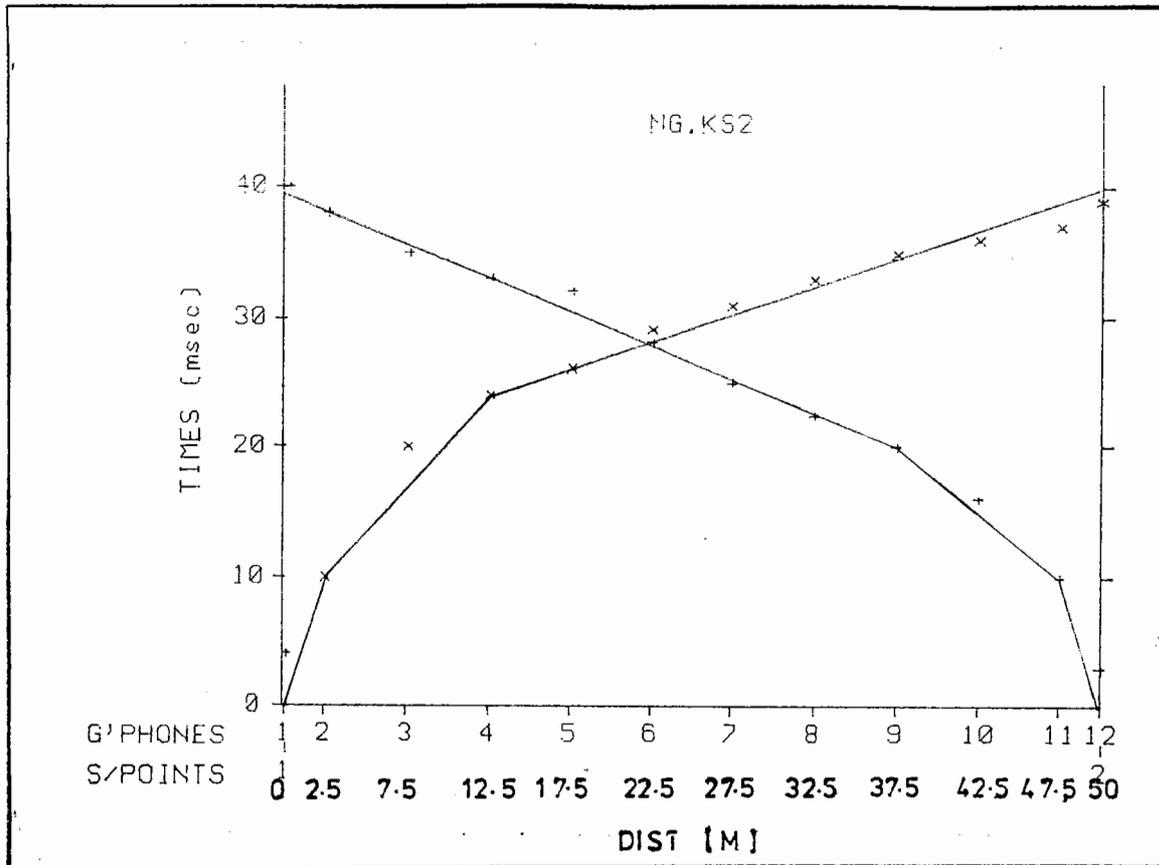
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG.KS2

Location: RAFI LGA SECRETARIAT KAGARA NIGER STATE



SHOT POINT 1 2

Velocity & Int. Time	depth	depth	avg. depth (m)		
V1	278	1.1	278	1.2	1.15
Ti1	7.5		7.8		
V2	714	6.5	1000	3.6	5.05
Ti2	19.9		13.6		
V3	2616		1916		

Comment :

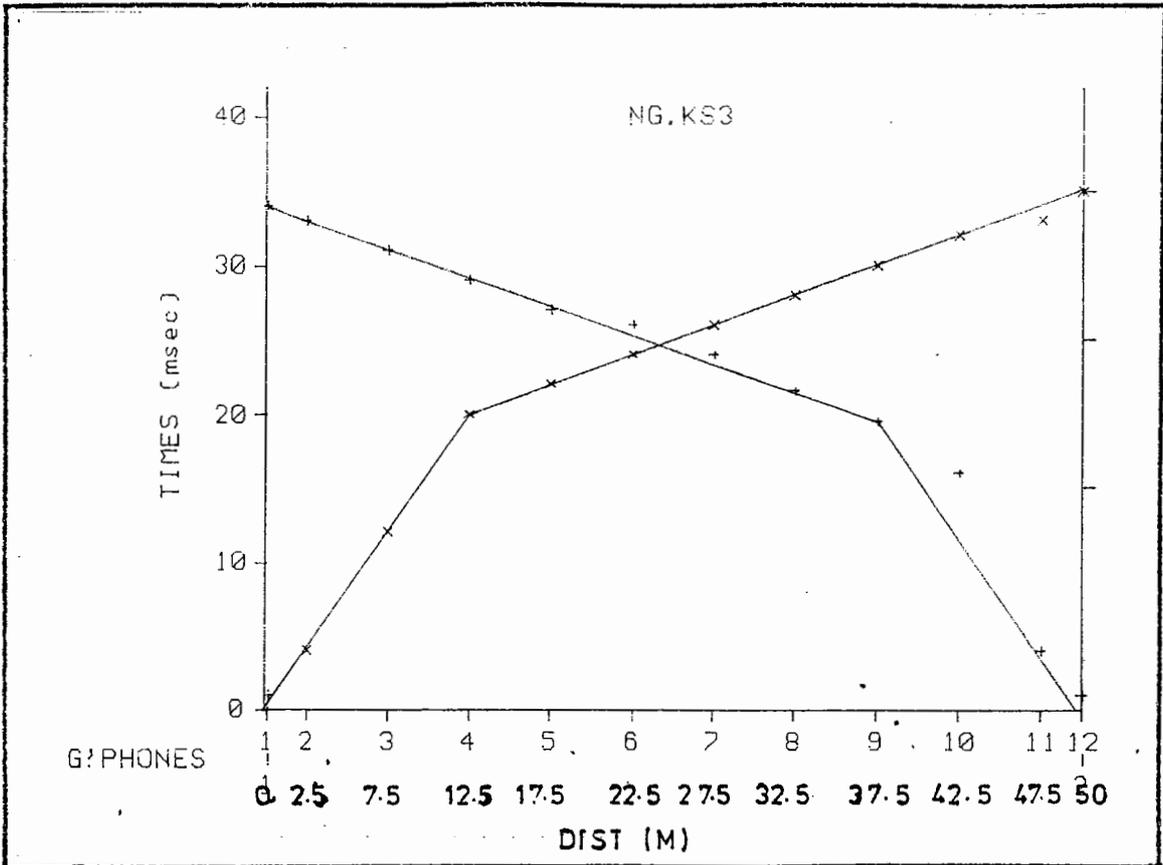
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG-KS3

Location: AHMADU ATTAHIRU SEC SCH KAGARA
NIGER STATE



SHOT POINT 1 2

Velocity & Int. Time	depth		depth		avg. depth (m)
V1	640	5.0	614	4.8	4.9
Ti1	15.2		15.1		
V2	2570		2649		
Ti2					
V3					

Comment :

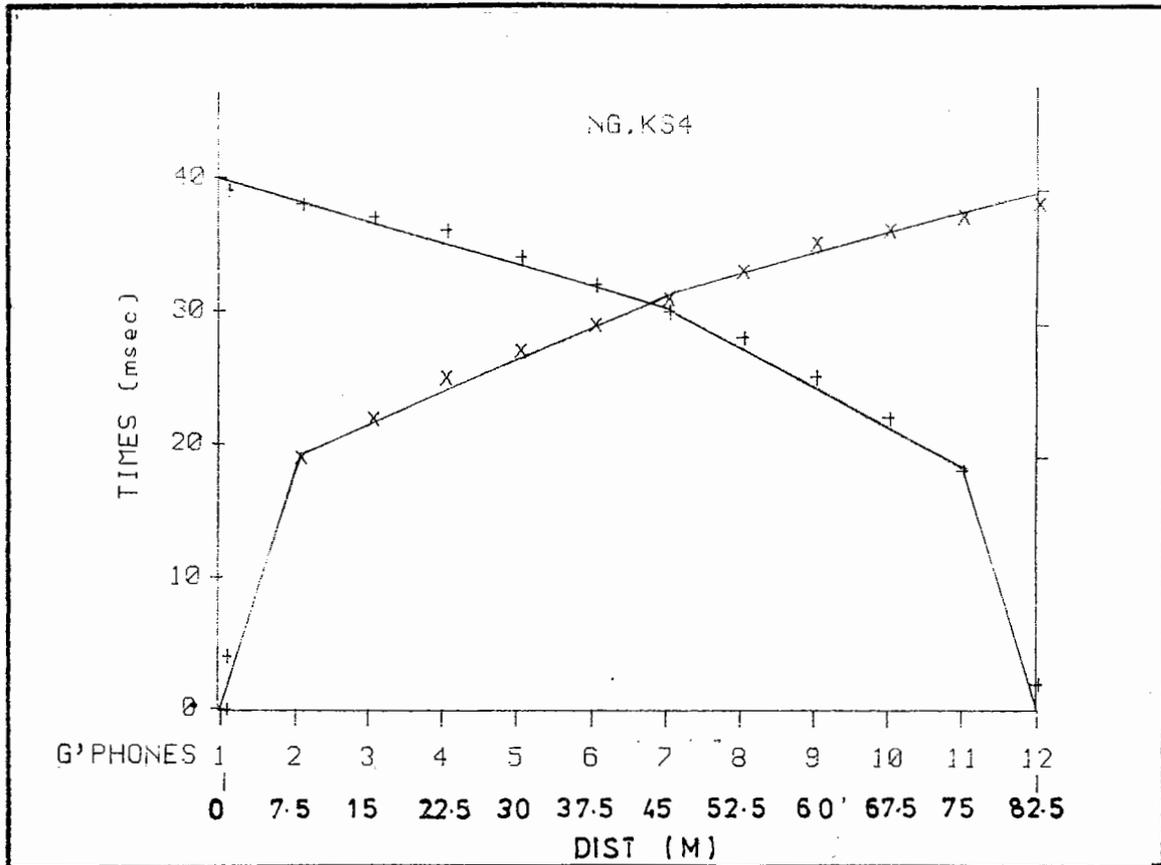
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG · KS4

Location: Ahmadu Attahiru secondary school Kaduna
Niger state



SHOT POINT 1 2

Velocity & Int. Time	depth		depth		avg. depth (m)
V1	417	3.6	441	3.6	3.6
Ti1	17.2		16.1		
V2	3163	13.9	2706	17.5	15.7
Ti2	23.3		24.3		
V3	5469		5469		

Comment :

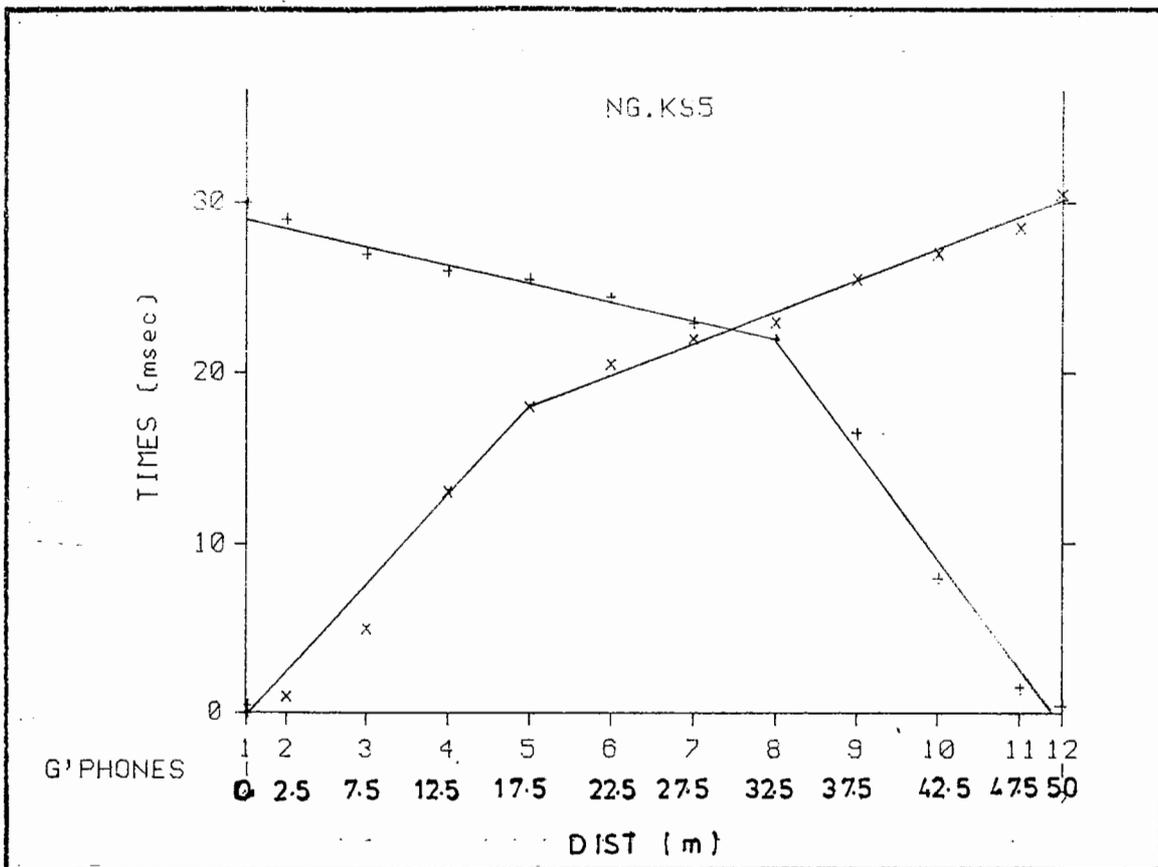
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG.KS5

Location: Low cost Housing Estate Kagara
Niger state



SHOT POINT 1 2

Velocity & Int. Time	depth		depth		avg. depth (m)
V1	966	6.0	779	7.3	6.65
Ti1	11.9		17.8		
V2	2788		4308		
Ti2					
V3					

Comment :

Figure III.12 Rijau - Location of Geophysical Stations

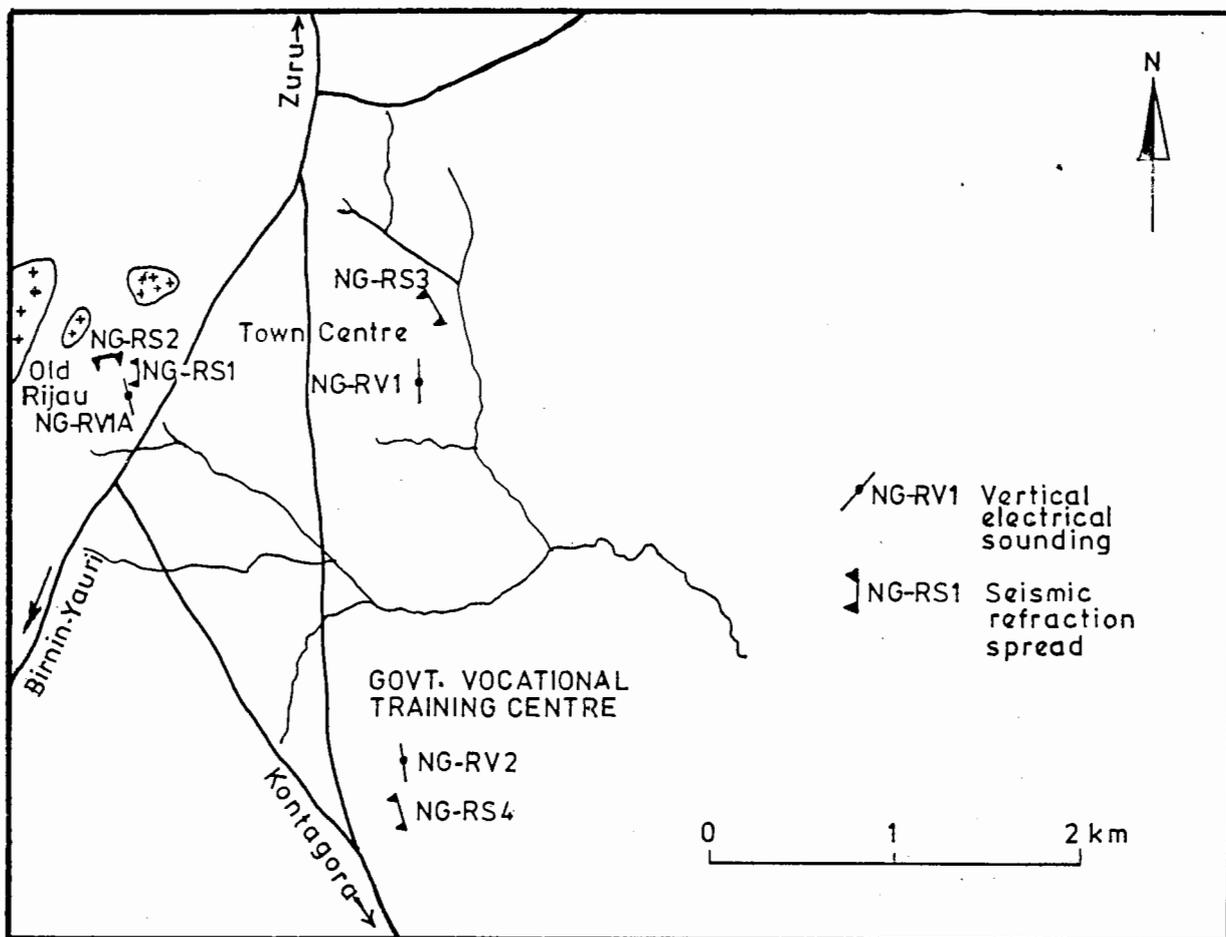
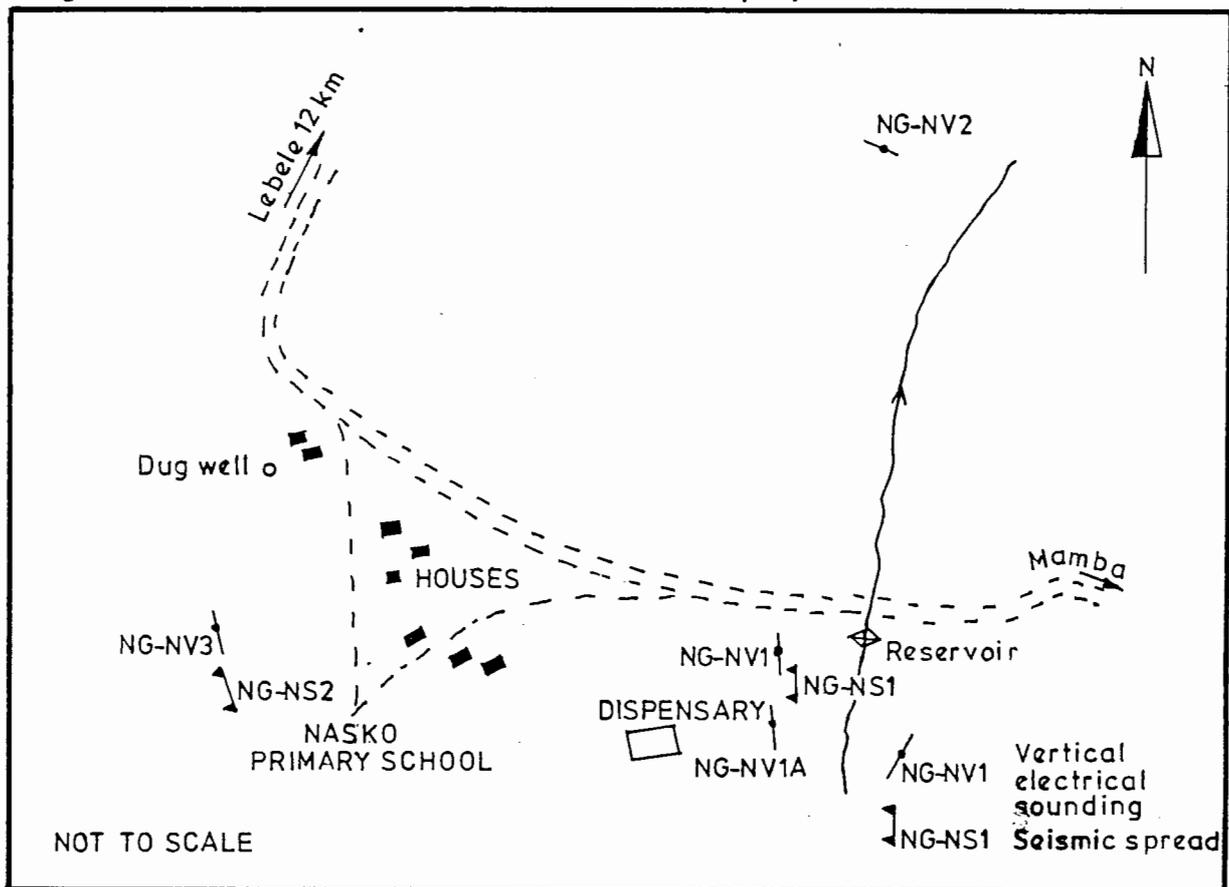


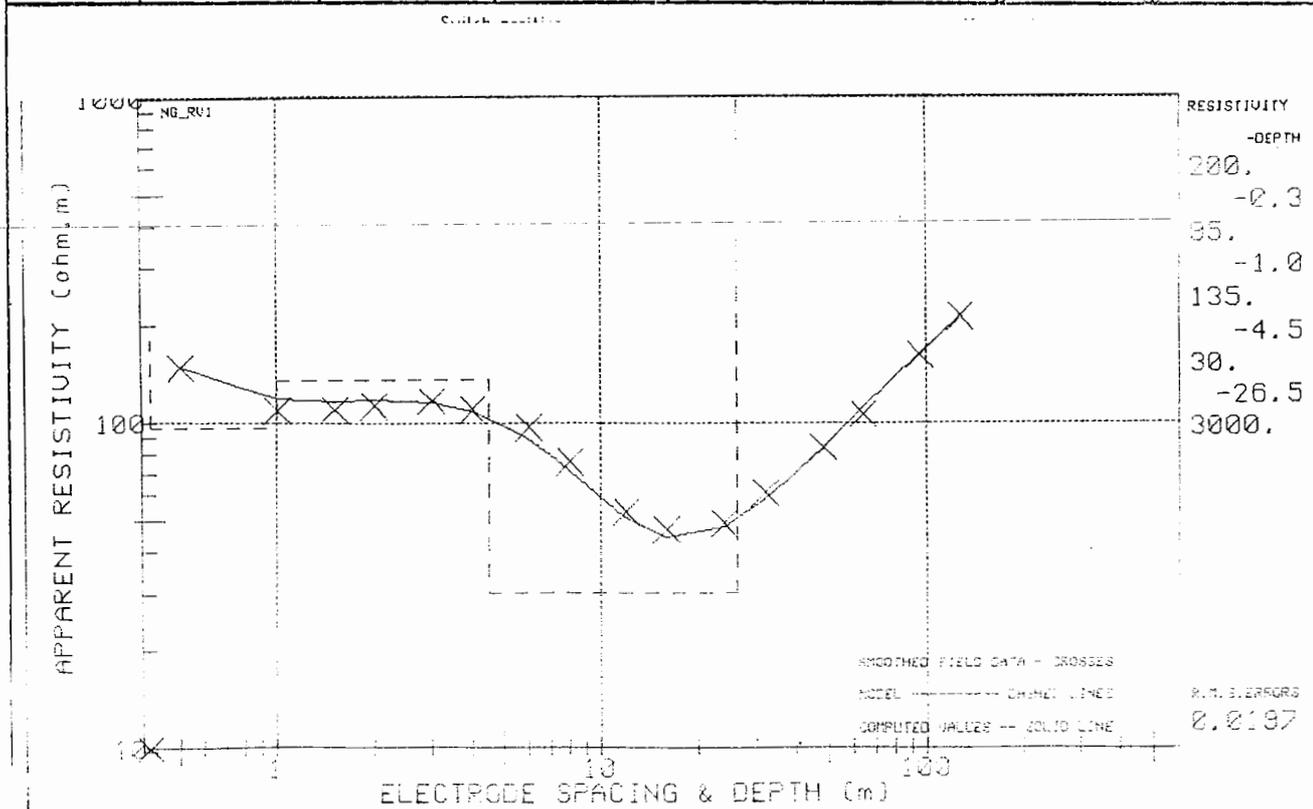
Figure III.13 Nasko - Location of Geophysical Stations



VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-RV1

LOCATION Sabon Gari, Rijau							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.00	-35.17	-61.67	0.5	148.3		
2	0.06	3.55	30.05	1	108.0	1.5	108.7
3	0.07	-32.72	-40.59	2	111.8	3	115.7
4	-0.12	3.03	-46.64	4	107.9	6	95.3
5	0.01	-21.09	-3.63	8	74.8	12	52.6
6	0.13	5.44	1.41	16	46.2	24	48.3
7	-1.06	-5.33	0.79	32	60.3	48	83.0
8	-8.56	-15.80	-	64	104.4	96	159.4
9	/	/	-	128	209	192	/
10	/	/	-	256	/	384	/
R. m. s. errors	3.05	19.63	34.94	512	/		



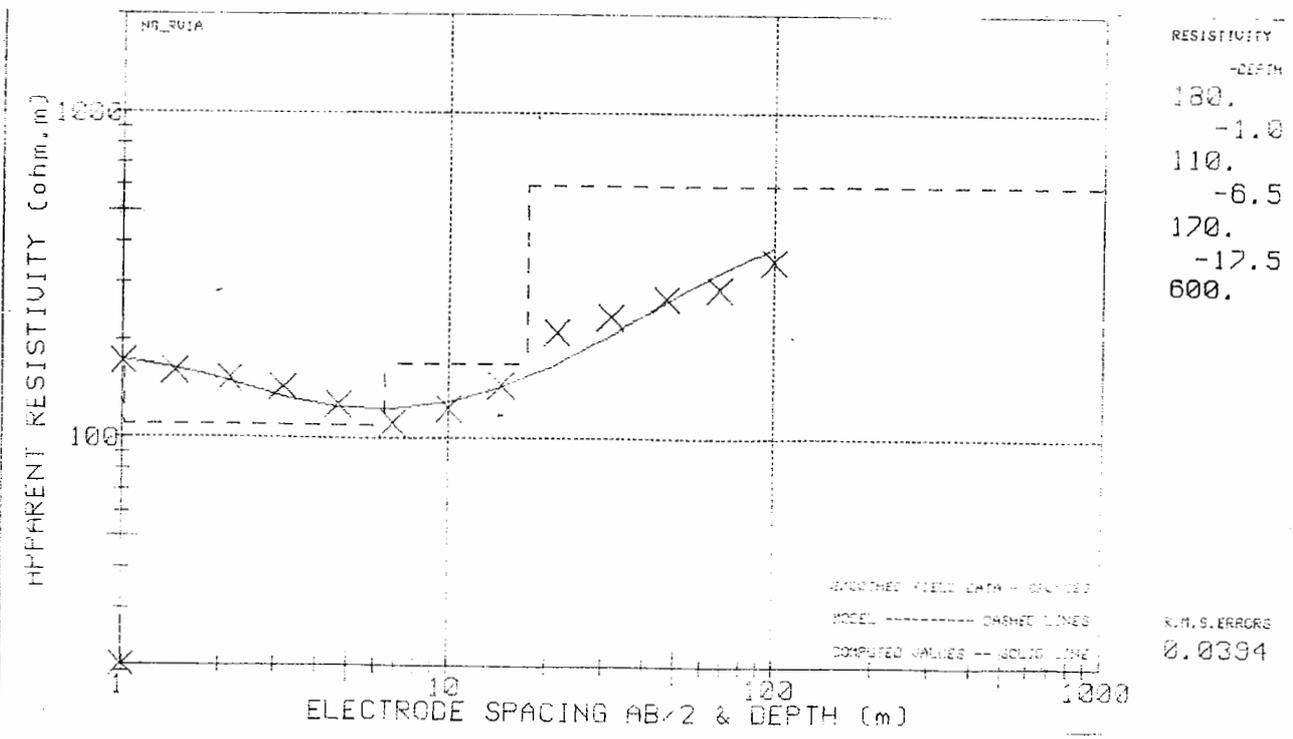
COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No. NG-RV1A

LOCATION: Near old town Primary School Rijau							
Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m)		
	measured	ratio	adjusted		measured	ratio	adjusted
1.0	171.2		171.2	100.0	556		351
1.45	159.9		159.9				
2.15	151.5		151.5				
3.15	143.2		143.2				
4.65	127.0		127.0				
6.8	110.7		110.7				
6.8	146.8		—				
10.0	163.1	0.754	123.0				
14.5	193.0		145.5				
21.5	280		211				
31.5	311		235				
31.5	372		—				
46.5	426	0.631	268				
68.0	455		287				

Unsmoothed data

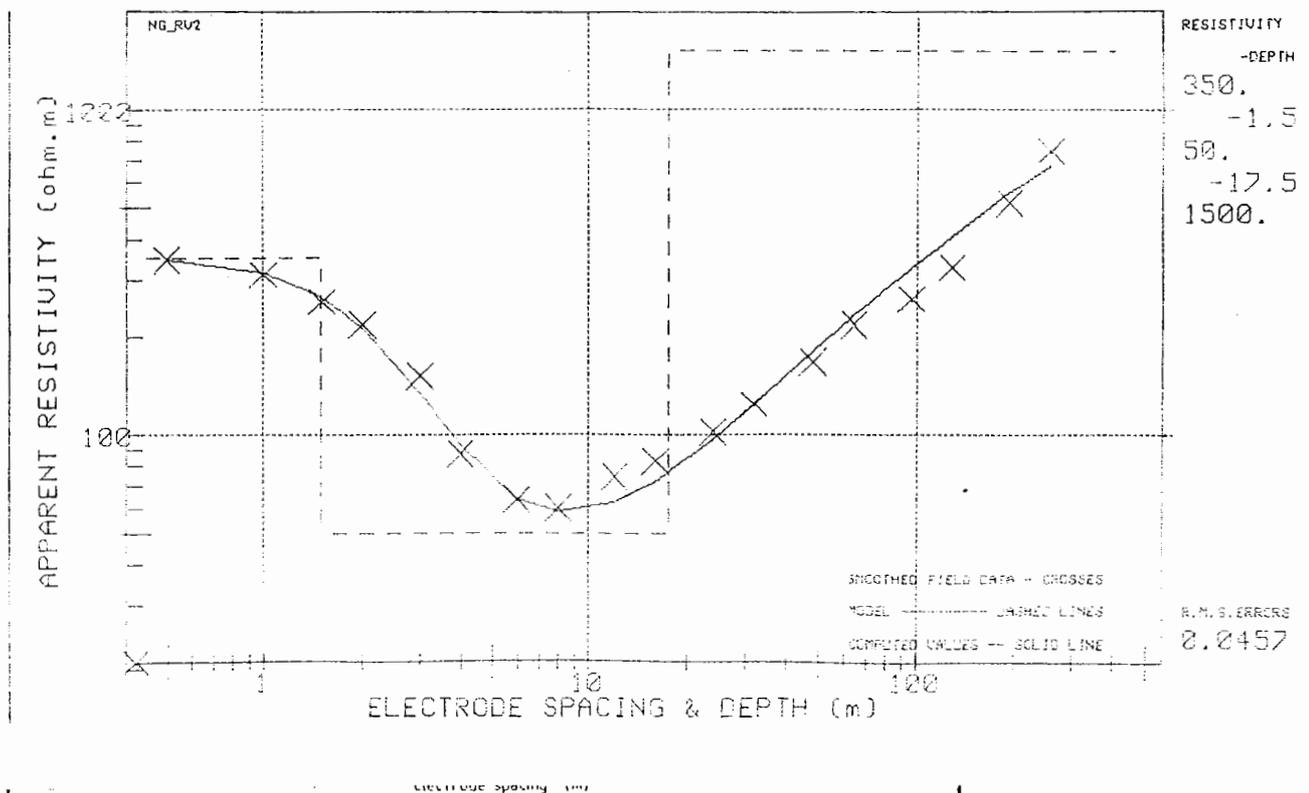


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-R V2**

LOCATION <u>Government Vocation Training Center, Rijau</u> <u>Niger State</u>							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.01	-2.82	-6.00	0.5	346		
2	0.16	26.55	-70.46	1	310	1.5	254
3	0.00	13.57	-111.32	2	217	3	151.9
4	-0.13	-8.39	-19.55	4	86.8	6	63.3
5	-1.69	-8.31	-1.87	8	59.9	12	74.0
6	-1.81	-0.37	4.01	16	82.5	24	101.8
7	-0.32	-11.86	26.83	32	123.8	48	166.8
8	-0.49	-50.46	-59.36	64	217	96	260
9	-1.34	-59.78	-	128	327	192	512
10	-	-	-	256	741	384	-
R. m.s. errors	0.70	28.47	52.48	512	-		



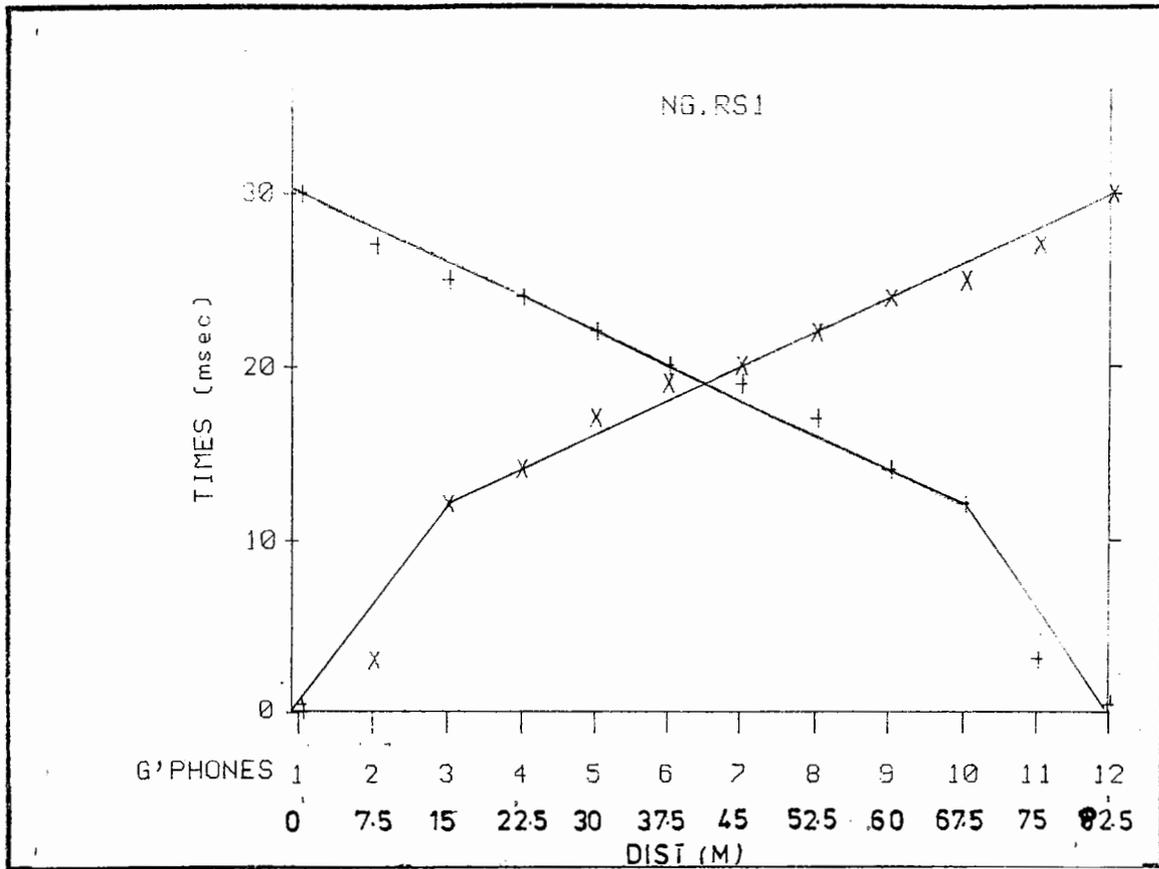
COMMENTS

SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No. NG.RS1

Location: old town settlement, Rijau. Niger state



SHOT POINT 1 2

Velocity & Int. Time depth depth avg. depth(m)

V1	1341	6.3	1341	6.3	6.3
Ti1	8.8		8.8		
V2	3992		3992		
Ti2					
V3					

Comment :

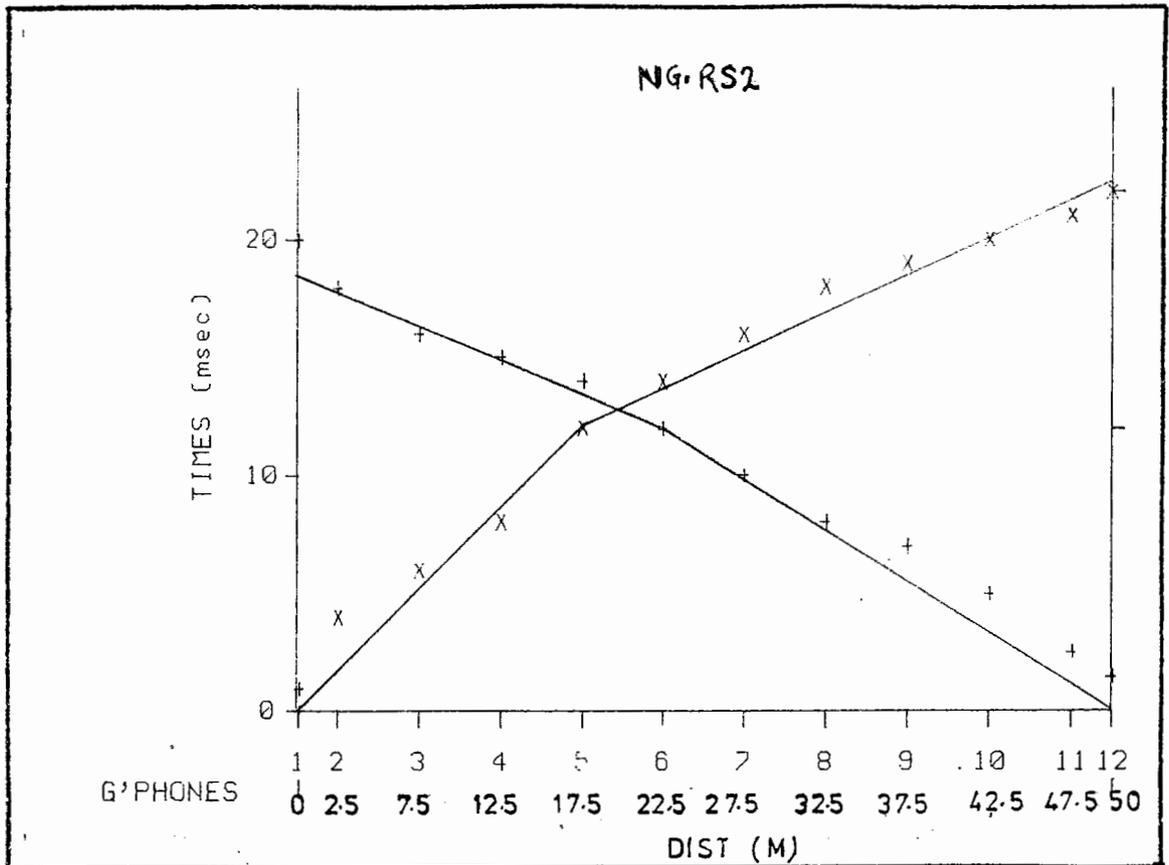
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG-RS2

Location: Old town settlement, Rijau Niger state



SHOT POINT

1

2

Velocity &
Int. Time

depth

depth

avg.
depth(m)

V1	1578	6.9	2423	5.6	6.25
Ti1	7.6		3.1		
V2	3404		3114		
Ti2					
V3					

Comment :

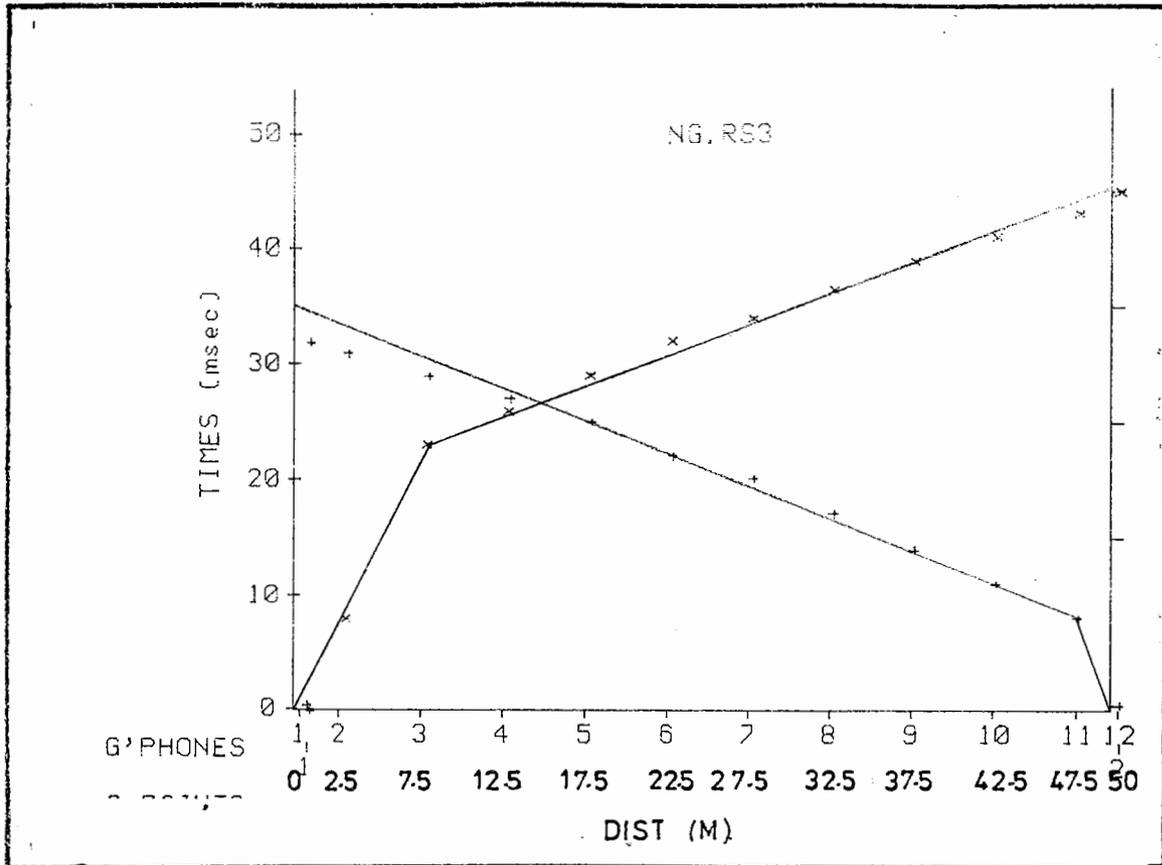
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG. RS 3

Location: Nursery Garden Sabon gari Magama LGA
Rijau Niger state



SHOT POINT 1 2

Velocity & Int. Time depth depth avg. depth (m)

V1	330	3.3	323	1.3	2.3
Ti1	20		7.7		
V2	2004		1989		
Ti2					
V3					

Comment :

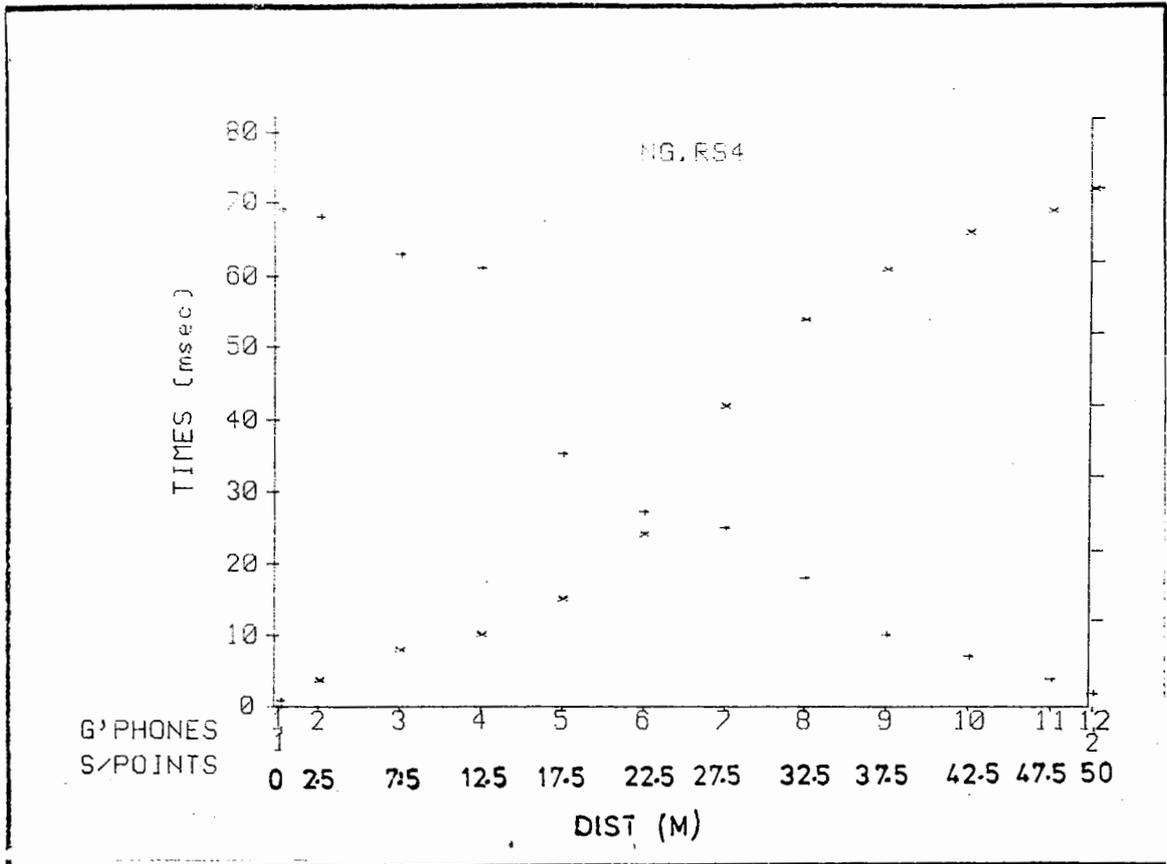
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG. RS4

Location: GOVT VOCATIONAL TRAINING CENTER RIJAU



SHOT POINT

1

2

Velocity &
Int. Time

depth

depth

avg.
depth (m)

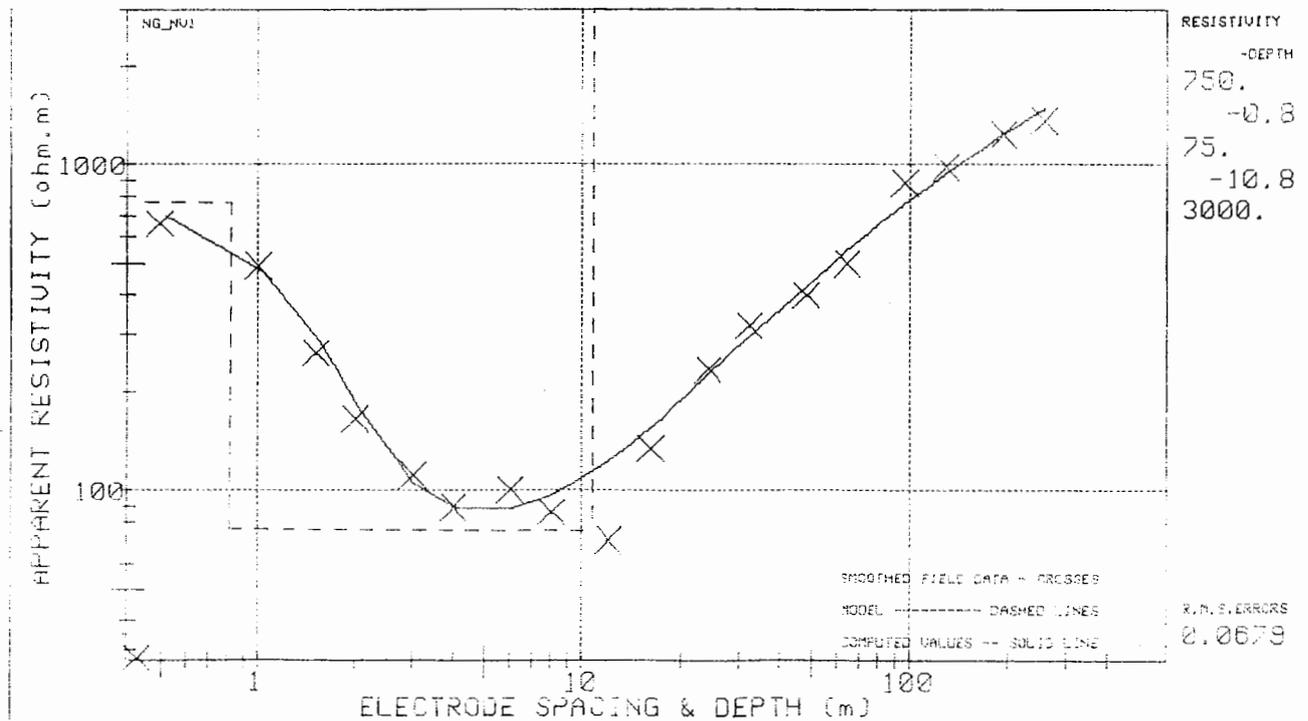
V1	706	10.1	791	18.3	14.2
T11	23.2		34.9		
V2	1020		1460		
T12					
V3					

Comment: The results of this spread is not very reliable due to the effects of winds during Survey.

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. NG-NV1

LOCATION Near the Dispensary, Nasko, Niger state							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.12	-1.91		0.5	657		
2	0.14	14.38	25.19	1	489	1.5	262
3	0.29	23.18	-108.53	2	165.9	3	111.8
4	-7.44	0.57	15.51	4	88.7	6	100.8
5	7.56	-18.86	-19.16	8	85.3	12	70.6
6	0.91	-9.49	-34.67	16	134.6	24	234
7	-1.40	12.19	1.87	32	320	48	398
8	1.88	-41.10	-72.12	64	495	96	877
9	-0.91	33.25	28.82	128	987	192	1237
10	—	—		256	1362	384	—
R. m. s. errors	2.11	21.44	50.32	512	—		

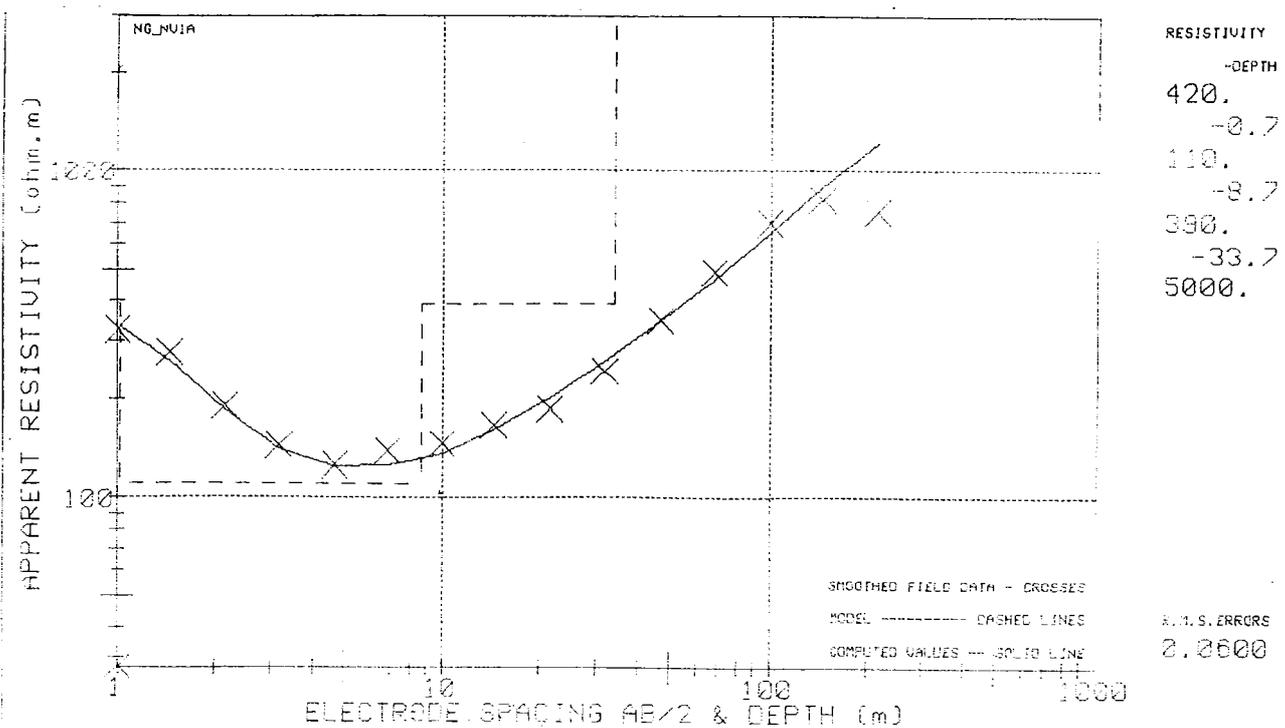


COMMENTS

VERTICAL ELECTRICAL SOUNDING (SCHLUMBERGER ARRAY)
Data Reduction & Interpretation

No. NG-NV1A

LOCATION: Near Nasko Dispensary by mamba road Nasko Niger state							
Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)			Electrode spacing AB/2 (m.)	Apparent resistivity (ohm.m.)		
	measured	ratio	adjusted		measured	ratio	adjusted
1.0	325		325	100	520		698
1.45	278		278	100	556		—
2.15	190		190	145	654	1.256	821
3.15	143.5		143.5	215	600		754
4.65	124.9		124.9				
6.8	138.2		138.2				
6.8	119.1		—				
10.0	125.4	1.161	145.6				
14.5	142.7		165.7				
21.5	160		185.8				
31.5	210		243				
31.5	181.2		—				
46.5	258	1.344	347				
68.0	365		490				

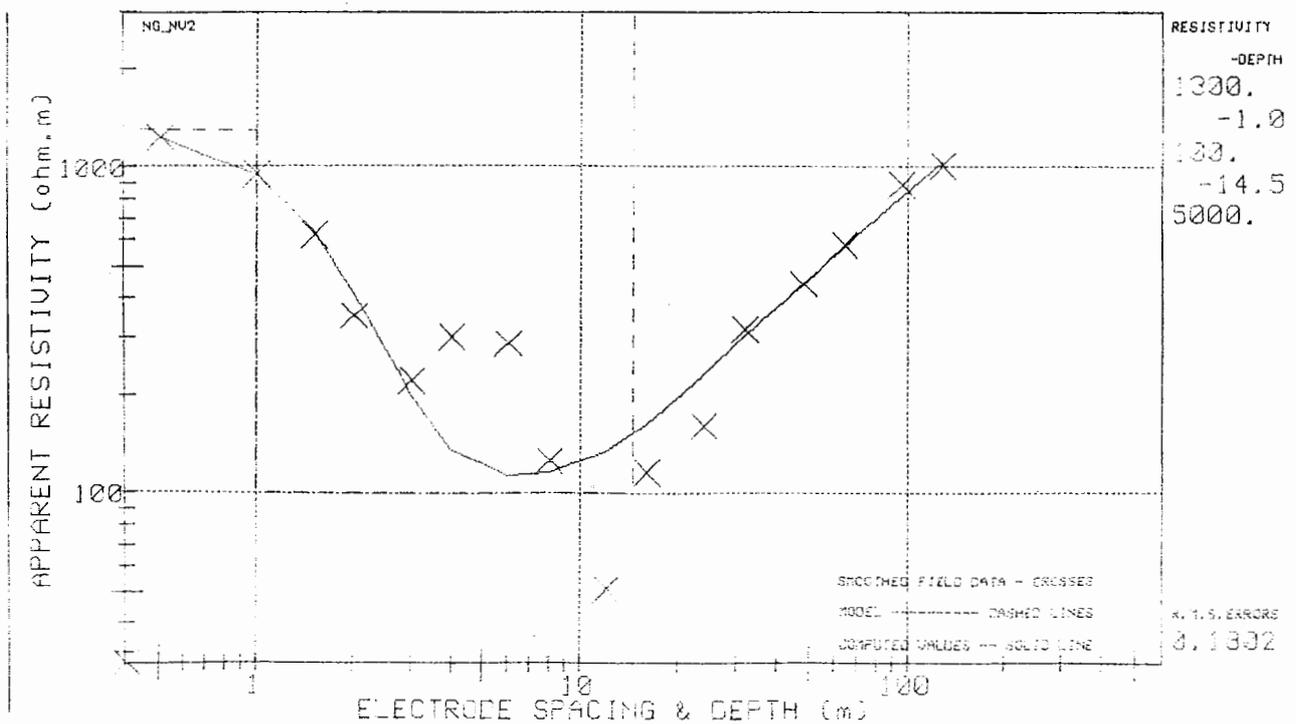


COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-NV2**

LOCATION <u>Last point on traverse line, Nasko Village,</u>							
Niger State							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.04	10.18	22.29	0.5	1235	 	
2	-3.05	-23.35	87.39	1	953	1.5	622
3	0.38	-34.70	-261.96	2	351	3	221
4	-1.66	-146.23	-3105.59	4	302	6	287
5	-21.44	70.51	-386.05	8	125.6	12	50.9
6	-3.62	7.43	18.43	16	116.3	24	161.7
7	-0.52	87.34	-75.18	32	318	48	443
8	-3.51	45.16	—	64	580	96	888
9	—	—	—	128	1017	192	—
10	—	—	 	256	—	384	—
R. m.s. errors	3.77	68.86	1187.82	512	—	 	

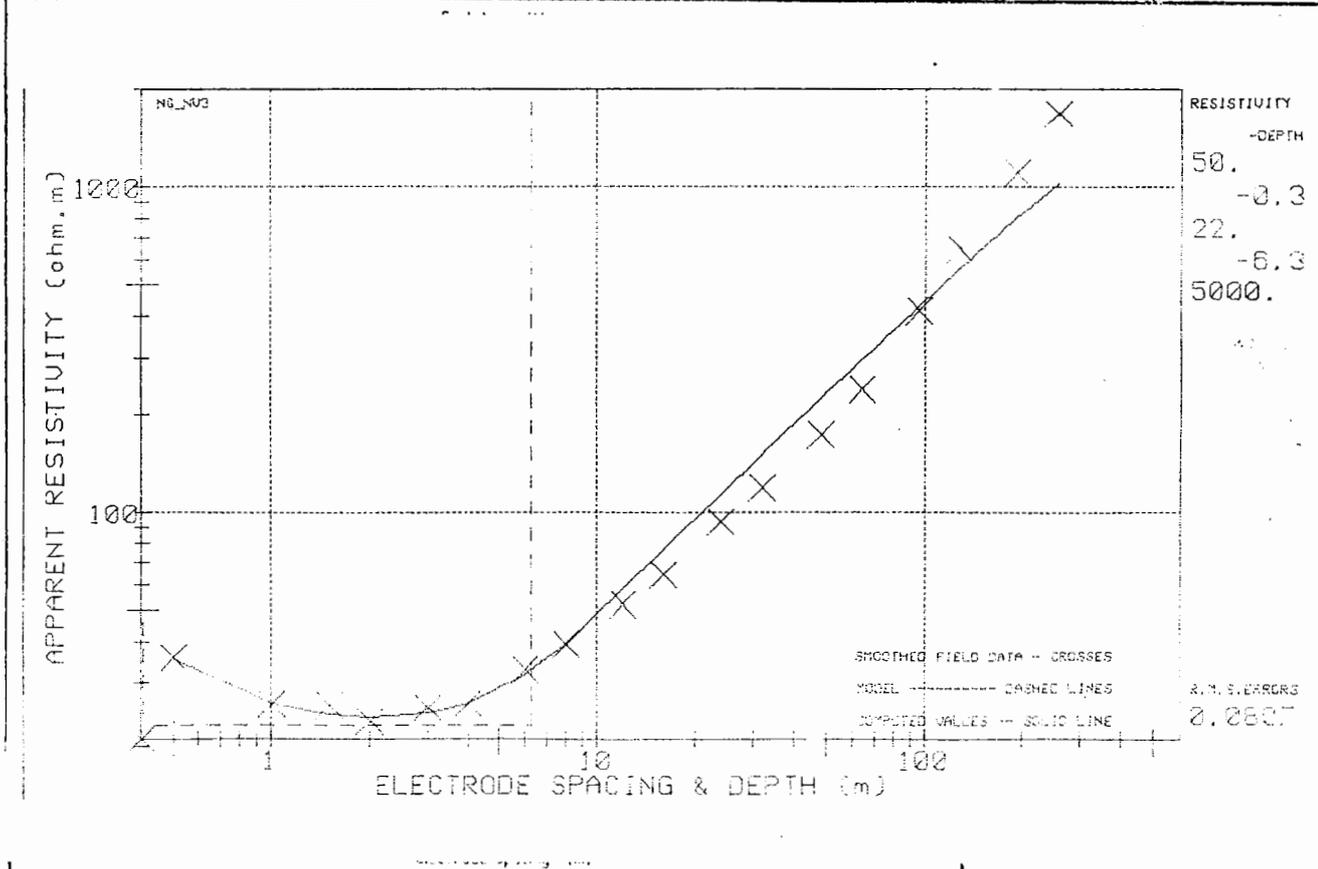


COMMENTS *the presence of a closeby stream could be attributed to the high lateral variation observed in the scattered points*

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **NG-NV3**

LOCATION <u>Nasko Primary School, Nasko, Niger state</u>							
Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.20	10.60	-118.89	0.5	35.9		
2	-0.00	-61.75	-85.29	1	25.5	1.5	25.3
3	0.59	-30.09	-48.29	2	22.7	3	24.9
4	-1.17	-23.13	-13.64	4	25.7	6	32.8
5	-0.25	-14.24	-17.17	8	39.2	12	52.0
6	-0.40	-18.01	2.99	16	64.2	24	93.0
7	-0.84	-9.11	-8.07	32	119.2	48	172.1
8	0.10	-18.40	10.67	64	238	96	414
9	-0.90	38.39	-	120	641	192	1097
10	-	-		256	1673	384	/
R. m. s. errors	0.28	29.42	55.24	512	/		



COMMENTS

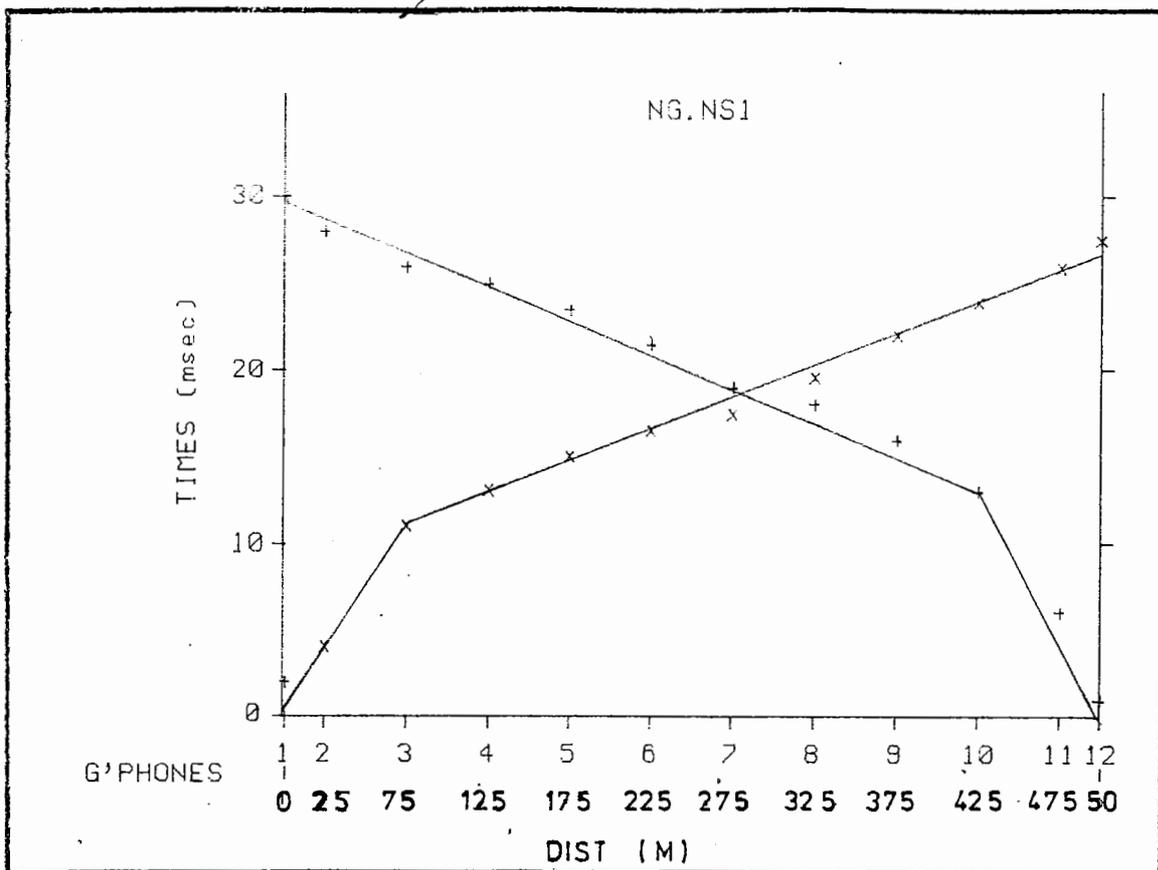
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG.NS1

Location: Nasko dispensary mamba road Nasko
Niger state



SHOT POINT

1

2

Velocity &
Int. Time

depth

depth

avg.
depth(m)

V1	750	3.1	600	3.4	3.25
Ti1	8.0		11.0		
V2	2654		2707		
Ti2					
V3					

Comment :

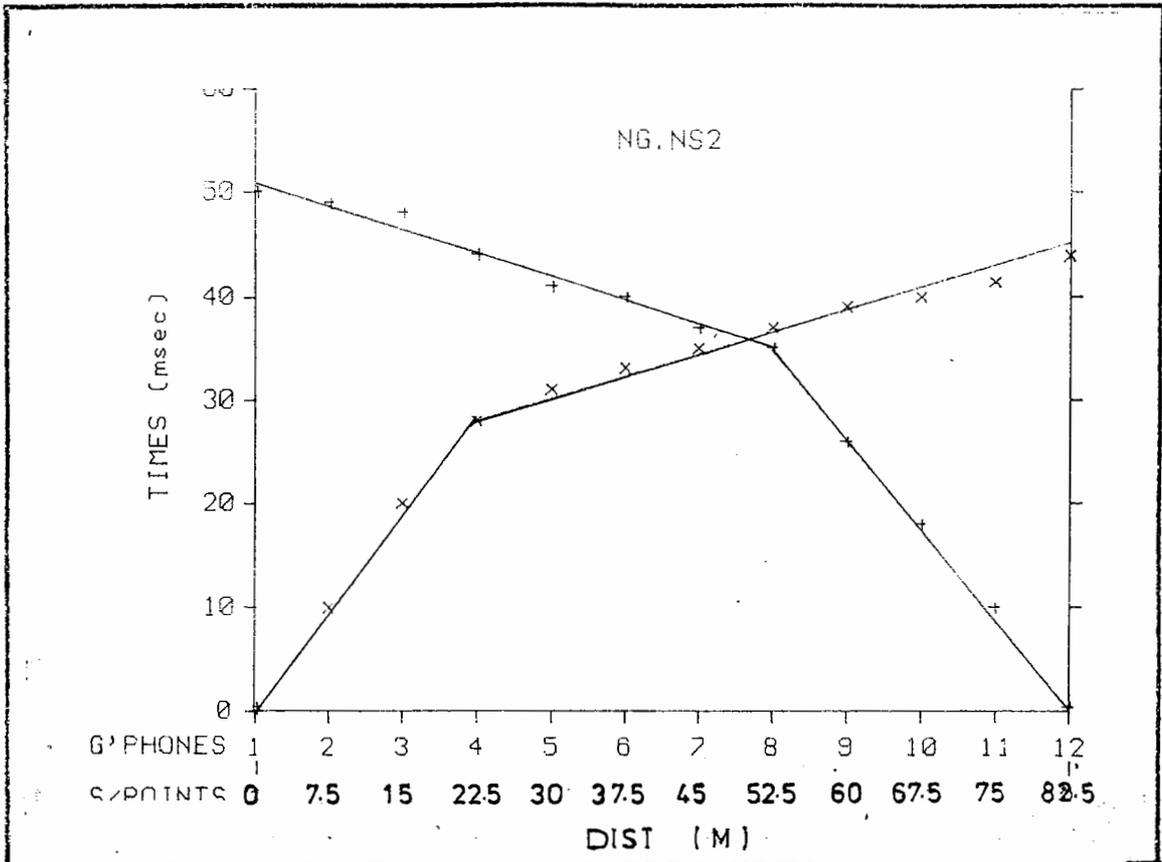
SEISMIC REFRACTION SURVEY

Data Computation & Interpretation

No.

NG.NS2

Location: near Nasko primary school, Nasko.
Niger state



SHOT POINT

1

2

Velocity &
Int. Time

depth

depth

avg.
depth(m)

V1	799	9.5	871	11.6	10.55
Ti1	23.3		25.9		
V2	3965		3281		
Ti2					
V3					

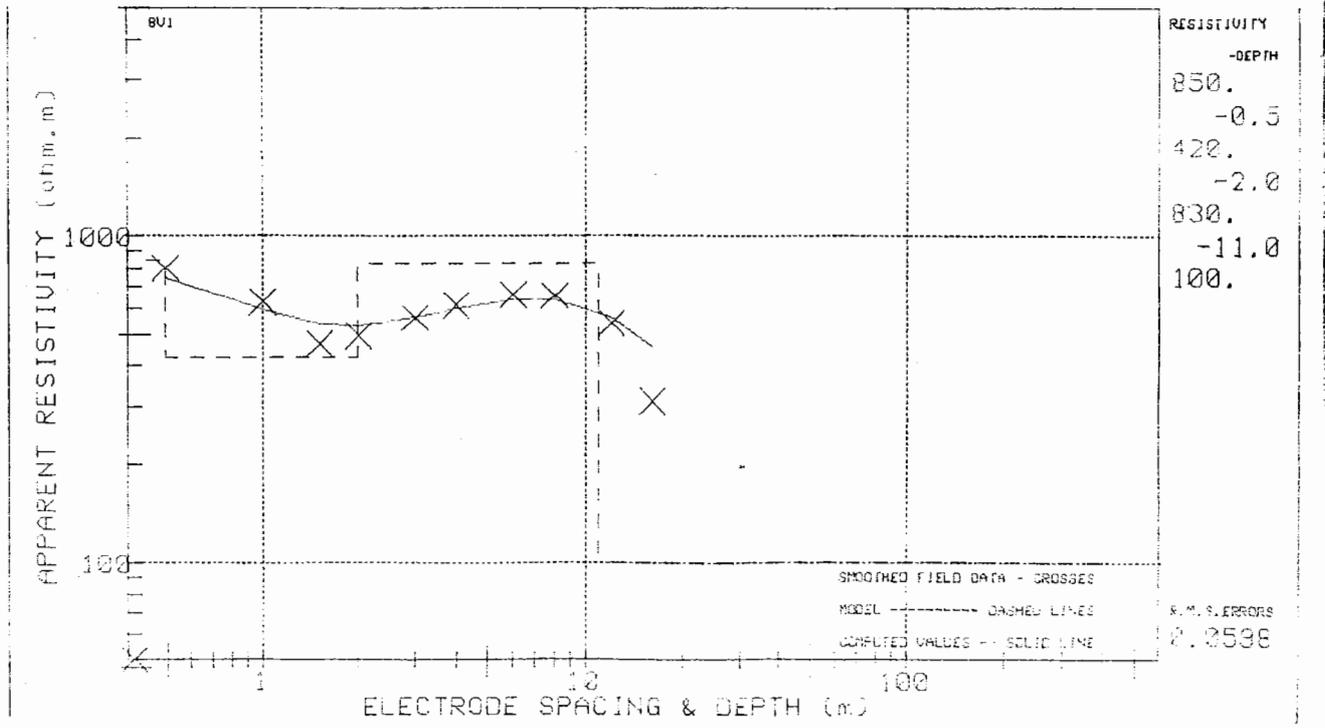
Comment :

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. **8V1**

LOCATION ST GERARD CATHOLIC HOSPITAL, KAKURI, KADUNA.

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	-0.44	-20.83		0.5	800		
2	-0.02	-3.21	70.10	1	626	1.5	461
3	-0.17	-13.03	-20.51	2	492	3	561
4	-0.20	-15.95	24.68	4	614	6	658
5	0.04	-2.83	-22.54	8	658	12	539
6	-	-	-	16	311	24	-
7	-	-	-	32	-	48	-
8	-	-	-	64	-	96	-
9	-	-	-	128	-	192	-
10	-	-	-	256	-	384	-
R. m. s. errors	0.14	13.24	40.16	512	-	-	-



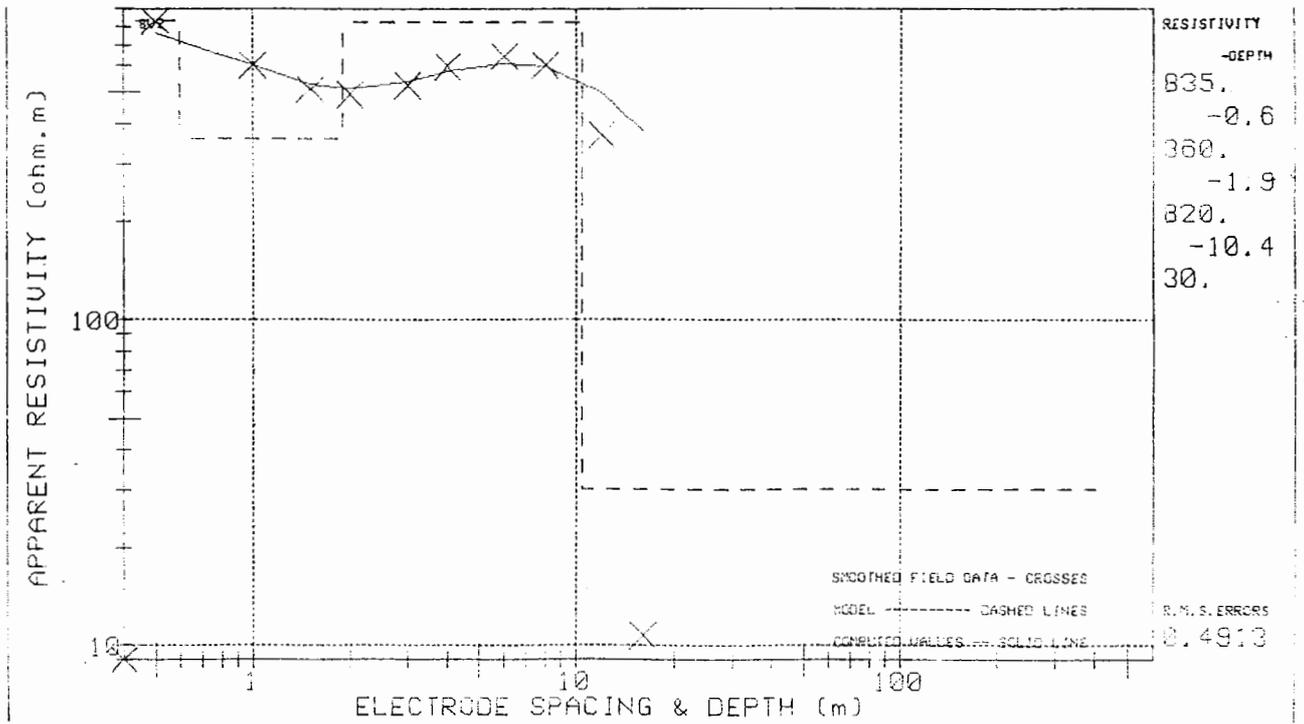
COMMENTS

VERTICAL ELECTRICAL SOUNDING (OFFSET WENNER ARRAY)
Data Reduction & Interpretation

No. 8V2

LOCATION SAME POSITION AS YES 8V1

Switch position	Errors (%)			Electrode spacing (m)	Apparent resistivity (ohm-m)	Electrode spacing (m)	Apparent resistivity (ohm-m)
	observed	offset	lateral				
1	0.09	0.38	11.75	0.5	828	0.5	828
2	0.	-16.25	11.75	1	603	1.5	507
3	-0.13	-15.70	56.10	2	488	3	520
4	0.12	-8.03	16.13	4	594	6	641
5	-0.11	1.33	-11.23	8	603	12	370
6	—	—	—	16	10.71	24	—
7	—	—	—	32	—	48	—
8	—	—	—	64	—	96	—
9	—	—	—	128	—	192	—
10	—	—	—	256	—	384	—
R. m. s. errors	0.05	10.74	30.30	512	—	384	—



COMMENTS

