the 1:200 scale sketch.

Results: Among the samples collected from the central part of the area (Nos 1 to 5), only one soil sample gives gold flakes and all the analytical values of Au for soil and vein quartz were low. A phyllite sample with quartz vein collected from the Trench No. 6 assayed 3.25 ppm Au. Among the six trenches in the eastern part of the area five trenches give Au assay ranging from 0.3 to 3.6 ppm at sampling width of 2 to 4m. The Au values tend to increase with depth.

1-6 Geophysical Exploration

Phase: I

Objectives: To investigate the possible existence of auriferous quartz veins by clarifing the resistivity structure of the survey area.

Survey area:4km^2 in the Bukit Mas area located southeast of the Tapah.

Survey method:The CSAMT survey was conducted in the Bukit Mas area utilizing the controlled source of 10 frequencies (4 to 2,048Hz). The measurement of an electric (Ex)-magnetic (Hy) field was done at a total of 113 observation points which were set with a nearly grid configuration of 150m to 200m distance, in order to clarify the resistivity structure in the survey area. A total of 11 rock samples were also collected from the survey area to measure their resistivities and to help the analysis for the CSAMT data.

Analysis method: 1-D resistivity analysis was done using observed data from each point and 2-D resistivity analysis was also executed on several main profiles along observation points by the processing shown in Fig.II-1-9.

Survey results: The resistivity distribution in the area was classified into three zones; the high resistivity zone (more than 400 ohm-m), the low resistivity zone (less than 100 ohm-m) and the middle resistivity zone (100 ohm-m to 400 ohm-m). The high resistivity zones were detected at two places. One is distributed in the western part of the area with an elongation form in the NNW-SSE direction and has a

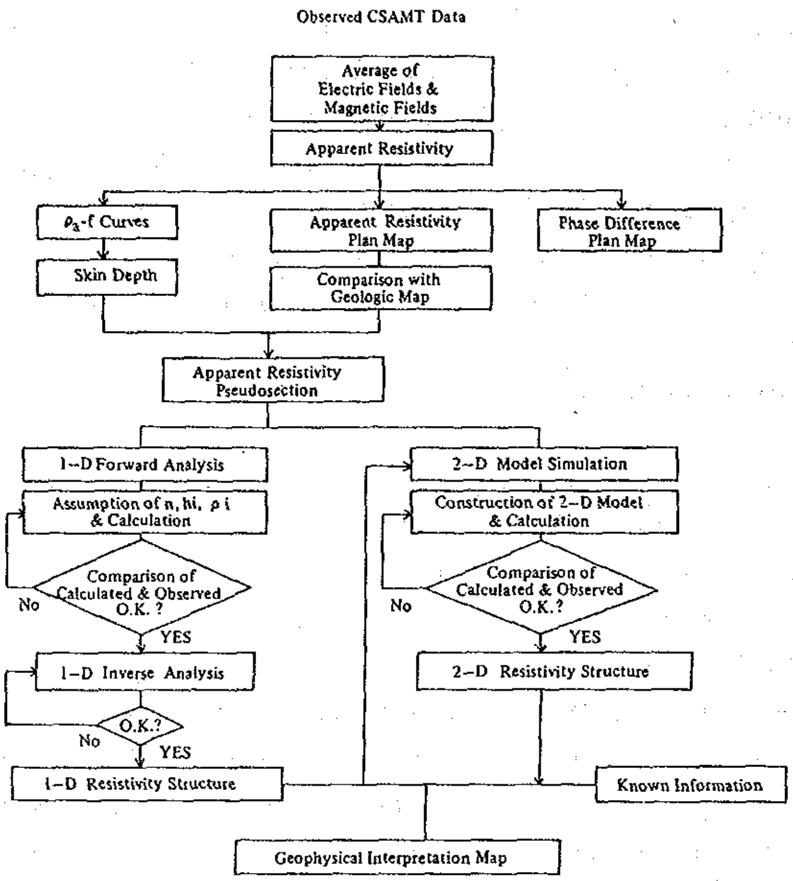

Fig. II-1-9 Flow chart of CSAMT data analysis

width of 300m to 400m in the north side and about 100m in the south and continues to the deeper portion. The other is distributed in the eastern part as well as the southwest edge of the area. The middle resistivity zone is partialy distributed east of the mentioned high resistivity zone in the western part of the area and seems not to continue to the deeper portion. The low resistivity zone is widely distributed in the central part of the area as well as at the west of the above elongated high resistivity zone.

The comparison of these resitivity zones with geology in the area gives following aspects:-

The elongated high resistivity zone in the western part of the area corresponds to metasediments, and the high resistivity zone in the southwest edge and in the eastern part corresponds to granite and phyllite, respectively. The low resistivity zones correspond to graphitic phyllite. Although the high resistivity zones induced by auriferous quartz veins itself were not detected, there is a possibility of the existence of auriferous quartz veins in the mentioned elongated high resistivity of the NNW-SSE direction, because the Au anomaly zone detected by a soil geochemical survey overlaps this high resistivity zone.

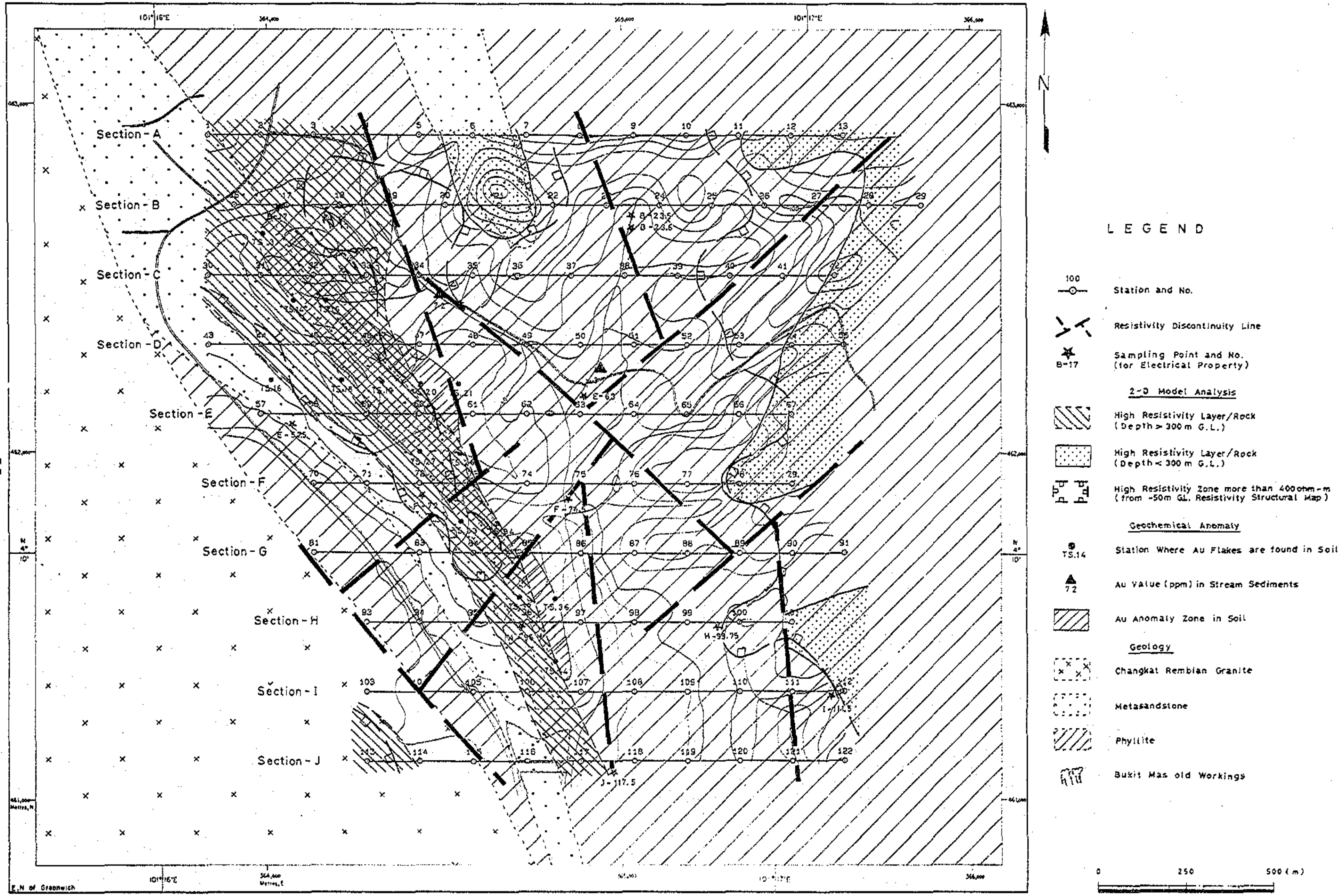

Fig. II-1-10 CSAMT interpretation map

1-7 Drilling

Phase: III

Purpose: Drilling was conducted in northeastern part of the area, west of the Main Range Granite, where an existence of Au mineralization was suggested by soil geochemical survey and trenching during Phase II, to examine possible occurrences of auriferrous quartz veins or Au dissemination.

Area: Eastern part of the Area a-1 (Fig.II-1-11).

Drill Method: Longyear "34" owned by GSM was employed for diamond core drilling.

Specifications: The target of the drilling was set to areas beneath the trenches Nos. 8, 9 and 13 which show high Au grade. Considering general trend and dip of the quartz veins on the surface, the location, bearing, inclination, and length of each drill hole were determined as below, so as to perpendicularly intersect quartz veins.

Hole No.	Bearing (degree)	Inclination (degree)	Scheduled Length(m)	Actual Length(m)
MJMP-10	45	-30	150	150.60
MJMP-11	45	-30	160	160.50
MJMP-12	45	-30	150	150.50
MJMP-13	45	-60	140	140.40
MJMP-14	45	-60	150	150.60
MJMP-15	45	-60	150	150.70

Survey Results (Fig.II-1-12 and 13): Talus deposit, reaching thickness up to 40m, and underlying amphibolite and green schist of a possible pyroclastic origin were confirmed in the area. A concealed, primary Au mineralization, with the maximum Au grade of 2.1 ppm, in silicified schist at approximately 50m and a weak base metal (Cu, Pb, Zn) mineralization with Ag in silicified rock at approximately 120m were confirmed by drilling.

The most possible source of high Au concentration in talus deposit is the fragments of schist transported from the slopes of mountains in the northeastern part of the area. The primary Au mineralization can be related to the silicified rock and As concentration.

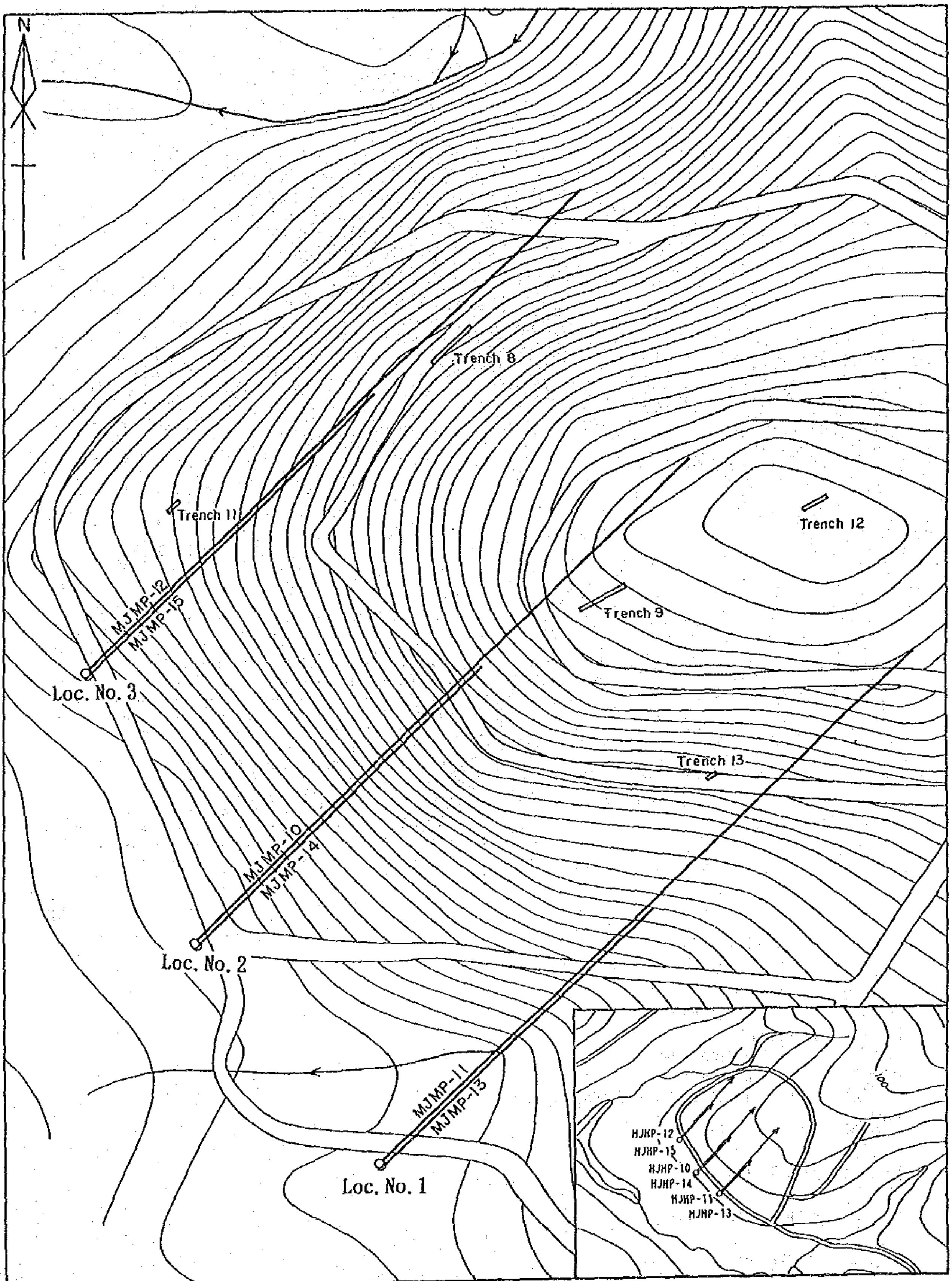

Fig. II-1-11 Location map of the drill holes and its related trenches in eastern part of Area a-1

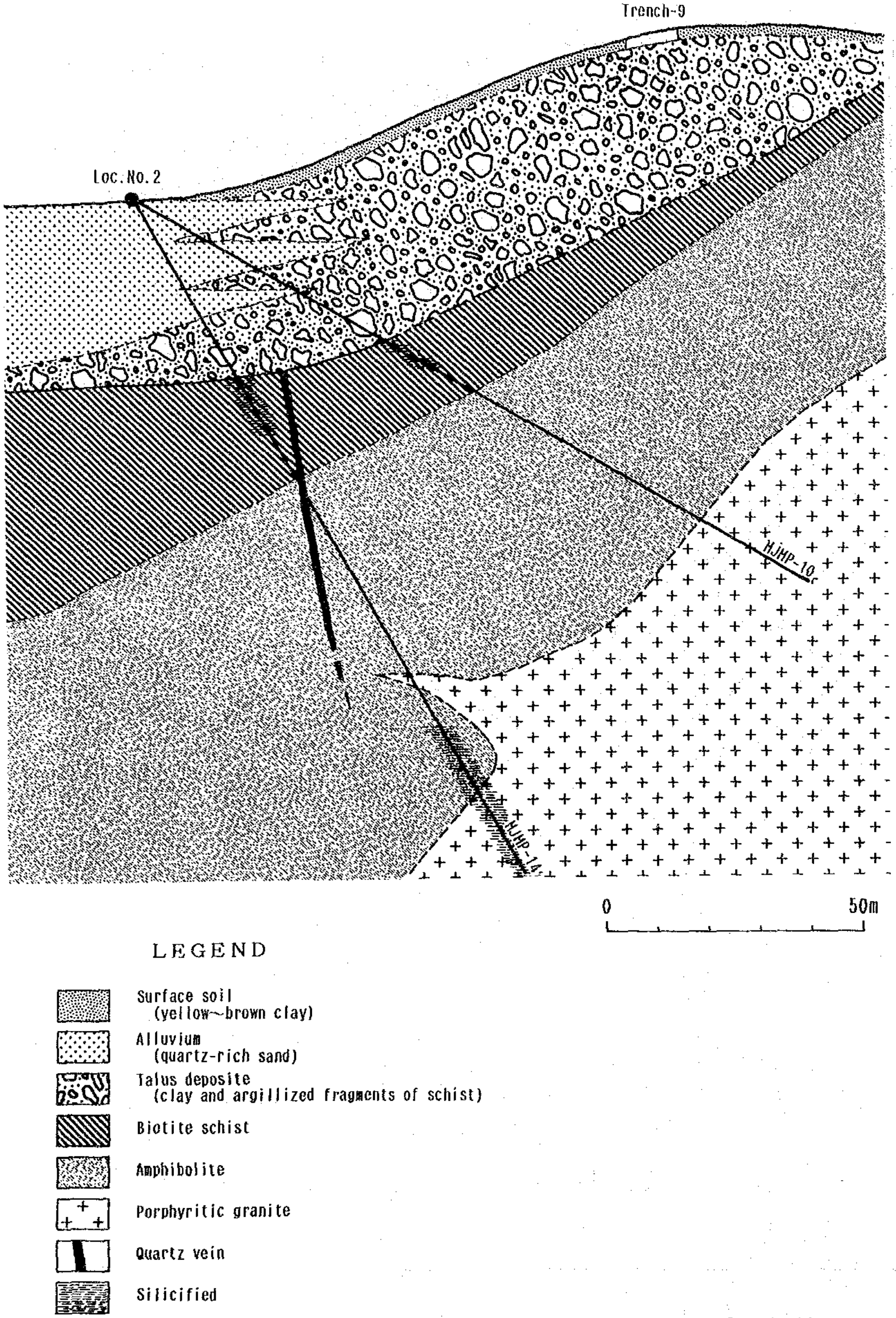

Fig.II-1-12 Geological cross section through drill holes, MJMP-10 and -14 in eastern part of Area a-1

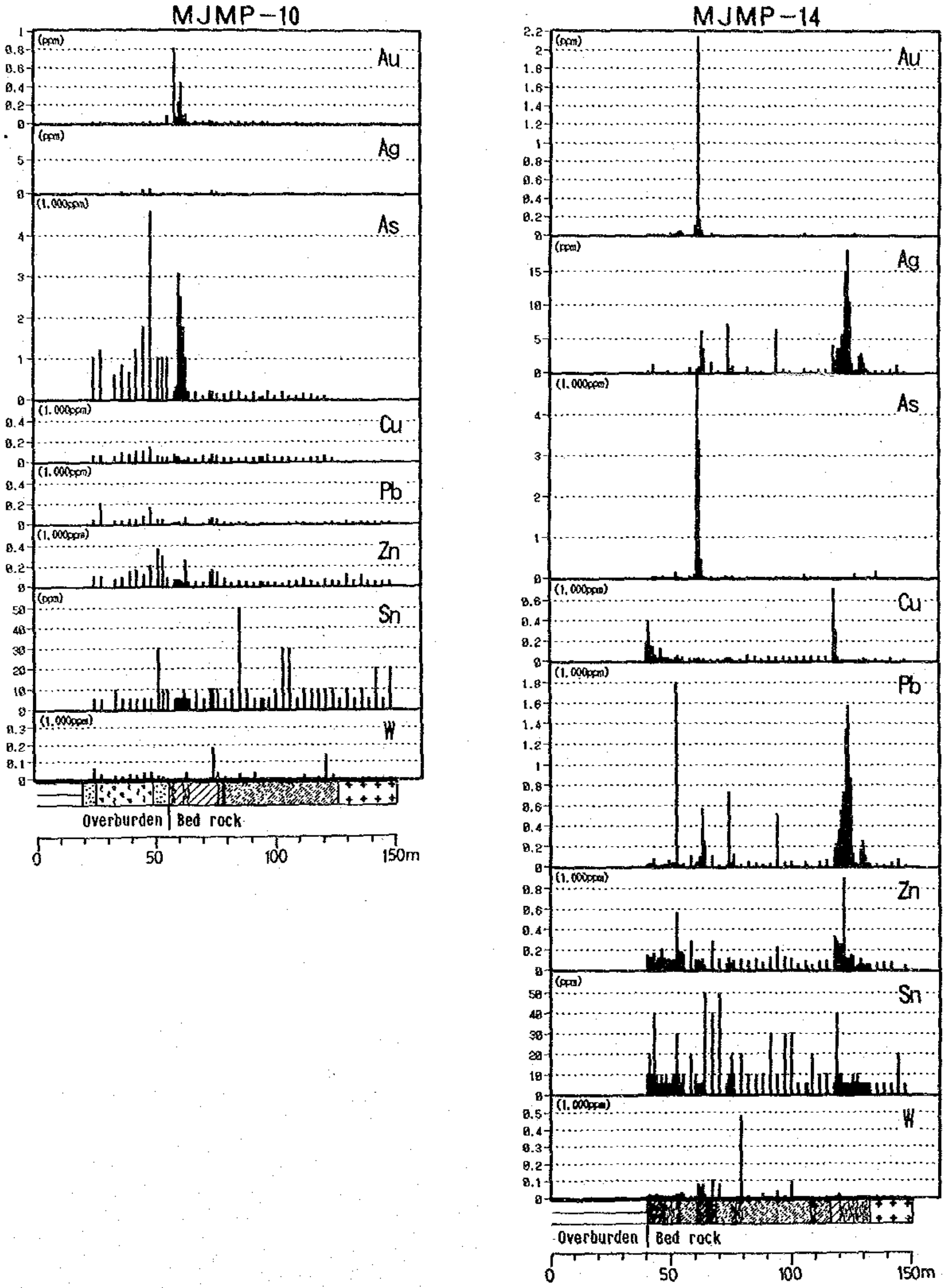

Fig.II-1-13 Metal contents in drill holes, MJMP-10 and MJMP-14 in eastern part of Area a-1

Chapter 2 Area B

2-1 Geology

Area B is covered entirely by unconsolidated Quaternary sediments belonging to the Simpang Formation, the Beruas Formation and the Gula Formation (Loh 1987, manuscript). In places, unconsolidated sediments are more than 100m thick.

(2) Simpang Formation

The Simpang Formation covers a small area in the northeastern sector of Area B. However, in the entire survey area, it underlies the Beruas Formation and the Gula Formation and is resting directly on the bedrock.

The formation comprises a thick sequence (40m - 90m thickness) of gravel, sand, silt, clay and peat deposited in a terrestrial environment. The presence of thick gravel and sand layers suggest that the formation is made up largely of alluvial fan and braided stream deposits.

The age of the Simpang Formation is believed to be Pleistocene. Relatively rich tin placers are associated with this formation.

(2) Beruas Formation

The Beruas Formation covers the central part of the survey area. It is made up entirely of fluviatile deposits consisting of gravel, sand, silt, clay and peat.

The age of the formation is Holocene.

(3) Gula Formation

The Gula Formation is exposed in the southwestern sector. It is marine in origin consisting largely of marine clay and silt with shell fragments and minor amount of sand and gravel. The formation is contemporaneous with the Beruas Formation and is Holocene in age.

2-2 Mineralization

There is no known mineralization or mining activities in Area B. However, immediately north of the area is the Tanjung Tualang tin field, one of the well known tin producing centres in the Kinta Valley. In the Tanjung Tualang area, tin mineralization is associated with quartz veins occurring both in granite and in sedimentary rocks near the contact zones.

2-3 Geophysical Exploration

Previous studies undertaken by the Geological Survey of the Malaysia indicated the presence of deep-seated placer tin deposits in Area B and that Paleo-river channels located on the bedrock are favourable sites for placer tin concentrations.

Under Phase II and III of the project, a gravity survey was undertaken in Area B (Area b in Phase II and Area b-2 in Phase III) in order to determine the relationship between the distribution of placer tin and gravity basement structure.

Survey Area: The location of the Area b and Area b-2 are shown in Fig.1.
Survey Method: For both areas, a gravity survey was undertaken. In the Area b, measurements were made at 860 stations covering 30km^2 while in the Area b-2, a total of 613 measurements were taken over an area of 25km^2. The station spacing was 150m to 250m in both areas.
Data Analysis: Data obtained from both areas were compiled and analyzed by the processing shown in Fig.II-2-1. The bouguer anomalies were calculated by a density of 1.8 g/cm^3, and then the depth to the gravity basement were estimated by a density difference assumption of 0.75 g/cm^3 between the Quarternary sediments and Paleezoic sediments.

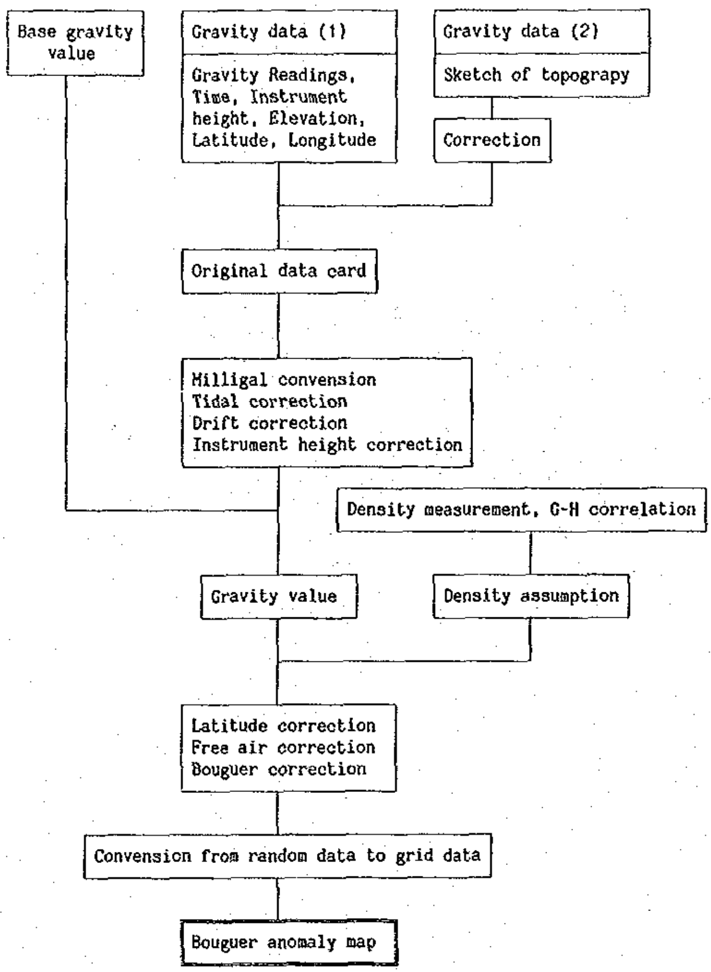

Fig. II-2-1 Flow chart of gravity data processing

Two-layered model sections showing the depth to the gravity basement are attached along with the drilling results in the Appendix-2(1)-(5), and a regional gravity map also attached in Appendix-1.

Survey Result (Fig.II-2-2 and 3): The Bouguer anomaly values ranging between 5 to 15 mgal have a tendency to increase from NE to SW. A steep gravity gradient in the NW-SE direction, reflecting a fault, is clearly seen in the northeastern part of the area and its direction changes to a N-S trend in the northeast edge of the area. The gravity basement, probably indicating the bedrock of Palaeozoic sediments exists between the depth of 55m to 110m from the surface. The difference between the depth of gravity

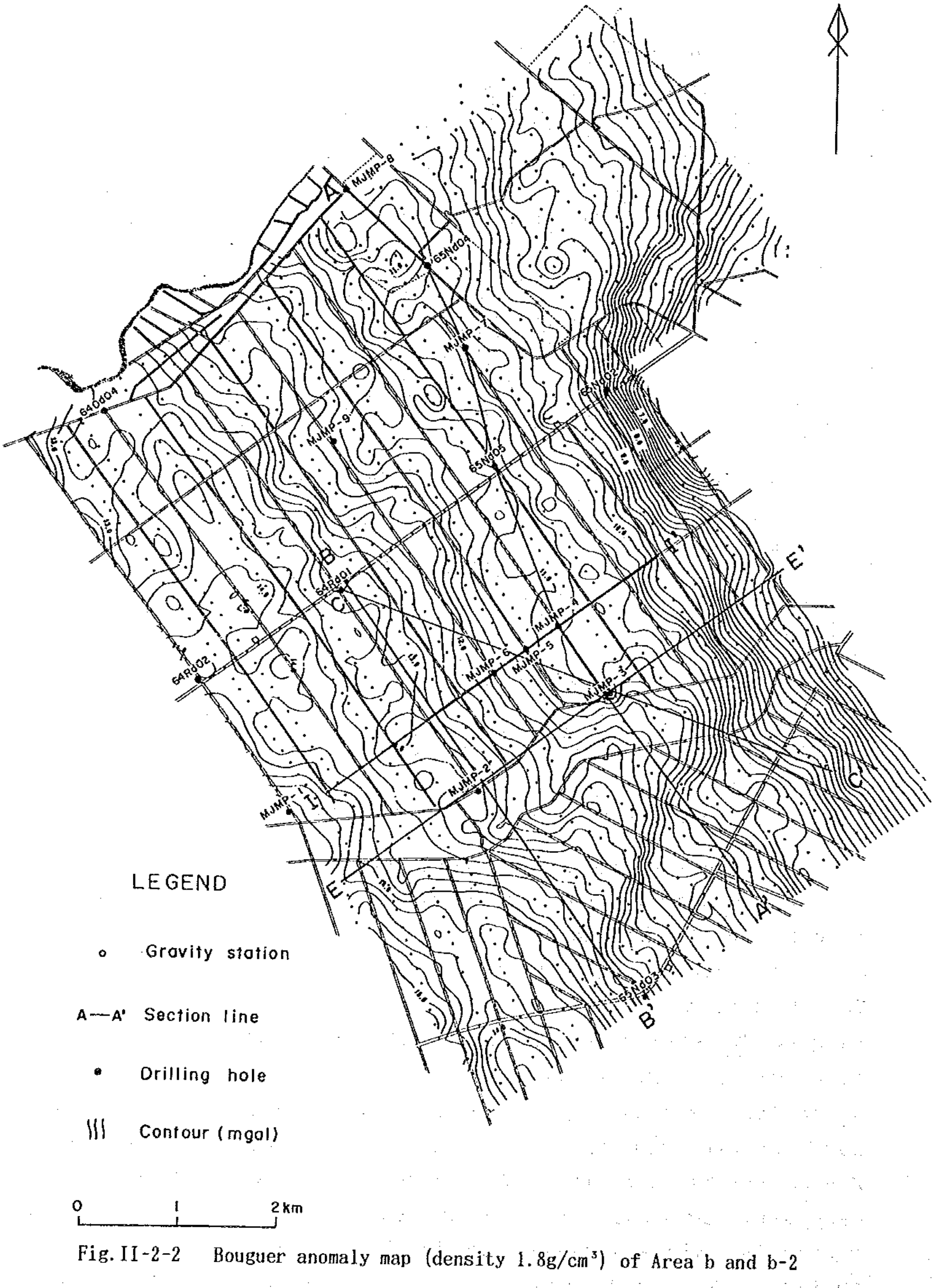

Fig. II-2-2 Bouguer anomaly map (density 1.8g/cm^3) of Area b and b-2

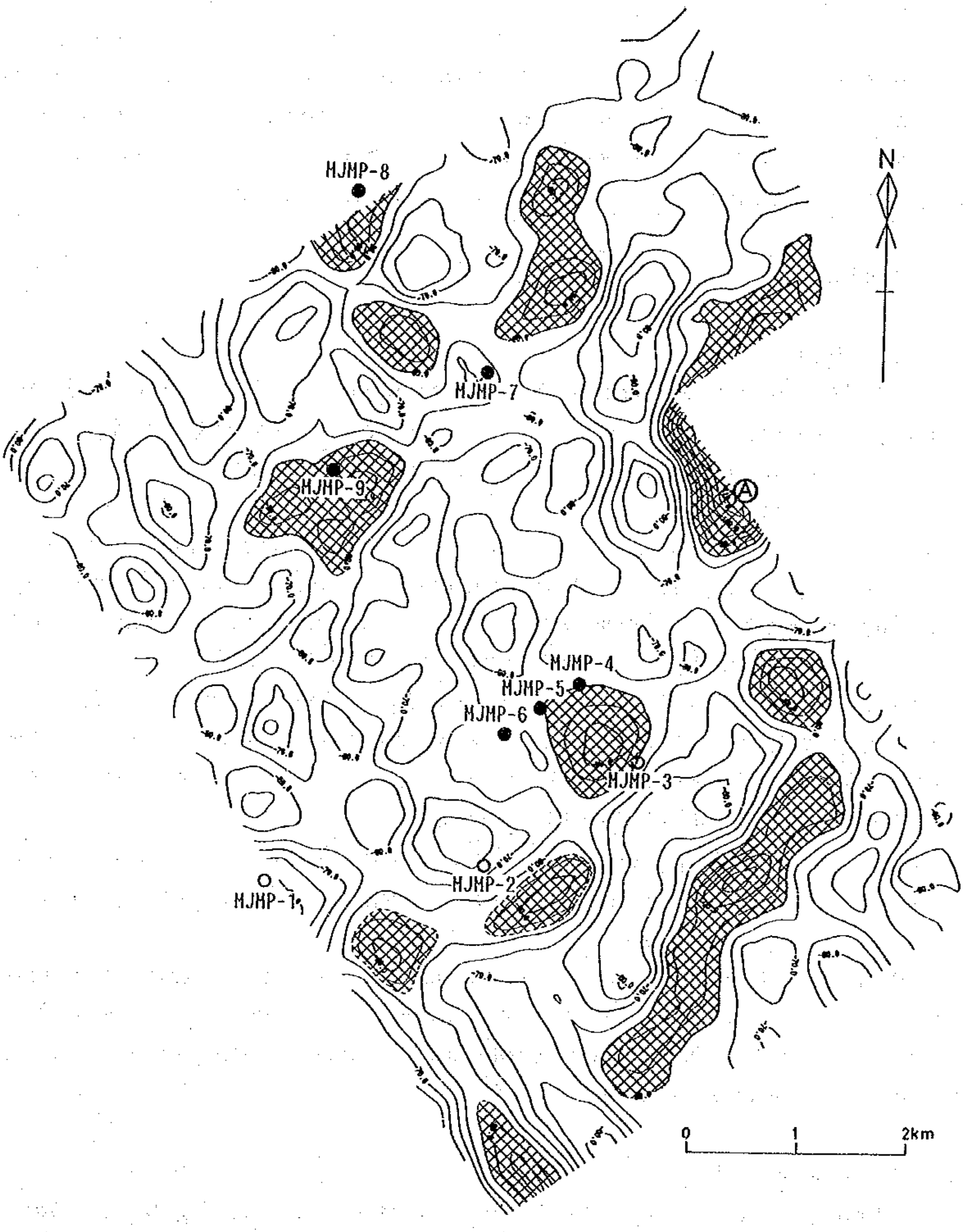

Fig.II-2-3 Gravity basement map of Area b and b-2 basement and Paleozoic sediments confirmed by drilling is approximately within 10% in most places. A series of discontinuous zones of deeper than 80m seems to indicate paleo-river channels. In particular the concaved zone in the northeastern edge of the area (although not entirely covered during the surveys) steeply deepens and seems to extend to the east. Further work is recommended in this zone.

2-4 Drilling

2-4-1 Phase II

Under Phase II three holes were drilled in conjunction with the gravity survey so as to obtain information for the interpretation of the gravity data (Fig.II-2-3).

Drilling Method: A semi-mechanized banka was used for the drilling. A heavy mineral concentrate sample was obtained by panning the sludge from every 1.5m of the drill length and analyzed for Au, Ag, Pb, Zn, Cu, As, W and Sn.

Results: The lithology of the drill holes (MJMP 1,2,3) and the analytical results of heavy mineral concentrates are shown in Fig.II-2-4. Thick sand and gravel layers occur in the lowest part of the drill holes.

Except Sn, all elements show low values. Placer tin concentrations in terms of kg/m^3 SnO_2 are significant in the following sections.

A total of 11 clay samples were subjected to firing test and were found to be suitable only as raw material for structural clay products such as bricks, clay pipes, wall tiles and roofing tiles.

2-4-2 Phase III

Under Phase III, six holes (MJMP-4, 5, 6, 7, 8, 9) were drilled to determine the distribution of placer tin (Fig.II-2-1). Except for MJMP-7, all the holes were drilled into or near the concave structures identified by gravity survey.

Drilling Method: Drilling method is similar to Phase II. Since the Phase II results indicate an occurrence of placer tin concentrations only near the bedrock, only those concentrate samples collected near the bedrock were analyzed.
Results: The lithology of the drill holes and the analytical results of heavy mineral concentrates are shown in Figure II-2-4.
Except for Sn and possibly Au, all the other elements show low values. In MJMP-5, one sample yielded 11.4 ppm Au. In MJMP-6, relatively high Au values of 1.4 ppm to 4.6 ppm were obtained. Gold flakes were observed in one concentrate sample in MJMP-6. Except for MJMP-7, significant tin concentrations were obtained in all the drill holes in sand and gravel layers near the bedrock (Fig.II-2-5).

Table II-2-1 Tin-ore beds intersected by drill holes, MJMP-1~9, Area B

Hole No.	depths		thickness	grade kg/c.m.
	from	upto		
MJMP-1	83.8m	93.0m	9.2m	0.452
MJMP-2	59.4m	76.2m	16.8m	0.264
MJMP-3	56.4m	61.0m	4.6m	0.577
MJMP-4	59.4m	67.1	7.7m	0.299
MJMP-5	64.0m	71.6m	7.6m	0.866
MJMP-6	62.5m	68.6m	6.1m	0.478
MJMP-7	-	-	-	-
MJMP-8	71.6m	79.2m	7.6m	0.736
MJMP-9	62.5m	80.8m	18.3m	0.425

* Ore bed = SnO2 content > 0.1kg/c.m.

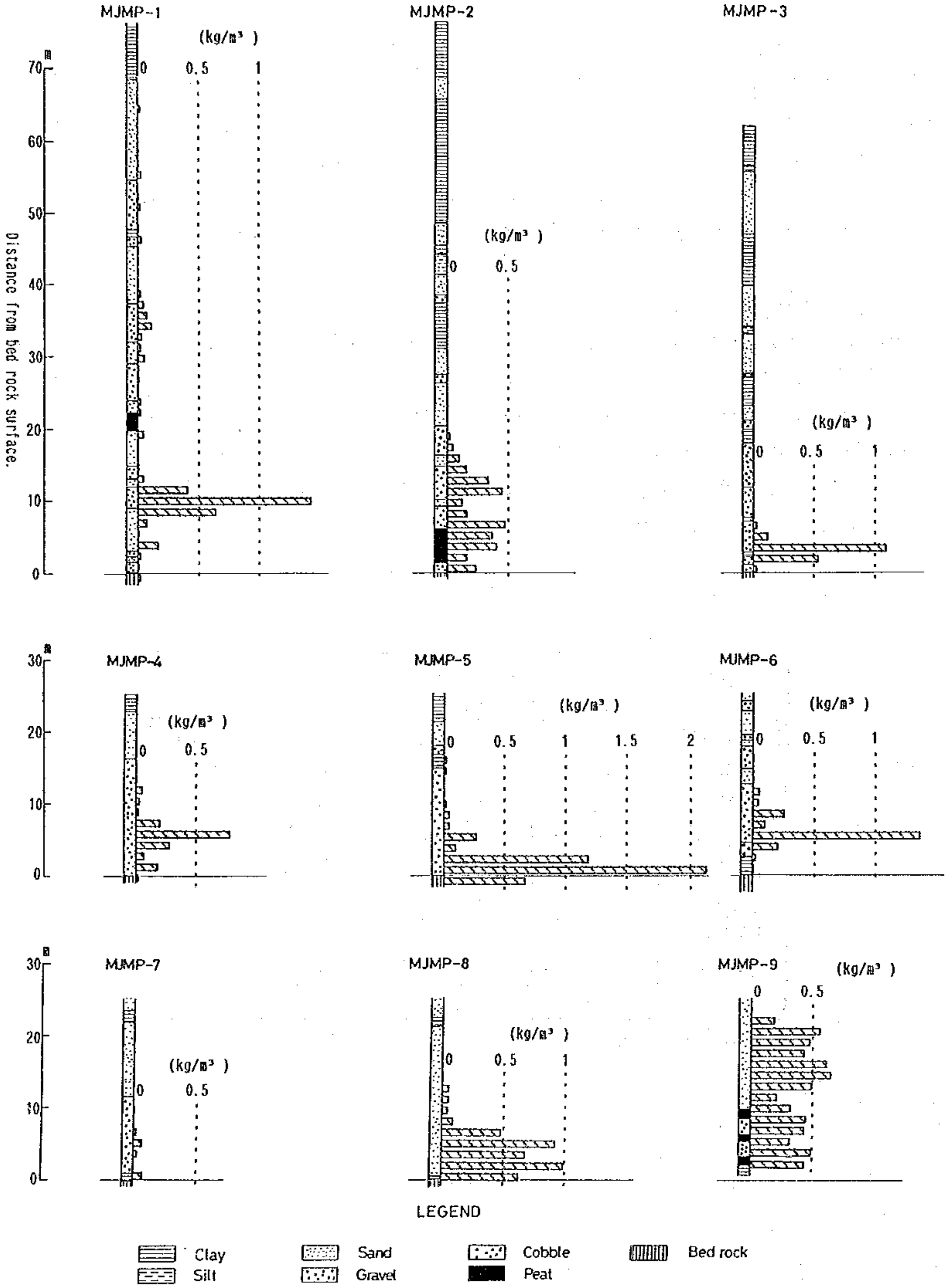

Fig. II-2-4 Variation of SnO_2 contents with depths in drill holes MJMP-1～9 in Area b and b-2

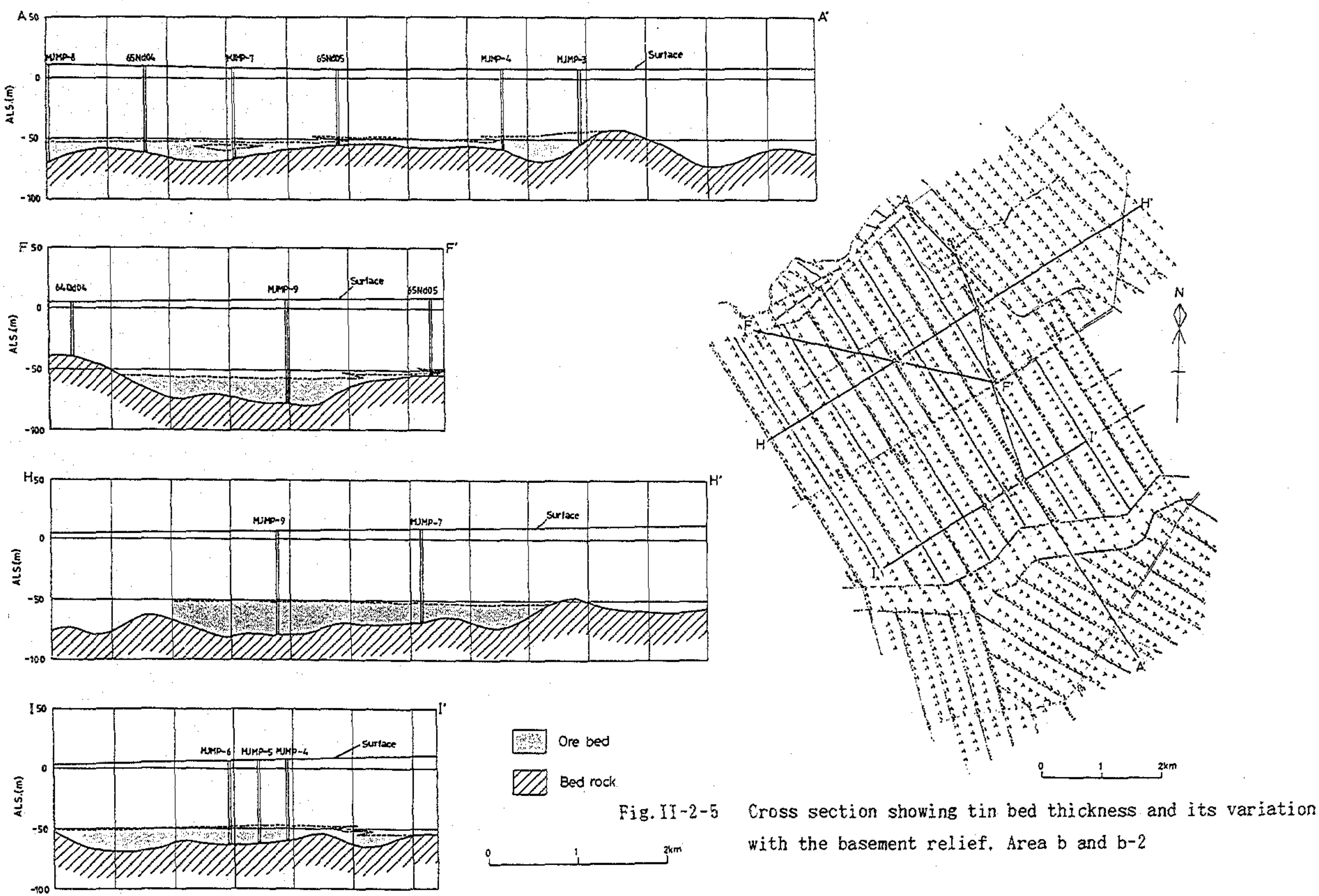

Fig.II-2-5 Cross section showing tin bed thickness and its variation with the basement relief. Area b and b-2

Chapter 3 Area C

3-1 Geology

Area C is composed mainly of early Paleozoic schists which are intruded by the Main Range granite (Fig. II-3-1).

The schists consist predominantly of quartz-mica schist and thin beds of chert. Segregation quartz veins, some of which contain pyrite are common. The schists appear isoclinally folded with fold axes trending NW-SE. Schist beds dip steeply towards NE.

The Main Range granite comprises porphyritic to non-porphyritic biotite granite. Dykes of aplite and pegmatite and quartz veins occur within the granite.

3-2 Mineralization

Very little is known regarding mineralization in Area C except for the reported occurrence of a few cassiterite - tourmaline - quartz veins near the granite contact. However placer gold is known to occur in the area.

3-3 Geochemical Survey

3-3-1 Geochemical Rock Survey (Preliminary)

Phase: I

Purpose: To understand the geochemical nature of each lithological unit

Sampling Area: Whole survey area

Sampling Method: Fresh, unaltered samples collected in conjunction with geological mapping.

Chemical Analysis: 29 elements

Data Processing: Geometric mean and standard deviation calculated for each element for each lithological unit.

Results: The results of 50 rock samples are presented in Table II-3-1.

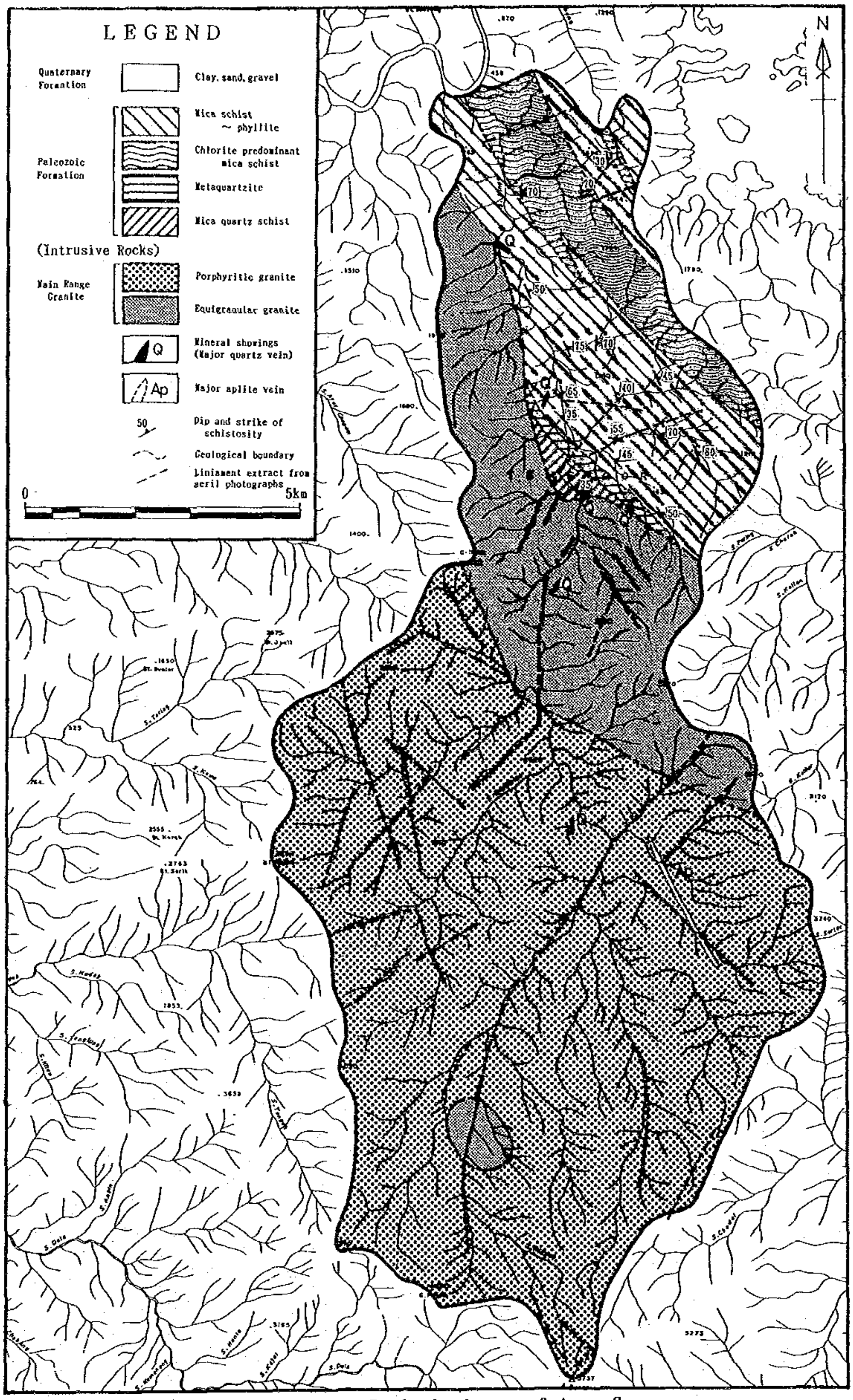

Fig. II-3-1 Geological map of Area C

Table II-3-1 Statistical parameters of elements analyzed (rock) in Area C

(ppm)

	Area C			
	Granite		Schist	
	Mean	S.D.	Mean	S.D.
Pb	9.623	2.153	11.776	2.767
Ni	5.340	2.547	7.143	1.660
Co	4.434	1.837	3.766	2.028
Ag	0.075	1.791	0.096	2.148
Mo	3.149	1.333	3.046	1.413
Cu	5.979	2.188	8.596	2.080
Zn	14.885	2.317	13.404	2.328
Fe	0.830	2.339	0.892	1.782
Mn	367.902	2.275	395.959	1.603
Au	0.009	1.403	0.009	1.556
As	5.193	1.928	27.247	3.597
Sn	8.838	1.726	6.255	1.535
W	5.363	1.991	8.459	2.489
U	4.291	3.606	0.192	3.334
Hg	0.077	1.227	0.079	1.138
Sb	1.378	1.710	2.394	2.735
Bi	2.137	2.301	1.091	1.276
Ba	203.244	3.499	232.673	3.793
Ce	40.981	3.565	35.681	3.451
Eu	0.543	2.410	0.490	2.275
La	43.036	2.275	21.238	2.649
Lu	0.323	1.774	0.261	1.977
Nd	14.549	2.265	11.419	1.746
Sm	1.762	5.058	2.057	4.064
Tb	0.486	2.178	0.347	2.443
Th	17.558	2.911	6.792	3.090
Yb	1.600	2.198	0.958	2.911
Ta	2.363	1.862	2.000	1.000
Nb	14.936	1.452	11.511	1.380

S.D.=Standard Deviation

3-3-2 Geochemical Pan-Concentrate Survey

Phase: I

Purpose: To understand the composition and distribution of heavy minerals in the area.

Sampling Area: Whole survey area.

Sampling Method: Samples were collected at the sampling locations of stream sediment geochemical survey. Panning was conducted, instantaneously, at the site to obtain heavy mineral concentrates more than 35g. Number of dulang to obtain concentrates more than 35g was recorded for each sample.

Chemical Analyses: Samples were treated following the flow chart shown in Fig. Semiquantitative mineral examination and chemical analyses of 18 elements (Au, Ag, As, Hg, Sn, W and 12 REEs) were conducted.

Data Processing: The semiquantitative mineral examination was done using the binocular microscope. Single component analysis and factor analysis were conducted for the results of chemical analyses.

Results: The results of semiquantitative mineral examination of 45 samples show that heavy mineral concentrates consists mainly of gold, ilmenite, tourmaline, monazite, xenotime, cassiterite, rutile, zircon and topaz. The following results are noted:-

(a) Heavy minerals in the upper reaches of S. Ringat are characterized by ilmenite, tourmaline and monazite.

(b) Cassiterite is common in the S. Jopal basin located near the schist-granite contact.

(c) Visible gold flakes were collected at only one locality.

The results of single component analysis are shown in Fig. II-3-2, each respectively showing distribution of Au, Sn and W anomalies. Au anomalous values (more than 1.10×10^{-6} g/d) are concentrated in the eastern tributaries of the lower reaches of S. Ringat. Scattered, Au anomalous values also occur in the upper reaches of S. Jopal. Highly anomalous Sn values (more than 660×10^{-3} g/d) are located in the drainage basin of S. Jopal. East of the lower reaches of S. Ringat, moderately anomalous Sn values (more than 274×10^{-3} g/d) overlap the Au anomaly. Anomalous W values (more than 5×10^{-3} g/d) are distributed along the upper reaches of S. Ringat showing no overlap with Sn.

Table II-3-2 shows the factor loadings of each element for four factors. Groups of elements controlling the four factors are as follows:-

Factor 1: Rare Earth Elements (REE)

Factor 2: Ni, Co

Factor 3: Au, Ag

Factor 4: As, Sn, W

Factor 1 high scores (more than 1.0) concentrate in the upper reaches of S. Ringat and in the S. Duabelas - S. Jopal basins. Monazite is the likely cause of the high scores. Factor 2 high scores are distributed in the upper reaches (granite terrain) and lower reaches (schist terrain) of S.

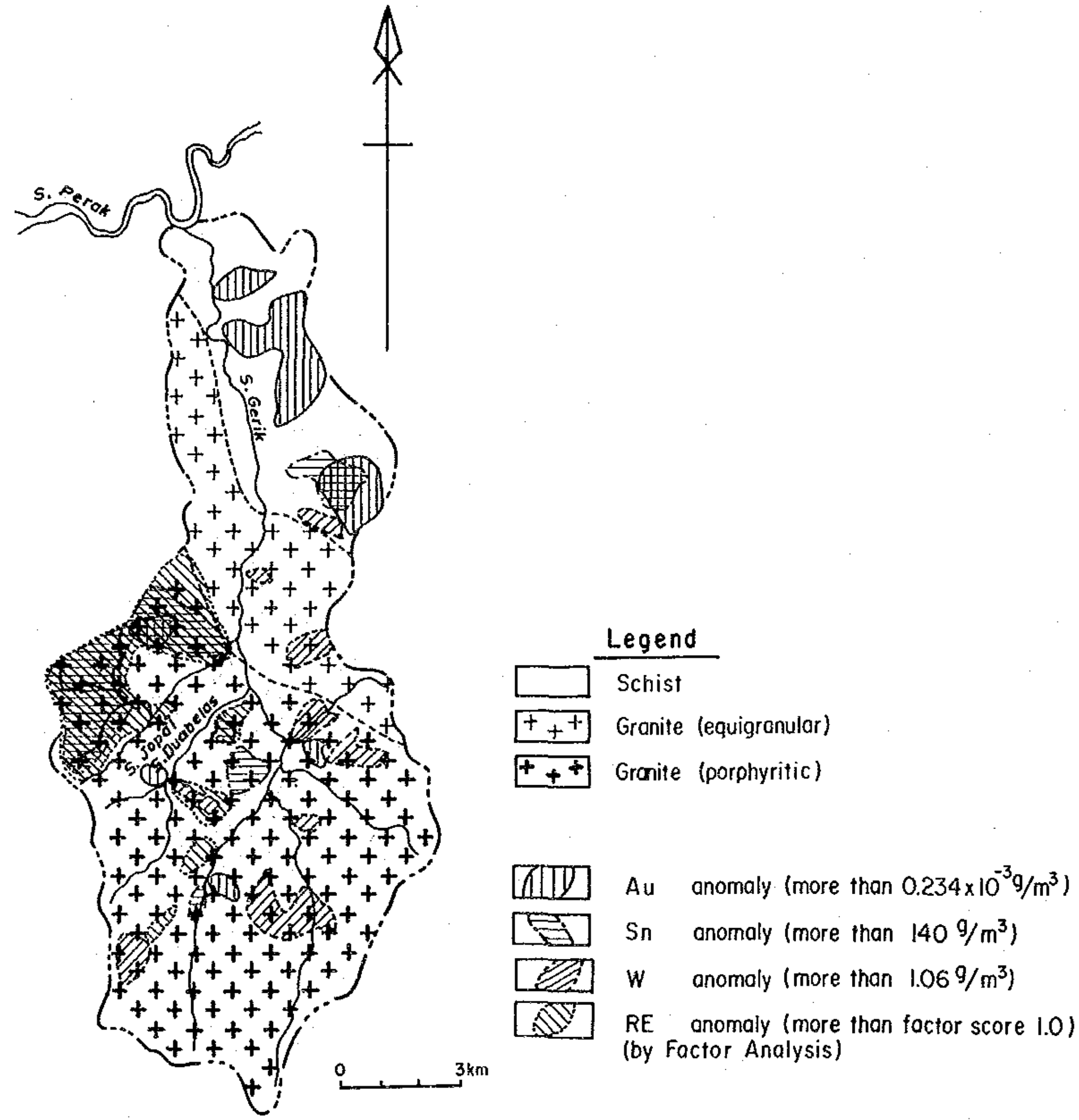

Fig. II-3-2 Geochemical anomalous zones for Au, Sn, W and REE in Area C (heavy mineral concentrate)

Ringat while Factor 3 high scores are located in the lower reaches of S. Ringat and along S. Jopal similar to single component analysis for Au. High Factor 4 scores are found near the granite-schist contact similar to W anomalies for single component analysis.

Table II-3-2 Factor loadings of elements analyzed in Area C

(heavy mineral concentrate)

Factor Loading

	Area C				
	Factor 1	Factor 2	Factor 3	Factor 4	Comunality
Au	-0.039	-0.335	-0.548	0.157	0.4394
Ag	0.283	-0.496	-0.437	0.265	0.6034
As	0.040	-0.462	-0.111	0.561	0.5625
Sn	0.470	0.035	-0.305	0.496	0.5977
W	0.238	-0.221	-0.107	0.675	0.6171
Hg	0.364	-0.595	-0.031	0.322	0.7139
Ni	0.091	-0.906	-0.169	0.176	0.8926
Co	0.184	-0.906	-0.136	0.030	0.8897
Ce	0.975	-0.123	-0.085	0.113	0.9895
Eu	0.754	-0.333	-0.367	0.047	0.8229
La	0.978	-0.123	-0.094	0.123	0.9963
Lu	0.762	-0.272	-0.040	0.150	0.9712
Nd	0.970	-0.120	-0.079	0.122	0.9778
Sm	0.930	-0.160	-0.114	0.186	0.9418
Tb	0.917	-0.217	-0.116	0.135	0.9672
Th	0.961	-0.085	0.035	0.148	0.9744
U	0.891	-0.049	0.127	0.133	0.8810
Yb	0.731	-0.273	-0.096	0.079	0.9614
Ta	0.842	-0.102	-0.046	0.282	0.9691
Nb	0.756	-0.260	0.007	0.319	0.9664
Factor Contribution	% 71.434	% 16.212	% 5.265	% 4.586	

(Heavy Mineral Concentrate)

3-3-3 Geochemical Stream Silt Survey

Phase: I

Purpose: To understand geochemical nature, concentration and distribution of various elements, in the survey area.

Sampling Area: Whole survey area.

Sampling Method: Stream sediments (silt) were collected, during geological survey, at approximately 1km intervals along the main drainage systems over the survey area.

Chemical Analyses: Eight metallic elements (Au, Ag, As, Hg, Sn, W, Ni, Co).

Data Processing: Single component analysis and factor analysis.

Results: Results of single component analysis are given in Table. Fig shows the distribution of anomalous values for Au and Sn. Four anomalous Au values are concentrated just east of the S. Ringat-S. Duabelas confluence. Anomalous Sn values are distributed along the upper reaches of S. Ringat and along S. Jopal-S. Duabelas.

Factor analysis gives factor loadings of each element for four factors. Factor 1 is controlled by Ni and Co while Factor 3 is controlled by Sn and W. High Factor 1 scores are concentrated in the northeast (Schist zone) and along S. Jopal and S. Ringat (granite zone). High Factor 3 scores are located in the upper reaches of S. Ringat and along S. Jopal-S. Duabelas.

3-3-4 Geochemical Rock Survey (Detailed)

Phase: II

Purpose: To understand the geochemical nature and mineralization of Au, Sn and REE and to delineate areas of potential.

Sampling Method: Fresh rock samples collected at 250m intervals along traverse routes over an area of $18km^2$. A total of 123 rock samples collected.

Chemical Analysis: 20 elements.

Data Processing: Single component analysis (EDA) and factor analysis.

Results: All the elements show small anomalous zones which are scattered over the sampled area with no distinct patterns. Two relatively large Au anomalies are located in the centre and western part of the area. Sn anomalies are scattered, two of which partially overlapped the Au anomalies. The distribution of the anomalous values for REE are sporadic with no discernable pattern.

The factor loadings of each element suggest the following groups of elements controlling three factors:-

Factor 1: La, Ce, Nd, Sm, Th
Factor 2: Tb, Yb, Lu, U
Factor 3: Sn, Nb, Ta

The distribution of the high factor scores for Factor 1, Factor 2 and Factor 3 are sporadic with no discernable pattern.

Chapter 4 Integrated Discussion

4-1 Area A

The Area A is mainly underlain by Paleozoic metasediments of Terolak formation and Belata formation and they are intruded by the Main Range Granite and Changkat Rembian Granite. The metasediments, consisting of phyllite and metasandstone, show a west dipping isoclinal fold with NNW-SSE axis.

Similar lithological and chemical characteristics of the Main Range Granite and the Changkat Rembian Granite suggest a similar age of their intrusion.

Considering very poor exposure of the area and new findings of amphibolite and green schist by Phase III drilling, further detailed studies including drilling may provide new data on the litology in the area.

A gold anomalous zone covering an area of about 60km^2 is delineated east of the Tapah-Bidor-Sungkai highway. This zone can be subdivided into three Au anomalous areas - Northern Area, Bukit Mas Area and Southern Area. Based on size and Au concentrations, the northern Area appears to be most promising for primary gold mineralization. This is supported by analytical results of silt samples.

Based on the above result, soil geochemical surveys covering the anomalies were conducted on a grid system. Among the anomalous zones obtained by the soil geochemical survey, the one, 0.6km wide and 1.4km long, in the northeastern part of the Area a-1 is most prominent. It shows a mean value of 0.41 ppm Au and a maximum of 2.71 ppm Au and it spreads over two As anomalous zones with a average value of 814 ppm As and a maximum of 2,248 ppm As. Five trenches in the northeastern Au anomalies give high Au concentrations in the soil ranging from 0.27 ppm to 3.57 ppm.

The drilling survey was conducted in the northeastern Au anomaly to clarify the Au source, whether it is derived from auriferous quartz veins or Au dissemination in the country rock. The results of drilling survey reveals high Au concentrations in a talus deposit consisting of schists fragments, rejecting both of the above possibilities. The source of high Au concentrations in the talus deposit is thought to be a possible occurrence of schist roof pendants on the western slope of the granite range in the northeastern part of the area, subsequent erosion and transportation resulted in the present location of the talus deposit. A primary Au mineralization at approximately 50m depth in the silicified schist confirmed by the same drilling survey support the above hypothesis.

The concealed, primary Au mineralization in the silicified schist at approximately 50m gives a maximum Au grade of 2.1 ppm at sampling length of 1.0m. Furthermore, a base metal (Cu, Pb, Zn) mineralization with Ag was confirmed in the silicified rock at approximately 70m. The intimate association of As highs with the primary Au mineralization suggests As as an very effective pathfinder for exploration of primary Au deposits.

4-2 Area B

The Phase II, results indicate the presence of relatively rich tin placers only in the sand and gravel layers near the bedrock at depth of 60m or more. The clay samples tested were found to be of low quality.

Relatively rich tin placers were detected in the Phase III drill holes which were drilled into the concave structures in the gravity basement. The structures are therefore likely to be paleo river channels and are favourable sites for placer tin concentrations.

Concaved structures in the gravity basement occur as discontinuous curvilinear features. These concaved structures are considered to be meandering channels of paleo river. Assuming that the gravity basement map well shows such general basement topography, locations of drill sites can be considered in relation to the bedrock topography.

As shown in the gravity basement map superimposed on drill sites, MJMP-4, 5, 8 and 9 are located in the area of concaved bedrock topography, showing the altitude of bedrock appearance less than -80m. Although all of the four drill sites are located less than 500m apart from the bottom of the concaved places, only MJMP-4 shows relatively low grade of tin compared with th other three holes. The reason for this can be atributed to the location of MJMP-4 on the local and steep slope. MJMP-6 and 7, on the other hand, are located on the local uplifts of paleo river channels. This is not preferable site for the placer tin deposits.

The tin-bearing gravel and sand layers are generally several metres thick (maximum 19.8m) and occur at depths of more than 60m below ground surface. As such, the placer tin deposits have little economic significance at the moment due to the thick overburden which results in low overall tin grades.

The thickness of the tin-bearing layers appears to increase towards the north suggesting that the source of SnO_2 in probably the Tanjung Tualang tin field.

4-3 Area C

The Area C is composed of the Main Range granite with megacrysts of K-feldspar.

Geochemical rock survey conducted in the drainage basin of Phase I anomalies of Au, Sn and REE revealed Au anomalous zones (area: 1.5km^2, mean value=0.006 ppm maximum value=0.009 ppm) and Sn anomalous zones (area=0.8km^2, mean value=50 ppm, maximum value=70 ppm) in the central part of the area. Both anomalous zones are partly overlapped. The souce of geochemical anomalies of Au and Sn was thus confirmed. The mean values of anomalies are 1-5 times as high as those of the Main Range granite.

It became clear that REE anomalies did not show an areal extension but sporadical distribution. This fact is probably due to point distribution of REE minerals such as monazite.

The anomalous values themselves are not so high, showing low potential for Au, Sn and REE resources.

PART III CONCLUSIONS AND RECOMMENDATIONS

Chapter 1 Conclusions

The following are conclusions obtained from the geological, geochemical, geophysical and drilling surveys for three phases of the project:

Area A

(1) The five trenches (Nos.8, 9, 11, 12 and 13) that gave high Au concentrations in the Phase II survey are located on a talus deposit (up to 40m thick) which shows an interfinger relation with alluvium. The talus deposit, consisting of mainly angular rock fragments of schist, have high Au concentrations. Consequently, the high Au concentrations in the talus deposit are thought to be derived from a possible occurrence of schist roof pendants on the Main Range Granite in the northeastern part of the area. Subsequent erosion and transportation have led to the deposition of the talus deposit in the survey area.

(2) Concealed primary Au mineralization with a maximum value of 2.1 ppm Au and base metal (Cu, Pb and Zn) mineralization with Ag were confirmed in silicified rock at approximately 50m and 120m below the surface respectively.

(3) The primary Au mineralization is associated with As in silicified rock. Therefore, As should be a good pathfinder element for the future exploration of the primary gold in Area a-1.

Area B

(1) The preferable locations for large scale, high grade, placer tin deposits are at bottom of concaved basement structures (bottom of paleo river channels).

(2) Among the concave basement structures detected, the largest, located at the northeast (basement altitude less than -100m) is considered to have the best potential for high grade placer tin deposit.

(3) The placer tin beds intersected by 6 drill holes all lie at the depth of more than 60m corresponding to the

mining limit at the moment. In addition, the overall tin grade is low due to the thick overburden (high grade tin beds only occur near the bedrock). Therefore they probably have little economic significance at the moment.

Area C

(1) The geochemical rock survey undertaken in Area C indicated weak and sporadic anomalies for Au, Sn and REE.

(2) Area C is therefore considered to have very low potential for the elements investigated.

Chapter 2 Recommendations

The gold and tin deposits discovered by the project have little economical significance at the moment. When the metal deposits are re-evaluated in the future, however, the following are recommended:-

Area A

(1) Grid Banka drilling is recommended to clarify the three dimensional distribution of gold in the talus deposit, Area a-1.

(2) Some of the geochemical Au anomalous areas located near the contact with Main Range granite, extracted by Phase I and II surveys, probably have talus deposits. Therefore, detailed mapping should be carried out to delineate such talus deposits followed by detailed soil sampling and Banka drilling.

(3) Follow-up drilling is recommended to clarify shape, size and Au grade of the primary Au mineralization confirmed by the Phase III drilling in Area a-1.

Area B

(1) Drilling a limited number of Banka holes arranged across the paleo river channels is recommended to obtain a better understanding of the occurrence and distribution of the placer tin.

(2) Additional gravity survey and Banka drilling are recommended to reveal entirely the concaved structure, suggested by the gravity survey, in the northeastern part of the area and to obtain a better understanding of the occurrence and distribution of placer tin there.

Area C

(1) No further work is recommended for Area C as it is considered to have very low potential for the elements investigated.

PREFERRENCES

REFERRENCES

Chu,L.H.(1985) Heavy Mineral Concentrates and Rock Sampling in Tin Exploration. SEATRAD Technical Publication, No.5, pp.91-96.

Fateh,C.(1980) A Manual of Geochemical Exploration Methods. GSM Special Paper, No.3.

Fletcher,W.K.(1984) Behaviour of Tin and Associated Elements in a Mountain Stream, Bujang Melaka, Perak, Malaysia. SEATRAD Report Investigation, No.24.

Gan,A.S.(1978) The Geology and Mineral Resources of the Tanjong Malim Area, Perak. GSM report (unpublished)

Goldstein,M.A. et al.(1975) Audio Frequency Magnetotelluric with a Ground Dipole Source. Geophysics, Vol.40, pp.669-684.

Hagiwara,Y.(1982) A Fomula Expressing Vertical Gradient of Normal Gravity. Jour. Geodetic Soc. Japan, Vol.28, No.3, pp.215-239.

Hosking,K.F.G.(1977) Known Relatinships between the Hard-Rock' Tin Deposits and the Granites of Southeast Asia., Geol. Soc. Malaysia Bulletin, No.9, pp.141-157.

Hutchison,C.S.(1977) Granite Emplacement and Tectonic Subdivision of Peninsular Malaysia, Geol. Soc. Malaysia Bulletin, No.9, pp.141-157.

Ingham,F.T.(1938) The Geology of the Neighbourhood of Tapah and Telok Anson, Perak, with an Account of the Mineral Deposits, GSM Mem., No.2, pp.72.

Kurzl,H.(1988) Exploratory Data Analysis, J. Geochem. Explor., Vol.30, pp.309-322.

Lee,S.L. et al.(1985) GSM report (unpublished)

Loh,C.H.(1987) Quarternary Geology of the Teluk Intan Area, GSM report (unpublihed)

Mitchll,A.H.G.(1977) Tectonic Setting for Emplacement of Southeast Asian Tin Granites, Geol. Soc. Malaysia Bulletin, No.9, pp.123-140.

Rajah,S.S.,Chand,F.and Singh,D.S.(1977) The Granitoids and Mineralization of the Eastern Belt of Peninsular Malaysia, Geol. Soc. Malaysia, Bul. 9, pp.209-232

Scrivenor,J.B. and Jones,W.R.(1919) Geology of South Perak, North Selangor and the Dindings, Geological Survey Department, Federated Malay States

Schwartz,M.O. et al.(1989) Geologic, Geochemical and Fluid Inclusion Studies of the Tin Granites from the Bujang Melaka Pluton, Kinta Valley, Malaysia. Econ. Geol. ,Vol.84, pp.751-779.

Sharif,A.B.(1986) Jaringan Graviti Asas Semenanjung Malaysia. Jabatan Geodesi dan Astronomi Fukulti Ukur Univ. Teknologi Malaysia.

Wilson,I.R.(1989) A Report on the Ball Clays from the State of Perak, Malaysia. GSM report (unpulished)

Wong, T.W.(1974, manuscript) Geology and Mineral Resources of Lumut-Tanjung Tualang Area, Perak, Malaysia Geological Survey, District Memoir.

Zantop,H. et al.(1979) Heavy-Mineral Panning Techniques in Exploration for Tin and Tungsten in Northwestern Spain in Geochemical Exploration 1978. J. Geochem. Explor., Rexdale Ont., pp.329-336.

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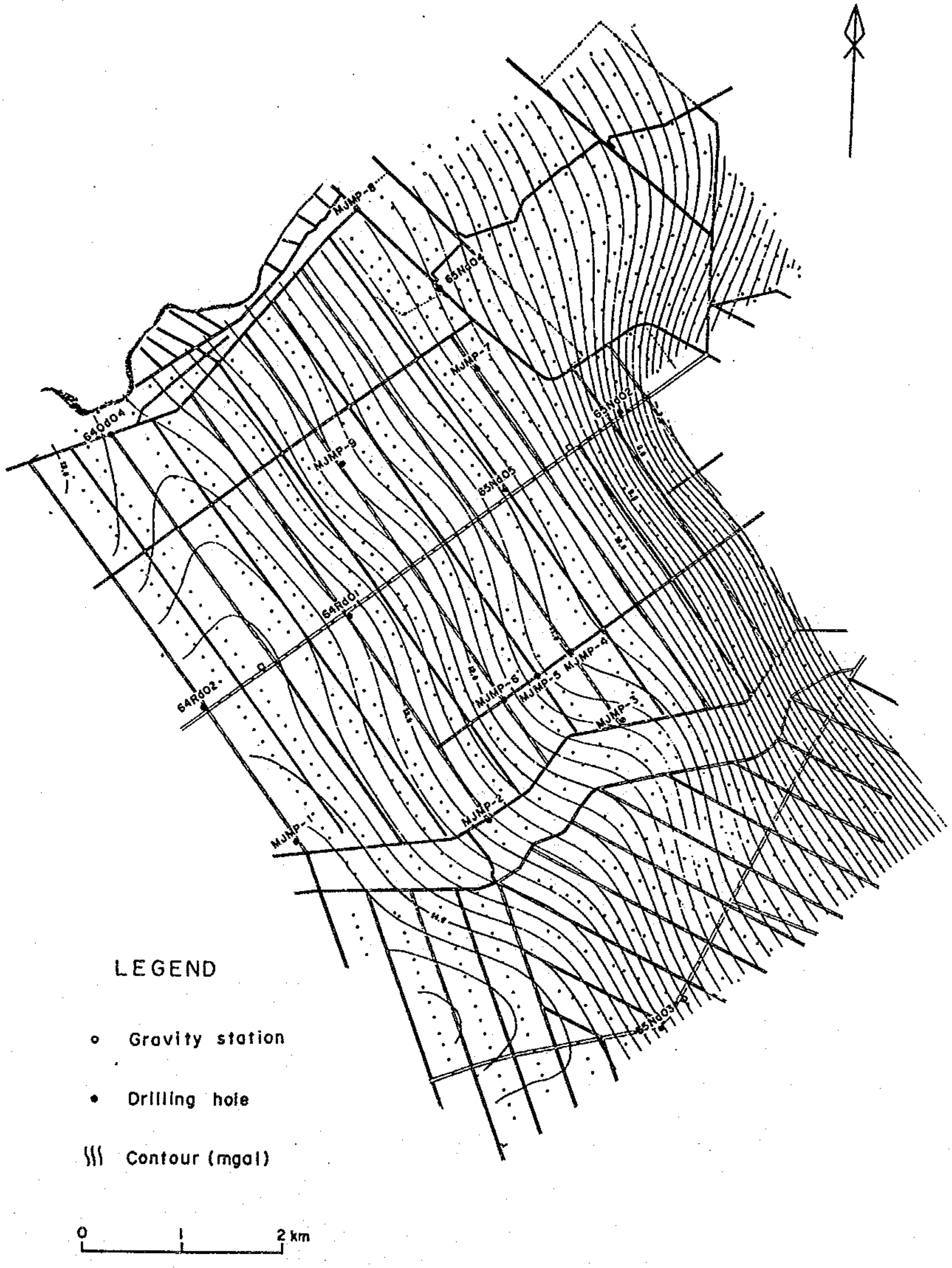

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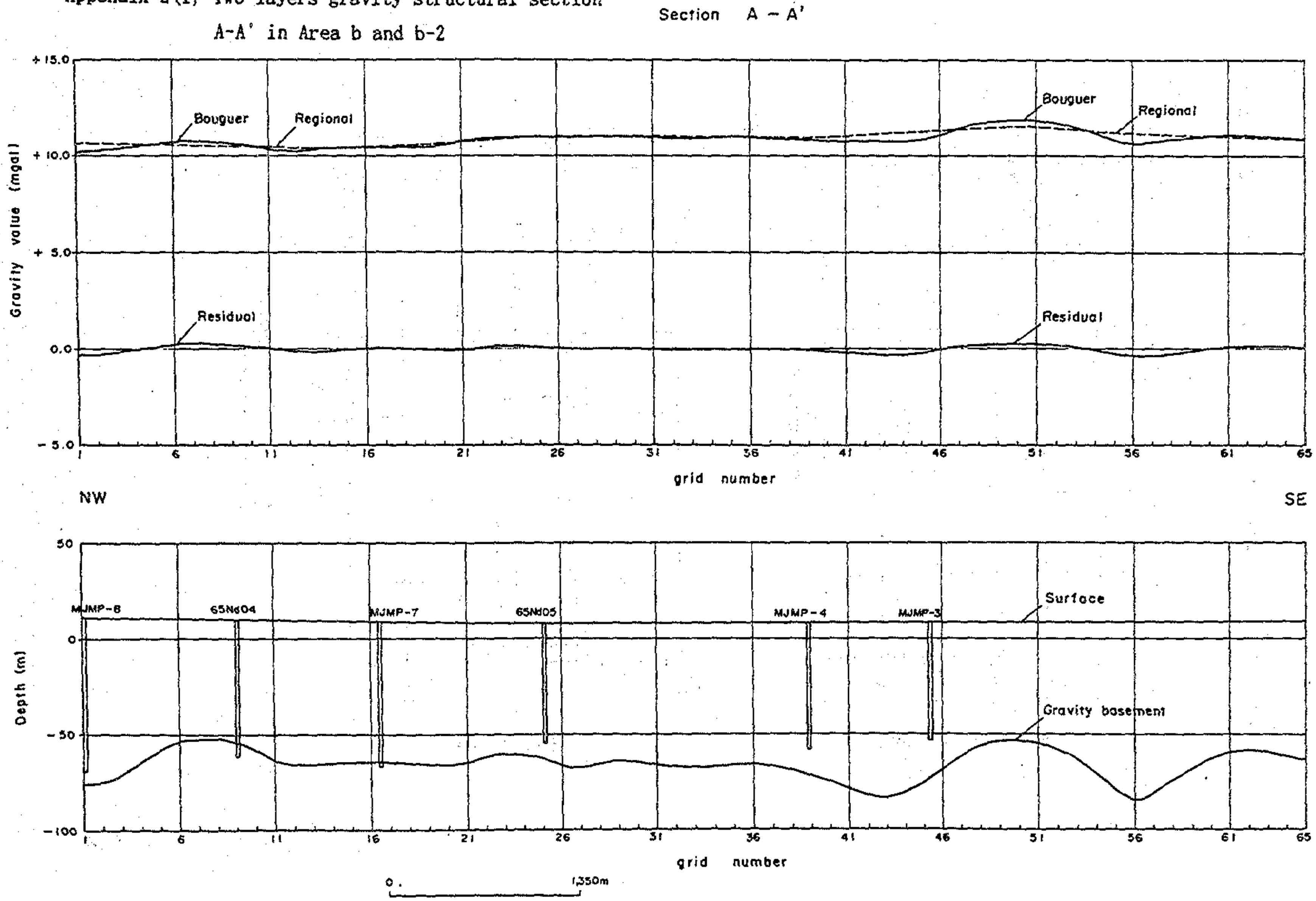

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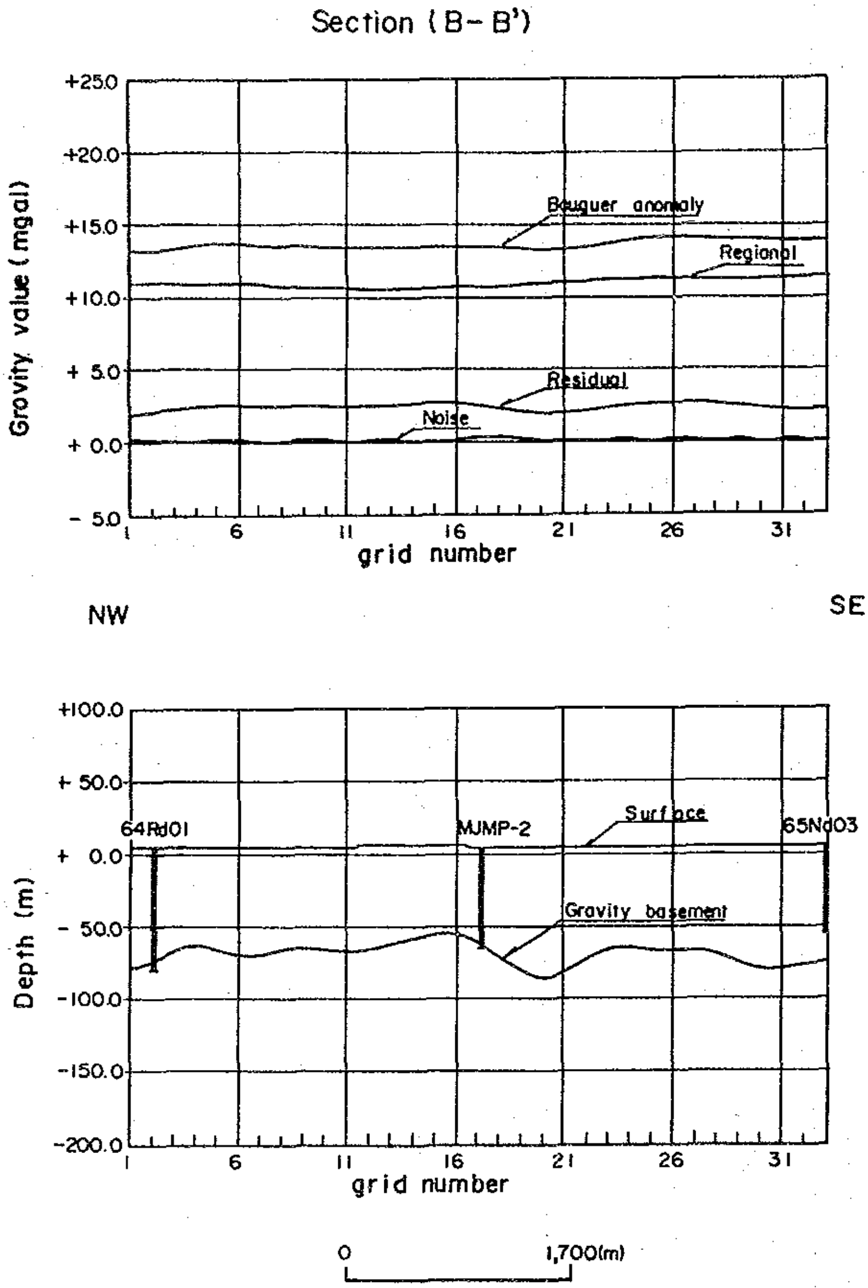

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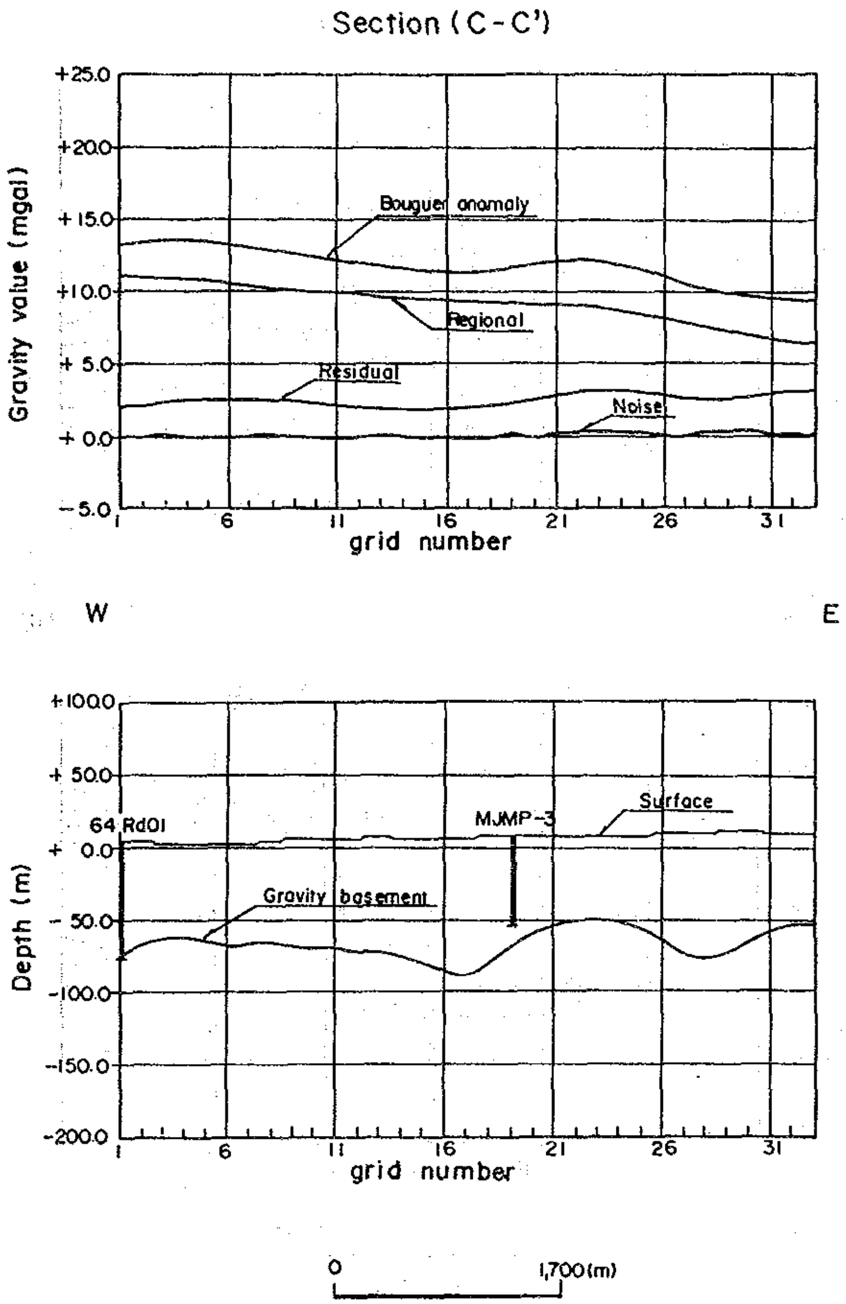
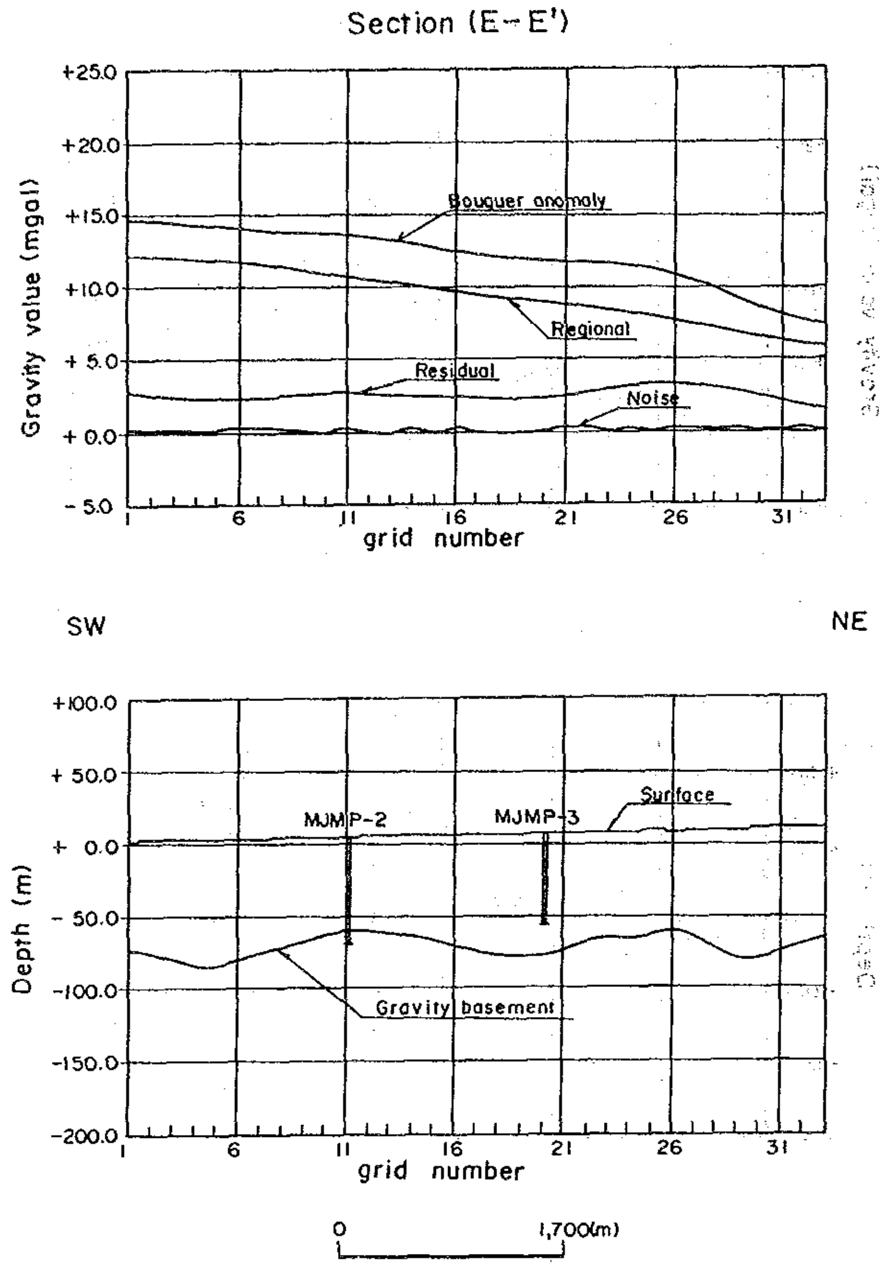
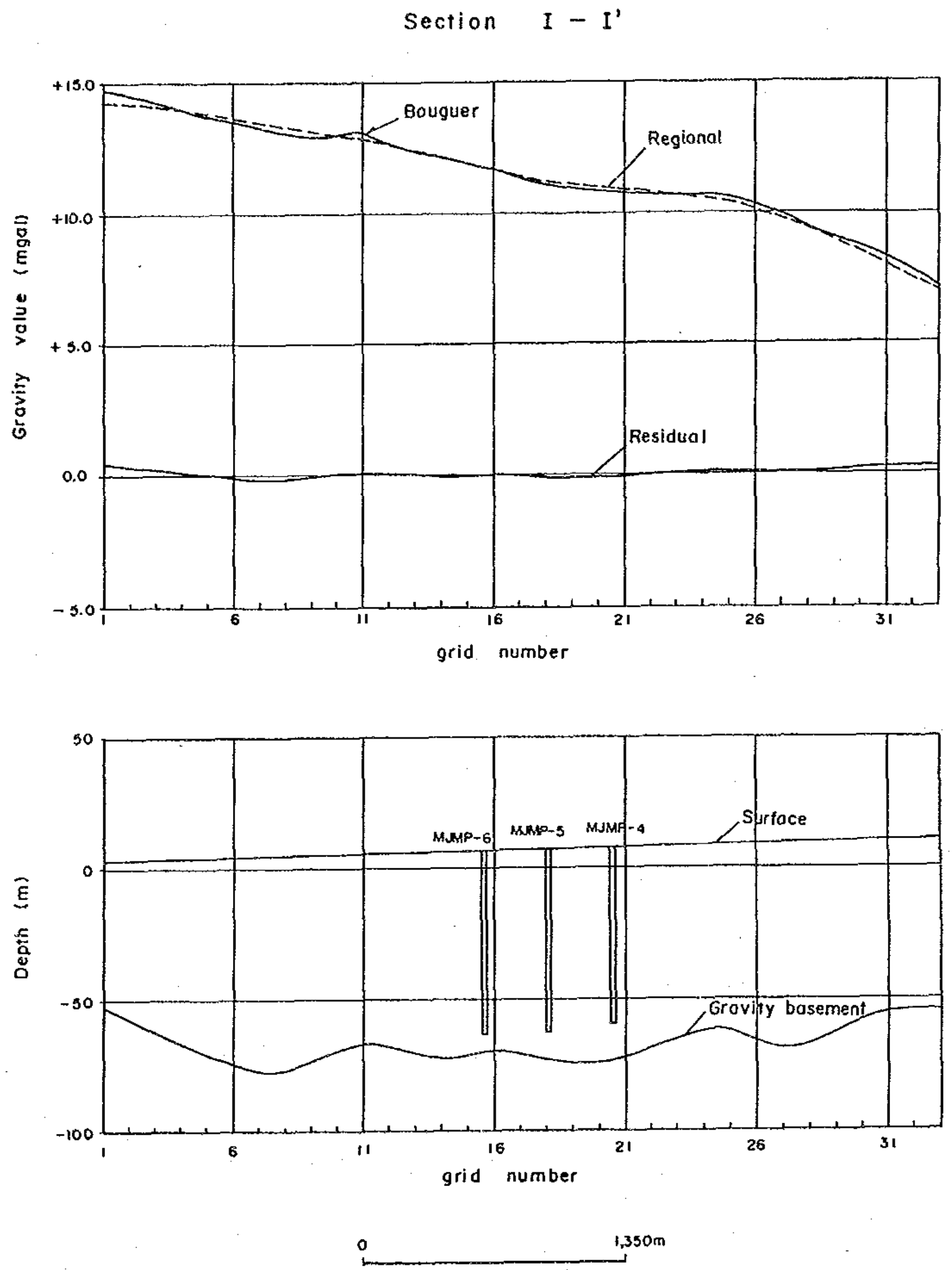


Appendix-2 (4) Two layers gravity structural section E-E' in Area b



Appendix-2(5) Two layers gravity structural section I-I' in Area b



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