In the structural resistivity section, the same cross-sectional lines as in an apparent resistivity section are used, and the layered resistivity model obtained from simulation analysis is plotted with the depths from the ground surface. In addition, it shows the underground resistivity structure expressed by connecting layered models, each having similar values of resistivity.

For each section such as A-A', B-B', C-C', D-D', E-E', and F-F' the apparent resistivity, resistivity structure, and geological sections were arranged respectively.

5-3 Survey Results and Interpretation

5-3-1 Survey Results

Appendix 10 shows all measured data of the each station, and Table 5-5 shows correlations between low apparent resistivity distribution and geology.

(1) Plan of Apparent Resistivity

P1.8 to P1.17 (scale 1:25,000) and Fig. 5-8 to Fig. 5-11 (scale 1:50,000) show plans of apparent resistivity. Since P1.8 and Fig. 5-8 (2,048 Hz) is suitable for obtaining information of the surface and shallow parts of the ground, main low apparent resistivity zones shown in the figure were named as L-1 to L-14. The apparent resistivity anomalies are classified into following zones.

Low Apparent Resistivity Zone ———— lower than 200 Ω·m
Medium Apparent Resistivity Zone ——— 200 to 500 Ω·m
High Apparent Resistivity Zone ———— higher than 500 Ω·m

The distribution pattern of the apparent resistivity is characterized as follows.

* High Resistivity Zones cover main parts of the area, but Low Resistivity Zones are scattered in an area south of the La Concha district, and northeastern and southern parts of the El Bramador district.

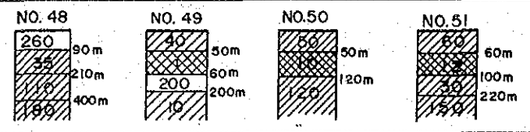
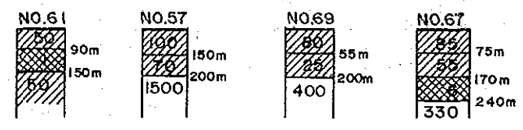
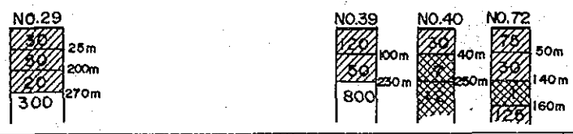
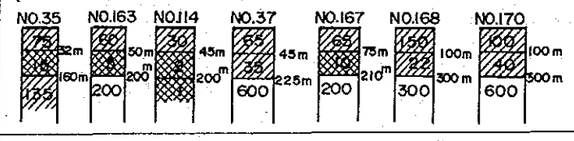
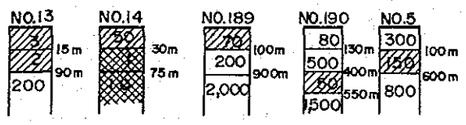
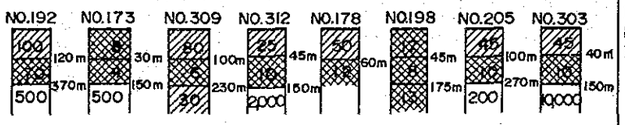
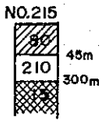
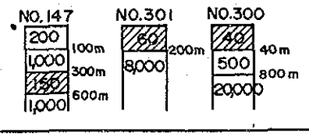
* Four small Low Resistivity Zones are located along the San Jeronimo valley, where old workings are distributed.

* Most of Low Resistivity Zones are scattered in areas of the metamorphic rocks of the Jurassic System (Jsch), dacitic pyroclastics of ore horizon (Koh-b), hanging wall dacite and dacitic pyroclastics (Kdc-sh), footwall dacite lava (Kdc1-b), and shale-sandstone formation (Ksh1).

* Most of High Resistivity Zones are in areas of dacites (Tdc1-b) and andesites (Tad1, Tad2) of the Tertiary System. From the distribution pattern of the resistivity, two directions of trends, northeast - southwest and northwest - southeast are predominant in the area. These trends possibly represent some of major tectonic lines.

* A Low Resistivity Zone located in the La Trozada Hill (L-1) dominantly extends to the depth, and is correlated with the distribution of the dacitic pyroclastics of ore horizon (Koh-b), unconformably covering the metamorphic rocks of the Jurassic System. It lies on a ridge.

Table 5-4 Correlations between Low Apparent Resistivity Distribution and Geology (1)

Locality (Code)	Analysed Resistivity Unit: Ω·m	Geology	Mineralization and Alteration	Geochemistry	Ore Deposit	Remarks
1) C. La Trozada (L_1)		Metamorphic Rocks (Jsch) Footwall Dacite (Kdc1-b) Ore Horizon Pyroclastics (Koh-b)	Argillization (Kaolinization)			L-1 shows low resistivity (1～40Ω·m) in the shallow part and little higher resistivity (200Ω·m) in the middle and low resistivity (10～150Ω·m) in the depth widely. A weathering and argillization zone is located in L-1.
2) North of the Los Caballos Village (L_2)		Metamorphic Rocks (Jsch) Footwall Dacite (Kdc1-b)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Cu-Pb-Zn)	La Castellana Los Alpes San Jose	L-2 shows low resistivity (1~200Ω·m) and intermits of 1500 meters length in the shallow part and shows low resistivity (35Ω·m minimum) of small size in the depth. L-2 extends to L-4.
3) La Concha (L_3)		Shale Intercalated with Sandstone (Ksh1) Footwall Dacite (Kdc1-b) Ore Horizon Pyroclastics (Koh-b)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Cu-Pb-Zn)	Delicias El Rosario La Colorados	L-3 shows low resistivity (20~50Ω·m) from the shallow part to the depth.
4) North of the Sidra Hill (L_4)		Hanging Wall Dacite·Pyroclastics-Shale (Kdc-sh) Andesite (Ad)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Pb)		L-4 shows separately two parts 1~170Ω·m and 10~150Ω·m respectively from shallow part to the depth. L-4 shows a complex figure controlled intrusive rocks. L-4 is connected with L-2 in the deep. A weathering and argillization zone is located in L-4.
5) Southeast of the La Concha (L_5)		Shale Intercalated with Sandstone (Ksh1) Footwall Dacite (Kdc1-b) Ore Horizon Pyroclastics (Koh-b) Hanging Wall Dacite · Pyroclastics-Shale (Kdc-sh)	Argillization (Kaolinization)			L-5 shows low resistivity (70 to 100Ω·m) from the shallow part to the depth. L-5 is possibly caused by fault or shear zone.
6) Northeast of the El Bramador Village (L_6)		Hanging Wall Dacite·Pyroclastics-Shale (Kdc-sh) II-Stage Andesite-Pyroclastics (Tad2)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)			L-6 shows low resistivity (4 to 150Ω·m) from shallow part to the little deeper and distributes very wide area. L-6 trends extending toward L-7. A weathering and argillization zone is located in L-6.
7) West of the Trinidad Hill (L_7)		II-Stage Andesite-Pyroclastics (Tad2)				L-7 shows low resistivity 80Ω·m in the shallow part and 15 Ω·m in the deep of small size.
8) East of the El Acajal Village (L_8)		I-Stage Andesite-Pyroclastics (Tad1) Andesite (Ad)				L-8 shows 40~60Ω·m in the shallow part and 150Ω·m in the little deeper of small size.

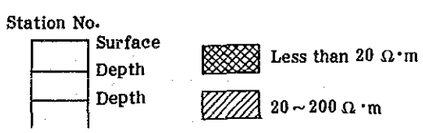
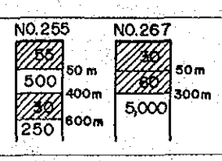
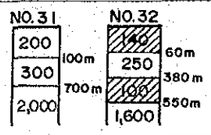
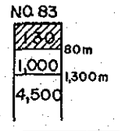
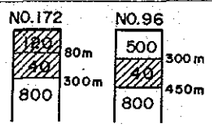
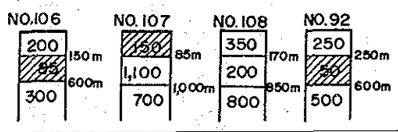
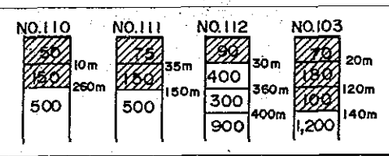
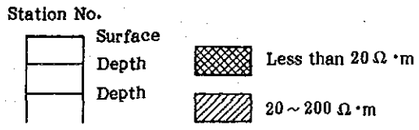


Table 5-4 Correlations between Low Apparent Resistivity Distribution and Geology (2)

Locality (Code)	Analysed Resistivity Unit: Ω·m	Geology	Mineralization and Alteration	Geochemistry	Ore Deposit	Remarks
9) East of the Trinidad Hill (L_9)		II-Stage Andesite-Pyroclastics (Tad2) I-Stage Dacite-Pyroclastis (Tdc1)				L-9 shows low resistivity (30~60Ω·m) from the shallow part to the depth and is of small size.
10) San Jose (L_{10})		Ore Horizon Pyroclastics (Koh-b) Hanging Wall Dacite · Pyroclastics-Shale (Kdc-sh)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Cu-Pb-Zn)	La Castellana Los Alpes San Jose	L-10 shows low resistivity (140~200Ω·m) in the shallow part and low resistivity (100Ω·m) in the depth like a sandwich. A mineralization zone is located in L-10.
11) Rosario (L_{11})		Ore Horizon Pyroclastics (Koh-b) Hanging Wall Dacite · Pyroclastics-Shale (Kdc-sh)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Cu-Pb-Zn)	Delicias El Rossario La Colorados	L-11 shows low resistivity (130Ω·m) in the depth and is of small size. A mineralization zone is located in L-11.
12) Santa Edwiges (L_{12})		Hanging Wall Dacite · Pyroclastics-Shale (Kdc-sh) Andesite (Ad)	Argillization (Potash Feldspar Alteration Sericitization Chloritization)	Multi-element (Ag-Pb)		L-12 shows low resistivity (40~120Ω·m) from the shallow part to the depth. L-12 is one of the potential areas for mineralization.
13) East of the El Banco Hill (L_{13})		Andesite (Ad)				L-13 shows low resistivity (50~180Ω·m) from the shallow part to the depth and is of small size.
14) West of the El Acajal Village (L_{14})		I-Stage Andesite-Pyroclastics (Tad1) II-Stage Andesite-Pyroclastics (Tad2) Andesite (Ad)				L-14 shows low resistivity (50~180Ω·m) from the shallow part to the depth and is of small size.



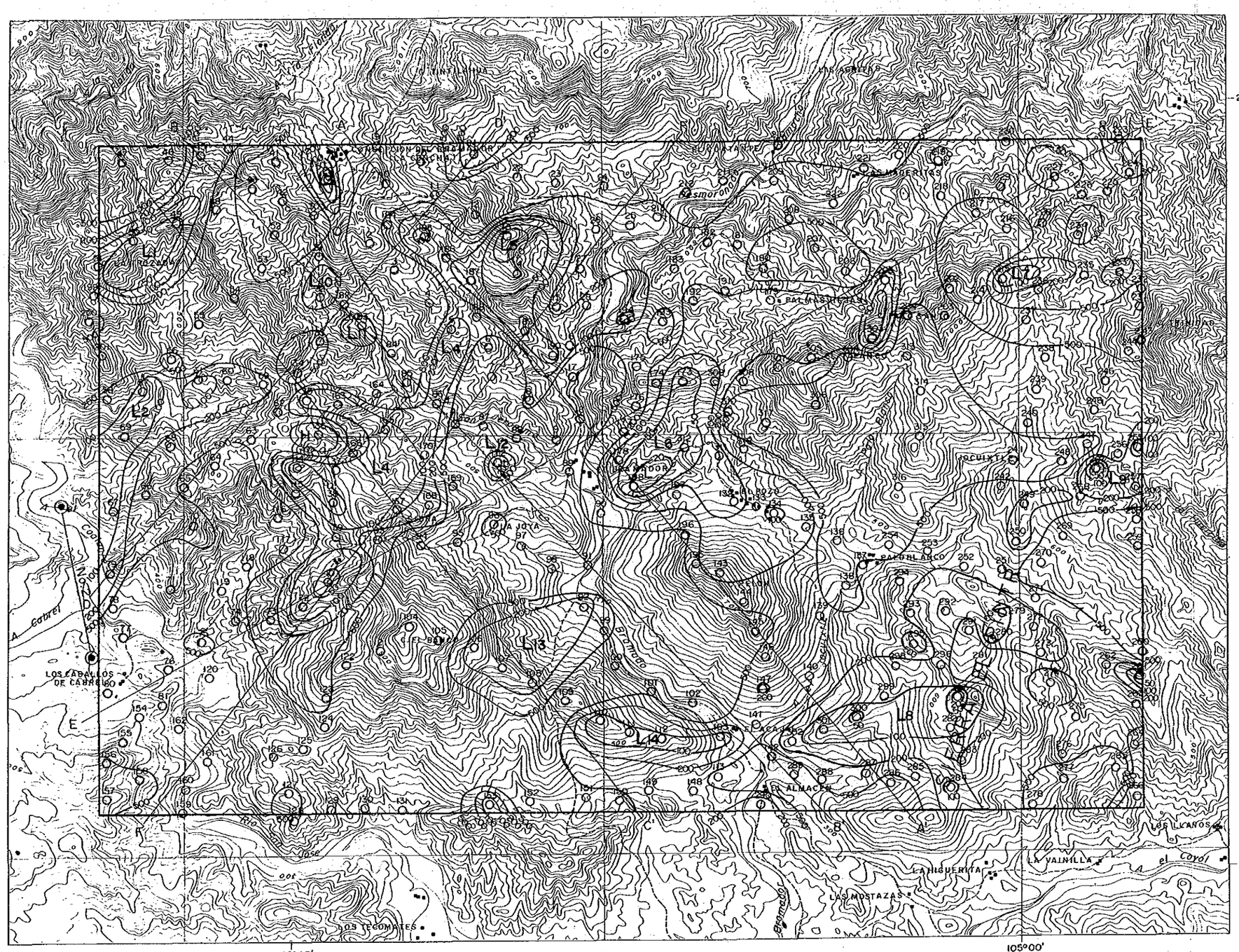


Fig. 5-8

Plan of Apparent Resistivity (2048 Hz)

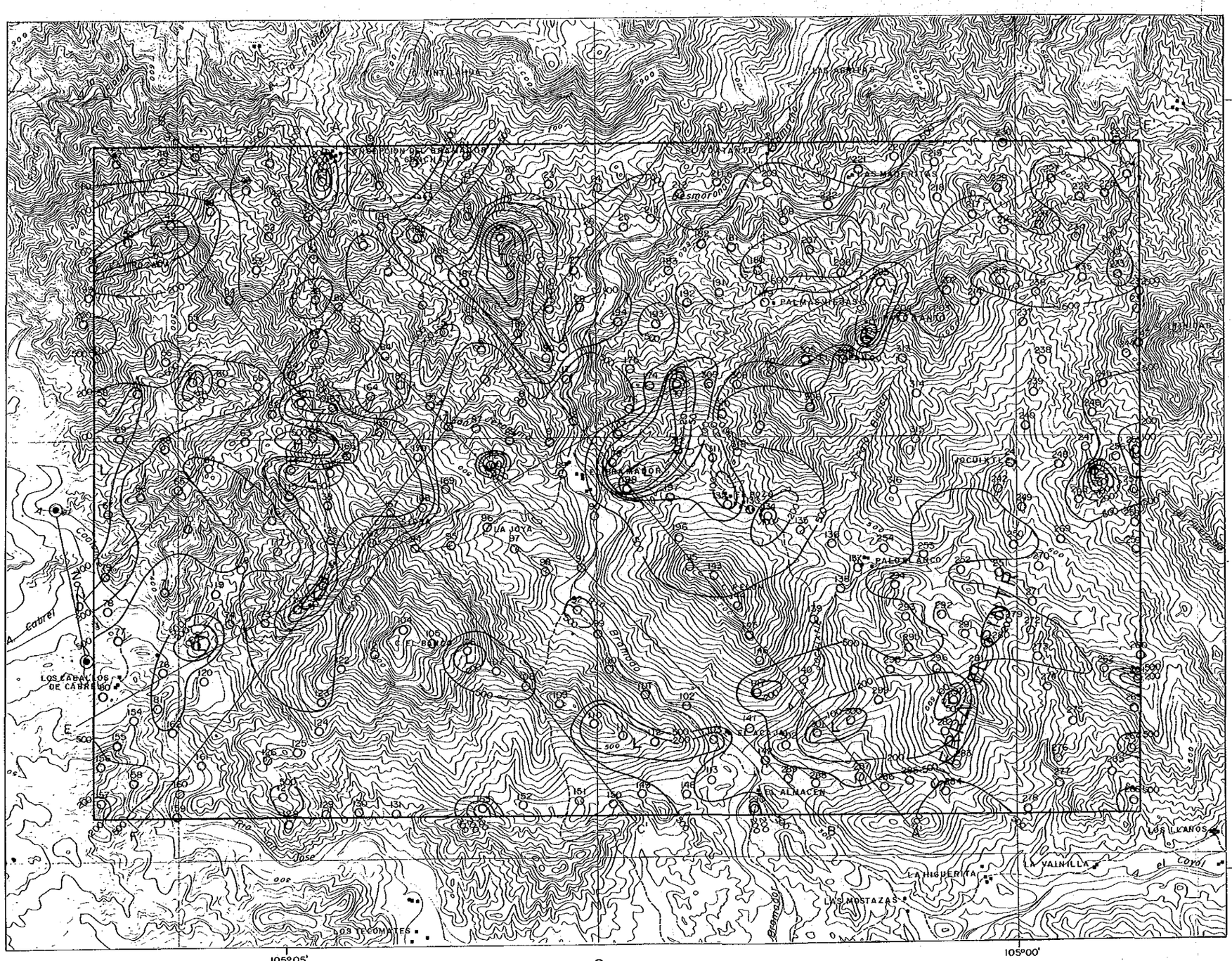


Fig. 5-9

Plan of Apparent Resistivity (1024 Hz)

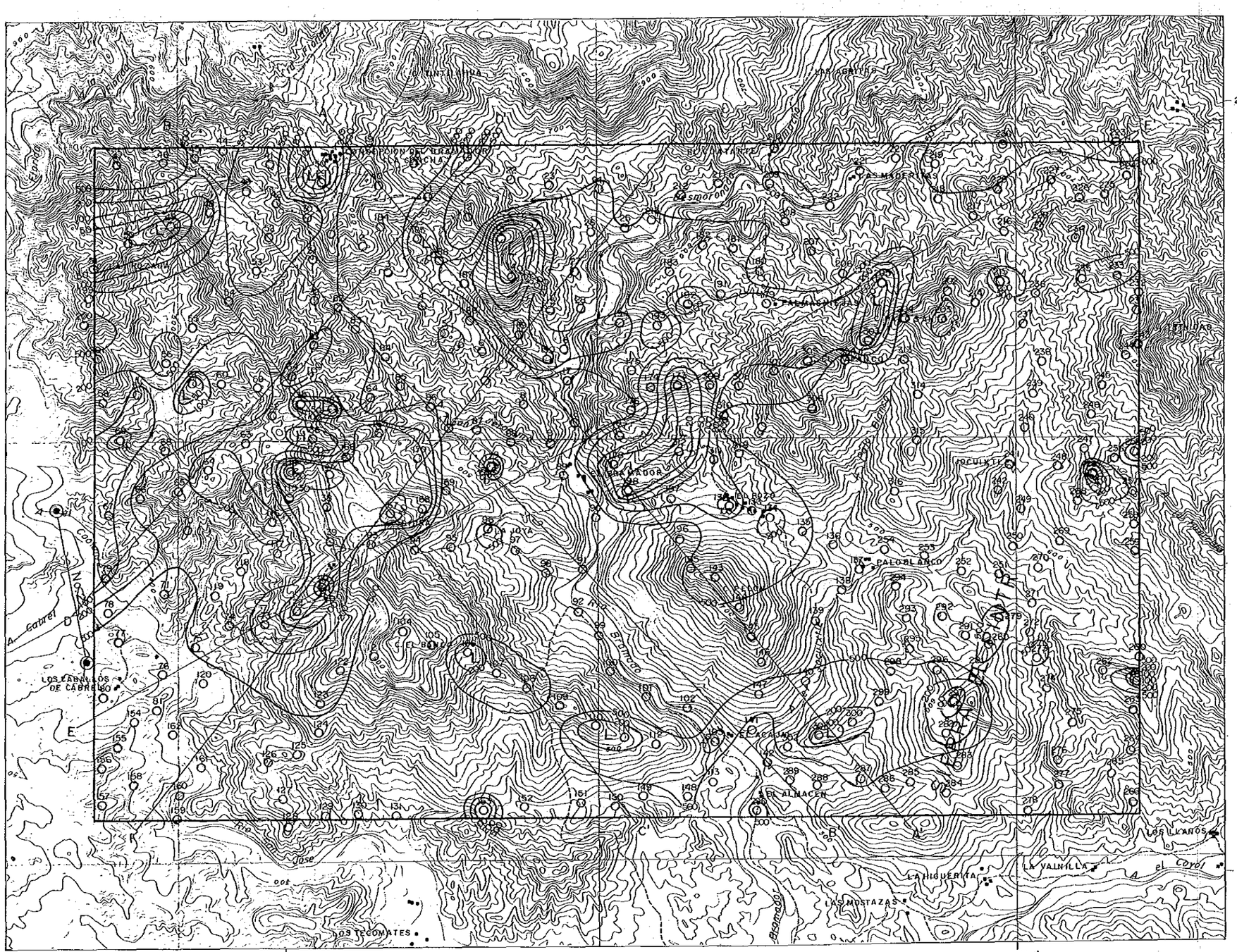


Fig. 5-10

Plan of Apparent Resistivity (512 Hz)

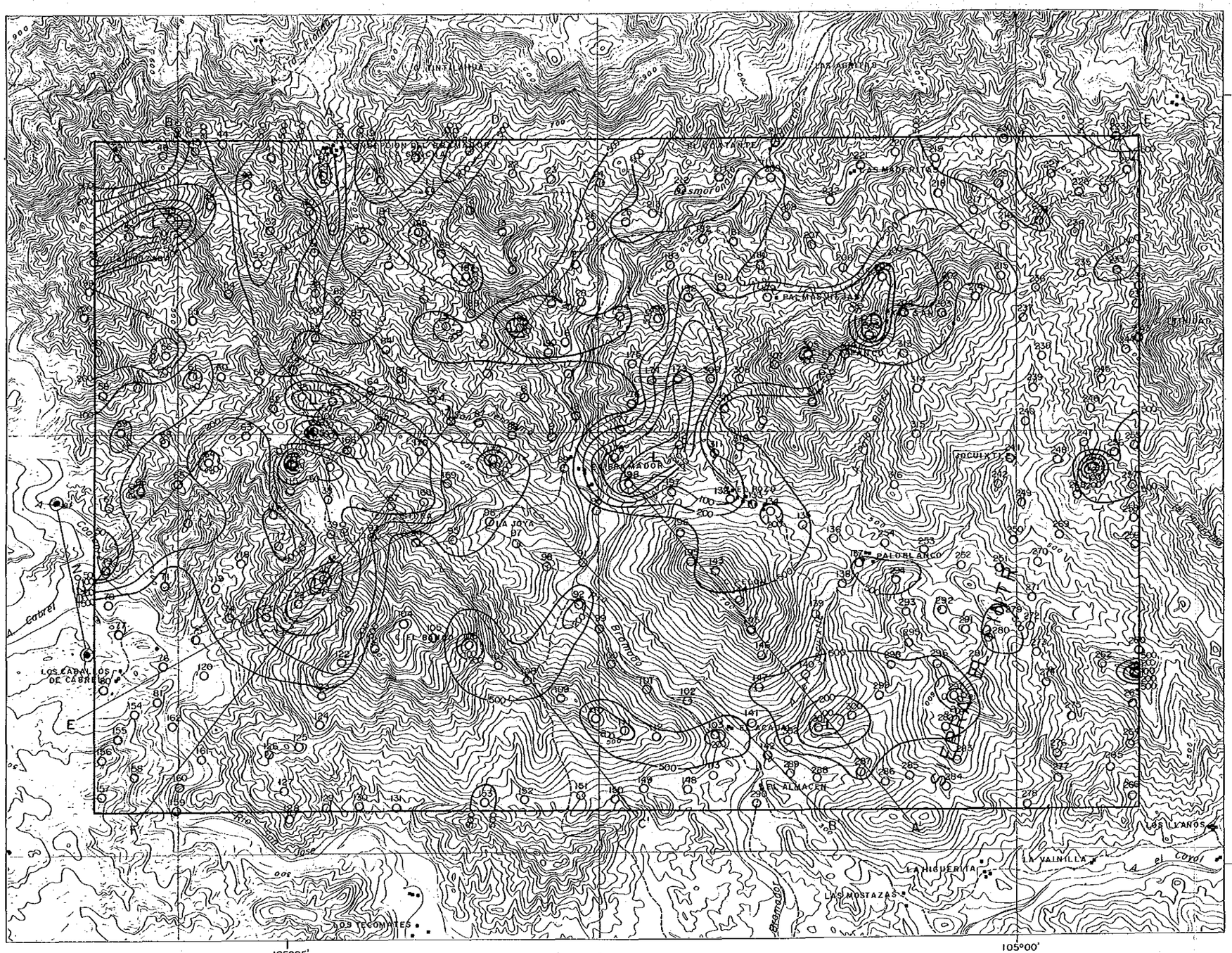
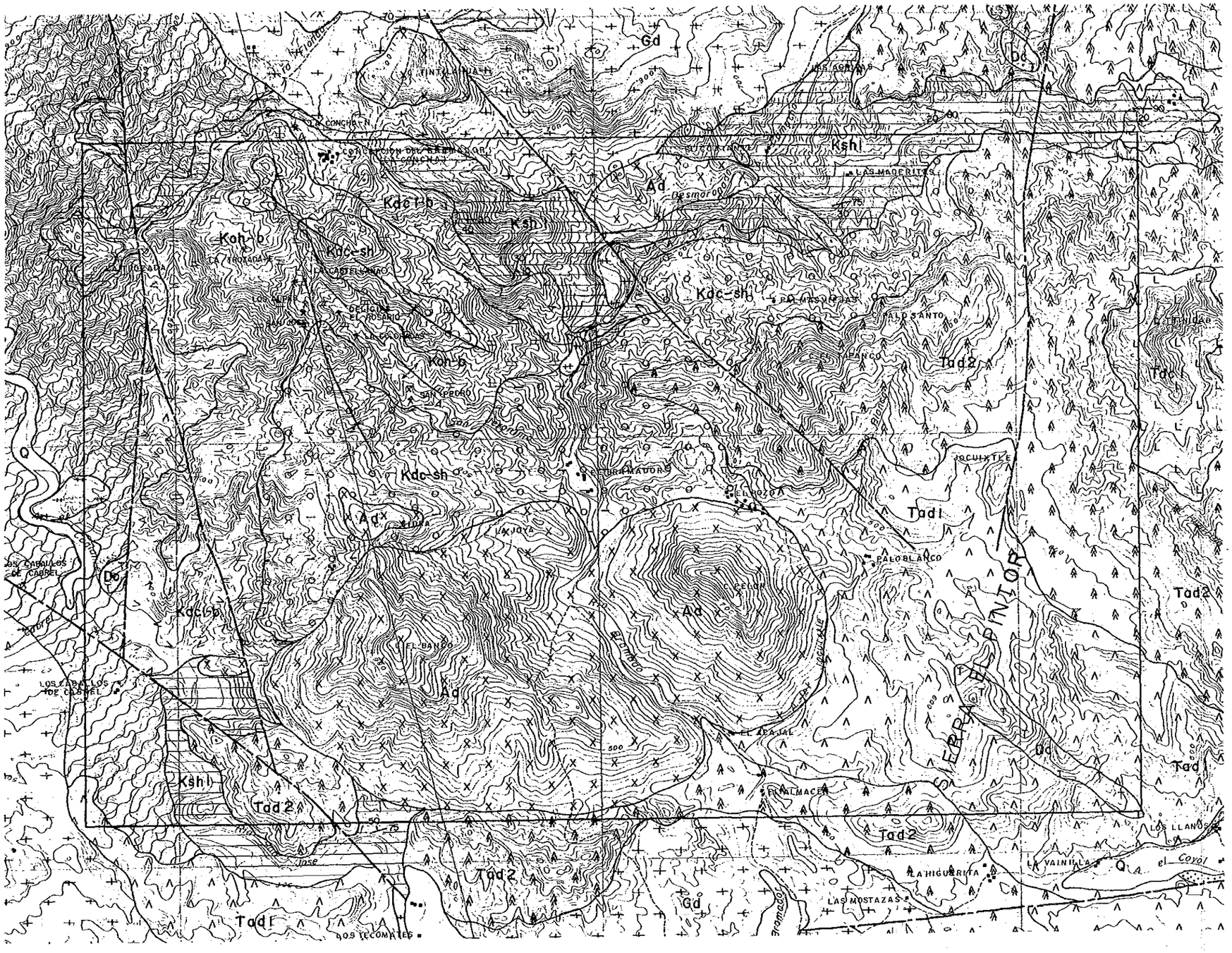


Fig. 5-11

Plan of Apparent Resistivity (256 Hz)



LEGEND

Quaternary System

- Q — Alluvium – Diluvium

Tertiary System

- Tdc1 — I-Stage Dacite-Pyroclastics
- Tad2 — II-Stage Andesite-Pyroclastics
- Tad1 — I-Stage Andesite-Pyroclastics

Cretaceous System

- Kdc-sh — Hanging Wall Dacite – Pyroclastics–shale
- Kshl-b — Ore Horizon Pyroclastics
- Kdc1-b — Footwall Dacite
- Kshl — Shale Intercalated with Sandstone

Jurassic System

- Jsch — Metamorphic Rocks

Intrusives

- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite

Fault

0 500 1000 1500 2000 2500m

Fig. 5-12 Geological Map of Geophysical Survey Area

* A Low Resistivity Zone located north of the Los Caballos Village (L-2) dominantly extends to the depth, appearing in the results on 8 Hz, and is correlated with the distribution of the footwall dacite lava (Kdc1-a, -b). It is connected with L-1 and L-4 in the depth.

* A small size Low Resistivity Zone located in the La Concha Village (L-3) trends north to south, and is maximized in the results of the 128 Hz measurement, disappearing in the lower frequency measurements. It is correlated with the distribution of the dacite lava (Kdc1-b) and the shale (sandstone) formation (Ksh1).

* A large size Low Resistivity Zone located north of the Sidra Hill (L-4) shows a complex figure, and extends to the depth. Judging from its trend, it is presumed that a tectonic line runs along the northeast - southwest trend. It is correlated with the distribution of the hanging wall dacite and dacitic pyroclastics (Kdc-sh). An outcrop of strongly argillized zone is exposed on the road connecting the La Concha Village to the Los Caballos Village.

* A Low Resistivity Zone located southeast of the La Concha Village (L-5) shows a complex figure, trending two directions, northeast - southwest and northwest -southeast. It is correlated with the distribution of the footwall dacite lava (Kdc1-b) and the shale (sandstone) formation (Ksh1). In addition very steep precipices and falls exposing black shale are distributed along the northeast - southwest trend. Therefore it is presumed that a tectonic line runs along the trend.

* A large size Low Resistivity Zone located northeast of the El Bramador Village (L-6) is extensively distributed, trending two directions, northeast - southwest and northwest - southeast. The anomally disappears in the depth represented by the results of the low frequency measurements such as 4 Hz and 8 Hz. It is mainly correlated with the hanging wall dacite and dacitic pyroclastics (Kdc-sh), but a part of that is in the andesites of the Tertiary System (Tad1, Tad2).

* A small size Low Resistivity Zone located west of the Trinidad Hill (L-7) is in the shallow part, and correlated with the distribution of the andesites of the Tertiary System (Tad2).

* A large size Low Resistivity Zone located east of the El Acajal Village (L-8) shows a complex figure, and is in the shallow part. It is correlated with the distribution of the andesites of the Tertiary System (Tad1) and the dacite intrusives (Dc).

* A small size Low Resistivity Zone located east of the Trinidad Hill (L-9) is in the shallow part, trending to the east, and correlated with the distribution of the andesites (Tad1) and dacites (Tdc1) of the Tertiary System.

* A small size Low Resistivity Zone along the San Jeronimo Valley (L-10, L-11, L-12) align in a line, connecting to the north-eastern end of L-4. It is in the shallow part, and disappears in the depth. It is correlated with the distribution of old workings, the San Jose, Rosario, Santa Edwinges, etc.

* A Low Resistivity Zone located east of the El Banco Hill (L-13) is in the shallow part, and correlated with the distribution of the andesite intrusives (Ad).

* A Low Resistivity Zone located west of the El Acajal Village (L-14) is in the shallow part, and correlated with the distribution of the andesites of the Tertiary (Tad1, Tad2).

Several other small size Low Resistivity Zones are detected in the area. However, judging from their scales, extensibility to the depth, geology, etc., L-1, L-2, L-3, L-4, L-5, L-6, and L-8 are favourable for further exploration activity.

(2) Cross-section of Apparent Resistivity

P1.24 to P1.29 and Fig. 5-13 to Fig. 5-18 show cross-sections of apparent resistivity. Assuming that measuring resutls of 2,048 Hz and 1,024 Hz represent states of shallow parts, and those of 512 Hz to 4 Hz represent states of deep parts, characteristics of the cross-sections of apparent resistivity are described as follows.

* Section A-A'

L-5 is bifurcated into two directions, northwest side and southeast side. In the northwest it shows a little higher resistivity in the medium depth, but lower in the depth.

L-6 extends from the shallow part to the depth.

L-8 is in the shallow part, and poorly extends to the depth.

* Section B-B'

L-1 is in the shallow part.

L-10 shows low resistivity in the shallow and deep parts, but slightly higher in the middle to deeper parts.

L-11 and the northern end of L-4 show a little low in the shallow parts.

L-12 is of small size in the shallow part, but enlarged to the depth.

L-13 extends to the depth.

L-14 is in the shallow part.

* Section C-C'

L-1 extends from the shallow part to the depth.

L-2 extends from the shallow part to the depth.

L-4 extends from the shallow part to the depth, including some very Low Resistivity Zones (lower than 20 $\Omega \cdot$m).

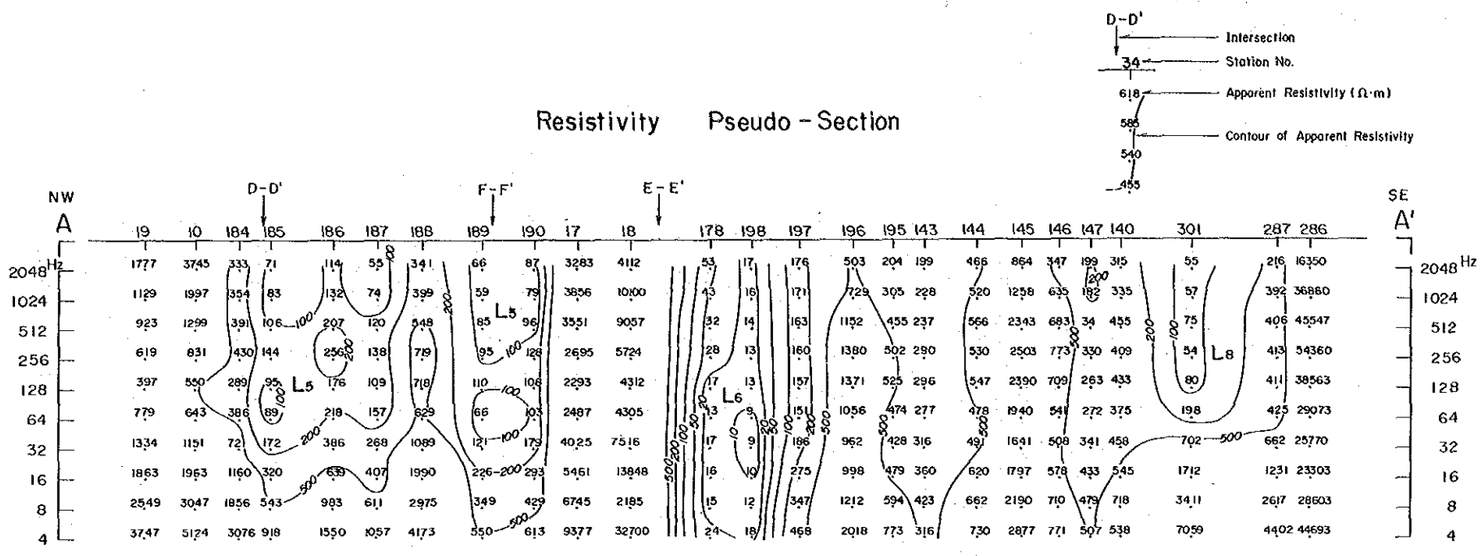
L-13 extends from the shallow part to the little deeper.

L-14 is in the shallow part.

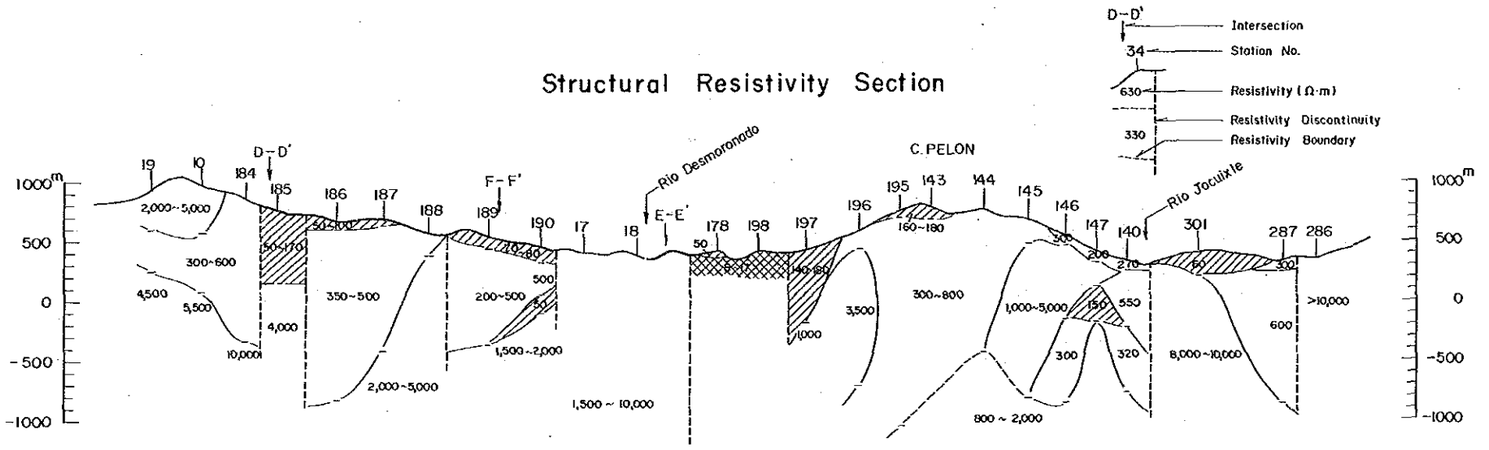
* Section D-D'

L-2 extends from the shallow part to the depth as well as horizontal extension. It shows extremely low resistivity (lower than 20 $\Omega \cdot$m) in the middle.

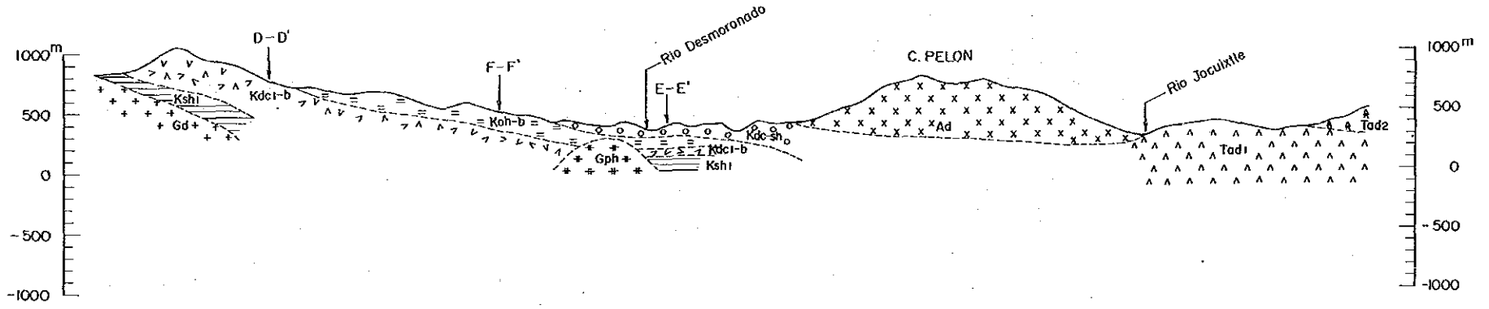
Resistivity Pseudo-Section



Structural Resistivity Section



Geological Section



LEGEND

- Low Resistivity Zone possibly related to Mineralization
  - <20 Ω·m
  - 20 ~ 200 Ω·m

Tertiary System

- Tdc1 — I - Stage Dacite - Pyroclastics
- Tad2 — II - Stage Andesite - Pyroclastics
- Tad1 — I - Stage Andesite - Pyroclastics

Cretaceous System

- Kdc-sh — Hanging Wall Dacite - Pyroclastics - Shale
- Koh-b — Ore Horizon Pyroclastics
- Kdcf-b — Footwall Dacite
- Kshi — Shale intercalated with Sandstone

Jurassic System

- Jsch — Metamorphic Rocks

Intrusives

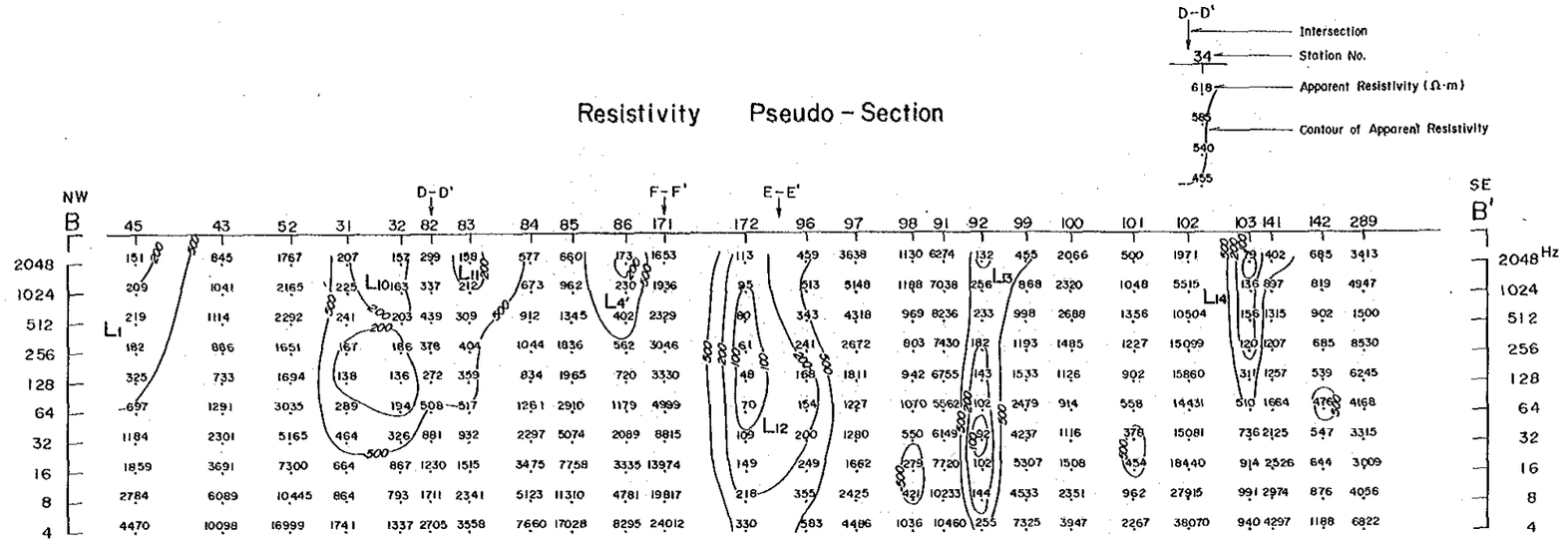
- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite
- Fault

0 500 1000 1500 2000 2500m

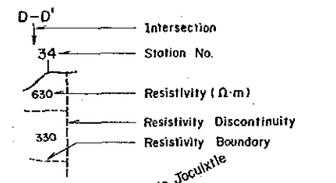
Fig. 5-13

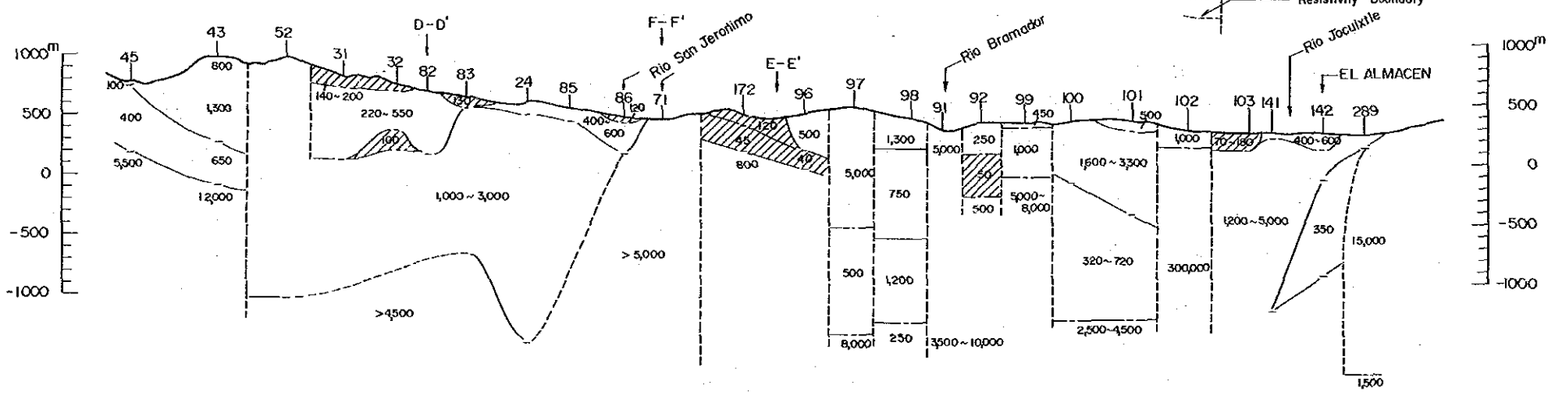
A-A' Section

Resistivity Pseudo – Section

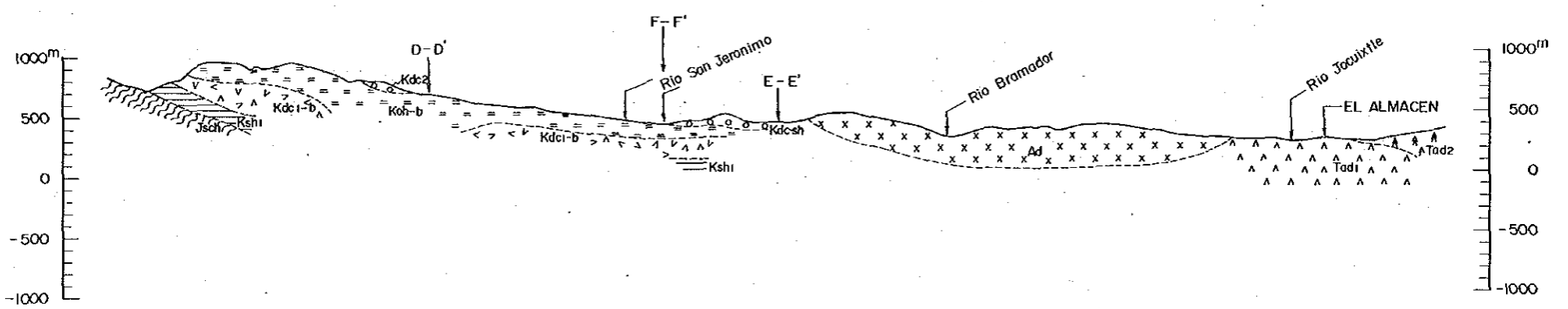


Structural Resistivity Section





Geological Section



LEGEND

- <20 Ω·m, 20 ~200 Ω·m — Low Resistivity Zone possibly related to Mineralization

Tertiary System

- Tdc1 — I – Stage Dacite – Pyroclastics
- Tad2 — II – Stage Andesite – Pyroclastics
- Tad1 — I – Stage Andesite – Pyroclastics

Cretaceous System

- Kdc-sh — Hanging Wall Dacite – Pyroclastics – Shale
- Kob-b — Ore Horizon Pyroclastics
- Kdc-b — Footwall Dacite
- Kshl — Shale intercalated with Sandstone

Jurassic System

- Jsch — Metamorphic Rocks

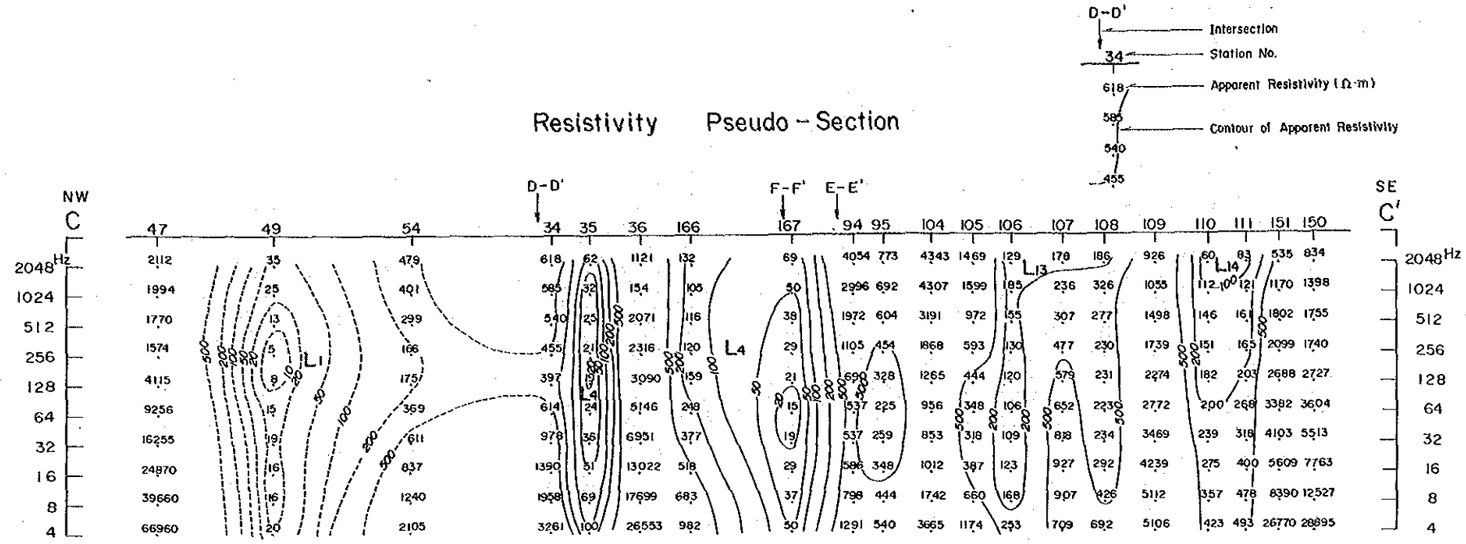
Intrusives

- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite
- Fault

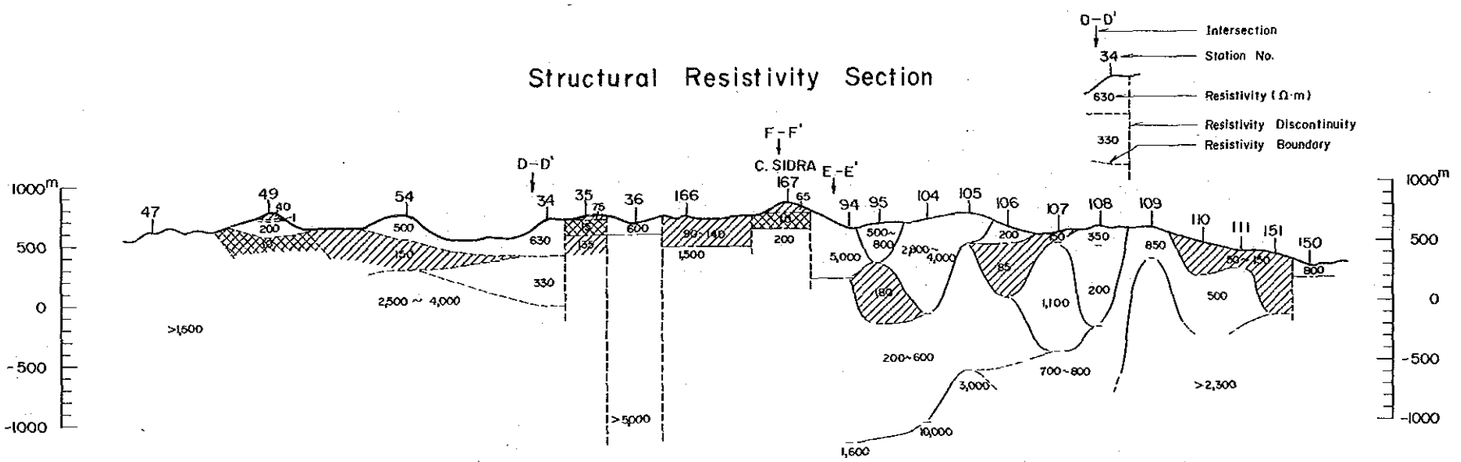
Fig. 5-14

B-B' Section

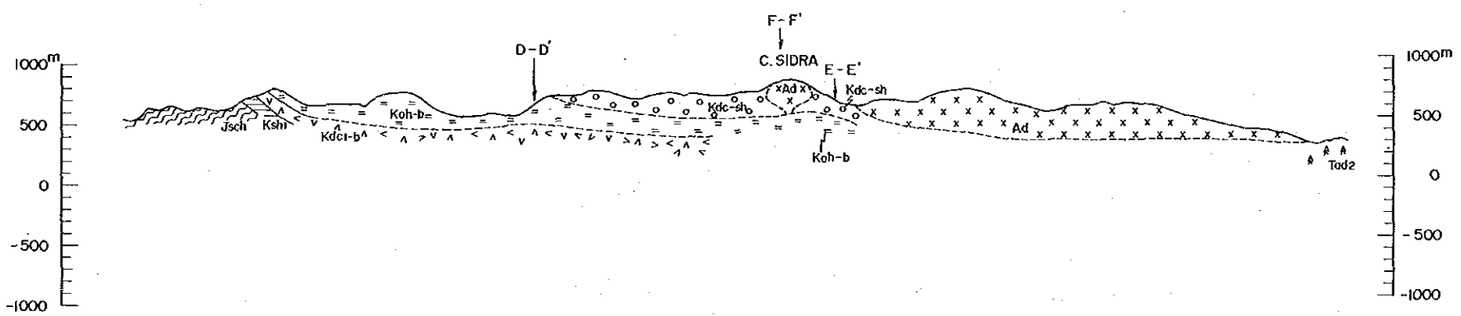
Resistivity Pseudo – Section



Structural Resistivity Section



Geological Section



LEGEND

- ≤20 Ω·m, 20~200 Ω·m — Low Resistivity Zone possibly related to Mineralization

Tertiary System

- Tdc1 — I – Stage Dacite – Pyroclastics
- Tad2 — II – Stage Andesite – Pyroclastics
- Tad1 — I – Stage Andesite – Pyroclastics

Cretaceous System

- Kdc-sh — Hanging Wall Dacite – Pyroclastics – Shale
- Koh-b — Ore Horizon Pyroclastics
- Kdc-b — Footwall Dacite
- Ksh1 — Shale intercalated with Sandstone

Jurassic System

- Jsch — Metamorphic Rocks

Intrusives

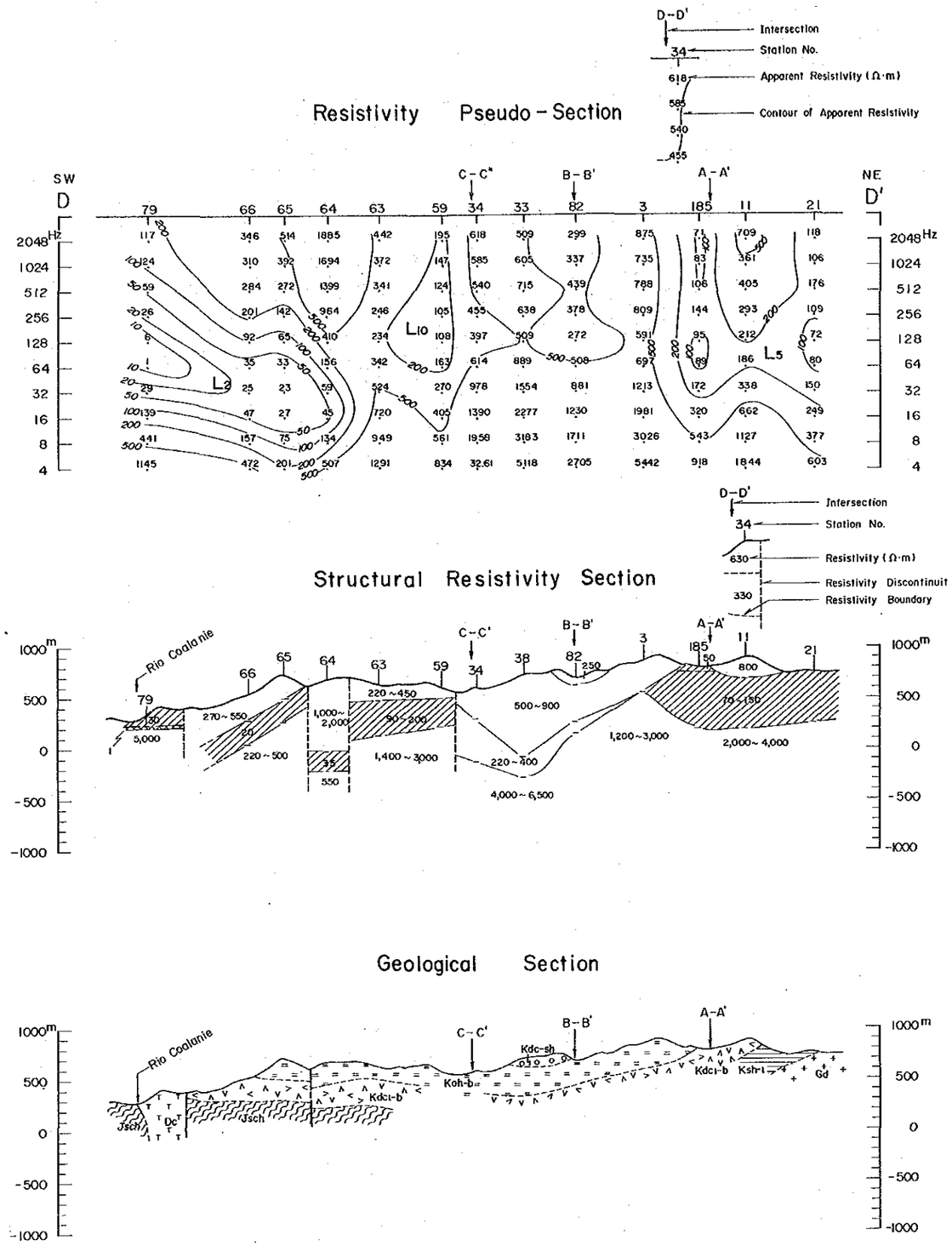
- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite

Fault

0 500 1000 1500 2000 2500m

Fig. 5-15

C-C' Section



LEGEND

- <20 Ω·m / 20~200 Ω·m — Low Resistivity Zone possibly related to Mineralization

Tertiary System

- Tdc I — I - Stage Dacite ~ Pyroclastics
- Tad2 — II - Stage Andesite ~ Pyroclastics
- Tad I — I - Stage Andesite ~ Pyroclastics

Cretaceous System

- Kdc-sh — Hanging Wall Dacite ~ Pyroclastics ~ Shale
- Koh-b — Ore Horizon Pyroclastics
- Kdci-b — Footwall Dacite
- Kshi — Shale intercalated with Sandstone

Jurassic System

- Jsch — Metamorphic Rocks

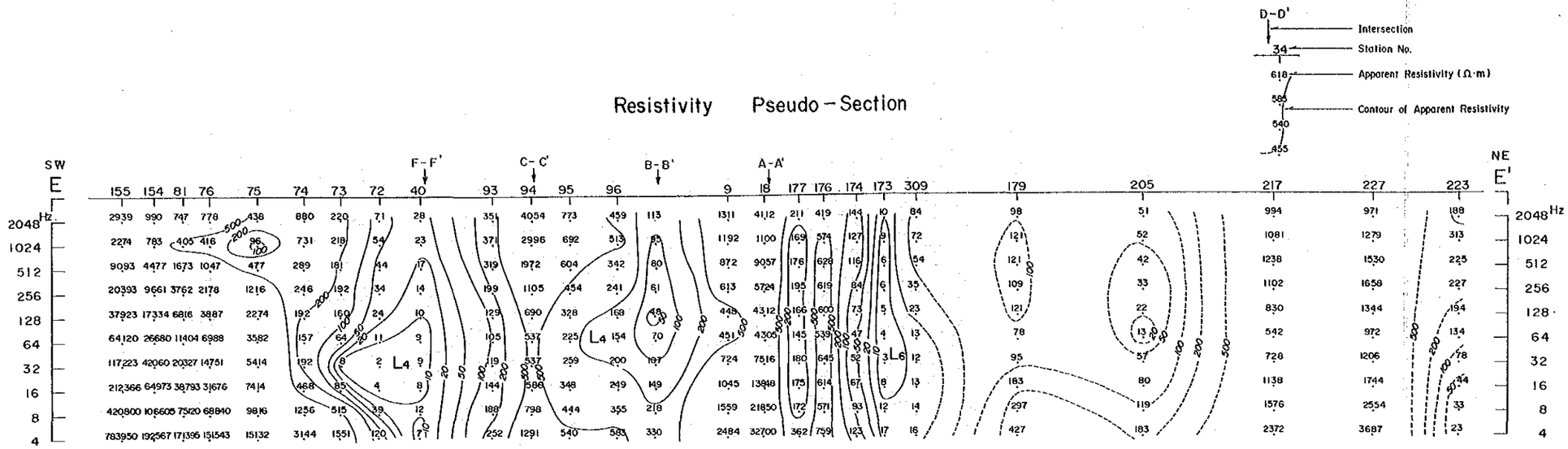
Intrusives

- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite
- Fault

Fig. 5-16

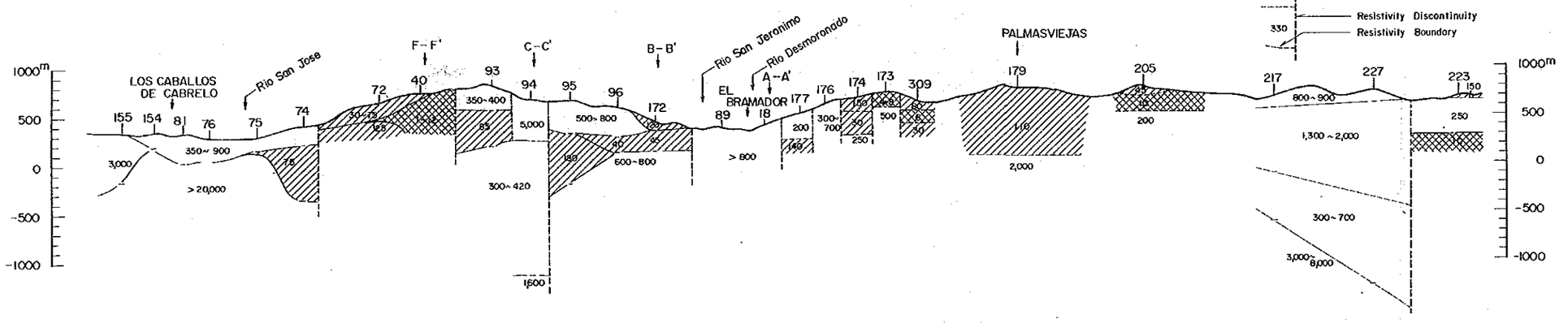
D-D' Section

Resistivity Pseudo-Section



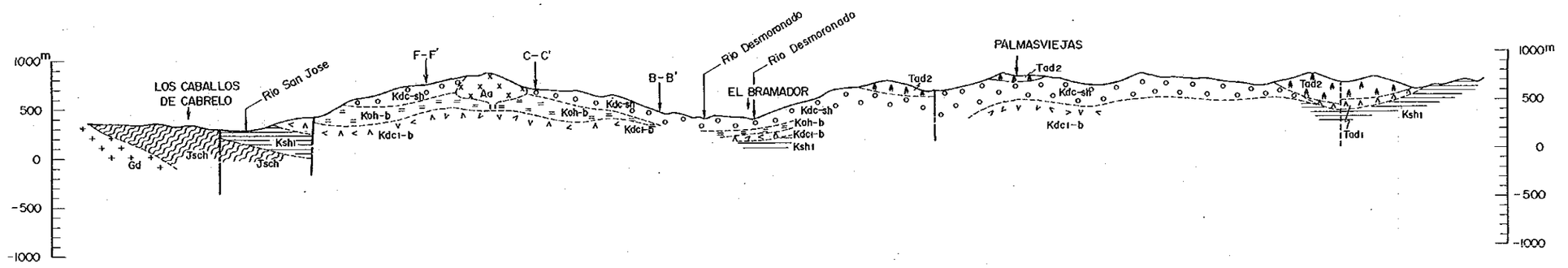
D-D'
- Intersection
- Station No.
- Apparent Resistivity (Ω·m)
- Contour of Apparent Resistivity

Structural Resistivity Section



D-D'
- Intersection
- Station No.
- Resistivity (Ω·m)
- Resistivity Discontinuity
- Resistivity Boundary

Geological Section



LEGEND

- <20 Ω·m
- 20~200 Ω·m

Low Resistivity Zone possibly related to Mineralization

Tertiary System
- Tdc1 — I-Stage Dacite-Pyroclastics
- Tad2 — II-Stage Andesite-Pyroclastics
- Tad1 — I-Stage Andesite-Pyroclastics

Cretaceous System
- Kdc-sh — Hanging Wall Dacite-Pyroclastics-Shale
- Koh-b — Ore Horizon Pyroclastics
- Kdcf-b — Footwall Dacite
- Kshi — Shale Intercalated with Sandstone

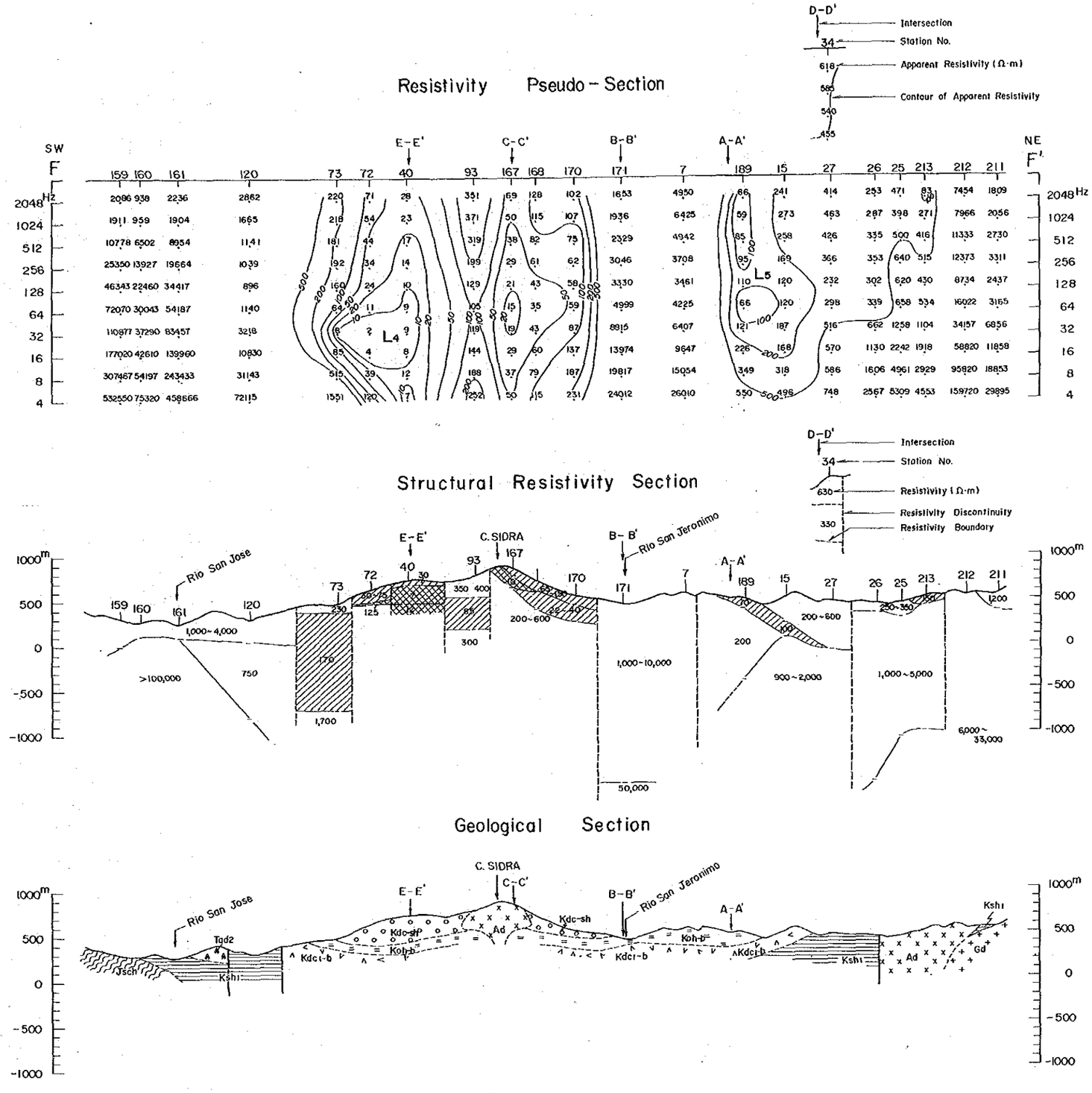
Jurassic System
- Jsch — Metamorphic Rocks

Intrusives
- Dc — Dacite
- Ad — Andesite
- Gph — Granophyre
- Gd — Granodiorite
- Fault

0 500 1000 1500 2000 2500m

Fig. 5-17

E-E' Section



LEGEND

Fig. 5-18

F-F' Section