CHAPTER 3 ZONE C

3-1 Outline of Zone C

3-1-1 General Geology

The basement rocks of this zone are the Emeşe Formation composed of green schist, pelitic schist and crystalline limestone and Ovacık Granite(Triassic). The Emeşe Formation occurs widely in the southern part of the zone, and it is overlain unconformably by the Sarısuvat Formation in the northern part. The Sarısuvat Formation comprises sandy limestone, and the age is Late Jurassic.

Cretaceous sediments are lacking here, and the Karanlık Formation was deposited in the Tertiary. The lower part of this formation is the Kızılcık Member, which is believed to be the basal conglomerate, and the upper part consists of the Kirazlıgeçit Member composed of silt and sandstone alternation. These are considered to be flysch-type sediments.

Eocene and Miocene volcanics are lacking, and the Akkayrak Volcanics consisting of post-Late Tertiary dacite, and Bakacaklı Volcanics consisting of andesites unconformably overlie the Karanlık Formation. The geologic map, cross sections, stratigraphic columns and Dikmen mineralized zone are shown in Figures 3-19 and 3-20.

3-1-2 Geologic Structure

The Emeşe Formation, which is widely distributed in the eastern part of this zone, is folded with a N-S fold axis. The Dikmen Fault trend NE-SW east of Dikmen Village, and the Emeşe Formation dips weatward west of the fault and eastward east of the fault. The Karanlık Formation also is gently folded to the west of Dikmen Fault. The existence of the Dikmen Fault is inferred also from Landsat image analysis, and geological survey revealed the intrusion of Dikmen Granite and serpentinites parallel to this fault. It is inferred that fractures not observed are developed in the NE-SW direction.

It was not possible to interpret the geological structure direct from the Akkayrak Volcanics and Bakacaklı Volcanics. It is inferred that this zone is located at the southwestern end of the depression formed by the Late Tertiary volcanism.

3-1-3 Geochemical Prospecting

A total of 312 rock samples were collected from Zone A. Basic statistical values and correlation matrices of the chemical values of rock samples were calculated, and the principal component analysis was carried out. These are listed in Tables 3-7, 3-8 and 3-9. By showing the localities with the first principal component exceeding 1 on the map (Figure 2-3), most of the localities where gold was detected are covered.

Table 3-8 Basic Statistical Values of Rock Samples of Zone C

(Number of Samples:312)

Element	Mean	Dispersion	S.D.	Min.	Max.
Au(ppb)	5.900	0.435	0.659	2.5	10000.0
Cu(ppm)	32.669	0.445	0.667	1.0	10000.0
Mo(ppm)	5.691	0.744	0.863	0.5	3550.0
Pb(ppm)	17.904	0.810	0.900	1.0	10000.0
Zn(ppm)	61.512	0.549	0.741	1.0	10000.0
Ag(ppm)	0.276	0.422	0.650	0.1	153.5
As(ppm)	29.551	0.562	0.750	1.0	8900.0
Se(ppm)	0.175	0.045	0.213	0.1	2.0
Hg(ppb)	495.488	0.662	0.814	10.0	100000.0
F (ppm)	139.977	0.127	0.357	20.0	2120.0
Ba(ppm)	161.829	0.295	0.543	20.0	10000.0
Tl(ppm)	0.229	0.177	0.421	0.05	84.0

Table 3-9 Correlation(upper) and Covariance(lower) Matrix of Rock Samples of Zone C

	Au	Cu	Mo	Pb	Zn	Ag	As	Se	Hg	F	Ba	Tl
Au	0.435	0.35683	0.30739	0.37495	0.20263	0.52368	0.28357	0.03749	0.29605	0.06209	0.19333	0.10113
Cu	0.157	0.445	0.36176	0.22375	0.44852	0.32864	0.46054	0.17716	0.44892	0.25705	0.14992	0.16905
Mo	0.175	0.208	0.744	0.20979	-0.08450	0.36680	0.07625	0.03659	0.35179	0.16342	0.24106	0.13734
Pb	0.222	0.134	0.163	0.810	0.53246	0.66073	0.56977	0.09555	0.51366	0.00050	0.28801	0.25724
Zn	0.099	0.222	-0.054	0.355	0.549	0.26600	0.64195	0.16504	0.44425	0.12489	0.09670	0.29350
Ag	0.224	0.142	0.206	0.386	0.128	0.422	0.39380	-0.03547	0.52052	0.02973	0.40641	0.14758
As	0.140	0.230	0.049	0.385	0.357	0.192	0.562	0.23258	0.60328	0.08633	0.09712	0.39520
Se	0.005	0.025	0.007	0.018	0.026	-0.005	0.037	0.045	0.11950	0.13780	-0.10545	0.07687
Hg	0.159	0.244	0.247	0.376	0.268	0.275	0.368	0.021	0.662	0.16862	0.22567	0.32264
F	0.015	0.061	0.050	0.000	0.033	0.007	0.023	0.010	0.049	0.127	0.36114	0.38469
Ba	0.069	0.054	0.113	0.141	0.039	0.143	0.040	-0.012	0.100	0.070	0.295	0.30311
Tl	0.028	0.047	0.050	0.098	0.092	0.040	0.125	0.007	0.111	0.058	0.069	0.177

Table 3-10 Eigenvalues and Eigenvectors of Rock Samples of Zone C

	1	2	3	4	5	6	7	8
Au	0.27435	0.20825	-0.27337	0.20119	-0.01454	0.51131	-0.61961	-0.09122
Cu	0.31362	-0.04048	0.08872	0.43569	0.51102	0.17189	0.17852	0.33193
Mo	0.20779	0.45821	-0.02672	0.44044	0.00000	-0.47632	0.00404	0.17783
Pb	0.36980	-0.07001	-0.25990	-0.26353	-0.30887	-0.03379	0.09375	-0.05750
Zn	0.31935	-0.43349	0.03088	-0.16780	0.23010	0.21813	0.14592	0.13443
Ag	0.35643	0.25012	-0.33023	-0.10083	-0.17526	0.06632	0.10245	-0.14119
As	0.37335	-0.36479	-0.01201	-0.06516	0.06558	-0.12313	-0.07822	0.02500
Se	0.09456	-0.34000	0.21800	0.50472	-0.71425	0.10316	0.09652	0.12223
Hg	0.38130	-0.04537	-0.03295	0.04187	0.09111	-0.40561	0.17164	-0.46554
F	0.14648	0.19192	0.65337	0.05095	0.04807	0.27116	0.06513	-0.57570
Ba	0.21309	0.44941	0.21955	-0.34579	-0.17584	0.24561	0.38155	0.40881
Tl	0.23842	-0.01135	0.46399	-0.29160	-0.06008	-0.32379	-0.59068	0.27879
Eigen	4.14377	1.53465	1.42335	1.12377	0.78809	0.72937	0.62293	0.44995
Propo.	0.34531	0.12789	0.11861	0.09365	0.06567	0.06078	0.05191	0.03750
Cum.prop	0.34531	0.47320	0.59181	0.68546	0.75114	0.81192	0.86383	0.90132

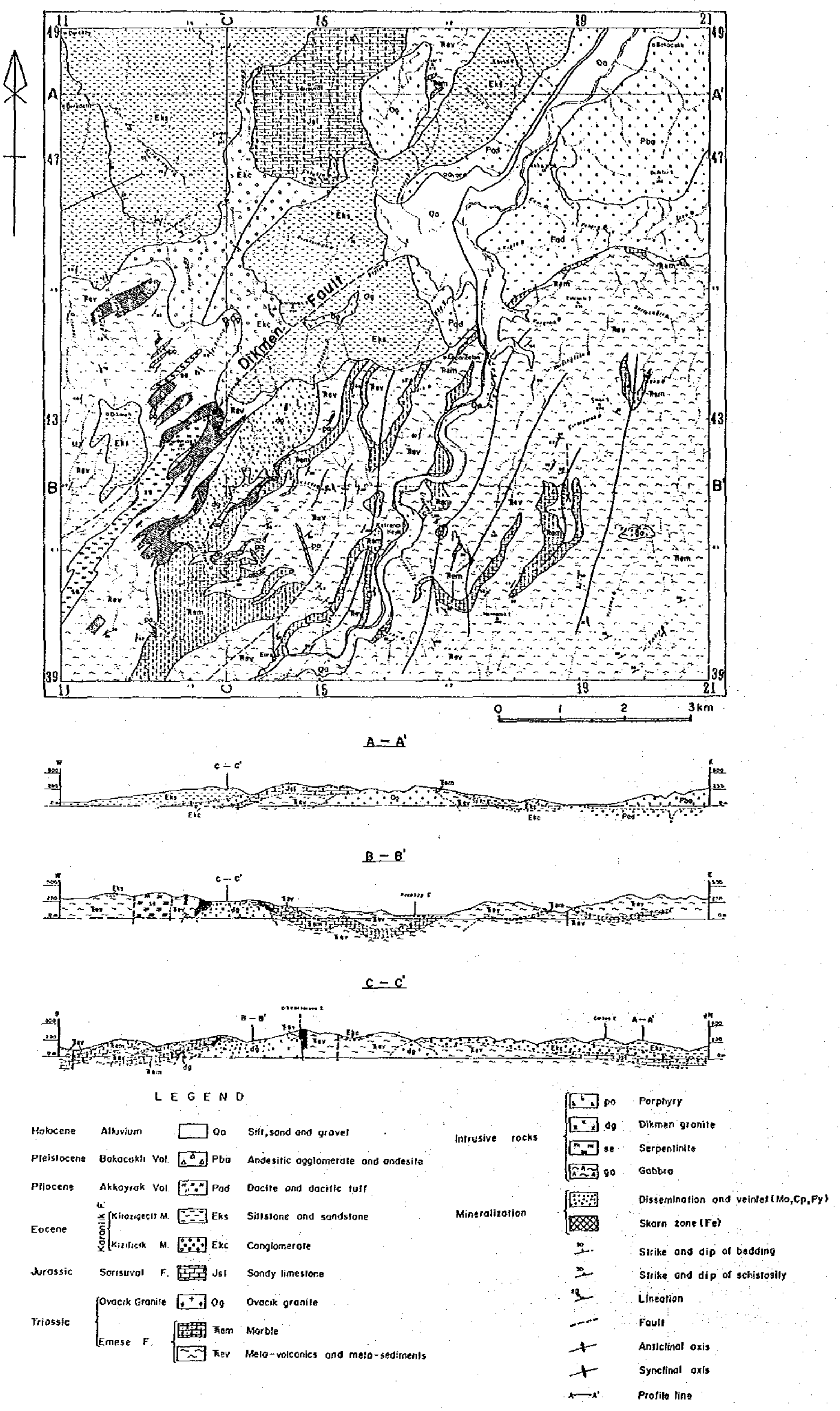


Figure 3-19 Geologic Map and Cross Sections of Zone C

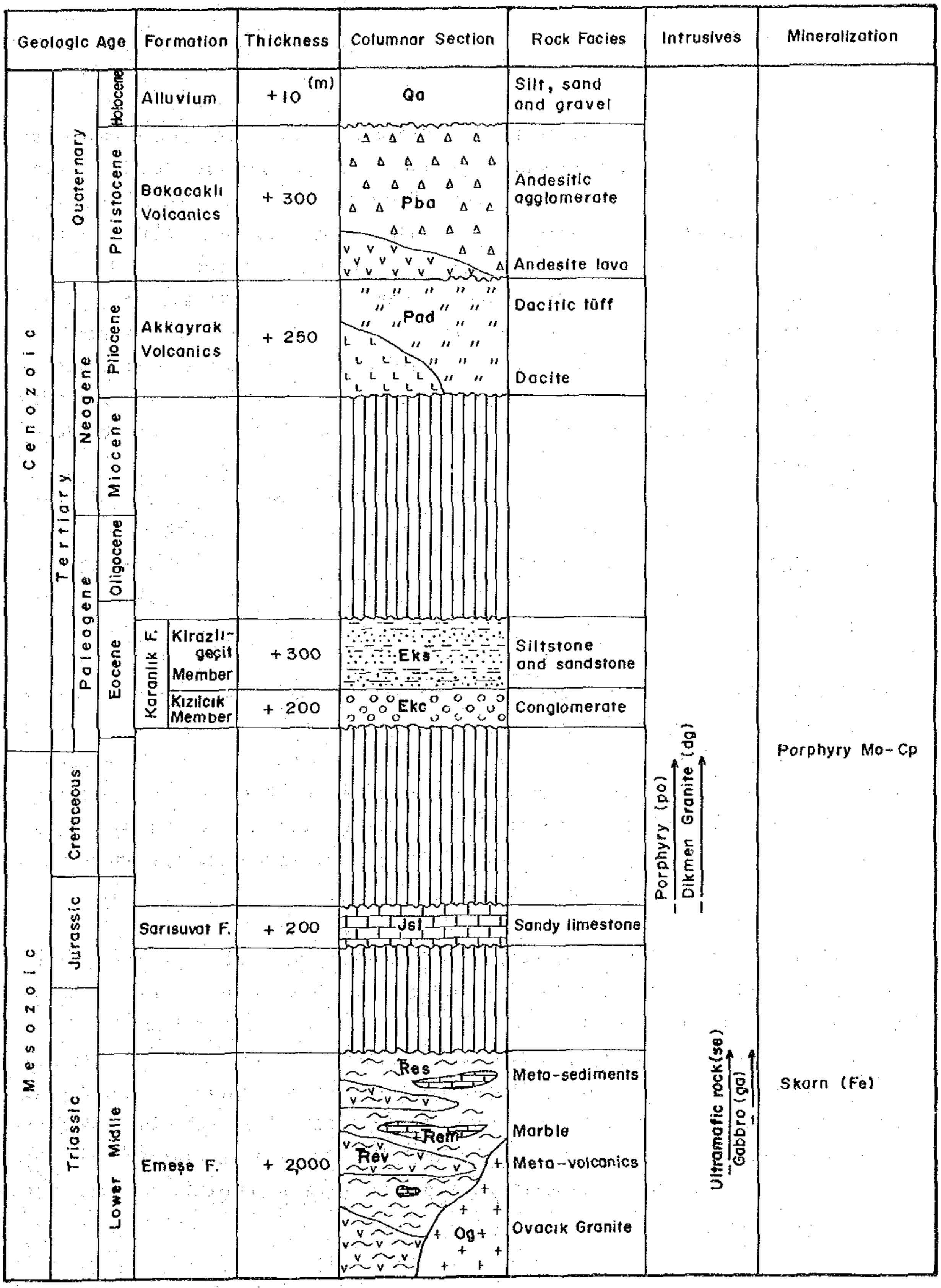


Figure 3-20 Schematic Column of Zone C

3-2 Dikmen Area

3-2-1 Stratigraphy

Emeşe Formation : This formation is composed mainly of green schist which was derived from basic volcanic rock, metagabbro, black pelitic schist, meta-sediments derived from sandstone, conglomerate and crystalline limestone (marble). Green schist becomes more abundant downward and pelitic schist upward. Green schists are usually greyish green, sometimes light brown, greyish brown and reddish brown in colour, and are of different softnesses. Fine-grained metamorphosed sandstones are characteristic of this formation. Bedding of the sandstones is not very good and shows thin to medium thickness. Schistosity is parallel to the bedding. Silicification and limonitization are the alteration types observed on these rocks, which are also cut by dense quartz veinlets.

This formation has been weakly metamorphosed, and a series of fold structures are revealed. The crystalline limestone of the southern part can be correlated by considering the schistosity of the pelitic schists as bedding and thus interpreting the geology. All of the above are in the same horizon, including massive olistoliths.

Karanlık Formation (Kızılcık Member) : This formation is pale grey in colour and consists of poorly consolidated porous conglomerate with pebbles of 5-6cm size. The pebbles are not well rounded and show subrounded to plate forms. The bedding and sorting of the conglomerate are poor. The rocks are oxidized by weathering and are discoloured. The pebbles are green schist, meta-volcanics, marble and meta-sediments. The matrix is predominantly quartz and micas.

Akkayrak Volcanics : The major components of this unit are greyish-white to pale yellow dacite lava with flow structure and dacitic pyroclastic rocks. The lower beds of this unit are exposed in the southern part and most of them are greyish-white to pale yellow tuff. These volcanics are generally argillized by weathering and diagenesis. X-ray diffraction showed the constituents to be montmorillonite, kaoline and other clay minerals. Bedding is not observed and the structure of the unit is difficult to clarify, but the general layout indicates a synclinal structure with a depression along the Biga River.

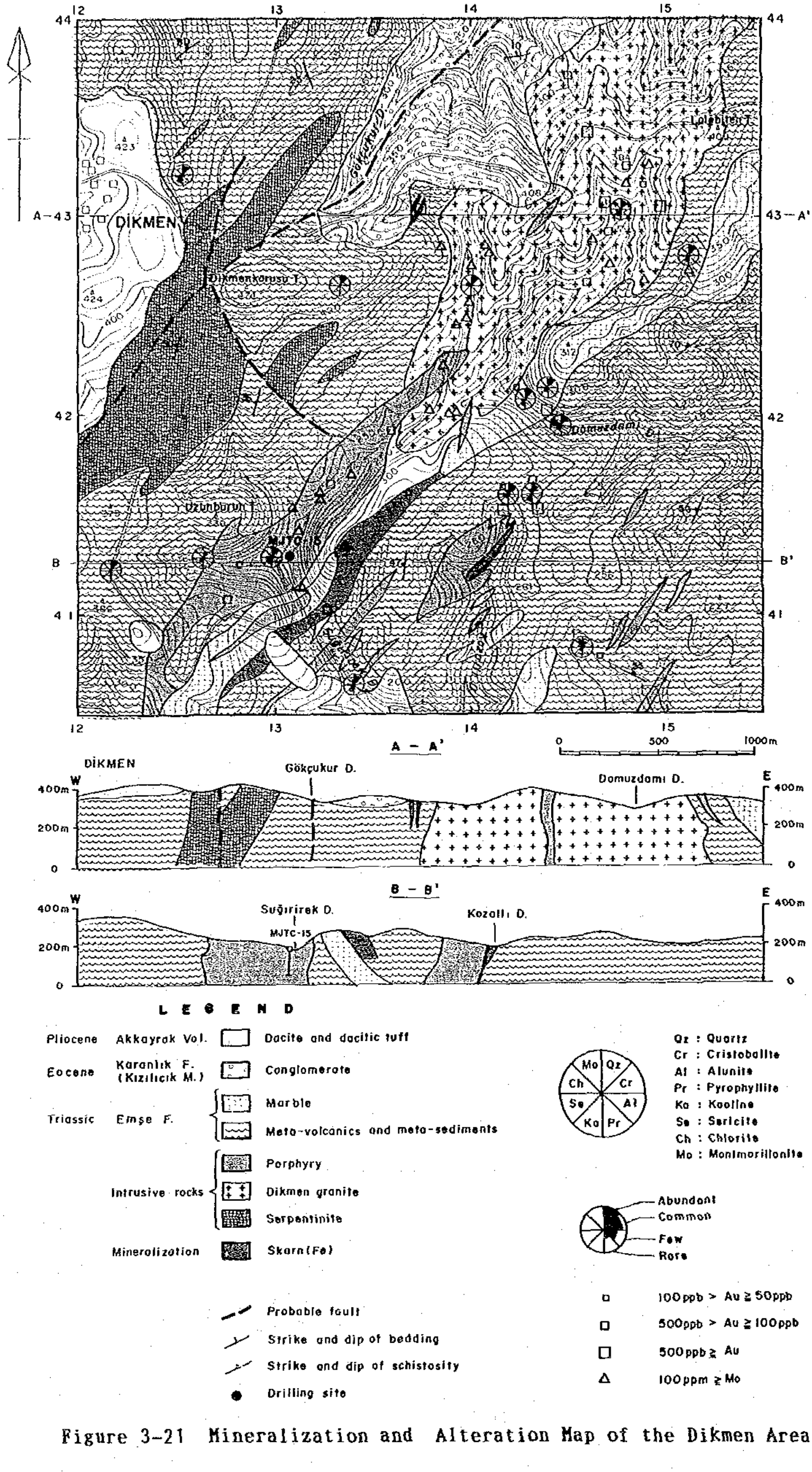


Figure 3-21 Mineralization and Alteration Map of the Dikmen Area

Intrusive Bodies

(1) Serpentinite

This unit has intruded into the Emeşe Formation mainly along the Dikmen Fault. It is approximately 500m wide and over 3km long. Serpentinite also occurs in small scale in the northeastern part of Dikmen Village. Similar rock is distributed outside of the survey area, and is considered to be latest Triassic (SIYAKO 1987).

(2) Dikmen Granite

This granite occurs at two localities along Sığırirek Stream and the upstream section of Domuzdamı Stream.

At the Sığırirek Stream upstream portion, it is 500m wide and 3km long in the same direction as the Dikmen Fault. Dikmen Granite has coarse-grained crystals and is greyish white in colour. It is generally formed by coarse plagioclase, quartz potassium feldspars and biotite crystals. Plagioclases are locally argillized while biotites are partially altered, giving a yellowish colour to the rock. The rocks are usually cut by quartz veinlets which are up to 50cm thick. The number of quartz veins and veinlets together with pyritization and molybdenite increase from north to south along the Sığırirek Stream. Molybdenite-bearing quartz veins generally trend between N60°E and N60°W with a northward dip.

The same rocks also crop out at the northern part of Domuzudamı Stream with the same texture, minerals and colours. Plagioclase and biotite are also altered in a similar way in the Domuzdamı Stream. The granite, which is cut by quartz veins and aplite dykes bearing partial pyrite, chalcopyrite and molybdenite, was observed to consist of coarse crystals of plagioclase, quartz, biotite and hornblende.

Regarding the age of intrusion, similar rock intruded into the latest Cretaceous melange, and is overlain by Neogene sediments. Thus the intrusion is inferred to have taken place between the end of the Cretaceous and the Miocene (SIYAKO 1987). This evidence coincides with the isotopic age (Table 1-15).

(3) Porphyry

Porphyries with light brownish colour and porphyritic texture are distributed in the east and southeast of Uzunburun Hill. Quartz crystals are observed as phenocrysts. Argillization and silicification are locally traced. These rocks are also cut in different directions by quartz veins whose thicknesses range from a few mm to 30cm and which bear pyrite, sometimes molybdenite and rarely azurite-malachite. Outcrops of the rocks usually showing greyish white and grey colour are also observed at the west slope of Kozallı Stream, Ortaburun and Tepetarla district. Their texture is porphyritic bearing phenocrysts of quartz. Plagioclases are mostly altered to sericite, biotites are usually altered, and the rock is also cut by many quartz veinlets. In addition, limonitization is sometimes traced along fractures and cracks.

The direction of intrusion is NE-SW east of the Dikmen Fault. The time of the intrusion is not clear, but is inferred to be latest Cretaceous, the same time as the Dikmen Granite intrusion.

3-2-2 Geologic Structure

The Emeşe Formation, which is widely distributed in the area, dips westward and eastward to the Dikmen Fault. The fault trends NE-SW in the eastern part of Dikmen Village. The Emeşe Formation is a folded zone with a N-S fold axis in the eastern part. The Karanlık Formation also is gently folded to the west of the Dikmen Fault. The existence of the Dikmen Fault is inferred also from Landsat image analysis, and geological survey revealed the intrusion of serpentinites, Dikmen Granite and porphyries parallel to this fault. It is inferred that unobserved fractures are developed in a NE-SW direction.

3-2-3 Mineralization and Alteration

Molybdenite and pyrite are traced in the Sıgırirek Stream in eastern Dikmenkorsu Hill, within the granodiorite as disseminations, as stains along fractures and cracks, and in quartz veins as grains or groups of grains and veinlets. Quartz veins with various directions generally bearing pyrite and sometimes molybdenite are also observed in the Yaylapınarı district. The porphyries, aplites and in particular, granodiorites in Domuzdamı Stream are cut by quartz veinlets (with thicknesses between 2mm and 30cm) bearing pyrite, molybdenite and chalcopyrite as disseminations and/or veinlets. Malachite, azurite, limonite and hematite are additionally traced as fracture fillings in silicified zones of the Emeşe Formation.

The silicified zones of NEN-SWS direction are partially observed in the northern part of Sıgırirek Stream within the Emeşe Formation. Silicification especially is traced within metamorphosed volcanics and sedimentary rocks of the Emeşe Formation around Dikmenkorsu Hill and northwest of the survey area as blocks of different sizes. They are highly limonitized and hematized. Copper hydroxides are also associated with these silicified blocks around Karaleylek Hill and Uzunburun Hill. Advanced argillization is also always associated with the silicified blocks. Silicifications are abundant within the metamorphosed volcanic and sedimentary rocks at the southeastern part of the survey area, although advanced argillization is mainly limited to the porphyries.

Table 3-11 Results of Ore Analysis

Zone	Sample No.	Ore Name	Ag g/t	Cu %	Pb %	Zn %	Mo %	WO_3 %	Sb %	Type of Ore	Location
A	HM201	Pb-Zn ore	195	0.12	3.76	12.10	tr	0.014	0.004	vein	Balcılar
	HM203	Cu ore	32500	15.40	4.36	0.57	tr	1.320	0.007	oxid.	ditto
	HM204	Pb-Barite ore	50	0.06	14.00	6.49	tr	0.013	0.002	vein	ditto
	HS269	Pb-Zn-Cu ore	33	0.90	8.51	1.72	tr	0.034	0.001	vein	S.Dededag
B	KS102	Pb-Zn ore	273	1.54	40.90	14.60		0.015	0.047	vein	Kocayokuş T.
C	KB005	Mo-W ore	1.3	<0.01	<0.01	<0.01	0.002	0.031	tr	diss.	Yaylayurt D.
	KB006	Sb ore	1.3	0.05	0.02	0.01	-	0.036	0.014	veinlet	ditto
	NY046	W ore	0.8	<0.01	<0.01	<0.01	-	0.022	tr	veinlet	ditto
	SR038	Zn ore	7.2	<0.01	<0.01	1.05	tr	0.009	tr	vein	Sığırirek D.
	KB007	Sulphide ore	0.5	<0.01	<0.01	<0.01	-	-	0.001	vein	ditto
	KB024	Mo ore	0.8	<0.01	<0.01	<0.01	0.088	0.129	0.003	vein	Domuzdamı D.
	KB037	Mo ore	8.8	0.04	0.68	0.03	0.178	0.060	-	vein	ditto
	KB047	Pb-W ore	30.0	<0.01	0.32	0.06	0.001	0.083	tr	float	ditto
	KB050	W ore	1.5	0.02	0.03	0.02	tr	0.023	0.010	diss.	ditto
	HB012	W ore	<0.5	<0.01	<0.01	<0.01	-	0.059	0.004	float	ditto
	KS006	Pb ore	30.0	<0.01	1.45	0.01	tr	0.022	0.011	float	SE.Karagedik T.

Zone	Sample No.	Ore Name	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Sb ppm	Hg ppm	Mo ppm	Location
C	K382	Qz-Py-Mo	1760	20.0	286	2460	1660	220	6.9	57	Quartz veinlets
	M363	Qz-Py-Mo	30	1.0	311	30	32	63.0	6.7	2360	in the Dikmen
	M364	ditto	35	0.5	24	70	16	9.4	3.0	1235	Granite
	S366	Qz-Mo	35	<0.5	16	<5	4	4.0	4.0	1755	
	T349	Qz-Mo	45	0.5	39	5	6	10.2	2.0	1510	
	T350	Qz-Py-Mo	5	0.5	108	<5	4	32.0	2.9	156	
	T358	Cp film	30	<0.5	471	<5	44	0.8	0.09	18	
	T360	Qz-Mo	10	<0.5	9	<5	2	2.4	0.09	27	
	T361	Qz-Mo-Py	45	1.5	277	5	10	295	11.0	250	
	Y322	Qz-Mo	<5	<0.5	41	<5	14	3.0	0.10	1535	

3-2-4 Geophysical Survey (SIP and IP Methods)

(1) Outline of the Survey

Objective of the Survey: The survey refers to an area where a mineralized zone of porphyry copper type has been found through geological and geochemical surveys of the initial phase. In 1989, the geophysical methods of SIP and IP were used to elucidate the emplacement condition and continuity of the mineralized area.

Area of the Survey: The area and arrangement of the survey lines are illustrated in Figures 3-22.

Length of Survey Line: 8.0 km in four lines

SIP: Line B,C 4.0 km in two lines 160 points

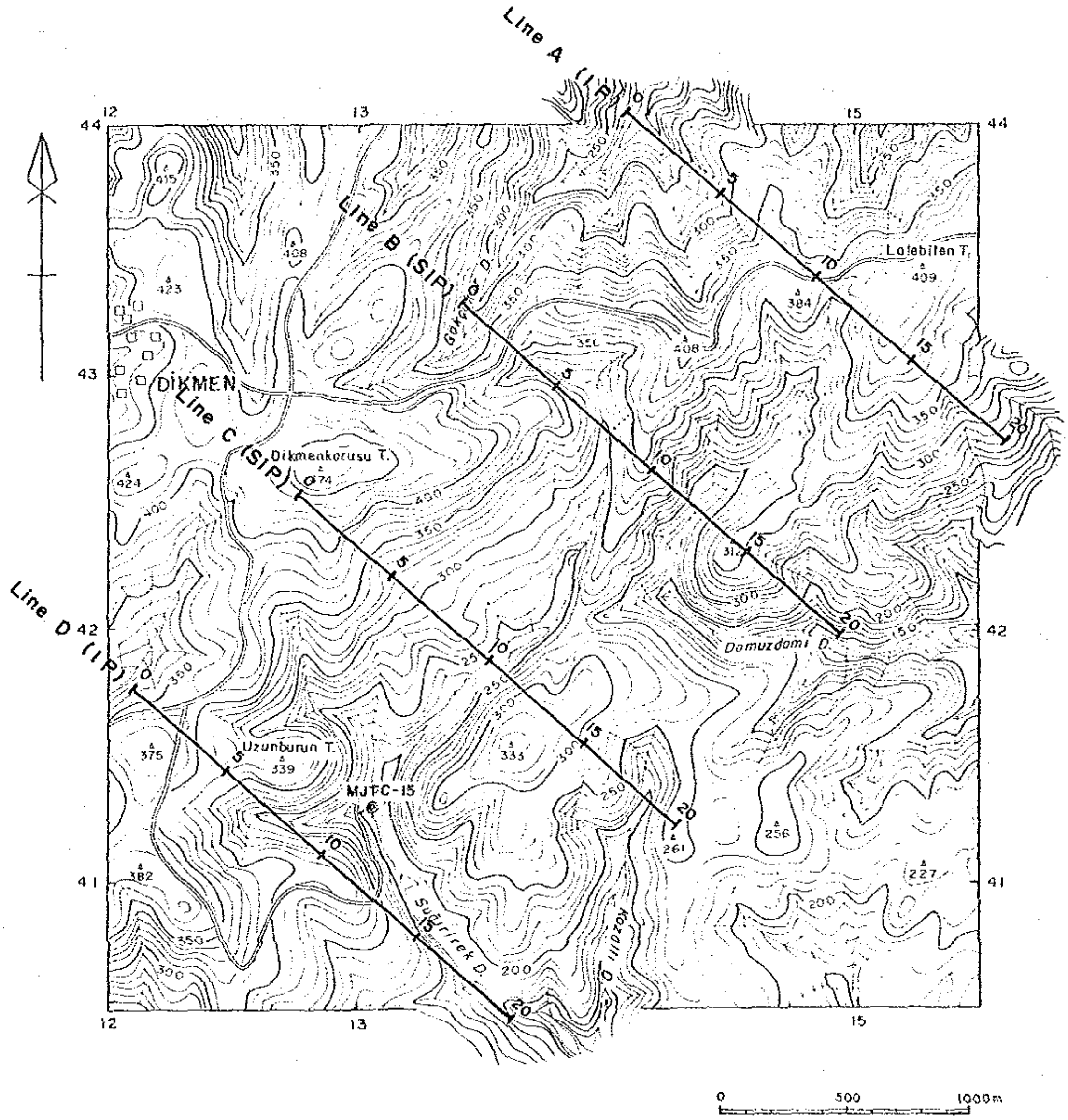
IP : Line A,D 4.0 km in two lines 160 points

Table 3-12 Equipment for SIP, IP Survey

ITEM	NAME	SPECIFICATION	QUANTITY
Transmitter System	Chiba Electric CH-86A SIP Transmitter	Output Voltage : 200, 400, 600, 800, 1000V Output Current : 0.2~5.0 A Waveform : Square wave Frequency : 0.125 Hz~8 Hz Weight : 37 Kg	1
	Zonge XMT-1 Transmitter Controller	Frequency Range : 1/1,024 Hz~2,048 Hz Weight : 5.8 Kg Power : 12V Battery	1
	Chiba Electric Model 8104T IP Transmitter	Output Voltage : 200, 350, 500, 650, 800V Output Current : 0.2~2.5 A Waveform : Square Wave Frequency : 0.1 Hz~3 Hz Weight : 14 Kg	1
Engine Generator	Zonge ZMG-5 SIP Engine Generator Honda G400	Output Power : 5 KW Frequency : 400 Hz Output Voltage : 115V Engine : 10 HP 4 Cycle	1
	McCulloch MK-II IP Engine Generator	Output : 2 KW Frequency : 400 Hz Output Voltage : 115V Engine : 5 HP 4 Cycle	1
SIP Receiver System	Zonge GDP-12/2GB	Signal Input : 2 Channel Frequency Range : 1/8~88Hz (18 Freq.) Sensitivity : 0.2μV Weight : 15 Kg Power : 12V Battery	2
	Zonge CAP-12 Mini Cassette/ Tape Recorder	Weight : 6.2 Kg Power : 12V Battery	2
	Laptop Computer NEC.PC-9800 LV21	16Bits : 1Mb x2 diskette Memory : 640K byte	1
	Zonge ISO/ Isolation Amp		3
	Zonge FP-1 Field Preamp.		5
IP Receiver	Chiba Electric Model 8104R IP Reciever	Frequency Range : 0.1 Hz~3 Hz Sensitivity :10μV(1, 10, 100, 1000mV) Weight : 3 Kg Power : 006P Battery 4 pcs	1
Electrode	Current Potential	Stainless ϕ0.6cm, Length 61cm Non Polarizable $CuSO_4$ Porous Pot	200 5

Survey Methods: The SIP method is the abbreviated name of the spectral induced polarization method which measures apparent resistivity and phase difference over a frequency range of 0.01 Hz to 100 Hz. The measurement data are expressed in spectral diagrams of phase and magnitude and in Cole-Cole diagrams. Analysis of these responses allows discrimination of minerals or types of mineralization and eliminates electromagnetic coupling. In this survey, the Harmonic System of Zonge (USA) was applied.

The conventional IP method measures the difference in apparent resistivity expressed as a ratio of 0.3 Hz and 3.0 Hz.



L E G E N D

MJTC-15 — Drilling Site

0 10 20 — Geophysic Survey and Station No.

Figure 3-22 Location Map of IP & SIP Survey Lines in the Dikmen Area

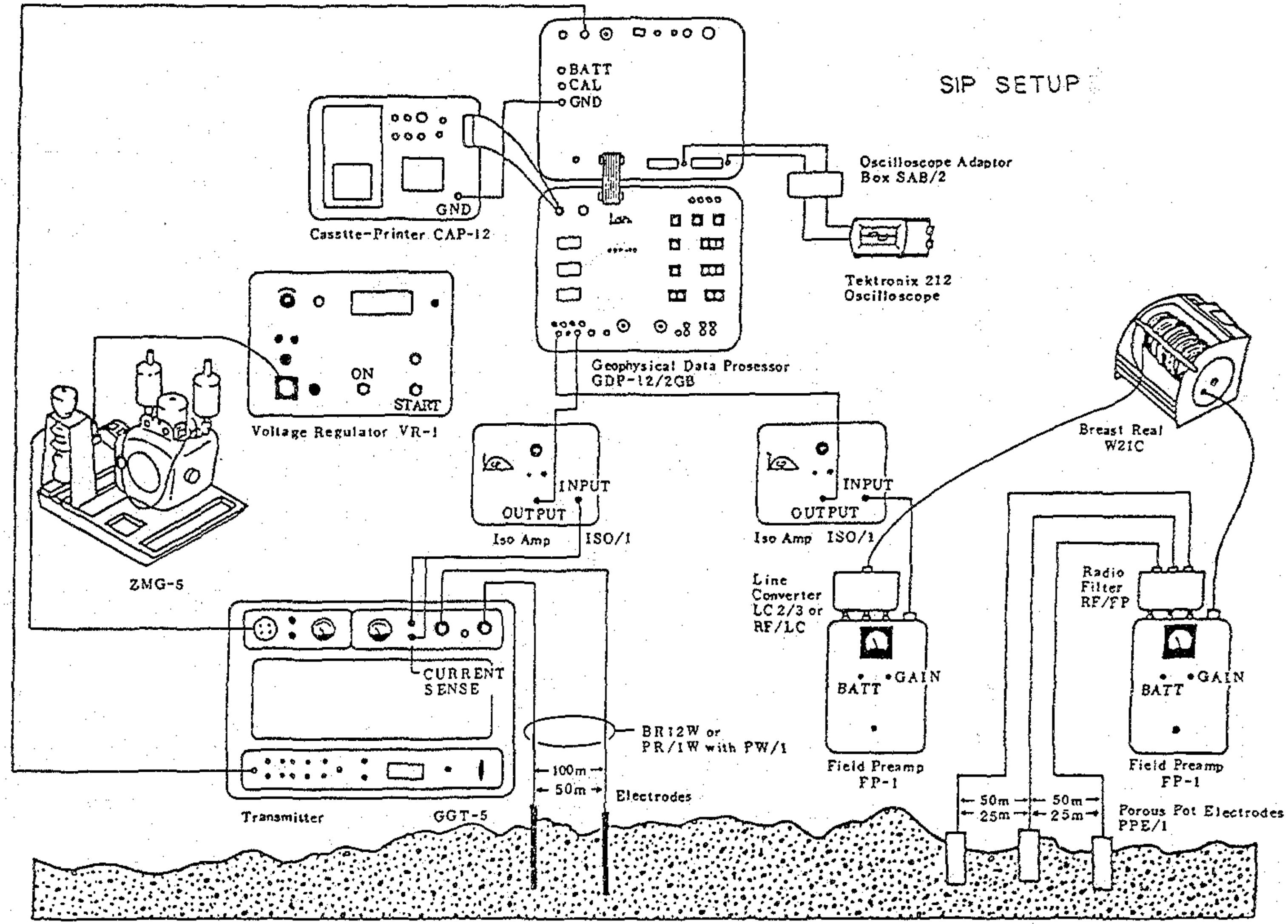


Figure 3-23 Illustrated Diagram for SIP Equipment

Survey Specifications: Fieldwork specifications were set as follows.

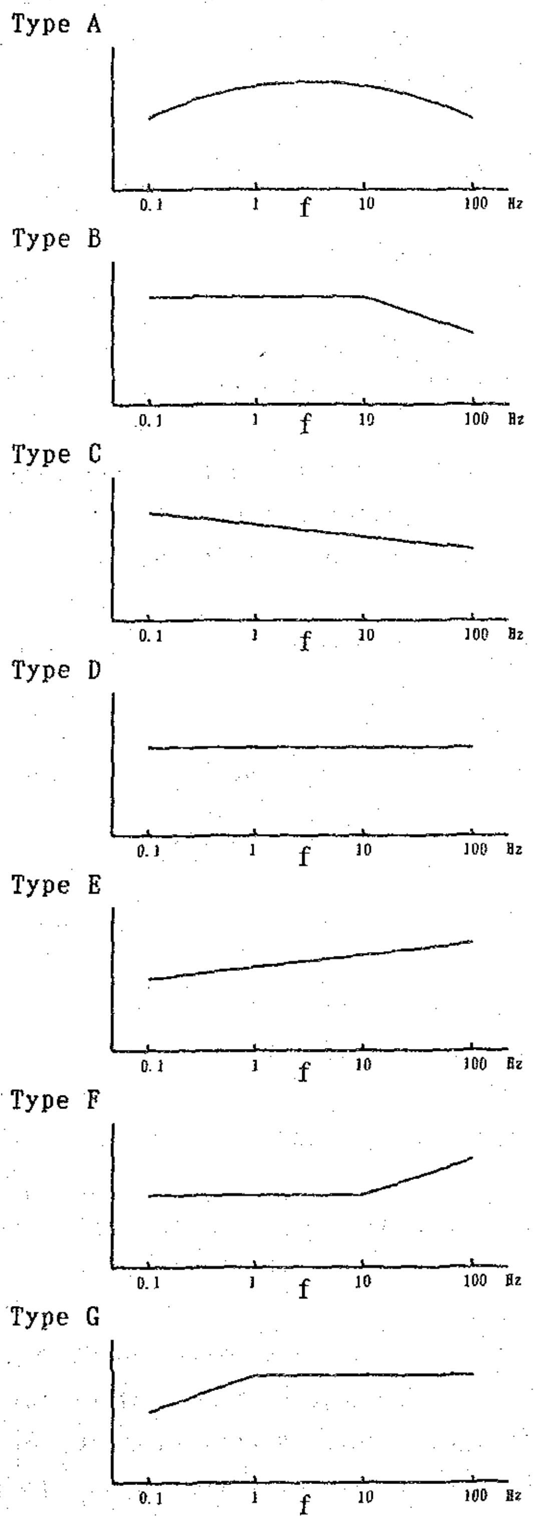
a. Electrode Configuration — dipole-dipole array
b. Electrode Separation — 100 m
c. Electrode Separation Coefficient — n = 1 ~ 5
d. Survey Line Separation — 1,000 m
e. Measurement Method — Frequency domain
f. Frequencies — SIP 0.125 Hz~ 88 Hz(18 frequencies); IP 0.3 Hz/ 3.0 Hz

Measuring Equipment: The equipment used in this survey are listed in Table 3-12.

Table 3-13 Results of Rock Sample Measurement (Dikmen Area)

Sample No.	Rock	Resistivity (ohm-m)	PFE (%)	Phase (-m rad)	Spectrum Type	Mineralization
1	Silicified Rock	26,650	1.9	11.7	A	
13	Silicified Rock	208,100	6.7	6.4	D	
	Average	117,400	4.3	9.1		
2	Porphyry	5,370	2.7	18.1	B	
11	Porphyry	5,206	2.3	19.7	B	Py diss
12	Porphyry	5,928	2.1	16.5	B	
18	Porphyry	25,200	3.4	16.8	C	
19	Porphyry	62,320	-0.2	13.3	D	Py diss
20	Porphyry	5,645	2.7	16.5	D	Py diss
21	Porphyry	1,273	1.7	9.3	A	Py diss
22	Porphyry	311	2.8	14.8	A	Py diss
23	Porphyry	3,310	2.7	19.2	D	
	Average	12,730	2.2	20.6		
3	Granodiorite	2,897	2.4	15.3	A	
4	Granodiorite	3,350	1.6	12.7	E	Py
5	Granodiorite	9,192	1.3	15.2	E	
6	Granodiorite	3,223	1.5	14.0	E	
10	Granodiorite	8,055	4.1	23.3	D	Py diss
14	Granodiorite	5,026	2.7	18.8	D	
16	Granodiorite	14,020	3.0	17.5	B	
27	Granodiorite	20,590	2.5	16.9	D	
29	Granodiorite	15,070	1.4	15.9	A	
30	Granodiorite	2,878	1.1	10.0	A	
	Average	8,140	2.2	16.0		
7	Quartz Vein	249,500	4.3	3.3	F	
8	Quartz Vein	449,300	8.8	5.1	F	Mo diss
9	Quartz Vein	935,900	-0.7	2.0	E	Mo(few)
15	Quartz Vein	67,260	3.5	1.1	D	Py, Mo diss
	Average	425,490	4.0	2.9		
17	Green Schist	3,292	3.2	15.9	D	
24	Green Schist	922	1.8	14.0	A	
25	Green Schist	85	2.7	17.5	A	
31	Green Schist	265	3.1	14.2	G	
32	Green Schist	20.9	5.9	15.7	A	
	Average	917	3.3	15.5		
26	Serpentinite	24.4	5.3	33.2	A	
28	Sandstone	2,100	0.3	17.2	C	
33	Marble	123,200	7.4	21.3	C	
34	Marble	44,230	1.4	37.5	A	
	Average	83,710	4.4	29.4		

Phase spectrum — Sample Nos.



Type	Sample Nos.
Type A	1 3, 21, 22, 24, 25 26, 29, 30, 32, 34
Type B	2, 11, 12, 16
Type C	18, 28, 33
Type D	10, 13, 14, 15, 17 19, 20, 23, 27
Type E	4, 5, 6, 9
Type F	7, 8
Type G	31

Figure 3-24 Phase Spectrum Types of Rock Samples

(2) Data Processing

SIP Data Processing: Data obtained in the field consist of real and imaginary parts of complex resistivity response at each frequency, apparent resistivity, phase and magnitude of received basic frequency, and so on. The following figures are determined using these data.

① Cole-Cole Diagram
② Magnitude Spectrum
③ Phase Spectrum
④ Raw Phase at five frequencies
⑤ PFE Pseudosection
⑥ Apparent Resistivity Pseudosection

SIP data are processed with the decoupling correction.

IP Data Processing: Sections of percent frequency effect (PFE) and apparent resistivity (AR) were provided from pseudosections of each line. Five plan maps were prepared for each electrode separation coefficient of n= 1~ 5.

(A) PFE: The PFE value is calculated by magnitudes (M) at 0.3 Hz and 3.0 Hz as follows:

$$PFE = \frac{M(0.3\ Hz) - M(3.0\ Hz)}{M(3.0\ Hz)} \times 100 \quad (\%)$$

(B) AR: The AR value is calculated by the following equation.

$$AR = \pi a \cdot n(n+1)(n+2) \cdot V/I \quad (ohm\text{-}m)$$

where
a : electrode separation in meters
n : electrode separation coefficient
V : voltage received in volts
I : transmitted current in amperes

In the present survey, the apparent resistivity at 0.3 and 0.375 Hz was calculated, and topographic correction was made with the computer.

Results of SIP Measurement of Rock Samples: The measurement results are summarized by rock type in Table 3-13. The phase spectra after plotting the rock's SIP response can be classified into seven kinds, A, B, C, D, E, F and G, as shown in Figure 3-24. From these results, the following are pointed out.

① By PFE value, serpentinite ranks at the top, showing 5.3%, followed by marble, silicified rock and the quartz vein, all attaining over 4%. They belong to a group of high PFE values among the rocks distributed in the present area. On the other hand, porphyry and granodiorite have a low PFE value, each being 2.2%. Green schist, widely distributed in this area, has an intermediate value of 3.3%.

② Many of the rock samples are generally high in resistivity. Very high values, over 10,000 ohm-m, are exhibited by the quartz vein, silicified rock, porphyry and marble. Lower resistivity is found in serpentinite and green schist, with the values of 20～270 ohm-m or so.

③ The phase variation is within the range of 3～30 mrad values; marble and pophyry have values over 20 mrad, next are granodiorite and green schist with values around 16 mrad, and the lowest value is 2.7 mrad for the quartz vein. In general, the phase variation is proportionately correlated with PFE, but no such correlation is noticed in the samples from this area. This may be explained by the fact that many samples have very high resistivity. Meanwhile, the phase variation is inversely proportionate to resistivity, and so there is a trend of increasing resistivity with decreasing phase variation.

④ The phase spectrum is exemplified by the mountain-shape spectrum (Type A) of Sample 32. Nearly flat-lying spectra are predominant except for some samples, and when these are excluded, the spectra can be classified into six kinds (Types B～G). Little correlation is recognized between the spectral type and the rock type.

(3) Results of Field Work

The results of field work are displayed as plan maps and sections of apparent resistivity and PFE, and spectrum diagrams of phase,Magnitude and Cole-Cole, IP and SIP anomalies are applied to model simulation. In the present examination, the results and the items for further examination are given in the following.

① Distribution of apparent resistivity

The apparent resistivity of the present area showed dominant values of 100～150 ohm-m. Zones of low apparent resistivity (lower than 30 ohm-m) were found mostly in the southeastern part of Line A and in the central-eastern part of Line C. These zones were ascertained in the border area between meta-volcanics and meta-sediments and limestone; they are attributable mainly to mineralization and groundwater.

Zones of high apparent resistivity occurred in the southeastern parts of Lines B, C and D, over a relatively wide sphere. These high resistivities are attributed mainly to limestone, and partly to porphyry and skarn zones.

② Distribution of PFE

As for PFE, the values less than 1.5% account for 62% or more of all measurements. By setting 2% as a weak anomaly zone and over 3% as an anomaly zone, high PFE anomalies of 4.3% and 5.5% were found in the central-southeastern parts of Lines B and C, respectively. These high values occurred in the area of porphyry, meta-volcanics and meta-sediments.

③ SIP measurements were conducted on 34 rock samples. In addition, their phase spectra, resistivities and PFE were measured. The result revealed that many samples had high resistivity. Marble, silicified rock and the quartz vein showed very high values, over 10,000 ohm-m. On the other hand, low resistivity is represented by the 20～270 ohm-m range of serpentinite, meta-volcanics and meta-sediments (green schist).

The PFE values ranged from the maximum of 8.8% (quartz vein) to the minimum of 0.3% (sandstone). Porphyry and granodiorite showed 2.2%, and the values over 4% were shown by silicified rock, the quartz vein and limestone (marble).

As for the phase spectrum, the mountain-shape type (Type A) was characteristic; the flat-lying type was also seen. The flat-lying spectra can be classified into seven kinds, but these are not necessarily correlative to rock types. No correlation was noticed either with the PFE values or phase values. This may be because the rocks distributed in this area have very high resistivity and low sulfide mineral content.

④ The results of SIP measurements made for Lines B and C showed that the phase spectrum is dominantly the flat-lying type, and the magnitude spectrum is also, for the most part, flat-lying. The Cole-Cole arcs are short, and the phase variations with frequency are not so notable as to constitute a spectrum. This is because the resistivity of rocks is very high. Therefore, application of the spectral IP method for exploration of a high resistivity zone such as the porphyry-copper zone would call for careful consideration.

⑤ By the simulation analysis of PFE anomalies detected along Lines B, C and D, the locations of the sources of PFE anomalies were inferred, and the depth of their occurrences and the values of PFE and resistivity were estimated (Table 3-15). Consequently, it is concluded to that the anomaly sources occur in the Dikmen Granite and porphyry distributed in the NE direction from the

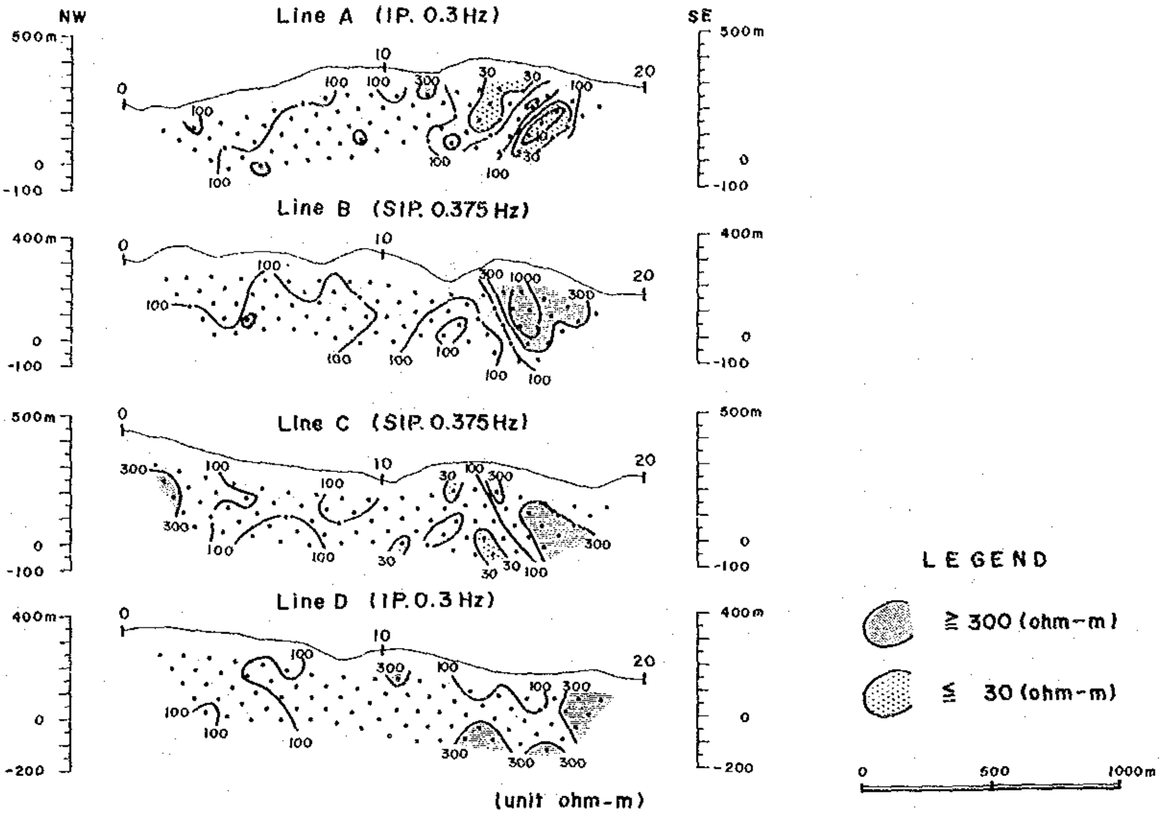


Figure 3-25 Sections of Apparent Resistivity [0.3/0.375 Hz] (Line A-D)

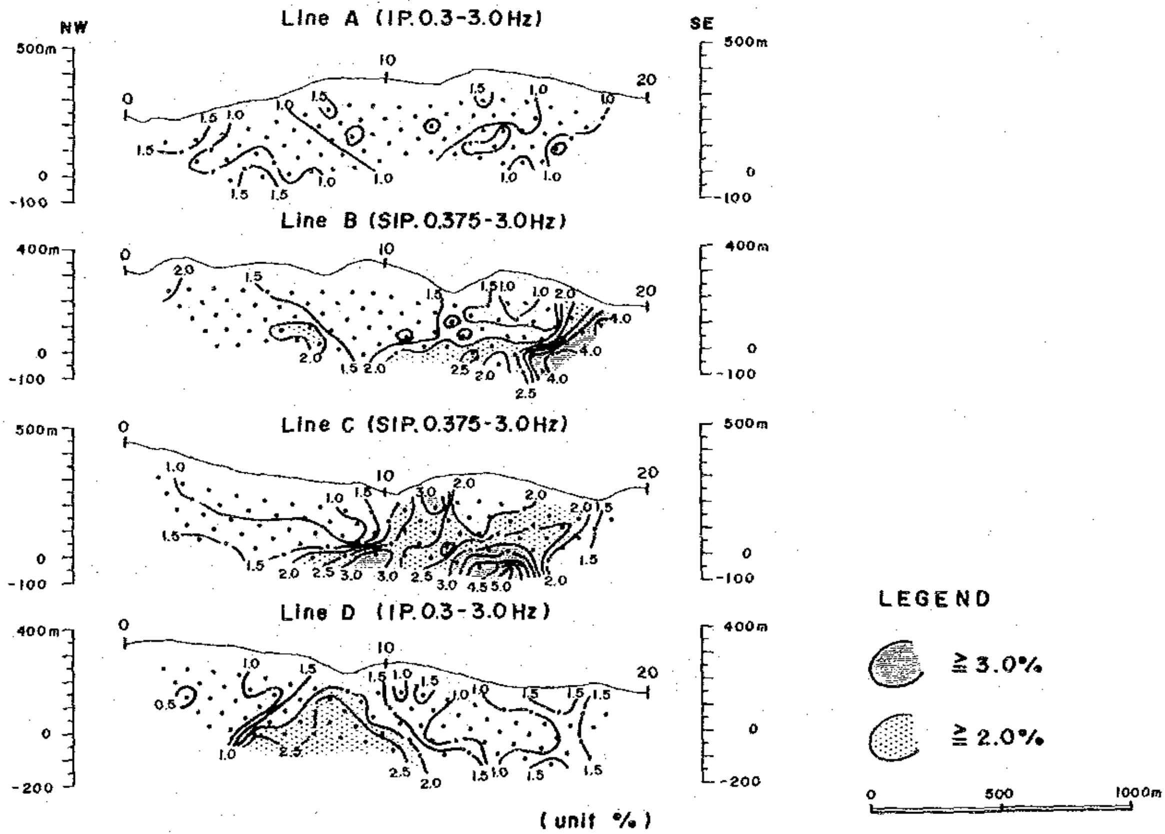
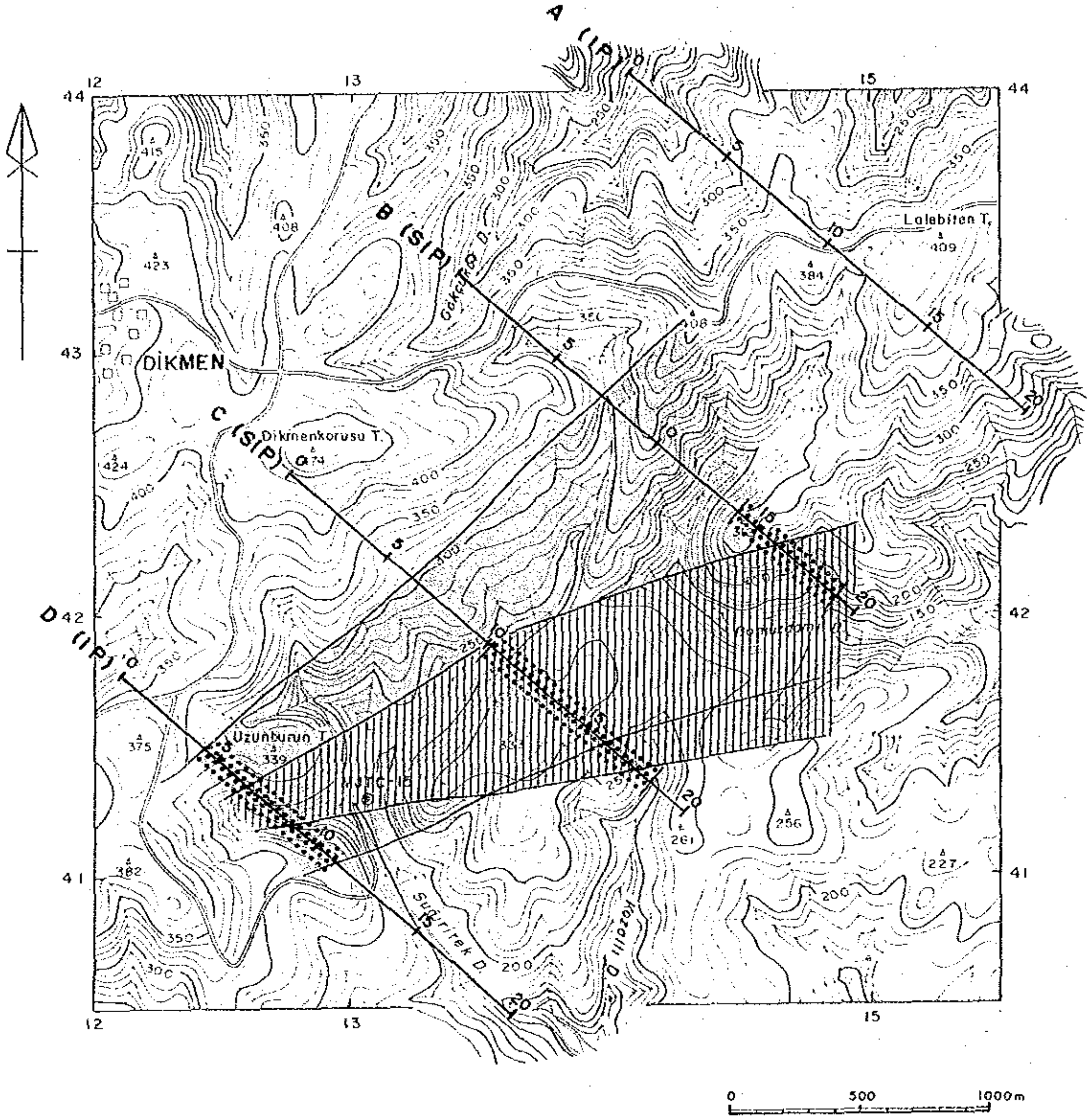


Figure 3-26 Sections of PFE [0.3-3.0, 0.375-3.0 Hz] (Line A-D)



LEGEND

MJTC-15 Drilling Site

PFE Plan (n=2) High PFE (≧2%) Zone

PFE Plan (n=5) High PFE (≧2%) Zone

Location of PFE Anomaly Sourse

Figure 3-27 Geophysical Interpretation Map in the Dikmen Area southwestern part of the survey area, and also in the surrounding area where meta-volcanics and meta-sediments and limestone are distributed. Their depth of occurrence becomes shallower from the southwestern part to the northeastern part. The low values of PFE, 5-8%, suggest the occurrence of low-grade iron sulfide.

⑥ The results of the investigation were integrated into the interpretation map (Figure 3-10). Represented on the map are the zones of weak anomaly (over 2%) and the zones of anomaly (over 3%) based on the PFE plan maps of N=2 and N=5. The locations of PFE anomaly sources estimated from the simulation analysis are also shown. In the present investigation, the line spacing, 1 km, was too wide, but the continuity of the anomaly sources could be inferred from the geological distribution and geological structures, and so we dared to express the sphere of anomaly zones on the map. From the result of geochemical prospecting, anomaly zones of score 1 or over are also indicated. But the geochemically defined anomaly zones are located mostly in the northwestern part of the PFE anomaly zone, partly overlapping the PFE anomaly zone in the central part of Line B.

As mentioned in (①-⑤), the high PFE anomaly zones defined by the present investigation are located at and around the boundary between the distribution area of limestone, meta-volcanics and meta-sediments and that of Dikmen Granite and porphyry intruding the former. It can be inferred, therefore, that porphyry-copper-type mineralization accompanying these intrusive rocks is responsible for the PFE anomalies.

Based on the above-described circumstances, an important sphere for prospecting would be the area around the granite, porphyry and limestone in the central and northeastern parts of the survey area.

Table 3-15 Results of Simulation of IP and SIP Anomalies

Line	Location	Depth (m) (underground)	Resistivity (ohm-m)	PFE (%)	Rock
B	Nos.14～19	30～300	200	5	limestone, meta-volcanics and meta-sediments
C	Nos.10～16	60～300	200	5	granite, meta-volcanics and meta-sediments
C	Nos.16～18	100～300	800	8	meta-volcanics and meta-sediments
D	Nos. 4～11	160～500	200	6	porphyry

3-2-5 Diamond Drilling

(1) Outline

As a result of geological, geochemical and geophysical surveys carried out in the first and second phase, the porphyry molybdenum-type and epithermal-gold-type ore deposits were expected as promising targets in the Dikmen area. In the third phase, a drilling survey consisting of one hole (total hole length 150m) was planned and subsequently carried out in order to explore the subsurface extent of mineralization from the outcrop downward.

The drilling machines, equipment and consumables were transported from the MTA Office located in Balıkesir. As there was no access road, a new 2km road for MJTC-15 was constructed by a bulldozer. The drilling operation was commenced on August 29, 1990, and ended on September 15, 1990. It was performed by means of the wire line method using NQ-size diamond bits. The core recovery was 93.5%.

Location of drill holes

No.	X	Y	Z [m Sea Level]	Direction	Dip
MJTC-15	79150	20760	364	-	-90°

(2) Assay Results of Core

Mineralization containing molybdenum in excess of 100 ppm was detected in the silicified-argillized zones. In these zones, contents of copper, zinc, antimony and mercury are higher than in other mineralization zones, while contents of gold, silver and lead are low. Significant analytical results are as follows.

Sample No.	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Sb ppm	Hg ppb	Mo ppm
1504	30	0.5	2400	40	720	57.0	6700	136
1506	<5	<0.2	170	19	230	27.0	1500	105
1510	<5	<0.2	160	25	260	22.0	1200	116
1515	<5	<0.2	32	2	38	3.6	1700	100
1535	<5	<0.2	36	8	38	5.6	4400	320
1536	<5	<0.2	54	9	36	13.0	5800	105
1538	<5	<0.2	675	18	230	100.0	3400	235
1539	<5	<0.2	62	5	48	14.8	8200	100
1545	<5	<0.2	44	59	620	7.6	6800	110
1546	<5	<0.2	36	52	500	7.6	3500	130

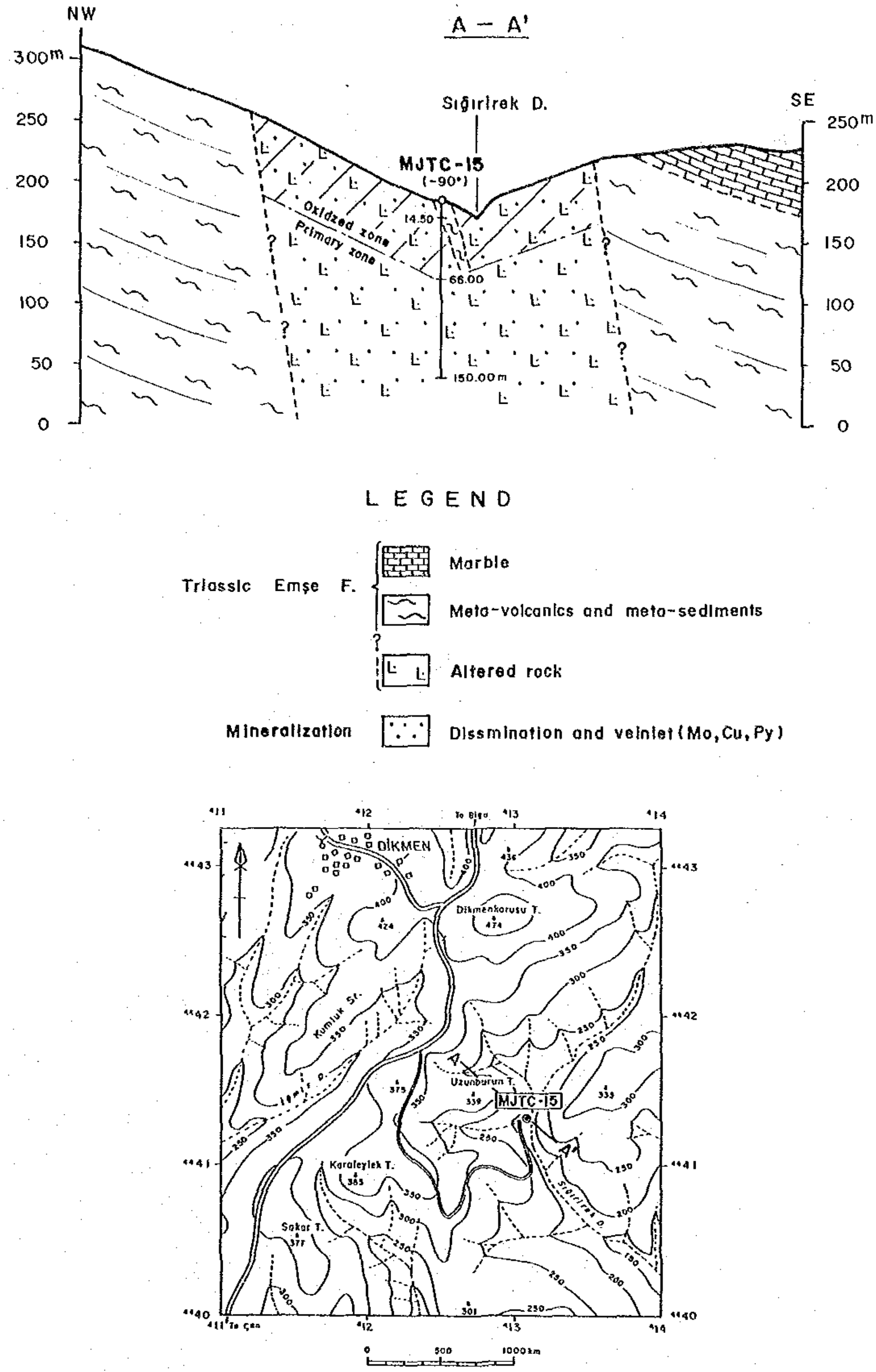


Figure 3-28 Geologic Cross Section of Drill Hole (MJTC-15)

PART IV

CONCLUSIONS AND RECOMMENDATIONS

PART IV CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 1 CONCLUSIONS

During the three years, geological and geochemical surveys were conducted in Zones A, B and C. Further trench survey was carried out in the Arlık Stream and Piren Hill Areas, geophysical survey (SIP and IP methods) in the Dikmen, and drill survey in the Arlık Stream, Etili and Dikmen. Compiled maps of these areas are shown in Figures 1-4, 1-5 and 1-6, the list of geological and geochemical characteristics in Table 1-9, and the summary of the these areas is below.

(1) Arlık Stream Area

Silicified and argillized zones occur in Şapçı Volcanics and part of the Kirazlı Conglomerate. The Kocataş silicified zones occurring in Şapçı Volcanics were evident to 100m in MJTC-5, 6, 7 and 8, after which Kirazlı Conglomerate was intersected, but the Sartaş and Güvemalanı silicified zones continued for at least 150m in MJTC-3, 4, 9, 10, 11, 12, 13 and 14. Altered zones with limonite are predominant on the outcrops, but pyrites are not observed. Of the results of the drill survey, the following are significant: fine-grained pyrites are developed in the section underneath the surface; limonitic silicified zones with open spaces (caves) were found by drill hole MJTC-4 and 10; and the low-grade auriferous zones continued from near surface to bottom in holes MJTC-4, 13 and 14. Therefore, it is considered that the potential for gold deposits is high. Generally, auriferous mineralization in the silicified body did not extend further downward, and silicified veins were observed in the periphery of the silicified zones. Thus it is considered that their shapes are "jellyfish-like" in geologic section.

(2) Piren Hill Area

The geology consists of Şapçı Volcanics in this vicinity. The original rocks cannot be distinguished in the altered zones. The volcanic rocks become thicker with distance from the geologic basement. Altered zones with limonite and hematite are predominant on the outcrops, and pyrites are not observed because of oxidation.

Gold anomalies were detected in the silicified zones located in the southern part of the large alteration zone. The zones extend in an E-W direction in the vicinity of Piren Hill. The auriferous zones, which occur in limonitic clay such as those in fault zones, were detected by drill hole MJTC-2. As a result of the trench survey, gold-bearing zones on the surface were small scale and the content of gold was low.

(3) Etili Area

Silicified and argillized zones occur in Şapçı Volcanics. The Halilaga silicified zones occurring in Şapçı Volcanics were evident as thin near the surface in MJTC-16 and 17, after which weakly altered andesites were intersected, but the Tepeköy silicified zones are inferred to continue for at least 150m because of large-scale silicified bodies. Altered zones with limonite are predominant on the outcrops, but pyrites are not observed.

Of the results of the drill survey, the following are significant: fine-grained pyrites are developed in the section underneath the surface, limonitic silicified-argillized zones were found by drill hole MJTC-16 and the low-grade auriferous zones continued from 2.80m to 16.65m in hole MJTC-16. Therefore, it is considered that the potential for gold deposits is low.

In the Tepeköy alteration zones, auriferous mineralization in the silicified body extend further downward, and silicified veins are expected to be found in the central portion of the silicified zones. Thus it is considered that their shapes are "mushroom-like" in geologic section, as in the Kestane Mt. Area.

(4) Dikmen Area

Geophysical prospecting was carried out together with a detailed geological survey and geochemical prospecting. The detailed geological survey has clarified the distribution and conditions of gold occurrence, argillized zones and skarnization. The geochemical work has revealed two types of mineralization. By geophysical methods, the subsurface extent of mineralization from the outcrop downward was shown by delineating the low-resistivity zone and FE anomalies by IP.

A porphyry molybdenum-copper deposit associated with the intrusion of the Dikmen Granite and porphyry was discovered. The mineralization extends from the eastern side of the Dikmen Granite in a NW-SE direction to the Emeşe Formation in the Sıgırirek Stream. The Emeşe Formation is altered, and minor amounts of sulfides such as molybdenite, chalcopyrite, wolframite, sphalerite and pyrite occur in the quartz veinlets. The analytical results show the existence of gold, arsenic, mercury and antimony. This shows that epithermal mineralization occurred after the porphyry molybdenum mineralization, and they now overlap spatially.

The porphyry molybdenum deposit mentioned above is expected to be a large-scale low-grade deposit as this type of mineralization is extensive at depth. It contains gold and antimony locally and may turn out to be a very important target.

The results of the Çanakkale Project summarized in (1)-(3) above, indicate the possibility of large-scale low-grade gold deposits in the alteration zone near the basement rocks. The porphyry molybdenum deposit mentioned in (4) also is expected to be a large-scale low-grade deposit as this type of mineralization is extensive at depth. It locally contains gold and antimony, and significant gold is expected to be found in the overlapping portion.

CHAPTER 2 RECOMMENDATIONS FOR FUTURE EXPLORATION

It is recommended that the following work be conducted in the promising areas delineated above (Figure 1-15). In the three localities of Zone B, epithermal gold mineralization is anticipated because of the gold showings of the alteration zones which were identified by geological and geochemical surveys. The hydrothermal gold mineralization is expected to extend both horizontally and vertically. Here, detailed geological survey clarified the distribution and extent of the alteration zone, and heavy mineral investigation in the vicinity located the position of the gold mineralization. On the basis of these findings, inclined drilling should be carried out in order to clarify the state of subsurface mineralization.

(1) Arlık Stream Area

The auriferous zones have been detected in Sartaş, Güvemalanı and İnkaya Hills; these localities belong to the concession of MTA. The drilling survey should be continued in these localities since auriferous zones were intersected by drill holes MJTC-4, 10, 13 and 14.

(2) Piren Hill Area

Gold anomalies were detected in the silicified zones located in the southern part of the large alteration zone which extends in an E-W direction in the vicinity of the Piren Tepe. The auriferous zone was detected by drill hole MJTC-2 in the Davulgılı silicified zones belonging to the concession of MTA. This zone was small and the content of gold was low on the surface. Further drilling survey should be carried out in the southeastern part of the Piren silicified zones, which corresponds to west of Muratlar Village.

(3) Etili Area

The auriferous zones have been detected in Hamam Hill of southern Tepeköy Village. Although this locality does not belong to the concession of MTA, the drilling survey should be continued here because the auriferous zones were found through study of many rock samples.

(4) Dikmen Area

Geophysical prospecting was carried out along with detailed geological survey and geochemical prospecting. By geophysical methods, the subsurface extent of mineralization from the outcrop downward was shown by delineating the mineralization zones corresponding to geophysical anomalies, and was intersected by drill hole MJTC-15. Further drill survey should be conducted in the mineralized zone of the localities distributed in the Dikmen Granite and porphyry.

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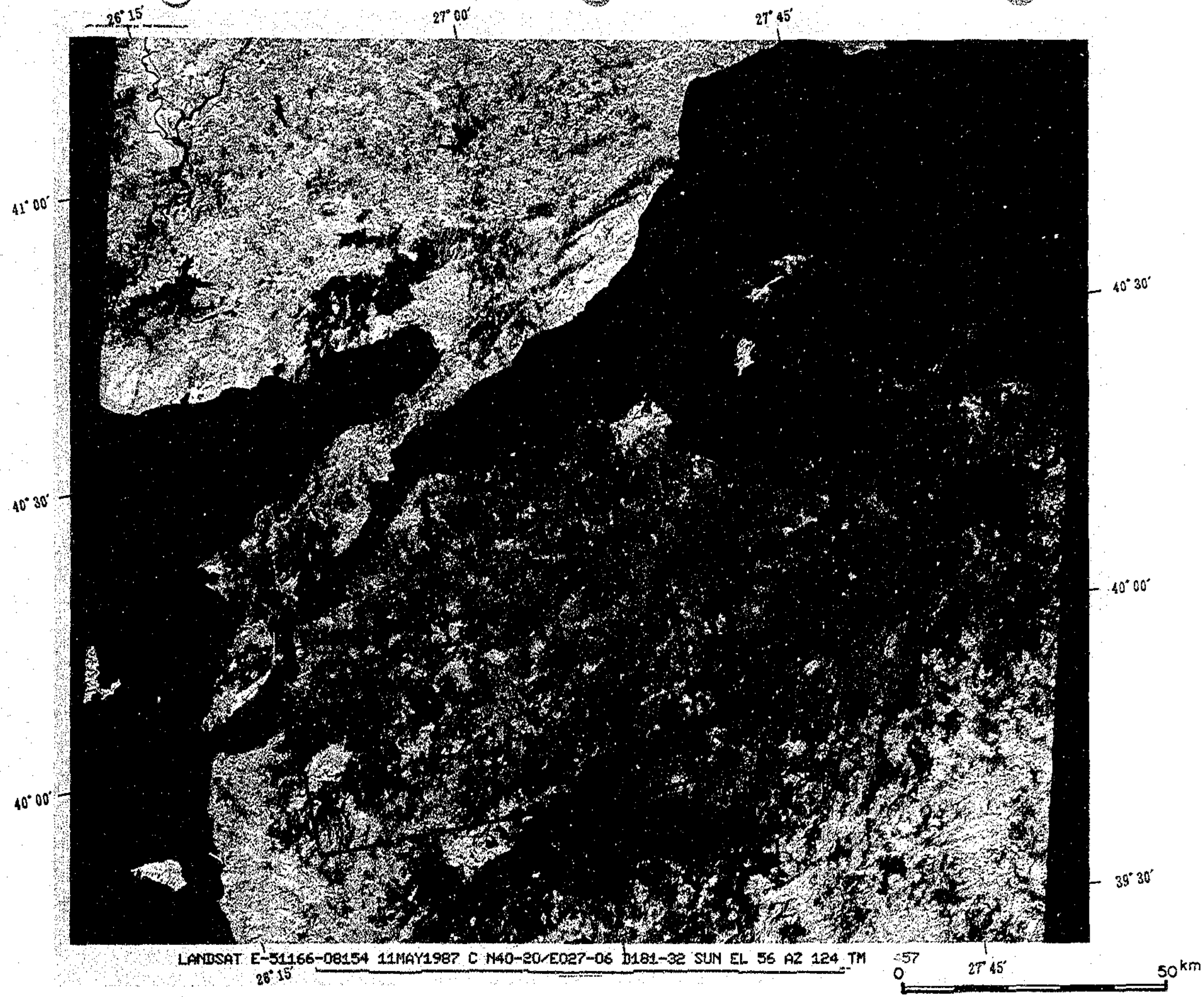


Photo. 1 False Colour Image of the Full Scene (Band 4:blue • 5:green • 7:red)

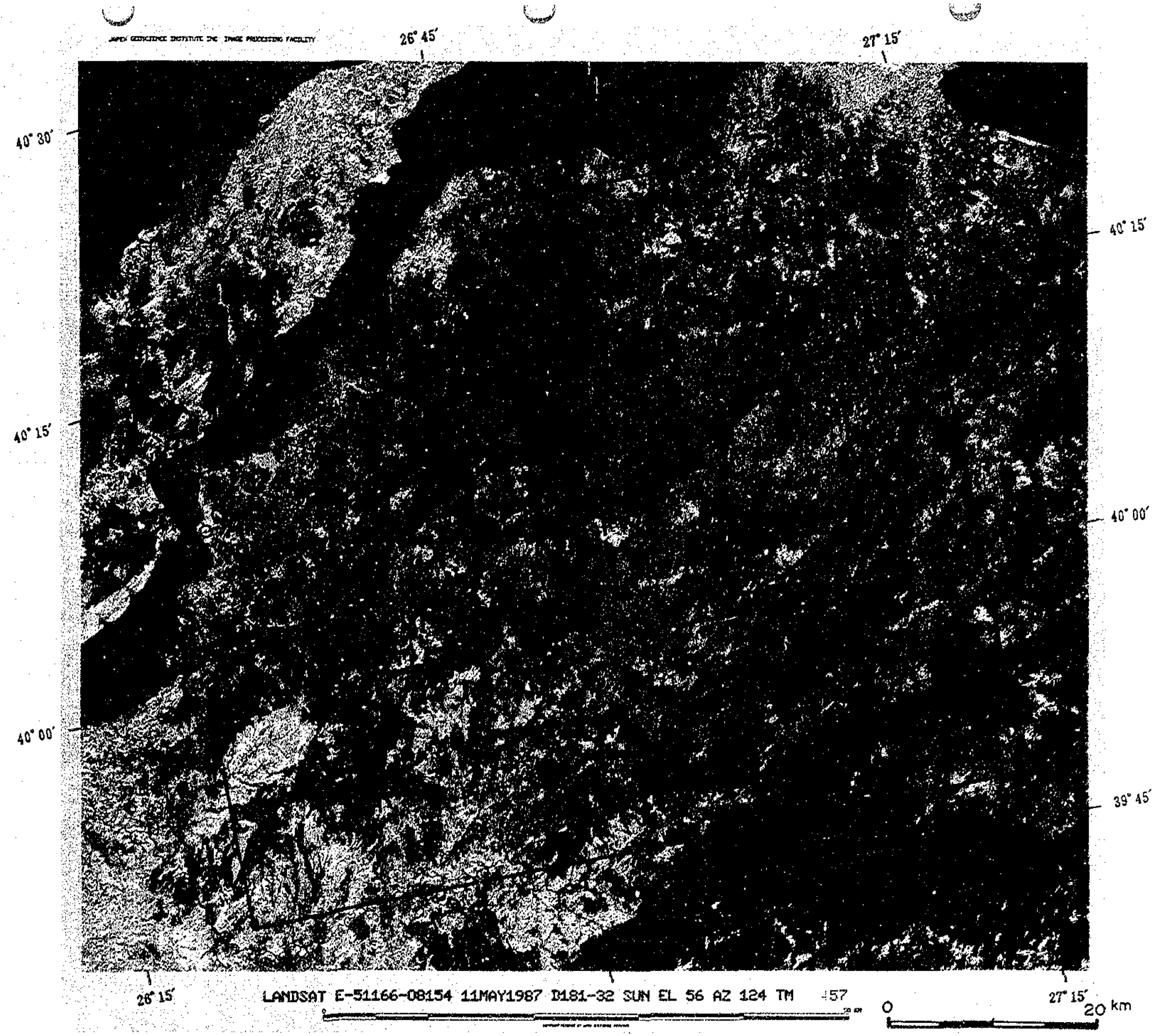


Photo. 2 False Colour Image of the Çanakkale Area(Band 4:blue • 5:green • 7:red)

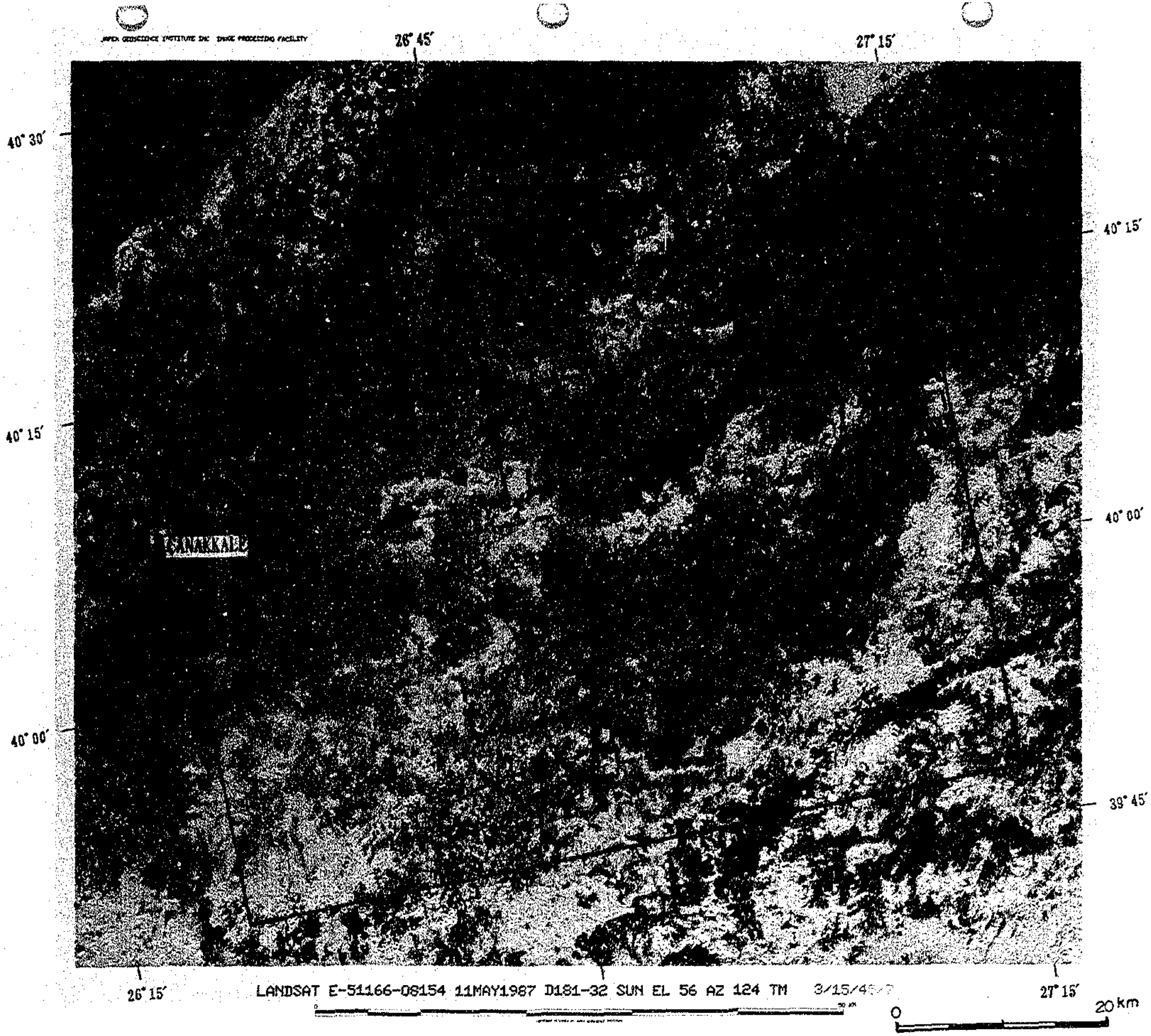


Photo. 3 Ratio Image (Band 5/7:blue • 5/4:green • 3/1:red)

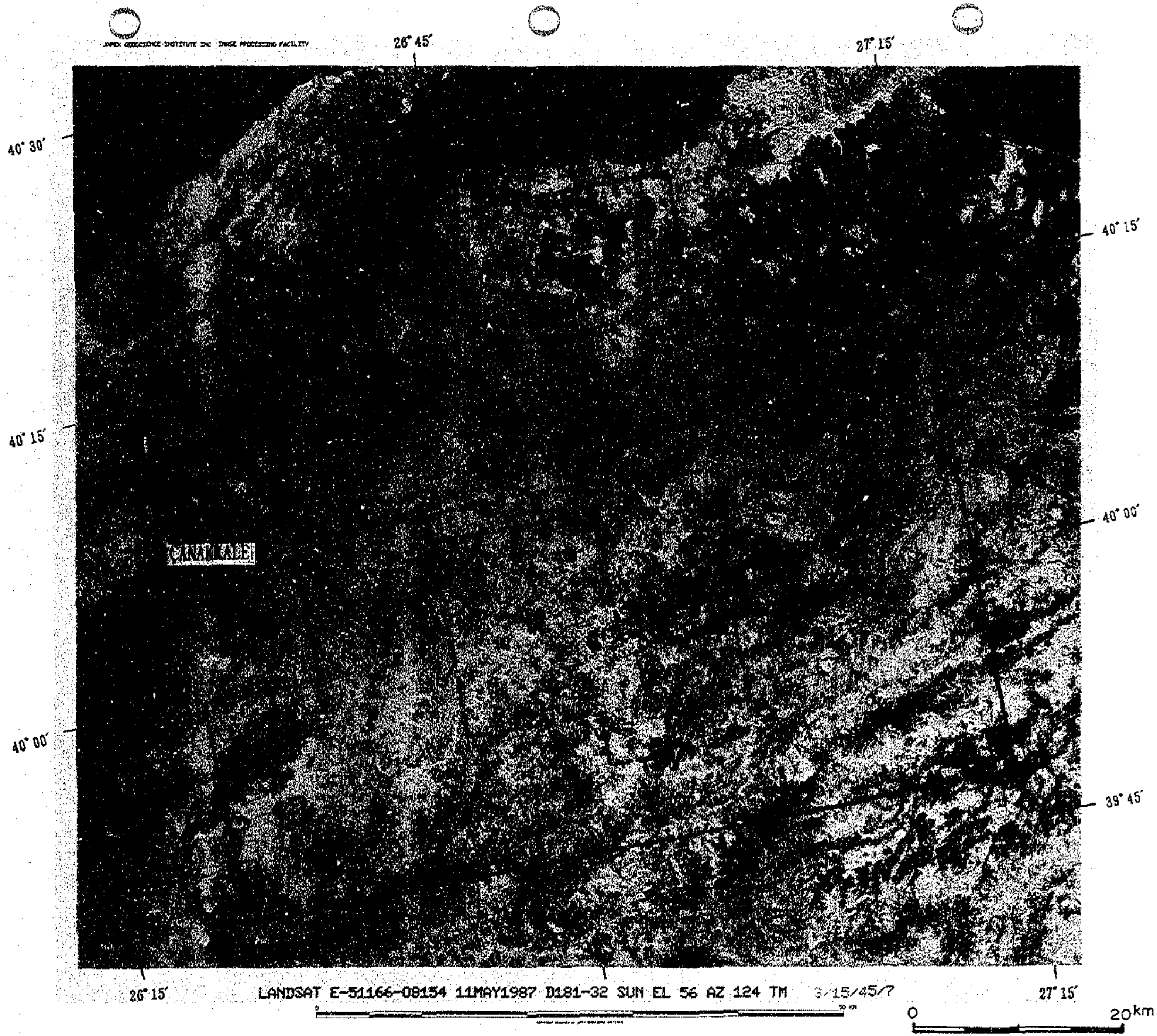


Photo. 4 Ratio Image (Band 5/7:red • 5/4:green • 3/1:blue)

APPENDIX

Table 1 Results of Microscopic Observation of Thin Sections

Sample No.	Rock Name	Rock unit	Texture	Phenocryst Qz	Kf	Pl	Bi	Ho	Au	Hy	Mf	Op	Groundmass Qz	Pl	Bi	Ho	Au	Hy	Mf	Op	G	Alteration
BB211	Andesite(Balcılar V.)	Mba	porphyritic			◎?		○?	○?											◎		Ch. (vs arg)
HS217	Dacite(Dededağ V.)	Pdd	ditto			◎	○					△		◎						○	○	Ch. (vs arg)
AK036	Andesite(Osmanlar V.)	Pod	ditto			◎	○	○				△		◎						◎	○	
TS093	Andesite(Şapçı V.)	Msa	ditto		□	◎	○	○				○		◎		○	○			○	◎	
TS078	Andesite(Şapçı V.)	Msa	ditto			◎	□	◎	○			○		◎		○	○			○	◎	
HS099	Andesite(Şapçı V.)	Msa	ditto			◎		○?	○?			○	○?	◎		○?	○?			○	○	Mafic→Ch. Ep.
AK026	Andesite(Çanyayla V.)	Eça	ditto		□?	◎	□?	○?	○?			△	○?	◎		○?	○?			△	◎	Mafic→Ch. Ep.
KS128	Andesite(Çanyayla V.)	Eça	ditto			◎	○	□	○	□		□		◎		○	○			○	○	
KS062	Andesite(Çanyayla V.)	Eça	ditto	□		◎		○?	□?			△								□	◎	Ch. Ep.
KS190	Granodiorite	Int	holocrystalline	○		◎	□	○				○										Ch.
KB023	Dikmen Granite	Int	ditto	◎	○	◎	○					□										
KB041	ditto	Int	ditto	◎	○	◎	○					□										Kf→Ch. Ep.
HB036	ditto	Int	ditto	◎	○	◎	○					△										Kf→Ch. Ep.
KS005	Ovacık Granite	Int	ditto	◎	○	◎	◎					△										Kf→Ch. Ep.
KS015	ditto	Int	ditto	◎	◎	◎	○					△										Kf→Ch. Ep.
S405	Fresh basaltic andesite	Msa	porpyritic			◎		○	○	□	□	□		◎					○	○	○	Ch. Ep
M419	Massive silicified rock	Msa	granular										◎						△	□		silicified. Ch
S415	Fresh basaltic andesite	Msa	porpyritic			◎		□	○	○	□	□		◎					◎	○		Ch. Ep
S463	Porous silicified rock	Msa	granular										◎						◎	○	△	Ch. vs Ep
M460	Alunitic silicified rock	Msa	granular										◎						○			
T485	Porous silicified rock	Msa	granular										◎						○	□		
M378	Massive silicified rock	Msa	granular	○							□		◎						○	△		Ser (Ch?)
S373	Fresh andesite	Msa	porpyritic			◎		○	○			□		◎		○	○			◎		Ch
K328	Dikmen granodiorite	Int	hypodiomorphic	◎	○	◎	□	△				△										Ser
Y309	Dikmen granodiorite	Int	hypodiomorphic	◎	○	◎	○	△	△			□										Ser (Ch?)
156	Dark grey andesite	Msa	porpyritic	□		◎		□	□		□	□		◎					◎	○		
256	Fractured andesite	Msa	porpyritic	○		◎					□?	□		◎					◎	○		phenocryst Mf→relict
356	Silicified rock	Msa	granular										◎							□		silicified
457	Silicified rock	Msa	granular										◎							○		vs silicified.
556	Silicified rock	Msa	porpyritic								◎	○	◎						◎	○		Ch. Ep
656	Silicified rock	Msa	porpyritic										◎						◎	◎	○	Ch
C679	Basaltic andesite	Msa	porphyritic			◎		□	□			○		◎					◎	◎		Ch. Ep
M605	Massive silicified rock	Msa	granular	○									◎									vs Ser. Ch. Mf→relict
M610	Massive silicified rock	Msa	granular	○	○							□	◎									vs Ser. Ch
P703	Granodiorite	Int	holocrystalline	◎	◎	◎	○	○	□			□										
P706	Andesite	Msa	porphyritic	□		◎	□	□				□		◎					○	◎		Ch. Mf→relict
S663	Basaltic andesite	Msa	porphyritic			◎						○		◎					◎	○		Ch. Ep
S699	Granodiorite	Int	holocrystalline	○	□	◎	○	○				○										Ch. Ep
S735	Biotite andesite	Msa	porphyritic		□	◎	○	□?				○		◎					◎			Ch. Bi→relict
Y630	Massive silicified rock	Msa	granular	□									◎						△			vs Ser. Ch. qz veinlet
Y682	Massive silicified rock	Msa	granular	□									◎						□			vs Ser. Ch
16110	Altered andesite	Msa	granular	□							△	△	◎						△	◎		vs Ser. Ch. Mf→relict
16135	Unaltered andesite	Msa	porphyritic			◎		△	△					◎						□		Ch. Ep
17694	Altered andesite	Msa	porphyritic	○		○		△	△			□	○							○		Ser. Ch
D151	Altered rock	Tev	granular										◎						○			Ch. Mf→Ep veinlet
D152	Altered rock	Tev	granular										◎						○	○		Ch. Ep. Op→pyrite?
D153	Altered rock	Tev	granular										◎						○	○		Ch. Ep. Op→pyrite?
D154	Altered rock	Tev	granular										◎						◎	○		Ch. Ep
D155	Altered rock	Tev	granular										◎						◎	○		Ch. Ep. Op→pyrite?

Abbreviations

S405, M419 : Arlık Stream   S415, S463 : Karaibrahimler   K328, Y309 : Dikmen

156 : MJTC-1 126.00 Dark grey andesite   256 : MJTC-2 96.60 Dark green fractured andesite

356 : MJTC-3 129.30 L.grey vs silicified rock with py diss   457 : MJTC-4 62.20 L.grey massive silicified rock

556 : MJTC-5 63.40 Grey porous silicified rock   656 : MJTC-6 67.80 Light brown porous s silicified rock

16110 : MJTC-16 11.0m   151 : MJTC-15 56.8m   154 : MJTC-15 135.0m

16135 : MJTC-16 135.0m   152 : MJTC-15 68.5m   155 : MJTC-15 149.5m

17694 : MJTC-17 69.4m   153 : MJTC-15 119.8m

◎:Abundant ○:Common □:Few △:Rare

Qz:Quartz, Kf:Potassium feldspar, Pl:Plagioclase, Bi:Biotite, Ho:Hornblende, Au:Augite, Hy:Hypersthene, Py:Pyroxene, Mf:Mafic mineral

Op:Opaque minerals Ser:Sericite Ch:Chlorite Ep:Epidote C:Calcite Ah:Anhydrite G:Glass

vs:very strong arg:argillization, Int:Intrusive rock

Tev:Emese Formation, Eça:Çanyayla Volcanics, Msa:Şapçı Volcanics, Mba:Balcılar Volcanics, Pod:Osmanlar Volcanics, Pdd:Dededağ Volcanics

Table 2 Chemical Analysis and CIPW Norms for Volcanics (1)

Sample No.	1 AK026	2 AK036	3 HB211	4 HS099	5 HS217	6 KS062	7 KS128	8 KS190	9 TS078	10 TS093
SiO_2%	66.08	64.50	51.35	55.51	73.19	66.01	57.58	63.66	61.21	58.40
TiO_2%	0.43	0.58	0.87	0.65	0.20	0.39	0.73	0.53	0.61	0.70
Al_2O_3%	15.66	17.45	19.60	16.95	13.97	15.03	17.23	15.57	16.60	18.10
Fe_2O_3%	1.27	2.36	6.48	2.42	1.32	1.59	3.83	2.25	5.21	5.52
FeO%	1.66	0.54	0.42	2.99	0.10	1.32	2.50	2.03	0.64	0.81
MnO%	0.11	0.08	0.05	0.15	0.04	0.08	0.13	0.12	0.17	0.05
MgO%	1.28	0.93	1.04	1.86	0.32	1.27	3.19	1.92	1.83	0.75
CaO%	2.83	3.34	6.50	5.85	0.94	1.92	6.64	4.52	5.42	3.49
Na_2O%	3.07	3.82	4.45	4.82	4.09	2.07	3.27	3.20	3.49	2.78
K_2O%	4.22	5.27	0.39	0.26	4.00	5.85	2.92	2.42	2.75	2.74
P_2O_5%	0.18	0.23	0.21	0.18	0.05	0.09	0.27	0.18	0.21	0.16
BaO%	0.09	0.12	0.02	0.02	0.09	0.16	0.08	0.07	0.09	0.08
LOI%	4.36	2.10	7.56	7.01	1.50	3.93	1.72	1.26	1.65	6.23
Total%	101.24	101.32	98.94	98.67	99.81	99.71	100.09	97.73	99.88	99.81
Q	23.94	14.27	9.37	11.33	31.79	25.55	10.20	23.26	17.52	23.61
C	1.33	0.00	0.99	0.00	1.38	2.02	0.00	0.00	0.00	4.60
or	24.94	31.15	2.30	1.54	23.64	34.57	17.26	14.30	16.25	16.19
ab	25.96	32.30	37.63	40.76	34.59	17.51	27.65	27.06	29.51	23.51
an	12.87	14.91	29.67	23.86	4.19	8.94	23.72	20.98	21.51	16.27
di-wo	0.00	0.07	0.00	1.67	0.00	0.00	3.12	0.11	1.67	0.00
di-en	0.00	0.06	0.00	1.00	0.00	0.00	2.40	0.08	1.45	0.00
di-fs	0.00	0.00	0.00	0.58	0.00	0.00	0.39	0.02	0.00	0.00
hy-en	3.19	2.25	2.59	3.63	0.80	3.16	5.54	4.70	3.11	1.87
hy-fs	1.49	0.00	0.00	2.12	0.00	0.62	0.91	1.20	0.00	0.00
mt	1.84	0.32	0.00	3.51	0.00	2.29	4.09	3.25	0.85	0.74
hm	0.00	2.14	6.47	0.00	1.32	0.00	0.00	0.00	4.62	5.00
il	0.82	1.10	0.99	1.23	0.30	0.74	1.39	1.01	1.16	1.33
tn	0.00	0.00	0.85	0.00	0.11	0.00	0.00	0.00	0.00	0.00
ap	0.43	0.54	0.50	0.43	0.12	0.21	0.64	0.43	0.50	0.38
S.I.	11.26	7.33	8.58	15.36	3.30	10.65	22.12	16.57	13.66	6.22
D.I.	74.84	77.72	49.30	53.63	90.02	77.63	55.11	64.62	63.28	63.31

Area No.	Sample No.	Rock Name	Coordinates	Rock Unit	Location
B 1	AK026	Andesite	73700 38950	Çamyayla V.	NW Osmanlar Vil
B 2	AK036	Unaltered andesite	72050 37350	Osmanlar V.	SW Osmanlar Vil
A 3	HB211	Unaltered andesite	88400 48300	Balcılar V.	Çam Hill
B 4	HS099	Andesite	73100 24700	Şapçı V.	N Aşağışapçı
A 5	HS217	Unaltered dacite	85050 51900	Dededag V.	Dededag
B 6	KS062	Andesite	85550 36100	Çamyayla V.	NW Alan Hill
B 7	KS128	Andesite	80900 31550	Çamyayla V.	Kocaçakıl Hill
B 8	KS190	Granodiorite	79950 30300	Akpınar Gr.	Cemiyet alanı
B 9	TS078	Andesite	76800 20400	Şapçı V.	Kemut Hill
B10	TS093	Andesite	76100 21550	Şapçı V.	NE Gökçeşme Vil

Table 2 Chemical Analysis and CIPW Norms for Şapçı Volcanics (2)
(unaltered)

Sample No.	11 S405	12 559	13 S415	14 S373	15 159	16 259	17* C679	18* P706	19* S663	20* S735	21* 16135	ACC A
SiO_2%	58.58	54.17	54.44	57.54	53.32	55.50	51.26	59.03	55.32	62.35	58.07	56.86
TiO_2%	0.71	0.71	0.88	0.86	0.88	0.96	1.20	0.71	0.77	0.60	0.60	0.78
Al_2O_3%	16.74	17.53	17.65	17.53	18.03	18.45	18.99	16.81	17.45	17.29	16.55	17.52
Fe_2O_3%	3.59	5.05	3.79	4.80	4.50	5.40	5.78	3.83	3.87	5.00	3.58	4.61
FeO%	3.07	0.14	4.79	2.03	4.07	1.30	2.66	0.96	3.05	0.13	2.19	1.99
MnO%	0.15	0.19	0.24	0.09	0.24	0.03	0.16	0.07	0.20	0.04	0.38	0.16
MgO%	2.78	2.50	2.57	2.61	2.62	0.77	3.16	2.87	1.72	0.56	0.93	1.97
CaO%	6.04	1.27	6.79	6.82	7.40	4.41	8.45	5.51	7.92	3.93	4.15	5.51
Na_2O%	3.07	0.84	3.21	3.27	3.13	3.06	3.55	2.96	3.97	3.40	2.95	3.05
K_2O%	3.29	2.70	2.58	2.41	2.15	2.21	1.85	2.67	0.60	3.47	4.08	2.58
P_2O_5%	0.35	0.24	0.35	0.27	0.32	0.24	0.38	0.22	0.28	0.22	0.20	0.26
BaO%	0.13	0.07	0.11	0.10	0.12	0.09	0.07	0.09	0.05	0.08	0.07	0.09
LOI%	1.70	15.24	2.71	2.64	3.66	8.92	3.45	3.55	3.88	2.50	4.79	4.69
Total%	100.20	100.65	100.11	100.97	100.44	101.34	100.96	99.28	99.08	99.57	98.54	100.07
Q	13.23	33.18	9.53	12.87	9.30	19.33	3.75	16.40	12.56	20.98	15.24	
C	0.00	11.49	0.00	0.00	0.00	3.58	0.00	0.00	0.00	1.85	0.21	
or	19.44	15.96	15.25	14.24	12.71	13.06	10.93	15.78	3.55	20.51	24.11	
ab	25.96	7.10	27.15	27.65	26.47	25.88	30.02	25.03	33.57	28.75	24.95	
an	22.19	4.75	26.14	26.04	28.80	20.32	30.42	24.70	28.03	16.64	19.29	
di-wo	2.30	0.00	2.20	2.52	2.43	0.00	3.77	0.50	3.94	0.00	0.00	
di-en	1.99	0.00	1.85	2.18	2.10	0.00	3.26	0.43	2.69	0.00	0.00	
di-fs	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	
hy-en	4.93	6.22	4.55	4.32	4.42	1.92	4.61	6.71	1.59	1.39	2.32	
hy-fs	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.78	
mt	8.33	0.14	13.20	4.34	11.35	1.51	5.62	1.26	5.61	0.00	5.19	
hm	1.26	5.49	0.00	4.05	1.19	5.80	1.91	2.96	0.00	4.99	0.00	
il	1.35	1.35	1.67	1.63	1.67	1.82	2.28	1.35	1.46	0.36	1.14	
tn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	
ap	0.83	0.57	0.83	0.64	0.76	0.57	0.90	0.52	0.66	0.52	0.47	
S.I.	17.59	21.59	15.17	17.27	15.90	6.04	18.59	21.60	13.02	4.46	6.79	
D.I.	58.63	56.24	51.93	54.76	48.48	58.27	44.70	57.21	49.68	70.24	64.30	

*Sample of third phase

Area No.	Sample No.	Rock Name	Coordinates	Rock Unit	Location
B11	S405	Basaltic andesite	82010 31055	Şapçı V.	Arlık Stream
B12	559	Andesite	82620 30220	Şapçı V.	MJTC-5(114.25m)
B13	S415	Basaltic andesite	80585 27755	Şapçı V.	Karaibrahimlrt
B14	S373	Andesite	79395 22330	Şapçı V.	Piren Hill
B15	159	Andesite	79150 20760	Şapçı V.	MJTC-1(126.00m)
B16	259	Fractured andesite	79580 20920	Şapçı V.	MJTC-2(96.60m)
E17*	C679	Basaltic andesite	90040 20630	Şapçı V.	Davulga Hill
E18*	P706	Andesite	90070 24240	Şapçı V.	Davulga Hill
E19*	S663	Basaltic andesite	96550 21710	Şapçı V.	Ardıç Hill
E20*	S735	Biotite andesite	97330 26100	Şapçı V.	Küçökpaşa
E21*	16135	Andesite	88338 20785	Şapçı V.	MJTC-16(135.00m)

Table 2 Chemical Analysis and CIPW Norms for Altered Şapçı Volcanics (3)

Sample No.	22 158	23 358	24 359	25 460	26 S463	27 558	28 656	29 M460	30* 17694	ACC C
SiO_2%	78.00	60.72	70.16	65.33	83.38	56.23	57.90	47.75	60.23	64.41
TiO_2%	0.74	0.90	0.81	0.72	0.61	0.57	0.64	0.95	0.74	0.74
Al_2O_3%	2.54	19.08	14.23	17.36	12.06	14.45	15.32	19.74	20.34	15.02
Fe_2O_3%	9.14	6.44	3.56	5.48	0.17	4.55	0.04	0.47	3.38	3.69
FeO%	0.94	0.20	0.10	0.12	0.18	0.14	0.06	0.12	0.68	0.28
MnO%	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
MgO%	0.06	0.55	0.02	0.10	0.01	0.03	<0.01	0.01	0.28	0.12
CaO%	0.12	0.36	0.17	0.13	0.11	0.15	0.24	0.21	0.46	0.22
Na_2O%	0.22	0.58	0.38	0.16	0.19	1.22	0.49	0.91	0.78	0.50
K_2O%	0.04	2.99	1.00	2.13	0.50	2.16	4.04	4.09	3.82	2.31
P_2O_5%	0.15	0.39	0.12	0.35	0.17	0.33	0.18	0.38	0.24	0.26
BaO%	0.08	0.16	0.04	0.07	<0.01	0.09	0.11	0.31	0.06	0.10
LOI%	8.08	7.98	9.76	8.19	3.13	20.92	22.48	26.00	8.96	12.84
Total%	100.12	100.36	100.36	100.15	100.53	100.85	101.52	100.95	99.98	100.49

Sample No.	31 M419	32 T485	33 M378	34 258	35* M605	36* M610	37* Y630	38* Y682	39* 16110	ACC B
SiO_2%	96.51	95.41	96.98	95.41	97.17	96.61	96.70	98.29	94.43	96.39
TiO_2%	1.81	0.71	0.81	0.74	0.86	0.54	0.59	0.59	0.61	0.81
Al_2O_3%	0.29	0.29	0.32	0.31	0.26	0.15	0.15	0.47	0.40	0.29
Fe_2O_3%	0.68	1.44	0.39	0.30	0.01	0.05	0.03	0.13	2.48	0.61
FeO%	0.71	0.26	0.50	0.16	0.09	0.06	0.06	0.03	0.30	0.24
MnO%	<0.01	0.01	0.01	<0.01	0.01	0.01	0.01	0.01	<0.01	0.01
MgO%	<0.01	0.01	0.01	<0.01	0.08	0.04	0.03	0.04	0.05	0.03
CaO%	0.04	0.10	0.09	0.05	0.22	0.19	0.19	0.25	0.19	0.15
Na_2O%	0.11	0.15	0.15	0.10	0.14	0.12	0.12	0.11	0.01	0.12
K_2O%	0.05	0.10	0.05	0.06	0.06	0.04	0.04	0.08	0.04	0.06
P_2O_5%	0.07	0.09	0.10	0.06	0.03	0.02	0.03	0.03	0.06	0.05
BaO%	<0.01	0.01	<0.01	0.08	0.03	0.11	0.09	0.02	0.08	0.05
LOI%	<0.01	1.10	1.36	1.43	0.40	0.40	0.35	0.41	0.89	0.70
Total%	100.31	99.68	100.78	98.72	99.36	98.34	98.39	100.46	99.55	99.51

* Sample of third phase

Area No.	Sample No.	Rock Name	Coordinates	Rock Unit	Location
B22	158	Porous sil rock	79150 20760	Şapçı V.	MJTC-1(42.20m)
B23	358	Arg rock	82980 30790	Şapçı V.	MJTC-3(30.00m)
B24	359	Massive rock	82980 30790	Şapçı V.	MJTC-3(140.20m)
B25	460	Arg rock	83400 30790	Şapçı V.	MJTC-4(100.00m)
B26	S463	Porous sil rock	80645 27570	Şapçı V.	Karaibrahimler
B27	558	Porous sil rock	82620 30220	Şapçı V.	MJTC-5(63.40m)
B28	658	Porous s sil rock	82340 30170	Şapçı V.	MJTC-6(77.80m)
B29	M460	Alunitic sil rock	76585 29075	Şapçı V.	Kestane Mt.
E30*	17694	Altered andesite	88338 20785	Şapçı V.	MJTC-17(69.40m)
B31	M419	Massive sil rock	82855 29790	Şapçı V.	Arlık Stream
B32	T485	Porous sil rock	75870 30160	Şapçı V.	Kestane Mt.
B33	M378	Massive sil rock	80720 21890	Şapçı V.	Piren Hill
B34	258	Massive sil rock	79580 20920	Şapçı V.	MJTC-2(5.70m)
E35*	M605	Massive sil rock	93850 24090	Şapçı V.	Baga Hill
E36*	M610	Massive sil rock	93835 24055	Şapçı V.	Baga Hill
E37*	Y630	Massive sil rock	94110 25175	Şapçı V.	Hamam Hill
E38*	Y682	Massive sil rock	93980 25090	Şapçı V.	Haman Hill
E39*	17110	Altered andesite	88338 20785	Şapçı V.	MJTC-16(11.00m)

Table 2 Chemical Analysis and CIPW Norms for Granitic Rocks and Altered Rock(4)

Sample No.	40 HB036	41 KB023	42 KB041	43 KS005	44 KS015	45 K328	46 Y309	47* P703	48* S699	49* D151	50* D152	51* D153	52* D154	53* D155
SiO_2%	67.91%	64.70%	67.42%	66.19%	64.90%	67.09%	67.64%	66.59	65.48	73.06	69.38	70.62	69.17	70.95
TiO_2%	0.28	0.35	0.25	0.26	0.30	0.33	0.33	0.40	0.42	0.25	0.23	0.24	0.24	0.25
Al_2O_3%	16.06	17.94	16.91	17.72	17.70	17.98	17.24	15.53	15.15	12.12	11.49	12.27	12.19	12.45
Fe_2O_3%	1.41	1.19	0.84	0.75	1.16	1.06	1.11	1.98	1.84	1.38	2.46	2.51	0.87	1.30
FeO%	0.74	1.55	1.09	0.98	1.20	1.62	1.66	1.70	2.06	0.13	0.50	0.19	0.67	0.36
MnO%	0.04	0.09	0.06	0.05	0.07	0.07	0.08	0.07	0.04	0.01	0.02	0.02	0.03	0.02
MgO%	0.67	1.58	0.83	0.84	1.32	1.12	0.83	1.46	1.81	0.50	1.04	0.71	1.24	1.03
CaO%	3.60	4.53	3.41	4.68	4.86	4.19	4.11	3.60	3.31	3.25	2.21	1.86	3.70	2.68
Na_2O%	3.96	4.85	4.32	4.90	4.80	5.08	4.32	3.65	2.86	0.25	0.21	0.25	0.24	0.27
K_2O%	2.67	1.38	2.54	1.21	1.49	1.40	1.88	3.52	4.12	3.43	3.67	4.04	3.14	4.34
P_2O_5%	0.11	0.14	0.13	0.12	0.12	0.18	0.23	0.25	0.19	0.12	0.15	0.14	0.16	0.15
BaO%	0.04	0.04	0.06	0.04	0.04	0.05	0.09	0.05	0.12	0.05	0.04	0.08	0.03	0.05
LOI%	1.51	0.93	1.69	1.90	1.08	1.10	0.67	0.56	1.61	5.70	6.08	5.11	7.59	5.93
Total%	99.00	99.27	99.55	99.64	99.04	101.27	100.19	99.36	99.01	100.25	97.48	98.04	99.27	99.78
Q	26.27	18.90	23.95	21.75	19.07	21.97	25.84	22.42	23.09	51.18	48.25	49.06	46.35	45.92
C	0.38	0.57	1.17	0.13	0.00	0.92	1.18	0.00	0.42	2.49	3.51	4.44	2.05	2.79
or	15.78	8.16	15.01	7.15	8.81	8.27	11.11	20.80	24.35	20.27	21.69	23.88	18.56	25.65
ab	33.49	41.02	36.53	41.44	40.59	42.96	36.53	30.87	24.19	2.11	1.78	2.11	2.03	2.28
an	17.14	21.56	16.07	22.43	22.36	19.62	18.90	15.60	15.19	15.01	9.99	8.30	17.32	12.32
di-wo	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00
di-en	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00
di-fs	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
hy-en	1.67	3.93	2.07	2.09	3.00	2.79	2.07	3.44	4.51	1.25	2.59	1.77	3.09	2.56
hy-fs	0.00	1.45	1.01	0.84	0.80	0.20	0.22	0.91	1.64	0.00	0.00	0.00	0.18	0.00
mt	1.70	1.72	1.22	1.09	1.68	4.15	4.28	2.87	2.67	0.00	1.01	0.00	1.25	0.50
hm	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	1.77	2.51	0.00	0.95
il	0.53	0.66	0.47	0.49	0.57	0.63	0.63	0.76	0.80	0.30	0.44	0.44	0.46	0.48
tn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.02	0.00	0.00
ap	0.26	0.33	0.31	0.28	0.28	0.43	0.55	0.59	0.45	0.28	0.36	0.33	0.38	0.36
S.I.	7.20	15.15	8.70	9.76	13.40	10.85	8.47	11.86	14.26	8.79	13.20	9.22	20.13	14.11
D.I.	75.54	68.08	75.49	70.34	68.47	73.20	73.48	74.09	71.63	73.56	71.72	75.05	66.94	73.85

* Sample of third phase

Area No.	Sample No.	Rock Name	Coordinates	Rock Unit	Location
C40	HB036	Granodiorite	14750 43200	Dikmen Gr.	Sıgırirek Stream
C41	KB023	Granodiorite	14440 42750	Dikmen Gr.	Domuzdamı Stream
C42	KB041	Granodiorite	14750 42950	Dikmen Gr.	ditto
C43	KS005	Granodiorite	14800 44450	Ovacık Gr.	S Karagedik Hill
C44	KS015	Granodiorite	15200 46900	Ovacık Gr.	SE Çüçul Hill
C45	K328	Granodiorite	14440 42755	Dikmen Gr.	Domuzdamı Hill
C46	Y309	Granodiorite	13960 42980	Dikmen Gr.	Sıgırirek Hill
E47*	P703	Granodiorite	89240 15300	Çavus Gr.	Bahçeler Hill
E48*	S699	Granodiorite	86870 17580	Çavus Gr.	Darı Hill
C49*	D151	Altered rock	13062 41280	Emeşe F.	MJTC-15(56.80m)
C50*	D152	Altered rock	13062 41280	Emeşe F.	MJTC-15(68.50m)
C51*	D153	Altered rock	13062 41280	Emeşe F.	MJTC-15(119.80m)
C52*	D154	Altered rock	13062 41280	Emeşe F.	MJTC-15(135.00m)
C53*	D155	Altered rock	13062 41280	Emeşe F.	MJTC-15(149.50m)

arg:argillized, sil:silicified rock, limo:limonite, diss:dissemination

ACC※ :Average of Şapçı Volcanics

A : Unaltered andesite (Sample Nos. from No.9 to No.21)

B : Altered andesite (Sample Nos. from No.31 to No.39)

C : Altered andesite (Sample Nos. from No.22 to No.30)

Table 3 Results of X-ray Diffractive Analysis(1)

Zone A

Sample	Altered Rock	Rock	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate		Feld.		Miscellaneous m.						
No.		unit		Mo	Ch	Se	Mu	Ka	Pr	Da	Al	Gy	An	Ca	Do	Si	Cr	Qz	Pl	Kf	Py	Ma	He	Ep	Ho	Cu	Mg
HM159	Al rock(s arg. massive)	Eça	Karatalma D.			△												◎									
HM165	Al an(m arg)	Eça	Karfatma D			•												○	△	•?							
HM168	Al rock with li(m arg)	Eça	SW. Çakmak D.			•?		•										◎	△	•?							
HM202	Al an(w arg)	Eça	Balcılar			•		•										◎					•?				
KB220	Al an tuff(m arg)	Eça	N. Bozburun															○	○	•							
KB225	Al fine tuff(m arg)	Eça	E. Balaban T.					△										◎	•								
KB232	Al an agg(w-m arg)	Eça	E. kaşaklı T.															◎									
KB236	Pale green tuff(unal)	Mba	SE. İncikli T.	•														△	△								
KB239	Dark grey siltstone	Eça	S. Çardaklı T.	•	•									△				△	△	•	•						
TS244	Al rock(s sil)	Eça	ditto					△										◎									
TS252	Iron oxides(m sil, m arg)	Eça	SE. Dededag		•													○	•								
TS254	Al rock(m-s sil, w arg)	Eça	ditto															○		△							
TS282	Al rock(m sil, m arg)	Eça	S. Çalılı T.					•										◎	△	•							
KS219	Purple an	Mba	W. Eçi Köyü	△															△								△?
KS223	Al rock(s arg)	Eça	E. Uzunkır T.	•		•												○	△	•							
KS240	Al rock(s arg)	Eça	Kilinli Mah			•												◎	○	•							
KS253	Purple an	Mba	Kavsara Ç.					•											△		•						
NY150	Al rock(m arg)	Eça	İhlamurlu D.			•												○	△				•				
NY165	Al rock with li(s arg)	Eça	Çıraralan D.			•		•										◎	△	•							
NY172	Al rock(s arg)	Eça	K. Kabak T.			•												○	△	•							
HB187	Al an(w arg)	Eça	Bozburun T.					△										◎									
HB203	White clay(vs arg)	Eça	S. Hacıgeldi T.					△										◎			•						
HB218	Propylitic an	Eça	E. Yale T.					•						△				△	△								
HS213	Pb-Zn-Cu ore(vein type)	Eça	SE Dedeag			•												△			•					△	
HS215	Bre an(m sil, m arg)	Eça	SE Dedeag		•													◎	•		•					△	
HS240	Al tuff(m sil, m arg)	Eça	Elezdag			•												◎									
HS257	Al tuff(m sil, m arg & py)	Eça	SE. Kocasivri					△										◎	•?				•				
HS262	Al tuff(m sil, m arg & py	Eça	S. Kocasivri		•													△	△								
AK096	Al an(s arg)	Eça	Egdidere			•		•?										◎	△	•							
AK104	Al an(s arg)	Eça	Kocataş T.	•		•												△	○	•							
SR150	Weathered an tuff	Mba	Gokdere	•										△				•	•								
SR168	Lithic an(unalt)	Eça	Hacıbayrarı D.					•										○	○	•?							
SR169	Al rock(s arg)	Eça	Hacıbayrarı D.			•		•										◎									

Table 3 Results of X-ray Diffractive Analysis(2)

Zone B

Sample	Altered Rock	Rock	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate		Feld.		Miscellaneous m.							
No.		unit		Mo	Ch	Se	Mu	Ka	Pr	Da	Al	Gy	An	Ca	Do	Si	Cr	Qz	Pl	Kf	Py	Ma	He	Ep	Ho	Tr	Cr	Hd
HM050	White clay in the an	Mşa	W. Osmanlar Mah.	•										◎			△											◎
HM055	Al rock with li(s sil)	Mşa	N. Örendag					△			•?							◎										
HM074	White clay in the al rock	Mşa	Göktepe					•										◎										
HM082	Al rock with li(m arg)	Mşa	W. Kocatepe					•										◎										
HM087	Al an with li(m arg)	Mşa	N. Kocatepe	•	•?															•						△		
HM090	Al rock with li(s arg)	Mşa	Kovandagı Mah.						•										◎									
HM094	Al an with li(s arg)	Mşa	Ada T.	?		•		•									△		•	•								
HM119	Al rock with li(s arg)	Mşa	E. Karacalar			•		•										◎										
HM114	Al rock with li(s arg)	Mşa	W. Güdük Br.			•		•							△?			◎						?				
HM125	Al rock with li(s arg)	Eça	Kargacık D.		•	•												◎										
HM135	Al rock (m arg)	Eça	Kızıltarla D.					•	△									◎										
KB058	Al an(w sil, m arg)	Mşa	NW. Muratlar					•									△	•?	•									
KB067	Al an(m sil, w arg)	Mşa	NE. Karibarabiler					△									△						•?					
KB071	Al granodiorite(w arg)	Rag	NW. Akpınar		•													◎	○	•								
KB087	Al an tuff(vs sil, w arg)	Mşa	SE. Kocataş T.					•									○											
KB089	Al tuff(m sil, w arg	Mşa	ditto								◎							○									△?	
KB101	Al an(s arg)	Mşa	E. Çatlı Mah.					◎																				
KB107	Al an(m arg)	Mşa	Çaltıkara					△									△	△										
KB113	Al an tuff(w arg)	Mşa	Hacıkasım			•		•										△		•?								
KB125	Al an tuff(vw sil, m arg)	Mşa	Deve yolu					•			○							◎										
KB133	Un an tuff	Mşa	Kılıçlanmış Mah.	•															△	•						△		
KB136	Al an tuff(w sil, w arg)	Mşa	Kılıçlanmış					△										△		•?								
KB176	Al an(w sil, m arg)	Mşa	Hacıdervişler Mah.					△									△											
KB192	Al an(vw arg)	Mşa	Teperarla			•?		•									△			•								
TS050	Al an tuff(m sil, m arg)	Mşa	Yukarısapcı			•?			△									◎								○		

Table 3 Results of X-ray Diffractive Analysis(3)

Zone B

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral Mo	Ch	Se	Mu	Ka	Pr	Da	Sulfate m. Al	Gy	An	Carbonate Ca	Do	Si	Silicate Cr	Qz	Feld. Pl	Kf	Miscellaneous m. Py	Ma	He	Ep	Bo	Rh	Pb	Zn
TS064	Al tuff(s arg)	Mşa	Taş T														△											
TS090	Al an(m sil, w arg)	Mşa	Akçaalan D.					•															◎	•				
TS106	Al an(m sil, m arg)	Mşa	Aladağ					•													◎							
TS114	Al an(m sil, w arg)	Mşa	Aladağ								•										○							
TS138	Al rock(s sil)	Mşa	Ada T.				•?													◎								
TS146	Al rock with ja & li	Mşa	Ada T.															◎			•?							
TS153	Al an(m sil, w arg)	Mşa	Egrildere			•												◎										
TS164	Al rock with py(s arg)	Mşa	Egrildere			•		△										◎										
TS175	Al rock(vs sil, w arg)	Mşa	Ala dağı					•										○										
TS181	Al an with sulphur(s sil)	Mşa	Ala dağı			•		•										△										
TS199	Al rock(s sil)	Mşa	W Dede T.			•		•										◎										
TS207	Al an(m sil, w arg)	Mşa	Köpektaş Mvk.			△		•										◎										
TS215	Al rock(m sil, w arg)	Mşa	W.Yukarişapçı			•		△										◎					•					
TS231	Al rock with li(m sil)	Mşa	Kestane dağı					•?										◎					•					
KS065	Atuff(green patch)	Eça	NW.Korluk T.											△				○	○	•								
KS078	Al atuff(w arg)	Eça	Gökçeören T.					△										◎		•								
KS082	Biotite bearing atuff	Eça	Taşoluk Mah.					•										○	◎	•								
KS090	Biotite bearing an	Eça	Kumarlar	•		•													◎	•								
KS093	Al rock(s arg)	Eça	Fırsat T.			•		•										◎										
KS103	Rhodochrosite/Zn-Pb-Cp	Eça	Kocayokuş T.																							◎	○	○
KS113	Atuff	Eça	Sivcidağ			•		•										◎	△	•								
KS126	Al an tuff(m arg)	Eça	Karahuseyin Dağı			•		•										◎										
KS130	Kaoline(kaoline diposit)	Eça	W.Tepetarla	•	•													◎	△	•								
KS138	Al an(m arg)	Mşa	Akmaçakıl T.					△										◎										
KS152	Al an(w arg)	Mşa	Kurt T.					△			•							◎										
NY060	Al atuff(m arg)	Eça	Osmanlar Mah.					△										◎										
NY076	Al an(m arg)	Mşa	E.Kurt T.			•					△							◎										
NY085	Al an(m arg)	Mşa	Gökbüyet D.	•		•												△	△	•?								
NY102	Al an(m arg)	Mşa	Kızılcıklı D.								△							◎	•									
NY119	Al rock with li(s arg)	Mşa	SE.Kok T.		•													△	◎									

Table 3 Results of X-ray Diffractive Analysis(4)

Zone B

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral Mo	Ch	Se	Mu	Ka	Pr	Da	Sulfate m. Al	Gy	An	Carbonate Ca	Do	Si	Silicate Cr	Qz	Feld. Pl	Kf	Miscellaneous m. Py	Ma	He	Ep	Bo
NY124	Al an with py diss(m arg)	Mşa	Hacıkar D.					•	•									◎	•						
NY127	Al an with py diss(s arg)	Mşa	Hacıkar D.					•										○	◎						
NY129	Al an(s arg)	Mşa	Hacıkar D.					•	•									◎							
HB047	Al an(s arg)	Mşa	Çaltıkara							•?							○								
HB085	Al an(w sil, m arg)	Mşa	Geldiren T.								•							◎							
HB090	Al an(w sil, m arg)	Mşa	Geldiren T.			•		•			•							◎	•						
HB093	Al an(s arg)	Mşa	Geldiren T.														•	△	•						
HB103	Al an(m arg)	Mşa	Muratlar			•		•									○	•							
HB108	Al an(m arg)	Mşa	Muratlar	•														○					•		
HB112	Al an(s sil, w arg)	Mşa	Muratlar					△			△							◎							
HB117	Brecciated an(m arg)	Mşa	Muratlar					△										○							
HB120	Al an(s arg)	Mşa	Muratlar															△	•		•?				
HB130A	Al tuff(s arg)	Mşa	Kocataş					○										◎							
HB132	Al an(s arg)	Mşa	Kara T.					△									△								
HB140	Al an(s arg)	Mşa	Kara T.			•												◎							
HB145	Al an(s arg)	Mşa	Çaltıkara					△									△								
HB168	Al an(vs arg)	Mşa	Geldiren T.														△								
HB173	Al an(vs arg)	Mşa	Geldiren T.					•									△								
BS075	Al tuff(m arg)	Mşa	NE.Yukarışapcı			•		•						△				◎			•?				
BS083	Al tuff(m sil, w arg)	Mşa	NW.Yukarışapcı			•		•	•									◎							
BS090	Al an(w sil, m arg)	Mşa	Tombaktaş Mvk.			•		•										◎							
BS093	Al an(w arg)	Mşa	Ocak D.			•		△										◎			•				
BS100	Al an(m arg)	Mşa	Inkaya Mvk					◎										◎							
BS110	Al tuff with li(m arg)	Mşa	Hacıdervişler								△						◎	•							
BS124	Al tuff(m sil, m arg)	Mşa	Hacıdervişler					•	•?		•						△	•							
BS131	An (w sil, m arg)	Mşa	Yanaı D.					•	•									◎							
BS141	An (m sil, m arg)	Mşa	Küçüktepe					△										◎							
BS143	Al tuff(m arg & li)	Mşa	NW.Karacaören T.					•	△									◎							
BS149	An (w arg)	Mşa	Düzpirna T.			•													△						
BS167	An (w arg)	Mşa	Kestane Dağı			•		△										◎							

Table 3 Results of X-ray Diffractive Analysis(5)

Zone B and C

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral: Mo	Ch	Se	Mu	Ka	Pr	Da	Sulfate m.: Al	Gy	An	Carbonate: Ca	Do	Si	Silicate: Cr	Qz	Feld.: Pl	Kf	Miscellaneous m.: Py	Ma	He	Ep	Ho	Tr	Bi
BS186	An (w sil, m arg)	Msa	Çatalkaya T.		·	△														◎							
BS192	Al tuff(m sil, m arg)	Msa	Çatalkaya T.			△														◎						·?	
BS193	Al an(m sil, m arg & py)	Msa	Kestanedağ			△														◎						·	
BS195	Al rock(vs sil, hematite)	Msa	Kestanedağ			△	·?												○					·			
BS200	Al tuff(m sil, m arg)	Msa	Kirazlı dağı			△				·?									◎								
AK018	Al an(m arg)	Eça	Çanakçı D.	·?		·												○	△	·							
AK032	Qz vein in the an	Eça	E. Osmanlar Mah.		·	·												◎									
AK045	Al an(m arg)	Eça	N. Karacalar														·		·								
AK072	Al rock with li	Msa	S. Kok T.			·		·										◎									
AK078	Al rock with li(s arg)	Msa	S. Kok T.		·?	·												○	○								
AK083	Al an with li(m arg)	Eça	NW. Kok T.	·		·												◎									
SR060	Al rock(vs arg)	Eça	Sarıkaya T.					△										◎									
SR075	White clay	Msa	Karaçam T.					△										◎	·	·?							
SR098	Al rock with li(s sil)	Msa	Kavsara T.			·		·										◎									
SR129	Al rock with li(s arg)	Msa	E. Route 60			·		·										◎									
HM004	Dacitic tuff	Pad	Akkayarak Köyü	·	·																					·	
KB003	Metamor rock(skarn zone)	Res	Dikmenkorusu T.																◎								
KB005	Granite(potassic zone)	dg	E. Dikmenkorusu		·														◎	◎		△	·?				△?
KB012	Green schist	Res	S. Sakat T.														△		◎								
KB018	Pelitic schist	Res	SE. Lalebiten T.			·											△		◎								
KB040	Granite(phyllic zone)	dg	SW. Lalebiten T.			·											△		○								
KB048	Qz porphyry with py diss	Po	SW. Lalebiten T.														△	·	◎								
KB056	Green schist with hem	Res	S. Lalebiten T.														△		◎								
TS026	Al rock with qz(s arg)	Res	W. Ortaburun			·											·		◎								
TS038	Meta-volcanic rock	Res	NW. Tabsbası		·													◎	△								
KS017	Limonitized porphyry	Po	Dikmen			·											△		○								
KS031	Granite with qz veinlet	dg	Uzunburun T.			·											△		◎	△		·					
KS040	Limonitized granite	dg	Uzunburun T.														·	◎	△								
KS048	Silicified meta-vol rock	Res	Karaleylek T.																◎								
HB015	Al rock(s arg)	Res	Domuzdamı D.			·											△		◎								
HB019	Granite(phyllic zone)	dg	Domuzdamı D.			·											·		◎								
SE023	Limonitized meta-vol rock	Res	Karaleylek T.																◎							·	

Abbreviations: ◎:Abundant ○:Common △:Few ·:Rare, Mo:Montmorillonite, Ch:Chlorite, Se:Sericite, Mu:Muscovite, Ka:Kaoline, Pr:Pyrophyllite, Da:Diaspore, Al:Alunite, Gy:Gypsum, An:Anhydrite, Ca:Calcite, Do:dolomite, Si:Siderite, Cr:α-Cristobalite, Qz:Quartz, Pl:Plagioclase, Kf:Potassium feldspar, Py:Pyrite, Ma:Magnetite, He:Hematite, Ep:Epidote, Ho:Hornblende, Hd:Heulandite, Tr:Tridymite, Cy:Chrysocolla, Kh:Rhodochrosite, Pb:Galena, Zn:Sphalerite, Mg:Magnetite, Bi:Biotite, Al:altered, Unal:unaltered, arg:argillized, sil:silicified, li:limonite, an:andesite/andesitic, agg:aggromerate, bre:brecciated, vs:very strong, s:strong, m:moderate, w:weak, T.:Hill, Mah.:Village, D.:Stream, N:North, S:South, E:East, W:West, Eça:Çanyayla Volcanics, Msa:Sapçı Volcanics, Mba:Balcılar Volcanics, Rag:Akpınar granite

Table 3 Results of X-ray Diffractive Analysis(6)

Zone B and C

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate		Feld.		Miscellaneous m.							
				Mo	Ch	Se	Mu	Ka	Pr	Da	Al	Gy	Ja	Ca	Do	Si	Cr	Qz	Pl	Kf	Py	Ma	He	Ep	Bo	Tr	Cr	Bd
C346	L brown s arg rock	Int	Dikmen	△		·		·										△	·	·								
M339	White s arg qz porphyry	Int		·		·		○										○		·	·							
M356	ditto	Int		·		·		○										○		·								
K414	white & perple m arg rock	Msa	Piren Hill								○							◎		·								
M406	White s arg rock	Msa		·														·	·	·								
M411	ditto	Msa															◎	△		·								
S380	ditto	Msa									·						○	·										
T366	White s arg porous rock	Msa						·			·						△											
T367	ditto	Msa						○									△	·										
T369	ditto	Msa						△			·						△											
K429	White m sil & s arg rock	Msa	Arlık Stream								○							◎		·								
K446	White s arg rock	Msa				·		·										○		·								
K490	Light grey arg mudstone)	Msa			·	△												◎										
K495	White arg fine tuff	Msa				·?		·	·		·							◎			·							
M317	White & brown m arg rock	Msa						·			○							○		·								
M321	ditto	Msa						·			○							◎		·								
M414	White m arg rock	Msa						·										△		·								
S391	ditto	Msa				·												◎		·								
K526	White m arg rock	Msa	Karaibrahimler			·		·										◎		·								
M446	White s arg rock(adit)	Msa						·									◎			·								
M447	ditto	Msa						△			·						·											
S439	White m arg andesitic tuff	Msa															△	·	△	·								
M460	Pinkish arg rock	Msa	Kestane Mt.					·			◎							◎		·								
T459	White arg rock(andesite)	Msa				·												◎	·	·								
T472	ditto	Msa				·		△										◎	·	·								

Table 3 Results of X-ray Diffractive Analysis(7)

Drill Cores

Sample No.	Altered Rock	Drill Hole No.	Depth	Clay Mineral							Sulfate m.			Carbonate			Silicate		Feld.		Miscellaneous m.							
				Mo	Ch	Se	Mu	Ka	Pr	Da	Al	Gy	Ja	Ca	Do	Si	Cr	Qz	Pl	Kf	Py	Ma	He	Ep	Bo	Rh	Pb	Zn
151	Vs arg rock with limonite		22.00	·				△										◎		·								
152	Dark grey s arg rock with py diss		50.00	△				·										○		·	·							
153	Dark grey brecciated rock(s arg)	MJTC-1	83.00	△				·										△	·	·								
154	Dark grey fractured andesite(w arg)		120.30	△				·										△		·	·							
155	Dark grey fractured andesite(w arg)		150.00	△				·												·	·							
251	White clay(vs arg)		17.00					·										◎		·								
252	Reddish brown limonitic clay(vs arg)		49.00										·					◎					·					
253	White grey clay(vs arg)	MJTC-2	60.80					△										△			·							
254	Dark green clay(m arg)		96.60	△														◎	·	·	·							
255	Dark grey clay(vs arg)		136.00	△				·						·				◎	·	·	·							
351	L grey arg andesite(m arg)		30.00			·		·										◎		·	·							
352	ditto		60.10			·		·										◎		·								
353	L grey m sil rock	MJTC-3	93.00			·		·			·							·	·	·	·							
354	L grey m sil rock		120.00			·		·	·		·							◎		·	·							
355	L grey m sil rock		140.20					·	·		·							◎		·	·							
452	White grey sil & arg rock		27.00						·		△							◎		·								
453	ditto		63.80						·		△							◎										
454	White s arg rock	MJTC-4	93.55					○			·							·										
455	Grey m arg rock with py diss		100.00			·?		△			·							◎	·	·	·							
456	L grey m arg rock with py diss		149.30					△		·	·							◎			·							
551	Light grey clay(vs arg)		30.00			·		·										◎		·	·							
552	Light grey arg & sil rock		60.00					△	·		·							◎		·	·							
553	ditto	MJTC-5	90.00					△	·		·							◎			·							
554	Pale green andesite(m arg)		121.00	·				·?										○		·	·							
555	Black arg mudstone		122.60			·												◎		·	·							
651	White grey s arg rock		33.00	·				·				·						○	·									
652	Reddish brown clay		53.00					·										◎					·					
653	Yellow brown clay	MJTC-6	63.50	·				·										○					·					
654	White grey s arg rock		87.20			·												△	·	·								
655	Grey s arg rock		104.00					·										○		·	·							

Table 3 Results of X-ray Diffractive Analysis(8)

Zone B

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate			Feld.		Miscellaneous m.				
				Mo	Ch	Se	Mu	Ka	Pr	Ha	Al	Gy	Ja	Ca	Do	Si	Cr	Tr	Qz	Pl	Kf	Py	Ma	He	Bi	Bo
C678	White altered andesite	Nsa	Bozcaoren Tepe	•?				•											◎		•					
C681	ditto	Nsa	Dikilitaş Tepe	•				△											◎	•	•					
C683	White altered tuff	Nsa	ditto					◎											◎		•					
N673	white altered andesite	Nsa	Tepetarla Tepe	•						•?							△	•	◎	○	•					
N677	ditto	Nsa	Mezarlık Dere														◎	△	◎							
N685	ditto	Nsa	Küçükpaşa	△													△	•		△	•	•				
N690	ditto	Nsa	Gole	•													○			◎	•					
N696	ditto	Nsa	Hasan Tepe					△									○		△	•						
N700	Grey altered andesite	Nsa	Halilage							•							△	△		•	•			•	•	
N701	White altered andesite	Nsa	ditto	•						•								△			•					
N703	L. brown altered tuff	Nsa	ditto	△				•		△			•				△			•	•					
P604	White altered andesite	Nsa	Seyret Tepe					△			△						○									
P690	L. brown altered andesite	Nsa	ditto					△			△						○		○							
P691	Purplish altered tuff	Nsa	ditto								○						△		○							
P692	White altered andesite	Nsa	ditto					•			○								◎							
P693	ditto	Nsa	ditto	△													△			•	•					
P694	Brown altered andesite	Nsa	ditto					•			○								◎					•		
P695	White altered andesite	Nsa	ditto					•			○								◎							
P696	ditto	Nsa	ditto					•			○					•?			◎							
P697	ditto	Nsa	ditto					•			△								◎							
P698	Yellow altered andesite	Nsa	ditto	•							•		•						○							
P699	L. brown altered andesite	Nsa	ditto					△			•								◎							
P700	White altered andesite	Nsa	ditto					•			•								◎							
P701	L. brown altered andesite	Nsa	ditto	•				•?		•	•						△	△								
P702	White altered andesite	Nsa	ditto					△			△								△							

Table 3 Results of X-ray Diffractive Analysis(9)

Zone B

Sample No.	Altered Rock	Rock unit	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate			Feld.		Miscellaneous m.				
				Mo	Ch	Se	Mu	Ka	Pr	Ha	Al	Gy	Ja	Ca	Do	Si	Cr	Tr	Qz	Pl	Kf	Py	Mo	He	Bi	Bo
S611	White altered andesite	Nsa	Örle Hill	•		○											△			◎	•					
S612	ditto	Nsa	ditto	•									•				•	•		•	•					
S665	White altered fine tuff	Nsa	Coal mine					•											◎	•	•					
S677	White altered rock	Tss	Kabak Hill			○													◎	•	•					
S680	Yellow altered rock	Tss	ditto		○	○													◎	•						
S681	Pink-grey altered rock	Tss	ditto		△	○													◎	•						
T678	Yellow altered andesite	Nsa	Gernetaş Hill	•						•							△		•	•	•					
T679	L. brown altered andesite	Nsa	ditto	△				•									△			•	•					
T680	Yellow altered rock	Nsa	ditto	△				•												•	•					
T681	Pink-grey altered rock	Nsa	ditto	△	•	•														•	•					
T682	White altered tuff	Nsa	Karaçan Hill	•													△			•	•					
T683	Yellow-white altered tuff	Nsa	ditto	△				•									△		•	•	△				•	
T684	White altered andesite	Nsa	Dışılık Hill	△													○		•	•	•					
T685	White altered tuff	Nsa	ditto	△				•									△		•	•	•					
T686	ditto	Nsa	Kocataş Hill			•													◎		•					
T687	ditto	Nsa	ditto			•													◎		•					
Y702	White altered andesite	Nsa	Hasan Hill	•				•									○			•	•					
Y740	ditto	Nsa	Tepeköy	•		•														•						
Y741	ditto	Nsa	ditto	•																•						
Y742	ditto	Nsa	Hasan Hill					○			•						○				•					
Y743	ditto	Nsa	Tepeköy	△													△				•					
Y744	ditto	Nsa	ditto	•				•?					△				•		•							
Y745	ditto	Nsa	Hasan Hill					○			•						△		•							
Y746	ditto	Nsa	ditto					△			△						○									
Y747	Pink-grey altered andesite	Nsa	ditto					△									○									
Y748	L. grey altered andesite	Nsa	ditto					•			△								◎							
Y750	White altered andesite	Nsa	ditto					△			•						○									
Y751	L. brown altered andesite	Nsa	ditto					△			•						△							•		
Y752	Yellow altered tuff	Nsa	ditto	△								△					•		△	•	•					

Table 3 Results of X-ray Diffractive Analysis(10)

Drill Cores

Sample No.	Altered Rock	Drill Hole No.	Depth	Clay Mineral Mo	Ch	Se	Ha	Ka	Pr	Da	Sulfate m. Al	Gy	Ja	Carbonate Ca	Do	Si	Silicate Cr	Qz	Feld. Pl	Kf	Miscellaneous m. Py	Mo	He	Gn	Mg	Bi	Ho
071	Limonitic s arg rock	MJTC-7	9.50			·		·										◎	·	·							
072	Grey s arg rock with py diss		47.00	△				·										△	·		·						
073	ditto		70.00	·				·										△	·	·	·						
074	Grey m arg fine tuff		96.50	△				·						△				△	·	·							
081	L.reddish-brown m arg andesite	MJTC-8	7.00			·												◎		·							
082	L.grey s arg rock		33.00			·												○	·	△	△						
083	L.grey m arg andesite with py diss		87.00			·		·										○	△	·	·						
084	ditto		113.00	·		·												○	△	·	·						
091	White-L.brown s-m sil rock	MJTC-9	10.00								△							◎									
092	L.grey m sil rock		32.00								○							◎					·				
093	L.grey sil fine tuff		76.00								△							◎									
094	L.grey m sil rock with py diss		151.00					·			△							◎			·						
101	L.grey s sil rock	MJTC-10	40.00					△										◎	·	·	·						
102	White brecciated sil rock		83.80					·										◎	·	·							
103	Grey vs massive sil rock with clay		125.00					△										△	·	·				·			
104	L.grey brecciated sil rock		147.00					·			○							◎			·						
111	Grey vs sil rock with alunite	MJTC-11	56.00						△	·						·?	·	△	·	·							
112	ditto		71.40						△		◎	·		·		·	·	○									
113	Grey m-s arg rock with py diss		114.00						○		△	·		·			·	△							·		
114	L.grey s arg rock with py diss		149.00						△										·	·	·						
121	Limonitic s arg rock	MJTC-12	16.00			·		·			△							◎									
122	Reddish grey s arg rock		59.50				·		·		△							○									
123	Grey-red massive vs sil rock		94.60				·		△		·							◎									
124	Grey s arg rock with py diss		148.00			·		△			·							○			·						
131	White clay	MJTC-13	40.80					·	△		·							◎									
132	L.grey fine-grained rock		44.70					·	△		·							◎									
133	Fractured s sil rock		90.30															◎									
134	L.grey fractured s arg rock		117.80					·	△					·?													

Table 3 Results of X-ray Diffractive Analysis(11)

Drill Cores

Sample No.	Altered Rock	Drill Hole No.	Depth	Clay Mineral Mo	Ch	Se	Ha	Ka	Pr	Da	Sulfate m. Al	Gy	Ja	Carbonate Ca	Do	Si	Silicate Cr	Qz	Feld. Pl	Kf	Miscellaneous m. Py	Mo	He	Gn	Mg	Bi	Ho
141	White grey s arg rock	MJTC-14	38.80					·	·		△							◎									
142	White s arg rock		57.30					·			△							◎									
143	L.green m arg andesite		61.20					·	△		△							○									
144	Fractured rock with limonite		119.80						○		·						△	○		·			·				
151	Altered porphyry	MJTC-15	44.20			·		△						·				◎		·	·	·					
152	Grey fault clay		52.70			·		·										◎		·							
153	Silicified rock		68.50			·		·						△				◎	○	·							
154	L.grey m arg porphyry		119.80			·		△										◎	△	·							
155	ditto		131.80			·		△										◎	·	·	·						
156	ditto		149.00			·		·										◎	△	·							
161	Grey m arg andesite	MJTC-16	17.10	△				·						△			△		·	·	·					·	
162	L.grey-green w alt andesite		64.00	○		·											△		·	·	·					·	
163	ditto		83.50	△				△									△	·	·	·			·				
164	Dark green auto-brecciated andesite		150.00	△		·											·	·	△	·	·						
171	Grey m arg andesite	MJTC-17	13.80	△				·											○	·	·						
172	ditto		70.00					△									△		·	·	·					·?	
173	L.grey w arg andesite		96.50					·			·						◎	△			·						
174	Cream yellow s arg rock		142.50	·				·											○	·	·					△	

Abbreviations: ◎:Abundant ○:Common △:Few ·:Rare, Mo:Montmorillonite, Ch:Chlorite, Mu:Muscovite, Se:Sericite, Ka:Kaoline, Pr:Pyrophyllite, Ha:Halloysite, Al:Alunite, Gy:Gypsum, Ja:Jarosite, Ca:Calcite, Do:Dolomite, Si:Siderite, Cr:α-Cristobalite, Tr:Tridymite, Qz:Quartz, Pl:Plagioclase, Kf:Potassium feldspar, Py:Pyrite, Ma:Magnetite, He:Hematite, Bi:Biotite, Ho:Hornblende, Tss:Sakar Dağı Formation, Mga:Gicikler Volcanics, Msa:Şapçı Volcanics

Table 4 Summary of Heavy Mineral Study(1)

Name of Area	Sample No.	Gold No.	Size of Gold Grain A	B	C	D	E	Heavy Minerals Ba	Gr	Ep	Bi	Px	Mz	Ci	Il	Zr	Mg	Rn	Py	Sp	Ga	Sc	Sh	Ru	Ch	Anomaly	Distance from Outcrops
Karaibrahimler	TA069D*1	22			9		13	◎	○			□	△	1	△	□	□	□	◎				□			Au-Ba	1.5km
	TA099D	5	2	2	2	1		○		△		△		○			△	□	□		△				○	Au-Pb-Hg	
	TA113D	57	51	2	1	1	2	◎	・			△						□	□							Au-Ba	0.5km
	TA114D	6	6					◎				○		1			△	△	□							Au-Ba	0.5km
	TA115D	74	70	2	1	1		□	○								□	□	○	△		△	△		□	Au-Ba	0.5km
	TA116T*2	27	20	4	1	1	1	◎										△	△							Au-Ba	0.5km
Kestane Mt.	TA026D	16	7	7	2			□								□	△	◎	□			△				Au	2km
	TA075D	16	6				10	△		○					◎	・	○	□	○						○	Au	1.5km
	TA076D	20	16		2	1	1	□					・		□			□	○		□				□	Au-Pb	1km
	TA111D	8	3	2	2		1	□	◎	○			□	□			○	□	○			○	△			Au-Pb-Hg	2.5km
	TA112D	13	1	2	2	4	4	□									○	◎	□		□	△			○	Au-Pb	2km
Kocataş Hill	TA083D	65	48	5	5	3	4	△	○	◎							□	△	○		・				○	Au	2km
Arlık Stream	TA037D	25	22	2		1		○			○	◎				・	□	□		△		△			□	Au	1.4km
South of Karacaören Hill	TA039D	9	1	8				◎			○	◎	□				◎	◎	△							Au-Ba	2km
	TA095D	10	8	2				△								△	・	□	□							Au	
Kirazlıçantepe	TA009D	9	9					○				△					□	○	○			△				Au	
Armutcuk	TA013D	13	12		1			△			○	◎					□	△	△							Au	1.3km
Karacalar	TA014D	13	13						△	△							○	□	△						□	Au	1km
Çesmetepe	TA049D	6	2	1	1	1	1	△								□	□	◎								Au	1km
Caltıkara	TA066D	16	12	2	2			○	□		○		△					◎								Au-Ba	
Madendagı ～ Kartaldagı	TA006D	14		4	5	5			□								□	□	□							Au-W	
	TA007D	18	11	7				△										△	○					・		Au	
	TA010D	16	11		4	1		□	○	○		◎				△	◎	◎								Au	
	TA011D	109	102	3	1	1		△					△			・	◎	◎	△							Au	2km～
	TA012D	59	46	10	1			○	□			□	△			□	◎	◎	□							Au	2.5km
	TA016D	4	2			1		△								△	□	◎	○	△						Au	
Dededag	TA091D	10	9		1			◎				◎			△		◎		△						○	Au-Ba	2km

Name of Area	Sample No.	Coordinates	Locality	km² ※1	Conditions of Sample※2 SD	ED	S	IC	AC	TS	Geology	Weight※3 -2mm	-1mm	Gravel Li	Si	Ar	Py	He	Remarks
Karaibrahimler	TA069D	8070 2719	S. Karaibrahimler	3.5	×			×			Şapçı V.	7	100		□	□	△		2C izabe
	TA099D	7800 2696	Sarp D.	3.0		×		×			Şapçı V.	5	50			□			
	TA113D	8095 2765	NE. Karaibrahimler	0.5			×			×	Şapçı Vol.	3	60		△	○	△		
	TA114D	8060 2770	N. Karaibrahimler	0.5			×			×	Şapçı Vol.	3	35			○			
	TA115D	8030 2765	Köse D.	1.0		×				×	Şapçı Vol.	3	90		△	○	△		
	TA116T	8070 2760	Karaibrahimler	-							Şapçı Vol.	3	30		○	○	△		
Kestane Mt.	TA026D	7682 3229	N. Karakuz T.	2.0			×		×		Şapçı V.	8	45	□	□	□	□		
	TA075D	7408 2990	Hacıkar D.	2.0							Şapçı V.	6	105	□	△				
	TA076D	7412 3000	W. Kestane Dagı	1.5		×		×			Şapçı V.	6	50	□	□		□		2A izabe
	TA111D	7825 3091	Karakoz D.	3.0	×				×		Şapçı V.	6	130	□	○	△			Spinel△, Pb□
	TA112D	7802 3100	Topallar D.	2.9		×		×			Şapçı V.	6	105	□	○				
Kocataş Hill	TA083D	8297 2946	Incirlık D.	1.0		×		×			Şapçı V.	5	50		□				Scheelite・
Arlık Stream	TA037D	8447 3265	Arlık D.	4.0		×		×			Şapçı V.	6	65						1A izabe
South of Karacaören Hill	TA039D	7810 2410	S. Gokyakan D.	2.0			×			×	Şapçı V.	5	165		○		△		1A izabe
	TA095D	7524 2596	Egri D.	2.5	×			×			Şapçı V.	6	55		□	□	□		
Kirazlıçantepe	TA009D	7302 3195	Kirazlıçantepe D.	5.0		×		×			Şapçı V.	5	75			□			
Armutcuk	TA013D	7054 3413	Armutcuk Çay	13		×		×			Out of area	8	95						
Karacalar	TA014D	7390 3621	Kavgımaç D.	30		×			×		Camyayla V.	8	90						
Çesmetepe	TA049D	7170 1990	E. Çesmetepe	1.5		×		×			Out of area	6	60	□	□			□	1E 500g
Caltıkara	TA066D	8350 2538	S. Taşagıl T.	0.5			×			×	Şapçı V.	4.5	40		□	△			2B izabe
Madendagı ～ Kartaldagı	TA006D	6810 3197	N. Sarp D.	2.0		×			×		Out of area	5	65	○		○	○		Scheelite○
	TA007D	6858 3160	N. İşret T.	2.0		×			×		Out of area	5	35			□	□	□	
	TA010D	6280 3488	Koca D.	3.5		×			×		Out of area	10	265						1A izabe
	TA011D	6252 3422	Kocaçay D.	7.0		×		×			Out of area	12	115						2B izabe
	TA012D	6590 3321	Ekşiçay	18	×				×		Out of area	10	445		□		□		2B izabe
	TA016D	6670 3038	S. Pırnallı T.	9.0		×			×		Out of area	8	130		◎	◎	◎	○	1A izabe
Dededag	TA091D	8317 5533	Asi Dere Yanı	3.0		×		×			Out of area	7	120	□		□			Diopsite◎

Table 4 List of Heavy Mineral Study (2)

Sample No.	Gold No.	Size of Gold Grain A	B	C	D	E	Heavy Minerals Ba	Gr	Ep	Bi	Px	Ci	Zr	Mg	He	Py	Sp	Ga	Ti	Remarks
P314T	1	1											·	△	□				·	
P315T							□						·						□	
P316T													·		○			·		
P317T													·		◎				·	
P319T													△	·	·				·	
P326T										·	·		△		□	△				
P330T							□						□	△		·				
P331T									·				△	△	□	△			·	
P332T							△						△	△		□				
P333T							□		·				·		□				·	
P334T									·		·		△	△	□					
P335T							·				·		△	△	□					
P336T	1	1					□		·		·	·	·		□					
P337D	2	2											·		○	·				
K400T							·		·				·		□					
P341T	2	2												□				·		izabe lead+silver ?
C301T	3	3							·	△			△		□	□				$PbCO_3$
P382D	5	3	1			1		·	○	□	·	△		·	△	□	△			E:400μ
P383D	3	3					·	△	·		△		·	△	△	△				Malachite
P384D	1					1	△	○	□		△		·	○	○	□				E:500μ
P385D	3					3	·	·	·		□		·	△	○	□				E:400~500μ ☆
P386D	3	1		1		1	△	○	□	○	□		·	○	○	□				Malachite. E:400μ
P387D							○		□		△		△	□	○	○	□			
P388D	1	1					·		·		△		△	·	△	△	△			
P389T	2	2									○		·	△	◎	△				
P390D											△		·		△	△				
P391D	15	15					△	·		○	□		·	□	·	·				Tourmaline
P392T	10	9	1					·	·		·		□		□					
P393T	92	91	1				·		·		△		□	△	○	□				
P394T	3	3					·	·	·		·		·	·	◎					

Locality	Sample No.	Coordinates	km² ※1	Conditions of Sample※2 SD	KD	S	IC	AC	TS	Geology	Weight※3 (kg)	Gravel Li	Si	Ar	Py	He
Piren Hill	P314T	80310 21700								Şapçı V	2		○	□		
	P315T	80095 21880								Şapçı V	2	△	○	□		
	P316T	80035 21840								Şapçı V	2	△	○	□	△	△
	P317T	80010 21920								Şapçı V	2	○	○	△		□
	P319T	80325 21970								Şapçı V	2		△	□		
	P326T	80325 21225								Şapçı V	2	□	○	△		△
	P330T	78875 21025								Şapçı V	2			□	△	
	P331T	78805 21060								Şapçı V	2			□	△	
	P332T	80750 21305								Şapçı V	2	△	□	○		
	P333T	80770 21345								Şapçı V	2.5	△	○	△		△
	P334T	81400 21215								Şapçı V	2	△	○	△		
	P335T	81505 21335								Şapçı V	2	△	○	△		
	P336T	81580 21525								Şapçı V	2	△	○	□		△
	P337D	81790 21115	0.25			×			×	Şapçı V	3	△	○	○		△
	K400T	81575 21545								Şapçı V	2	△	○	□		
Arlık Stream	P341T	82380 30640								Slag	2.5					
	C301T	83290 30865								Şapçı V	2		△	□		
	P382D	84350 27760	0.3		×					Şapçı V	5		△			
	P383D	83850 28110	0.1		×				×	Şapçı V	5		□			
	P384D	83690 27900	0.9		×		×			Şapçı V	6		□		△	
	P385D	82850 29150	0.6		×			×		Kirazlı/Şapçı	6		□			
	P386D	83500 29375	0.35		×		×			Şapçı V	6		□			
	P387D	84125 31225	0.15		×			×		Şapçı V	6		□			
	P388D	83285 31535	0.20			×			×	Şapçı V	6		△			
	P389T	83700 31450								Şapçı V	3		○			
	P390D	82725 31820	0.30			×			×	Şapçı V	6		△			
	P391D	82575 31750	0.40		×					Şapçı V	3.5		△			
	P392T	82360 30050								Şapçı V	4	□	○	□		△
	P393T	82440 30150								Şapçı V	4	□	○	□		△
	P394T	82650 30350								Şapçı V	4	□	○	□		△

Table 4 List of Heavy Mineral Study (3)

Sample No.	Gold No.	Size of Gold Grain A	B	C	D	E	Heavy Minerals Ba	Gr	Ep	Bi	Px	Ci	Zr	Mg	He	Py	Sp	Ga	Ti	Remarks
P355D	7	3	3	1			△				○		·	·	○	○		·		
P356D									△					△	△	□		△		
P357T										·	·		△		·					
P358D	2	1	1				△		·					·	□	△	·			
P360T							△						△		□	◎			·	
P363T											·		·		◎	○				
P364T											·			△	□	△				
P365T									△		△					□				
P366D											□		·	△	□	□				
P369D	12	12					◎	·	·				△			·				$PbCO_3$
P370T	7	6	1				○		·				△							$PbCO_3$
P371D							·			△	△			△		□				
P372T							△							·		·				
P373D	4	3	1				◎			□	△		·	△		□	·			Arsenopyrite
P374T							□	·			·		△		○					
P375T	2	2					□			○	·		△			·				
P376T	32	31				1	·				□		·	·	·	△	·			E:1,000μ
P377T							□				□			·	△	△				
P378D							◎			□	·		□	·	△	△	△			
P379D	6	6					·		·	□	△		·	△	◎					
P380D	2	2					□			○	△		·	·	△	△				
P381T										·	·		△		□					
E 2T	1	1					·		·		·		·	·		□				
E 5T	3	3					·		·		·			△		□				
E 7T	4	4					·		·		△	·		□	□	□				
E 9T	5	4	1				□		·		△	△			◎	□				
E 11T	15	15					○		·		□	·		□	◎	□				

Locality	Sample No.	Coordinates	km² ※1	Conditions of Sample ※2 SD	KD	S	IC	AC	TS	Geology	Weight ※3	Gravel Li	Si	Ar	Py	He
	P355D	80170 27680	0.5		×			×		Taşdibek F	6		△		△	
	P356D	80395 28100	0.25			×		×		Taşdibek F	6		△		△	
	P357T	80610 27790								Şapçı Y	3	△	△	□		
	P358D	80980 27800	0.25			×		×		Taşdibek F	6	△	△		□	
	P360T	80890 27550								Şapçı Y	2	△	□	□	△	
	P353T	79585 28170								Şapçı Y	5	□	□	□		
	P364T	79380 27975								Taşdibek F	3	□	□		△	△
	P365T	79555 27950								Taşdibek F	3	□	□		□	
	P366D	79590 27950	0.06		×				×	Taşdibek F	6	△	□		□	
	P369D	80650 27630	0.03			×			×	Şapçı Y	6	△	□	○		
Karaibrahimler	P370T	80685 27590								Şapçı Y	5	△	□	□		
	P371D	80960 27725	0.01		×			×		Şapçı Y	5	○	△	○		
	P372T	80935 27660								Şapçı Y	3	□	△	□		
	P373D	80890 27605	0.01		×			×		Şapçı Y	5	□	△	□		
	P374T	80845 27565								Şapçı Y	3	□	△	□		
	P375T	80800 27540								Şapçı Y	3	□	□	□		
	P376T	80500 27615								Şapçı Y	3		△			
	P377T	80500 27685								Şapçı Y	3		△	□		
	P378D	80915 27350	0.01		×			×		Şapçı Y	6	□	□	□		
	P379D	81810 27275	0.25		×	×				Şapçı Y	6	△	△			
	P380D	81485 27320	0.25	×		×				Şapçı Y	6		□			
	P381T	81265 27610						×		Şapçı Y	3		○	□		
	E 2T	93825 25070								Şapçı Y	6	△	○		△	
	E 5T	93980 25070								Şapçı Y	6	△	○			
Etili	E 7T	93960 24920								Şapçı Y	6	△	□	△		
	E 9T	93950 24850								Şapçı Y	8	○	○	△		○
	E 11T	94000 24860								Şapçı Y	8	○	○	△		○

Qualitative amount Abundant ◎, Common ○, Few □, Rare △, Trace · ※1:Stream sediment ※2:Soil sample

Size of gold grain : A:50μ>, B:50-100μ, C:100-150μ, D:200-300μ, E:300μ<, ☆r:Malachite+scheelite+slag

Hevey mineral:Ba:barite, Gr:garnet, Ep:epidote, Bi:biotite, Px:pyroxine, Mz:monazite, Ci:cinnabar, Il:ilmenite, Zr:zircon, Mg:magnetite, Hm:hematite.

※1 Area of stream.

※2 SD ; stream sediment (sulu dere), KD ; dray stream sediment (kuru dere), S ; flood sediment (selletmeli)
IC ; fine-grained sediment (iyi kansantre), AC ; coarse-grained sediment (orta kansantre), TS ; blend sediment of stream and soil (topraklı kansantre)

※3 weight of sample, Qualitative amount ; Abundant ○, Common □, Few △. Izabe:melted gold

Table 5 Consumables Used(1)

Description	Specification	Unit	Quantity					
			MJTC-1	MJTC-2	MJTC-3	MJTC-4	MJTC-5	MJTC-6
Light oil		ℓ	2,800	3,020	2,680	2,280	2,120	3,080
Petrol		ℓ	950	1,280	680	660	510	690
Engine oil		ℓ	40	60	40	40	40	60
Hydraulic oil		ℓ	20	20	20	20	20	20
Grease		Kg	20	20	20	20	20	20
Cement		Kg	1,500	2,500	1,000	1,000	1,000	2,500
Bentonite		Kg	2,900	5,500	2,900	2,600	2,750	8,350
C.M.C		Kg	-	50	60	60	60	160
Telcoat-L		ℓ	-	-	-	-	-	-
Diamond bit	NQ/BQ	pcs	5/0	9/0	4/3	7/4	4/0	3/3
Diamond reamer	NQ/BQ	pcs	3/0	5/0	2/2	3/2	2/0	2/2
Casing diamond shoe	NX/BW	pcs	1/0	6/0	1/0	6/1	1/0	-
Casing metal shoe	HW/NW/BW	pcs	1/0/0	2/5/0	1/1/0	1/5/0	1/1/3	0/1/0
Core barrel Ass'y	NQ/BQ-WL	set	1/0	2/0	1/1	1/1	1/0	1/1
Inner tube	NQ/BQ-WL	pcs	2/0	2/0	2/2	2/2	2/0	2/2
Core lifter case	NQ/BQ-WL	pcs	4/0	6/0	4/4	4/4	4/0	4/4
Core lifter	NQ/BQ-WL	pcs	6/0	8/0	4/4	4/4	4/0	4/4
Thrust ball bearing	NQ/BQ-WL	pcs	4/0	6/0	4/4	4/4	4/0	4/4
Chuck piece	NQ/BQ-WL	set	1/0	1/0	1/0	1/0	1/0	1/1
Cylinder liner	535-RQ	pcs	3	6	3	3	3	6
Valve seat	535-RQ	pcs	3	6	3	3	3	6
Steel ball	535-RQ	pcs	6	12	6	6	6	6
Piston rubber	535-RQ	pcs	9	9	6	6	6	12
Core box	NQ & BQ	pcs	31	28	30	22	33	28

Table 5 Consumables Used(2)

Description	Specification	Unit	Quantity					
			MJTC-7	MJTC-8	MJTC-9	MJTC-10	MJTC-11	MJTC-12
Light oil		ℓ	15,980	1,900	4,020	3,700	4,660	3,700
Petrol		ℓ	4,770	720	1,560	1,530	1,920	930
Engine oil		ℓ	280	40	40	60	80	60
Hydraulic oil		ℓ	120	20	20	20	20	20
Grease		Kg	120	20	20	20	20	20
Cement		Kg	9,500	1,000	1,000	1,000	1,000	1,000
Bentonite		Kg	25,000	1,800	5,300	6,050	2,550	3,600
C.M.C		Kg	290	20	60	60	30	30
Telcoat-L		ℓ	-	-	10	-	-	-
Diamond bit	NQ/BQ	pcs	32/10	4/0	3/4	8/9	7/6	3/3
Diamond reamer	NQ/BQ	pcs	17/ 6	2/0	2/2	4/4	3/3	2/2
Casing diamond shoe	NX/BW	pcs	15/ 1	0/0	1/2	3/2	1/1	1/1
Casing metal shoe	HW/NW/BW	pcs	6/13/3	0/1/0	0/1/1	1/3/2	1/3/4	1/2/0
Core barrel Ass'y	NQ/BQ-WL	set	7/3	1/0	1/1	1/1	1/1	1/1
Inner tube	NQ/BQ-WL	pcs	12/6	2/0	2/2	2/2	2/2	2/2
Core lifter case	NQ/BQ-WL	pcs	26/12	4/0	4/4	6/4	4/4	4/4
Core lifter	NQ/BQ-WL	pcs	30/12	4/0	4/4	6/4	4/4	4/4
Thrust ball bearing	NQ/BQ-WL	pcs	26/12	2/0	4/4	4/4	4/4	4/4
Chuck piece	NQ/BQ-WL	set	6/1	1/0	1/1	1/1	1/1	1/1
Cylinder liner	535-RQ	pcs	24	3	3	6	6	3
Valve seat	535-RQ	pcs	24	3	3	6	6	3
Steel ball	535-RQ	pcs	42	3	6	6	6	3
Piston rubber	535-RQ	pcs	45	6	9	12	12	9
Core box	NQ & BQ	pcs	172	32	26	25	28	28

Table 5 Consumables Used(3)

Description	Specification	Unit	Quantity					Total
			MJTC-13	MJTC-14	MJTC-16	MJTC-17		
Light oil		ℓ	3,200	3,100	3,160	2,900		50,070
Petrol		ℓ	1,320	1,290	1,110	1,020		17,460
Engine oil		ℓ	40	40	40	40		760
Hydraulic oil		ℓ	20	20	20	20		320
Grease		Kg	20	20	20	20		320
Cement		Kg	1,000	1,000	1,000	1,000		19,500
Bentonite		Kg	2,600	2,500	2,300	4,600		59,000
C.M.C		Kg	60	60	30	50		580
Telcoat-L		ℓ	-	-	10	10		40
Diamond bit	NQ/BQ	pcs	8/0	8/0	4/1	3/2		85/35
Diamond reamer	NQ/BQ	pcs	4/0	4/0	2/1	2/1		45/19
Casing diamond shoe	NX/BW	pcs	3/0	3/0	1/1	1/1		30/ 9
Casing metal shoe	HW/NW/BW	pcs	1/3/0	1/3/0	1/1/0	1/0/0		13/27/10
Core barrel Ass'y	NQ/BQ-WL	set	1/0	1/0	1/1	1/1		17/9
Inner tube	NQ/BQ-WL	pcs	2/0	2/0	2/2	2/2		32/18
Core lifter case	NQ/BQ-WL	pcs	6/0	6/0	4/4	4/4		72/32
Core lifter	NQ/BQ-WL	pcs	6/0	6/0	4/4	4/4		78/36
Thrust ball bearing	NQ/BQ-WL	pcs	4/0	4/0	2/2	2/2		60/28
Chuck piece	NQ/BQ-WL	set	1/0	1/0	1/1	1/1		15/7
Cylinder liner	535-RQ	pcs	3	3	3	3		60
Valve seat	535-RQ	pcs	3	3	3	3		60
Steel ball	535-RQ	pcs	3	3	3	3		81
Piston rubber	535-RQ	pcs	9	9	9	9		138
Core box	NQ & BQ	pcs	31	27	27	25		452

Table 6 Drilling Meterage of Diamond Bit, Reamer and Casing Shoe Bit Used(1)

Size	Drilling Meterage by Unit											
	MJTC-1		MJTC-2		MJTC-3		MJTC-4		MJTC-5		MJTC-6	
	Diam.	m	Diam.	m	Diam.	m	Diam.	m	Diam.	m	Diam.	m
	NT-1	10.95	NT-2	4.40	NT-23	11.40	NT-22	9.50	NT-13	33.65	NT-18	32.75
	NT-3	31.85	NT-4	5.45	NT-25	17.75	NT-24	10.55	NT-15	28.75	NT-20	23.35
	NT-5	29.15	NT-6	6.10	NT-30	28.25	NT-25	12.60	NT-17	39.65	NT-21	13.95
	NT-7	40.50	NT-8	15.95	NT-31	12.80	NT-26	9.80	NT-19	48.95		
NQ	NT-9	38.55	NT-10	11.50			NT-27	16.85				
			NT-11	17.10			NT-28	6.50				
Bit			NT-12	26.00			NT-29	7.40				
			NT-14	30.70								
			NT-16	33.80								
					BT- 8	23.05	BT- 4	8.40			BT- 1	26.15
BQ					BT- 9	30.15	BT- 5	20.70			BT- 2	28.55
Bit					BT-10	27.60	BT- 6	19.35			BT- 3	26.25
							BT- 7	29.45				
m/pc		30.20		16.78		21.57		13.74		37.75		25.17
	NR-1	42.80	NR-2	4.40	NR-15	29.15	TR-13	20.05	TR- 9	62.40	TR-10	56.10
NQ	NR-3	69.65	NR-4	11.55	NR-17	41.05	TR-14	22.40	TR-11	88.60	TR-12	13.95
	NR-5	38.55	NR-6	27.45			TR-16	30.75				
Reamer			NR-7	43.10								
			NR-8	64.50								
BQ					BR- 5	53.20	BR- 3	29.10			BR- 1	54.70
Reamer					BR- 6	27.60	BR- 4	48.80			BR- 2	26.70
m/pc		50.33		30.20		37.75		30.22		75.59		37.75
Casing	NX	1pc	NX	3pcs	NX	1pc	NX	3pcs	NX	1pc	NX	1pc
Shoe					BW	1pc	BW	1pc			BW	2pcs

Table 6 Drilling Meterage of Diamond Bit, Reamer and Casing Shoe Bit Used(2)

Size	Drilling Meterage by Unit									
	MJTC-7		MJTC-8		MJTC-9		MJTC-10		MJTC-11	
	Diam.	m	Diam.	m	Diam.	m	Diam.	m	Diam.	m
NQ Bit	NT-35	31.80	NT-31	35.15	NT-43	31.80	NT- 1	17.15	NT- 2	21.10
	NT-36	31.75	NT-32	45.75	NT-44	25.90	NT- 3	22.90	NT- 4	10.95
	NT-37	33.50	NT-33	45.55	NT-45	18.95	NT- 5	21.20	NT- 6	9.20
	NT-38	27.45	NT-34	24.55			NT- 7	21.25	NT- 8	5.55
	NT-39	26.50					NT- 9	20.65	NT-10	9.70
							NT-11	2.90	NT-12	6.10
							NT-13	4.15	NT-14	8.80
							NT-15	6.20		
BQ Bit					BT-20	15.75	BT- 1	1.80	BT- 2	11.80
					BT-21	19.15	BT- 3	2.15	BT- 4	12.95
					BT-22	24.55	BT- 5	4.10	BT- 6	6.10
					BT-23	14.90	BT- 7	5.55	BT- 8	12.00
							BT- 9	2.55	BT-10	18.50
							BT-11	6.10	BT-12	18.25
							BT-13	2.35		
							BT-14	1.75		
							BT-15	8.25		
m/pc	5pcs	30.20	4pcs	37.75	7pcs	21.57	17pcs	8.88	13pcs	11.62
NQ Reamer	NR-18	63.55	NR-16	80.90	NR-23	31.80	NR- 1	40.05	NR- 2	32.05
	NR-19	60.95	NR-17	70.10	NR-25	44.85	NR- 3	42.45	NR- 4	24.45
	NR-20	26.50					NR- 5	23.50	NR- 6	14.90
							NR- 7	10.40		
BQ Reamer					BR-11	34.90	BR- 1	3.95	BR- 2	24.75
					BR-12	39.45	BR- 3	9.65	BR- 4	18.10
							BR- 5	11.00	BR- 7	36.75
							BR- 6	10.00		
m/pc	3pcs	50.33	2pcs	75.50	4pcs	37.35	8pcs	18.88	6pcs	25.17
Casing shoe	NW	1pc	NW	1pc	NW	1pc	NW	3pcs	NW	1pc
					BW	2pcs	BW	2pcs	BW	1pc

Table 6 Drilling Meterage of Diamond Bit, Reamer and Casing Shoe Bit Used(3)

Size	Drilling Meterage by Unit									
	MJTC-12		MJTC-13		MJTC-14		MJTC-16		MJTC-17	
	Diam.	m	Diam.	m	Diam.	m	Diam.	m	Diam.	m
	NT-40	31.65	NT-19	22.45	NT-15	8.50	NT-46	22.95	NT-50	24.40
	NT-41	26.55	NT-20	19.85	NT-16	17.25	NT-47	37.60	NT-51	29.05
	NT-42	21.25	NT-24	25.90	NT-17	17.40	NT-48	30.35	NT-53	31.95
			NT-25	25.40	NT-18	23.30	NT-49	21.05		
NQ			NT-27	20.35	NT-21	18.90				
Bit			NT-28	12.90	NT-22	25.40				
			NT-29	15.35	NT-23	17.65				
			NT-30	8.80	NT-26	22.60				
	BT-16	16.80					BT-19	39.05	BT-24	35.05
BQ	BT-17	23.95							BT-25	30.55
Bit	BT-18	30.80								
m/pc	6pcs	25.17	8pcs	18.90	8pcs	18.90	5pcs	30.20	5pcs	30.20
	NR-21	31.65	NR-10	42.30	NR- 8	25.75	NR-24	60.55	NR-27	53.45
NQ	NR-22	47.80	NR-11	51.30	NR- 9	40.70	NR-26	51.40	NR-28	31.95
Reamer			NR-14	33.25	NR-12	44.30				
				NR-15	24.15	NR-13	40.25			
	BR- 8	40.75					BR-10	39.05	BR-13	65.60
BQ Reamer	BR- 9	30.80								
m/pc	4pcs	37.75	4pcs	37.75	4pcs	37.75	3pcs	50.33	3pcs	50.33
Casing	NW	1pc	NW	3pcs	NW	3pcs	NW	1pc	NW	1pc
shoe	BW	1pc					BW	1pc	BW	1pc

Table 7 Working Time Breakdown of the Drilling Operation

Hole No.	Drilling			Shift		Men Working		Working Time						
	Bit size	Drilling length	Core	Drilling	Total	Engineer	Worker	Drilling	Other work	Recovery	Total	Removal	Road construction and others	G. Total
		m	m	shift	shift	Number of men		h	h	h	h	h	h	h
MJTC- 1	NQ	151.00	145.75	34	42	53	152	152	120	8	280	24	40	344
MJTC- 2	NQ	151.00	130.05	54	58	63	244	202	190	40	432	16	16	464
MJTC- 3	NQ/BQ	151.00	139.55	25	36	48	180	155	73	-	228	40	48	316
MJTC- 4	NQ/BQ	151.10	113.80	25	32	32	156	148	76	-	224	16	16	256
MJTC- 5	NQ	151.00	151.00	19	27	27	140	133	57	-	190	16	48	254
MJTC- 6	NQ/BQ	151.00	138.75	32	44	44	200	183	125	-	308	16	48	372
Average	NQ/BQ	151.10	136.48	32	40	45	179	162	107	8	277	21	36	334
MJTC- 7	NQ	151.00	140.55	37	43	55	165	174	122	8	304	24	16	344
MJTC- 8	NQ	151.00	150.80	19	24	33	99	93	59	-	152	16	16	184
MJTC- 9	NQ/BQ	151.00	138.55	48	54	69	207	155	229	-	384	24	24	432
MJTC-10	NQ/BQ	151.10	119.95	44	51	68	204	180	188	-	368	16	24	408
MJTC-11	NQ/BQ	151.00	150.70	57	64	83	249	188	164	112	464	24	24	512
MJTC-12	NQ/BQ	151.00	142.70	26	32	42	126	141	75		216	24	16	256
MJTC-13	NQ	151.00	126.50	40	44	56	168	162	158	-	320	16	16	352
MJTC-14	NQ	151.00	121.95	38	43	54	162	134	178	-	312	16	16	344
Average	NQ/BQ	151.00	136.46	39	44	58	173	153	147	15	315	20	19	354
MJTC-16	NQ/BQ	151.00	136.45	32	37	48	144	154	101	-	255	24	16	295
MJTC-17	NQ/BQ	151.10	135.40	29	34	45	135	138	94	-	232	16	24	272
Average	NQ/BQ	151.00	818.90	189	239	267	1,072	973			1,662	128	216	2,006

Table 8 Significant Analytical Results of Core(1)

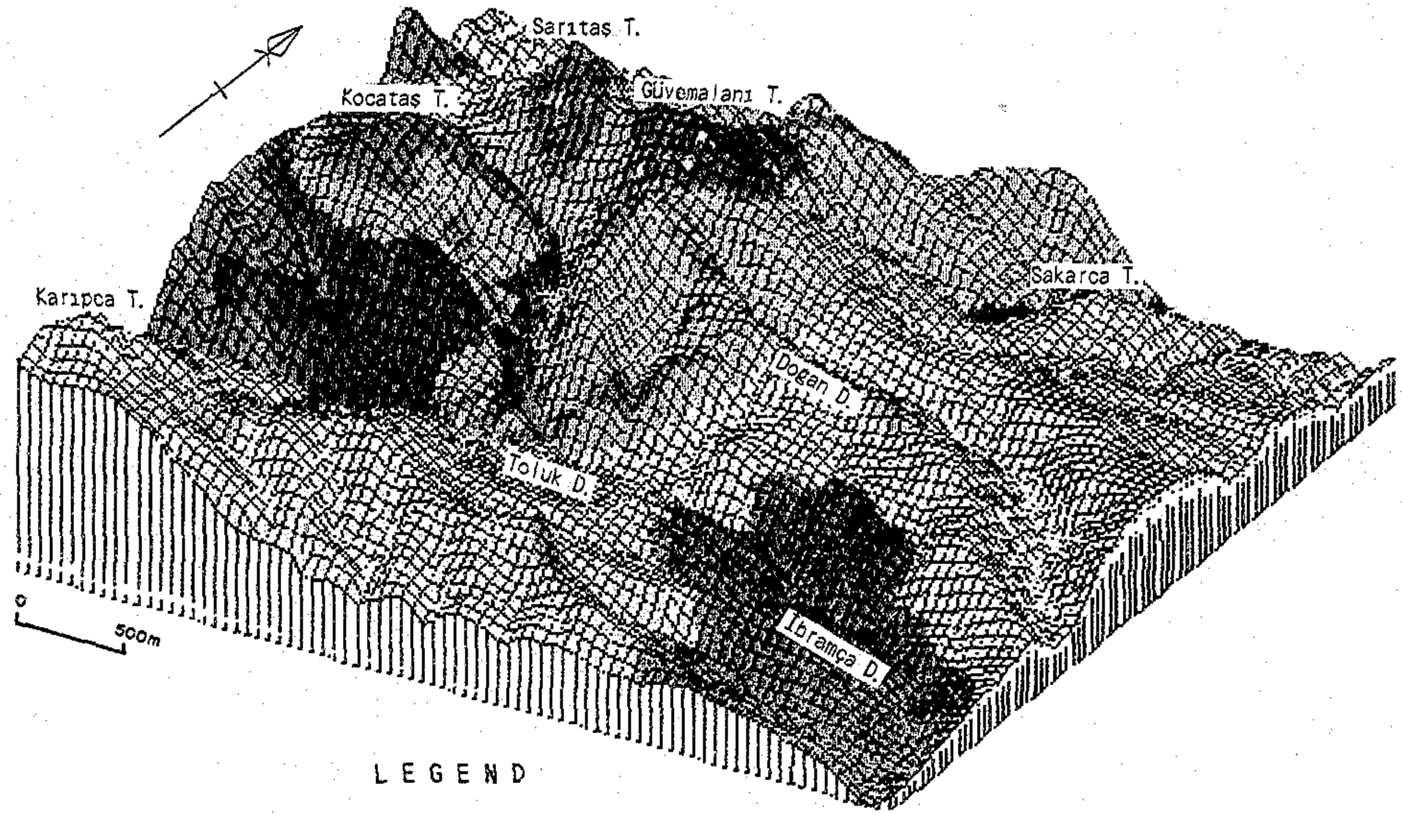
Drill No.	Sample No.	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Sb ppm	Hg ppb	Mo ppm
MJTC-10	1003	110	<0.2	10	5	4	0.2	30	60
	1004	105	<0.2	16	8	4	0.4	20	50
	1032	155	10.5	28	58	12	740	310	77
	1033	120	6.2	24	20	4	150	380	20
	1035	135	3.4	30	7	2	30.0	240	13
	1036	165	5.5	26	8	2	29.0	250	18
	1037	145	5.3	150	7	4	15.2	360	5
	1038	190	2.3	70	17	4	14.6	180	10
	1041	340	8.2	2600	33	30	150	330	12
	1042	105	<0.2	164	50	4	3.0	70	9
	1043	105	0.2	190	30	8	3.6	60	8
	1045	160	2.2	1800	42	14	14.4	110	10
	1046	420	1.7	3200	30	20	115	220	8
MJTC-11	1147	110	<0.2	12	26	40	0.6	20	26
	1148	120	<0.2	38	18	14	0.4	20	26
	1149	100	<0.2	8	15	6	1.6	20	33
MJTC-12	1236	820	<0.2	20	9	7	11.0	10	55
	1237	165	<0.2	42	10	12	9.8	10	70
	1244	110	<0.2	6	35	4	1.6	10	7
MJTC-13	1303	175	<0.2	220	6	178	0.2	20	7
	1324	105	<0.2	1	49	5	0.8	20	16
	1325	110	<0.2	1	30	4	0.4	20	10
	1328	110	<0.2	2	136	4	1.2	10	72
	1329	215	<0.2	2	160	3	1.8	10	70
	1330	130	<0.2	2	102	4	1.0	10	14
	1331	130	<0.2	3	32	5	0.4	10	4
	1332	125	<0.2	2	19	4	0.2	10	2
	1333	105	<0.2	5	7	4	4.2	20	16
	1334	200	<0.2	3	115	4	7.0	10	95
	1350	315	<0.2	1	30	4	0.4	20	9
MJTC-14	1402	180	<0.2	9	5	6	0.2	20	3
	1403	130	<0.2	48	3	26	0.2	20	3
	1405	180	18.2	86	4	26	0.2	20	2
	1406	110	0.4	24	3	16	0.4	20	4
	1407	145	<0.2	4	2	4	0.2	20	2
	1408	195	10.5	126	6	80	0.4	20	3
	1411	170	0.8	104	7	80	1.2	10	8
	1412	145	<0.2	6	93	8	2.4	20	17
	1413	110	0.3	96	12	56	0.8	20	9
	1414	220	<0.2	8	32	6	1.2	20	4
	1415	200	9.6	56	48	26	0.8	20	41
	1416	155	0.7	10	10	8	3.2	20	12
	1417	260	<0.2	6	40	4	2.6	20	38
	1418	105	<0.2	6	22	2	0.4	20	2
	1419	205	<0.2	6	24	2	1.8	20	20
	1420	240	<0.2	4	39	2	1.8	20	7
	1424	220	<0.2	4	28	2	2.0	10	7
	1426	800	<0.2	2	28	2	0.8	10	8
	1427	180	<0.2	2	18	2	2.4	5	28
	1429	360	<0.2	2	72	2	1.6	10	30
	1433	200	<0.2	4	23	2	1.0	10	10
	1448	100	<0.2	2	31	2	3.6	10	15

Table 8 Significant Analytical Results of Core(2)

Drill No.	Sample No.	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Sb ppm	Hg ppb	Mo ppm
MJTC-2	207	150	<0.2	10	38	4	12.6	40	8
	209	120	2.1	30	91	12	110.0	440	2
	210	570	<0.2	20	87	14	95.0	740	2
	211	215	<0.2	8	38	6	86.0	1800	1
	212	125	<0.2	56	97	22	380.0	2100	5
	214	535	1.9	39	79	8	110.0	880	5
	215	545	6.1	40	67	14	41.0	820	4
	216	2260	9.3	28	62	14	52.0	2000	3
	217	4400	4.5	108	370	36	180.0	2400	12
	218	375	0.3	25	57	8	21.0	1800	1
MJTC-4	407	445	<0.2	38	12	12	0.8	10	130
	408	100	<0.2	2	6	4	0.2	10	10
	413	1300	<0.2	4	4	2	0.2	10	11
	414	100	<0.2	32	3	4	0.2	10	76
	416	280	<0.2	59	6	4	0.6	10	110
	417	185	<0.2	22	6	4	0.2	10	70
	418	315	<0.2	35	4	4	0.6	10	50
	420	125	<0.2	17	6	6	0.4	10	64
	423	155	<0.2	25	34	4	0.4	40	40
	429	110	<0.2	17	18	2	<0.2	10	85
	431	110	<0.2	21	46	4	0.4	10	70
	433	240	<0.2	95	26	8	0.4	20	30
	434	305	<0.2	185	32	8	0.2	70	44
	435	145	<0.2	31	20	6	0.4	190	60
	437	120	<0.2	19	14	8	0.2	80	37
	442	110	<0.2	11	22	14	0.2	20	25
	443	100	<0.2	14	18	22	0.4	20	34
	446	100	<0.2	12	12	12	<0.2	10	67
	447	145	<0.2	12	10	8	0.2	20	50
	449	110	<0.2	11	12	6	0.2	20	18
	450	140	<0.2	10	12	6	0.2	10	52
MJTC-6	620	145	<0.2	70	60	6	4.6	350	6

Table 8 Significant Analytical Results of Core(3)

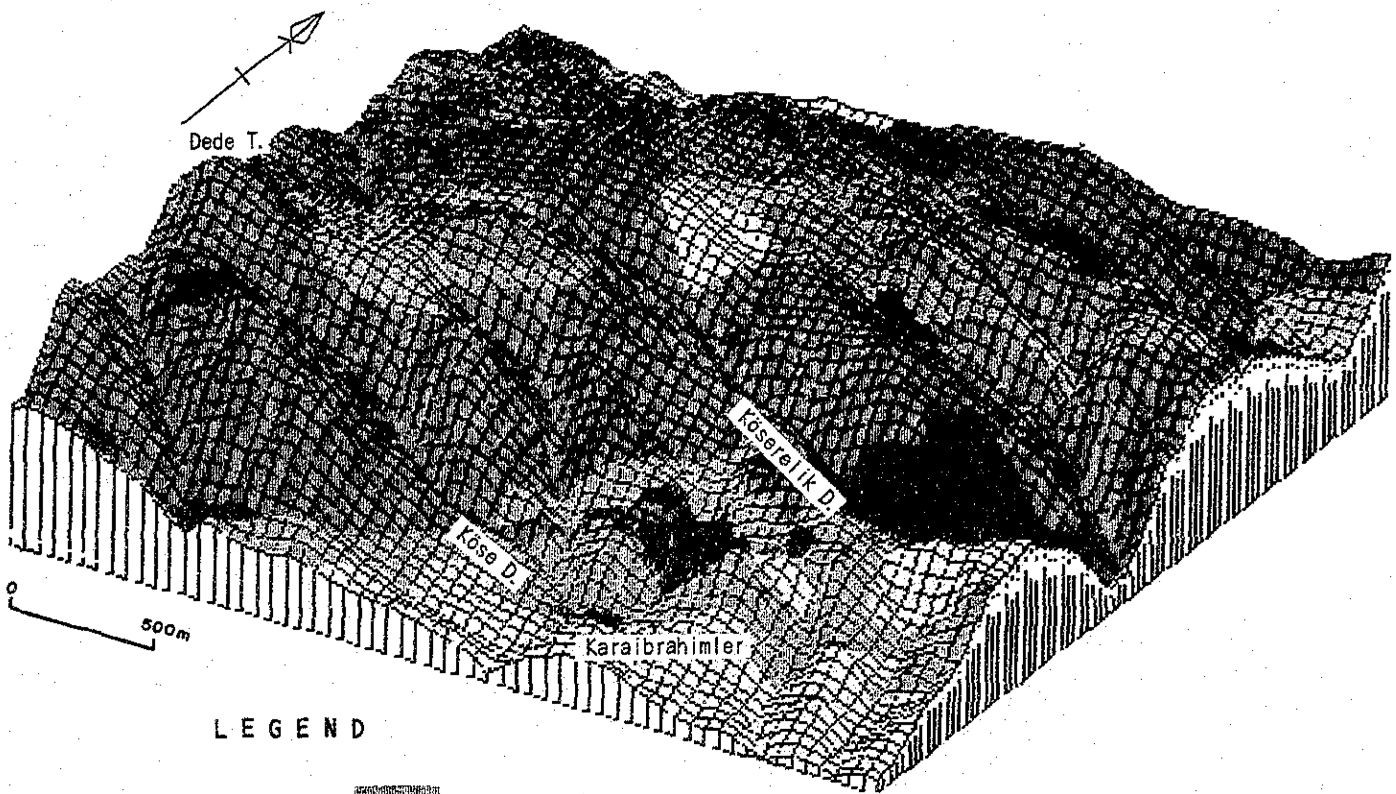
Drill No.	Sample No.	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Sb ppm	Hg ppb	Mo ppm
MJTC-16	1602	640	1.8	52	250	21	83.0	9600	15
	1603	1080	1.6	90	400	22	125.0	8800	18
	1604	575	1.4	54	220	12	87.0	8100	9
	1605	295	0.9	79	510	32	53.0	5500	7
	1607	310	1.1	85	310	42	77.0	4600	15
MJTC-15	1504	30	0.5	2400	40	720	57.0	6700	136
	1506	<5	<0.2	170	19	230	27.0	1500	105
	1510	<5	<0.2	160	25	260	22.0	1200	116
	1515	<5	<0.2	32	2	38	3.6	1700	100
	1535	<5	<0.2	36	8	38	5.6	4400	320
	1536	<5	<0.2	54	9	36	13.0	5800	105
	1538	<5	<0.2	675	18	230	100.0	3400	235
	1539	<5	<0.2	62	5	48	14.8	8200	100
	1545	<5	<0.2	44	59	620	7.6	6800	110
	1546	<5	<0.2	36	52	500	7.6	3500	130



LEGEND

Age	Unit	Lithology
Holocene	Kocaçakıl Basalt	Basalt lava
Holocene	Karaköy F.	Conglomerate, sandestone and mudstone
Miocene	Şapçı Vol.	Andesite lava and pyroclastics
Jurasaic	Kirazlı Conglomerate	Conglomerate, sandestone and mudstone
Triassic	*Taşdibek F.*	Meta-volcanics
Alteration		Moderately silicified
		Strongly silicified body
		Silicified and argillized zone
		Argillized zone

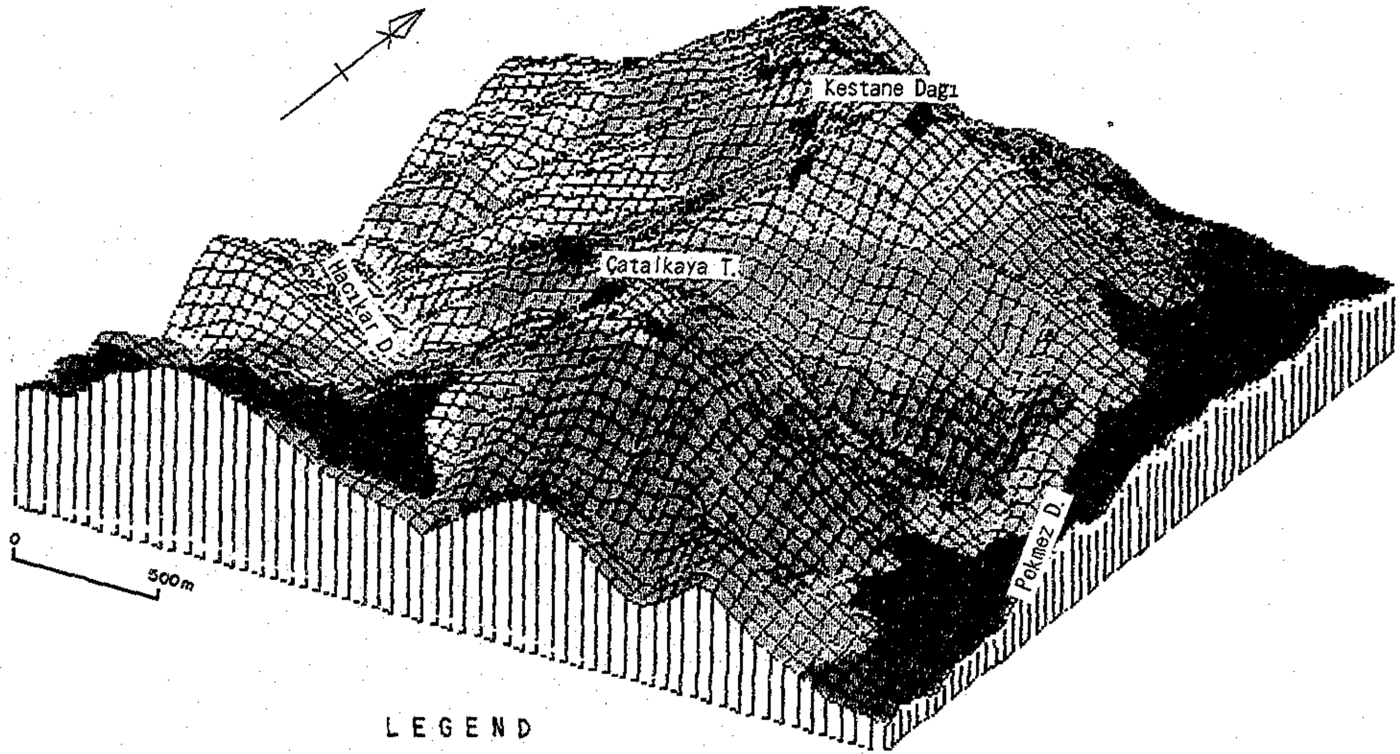
Figure 1 Topography and Geology of Arlık Stream Area



L E G E N D

Holocene Kocaçakıl Basalt		Basalt lava and dyke
Miocene Şapçı Vol.		*Andesite lava and pyroclastics*
Jurasaic Kirazlı Conglomerate		Conglomerate, mudstone and sandstone
Triassic Taşdibek F.		*Akpınar granite*
		Meta-volcanics and meta-sediments
		Crystalline limestone
Alteration		Strongly silicified body
		Moderately silicified, and argillized zone/or body
		Argillized zone
Mineralization		Skarn zone (garnet, henmatite)

Figure 2 Topography and Geology of Karaibrahimler Area



LEGEND

Holocene	Talus breccia	Breccia and sand
Miocene	Şapçı Vol.	Andesite lava and pyroclastics
Jurasaic	Kirazlı Conglomerate	Conglomerate, mudstone and sandstone
Triassic	Taşdibek F.	Meta-volcanics
Alteration		Strongly silicified body
		Moderately argillized body
		Silicified and argillized zone
		Argillized zone

Figure 3 Topography and Geology of Kestane Mt. Area

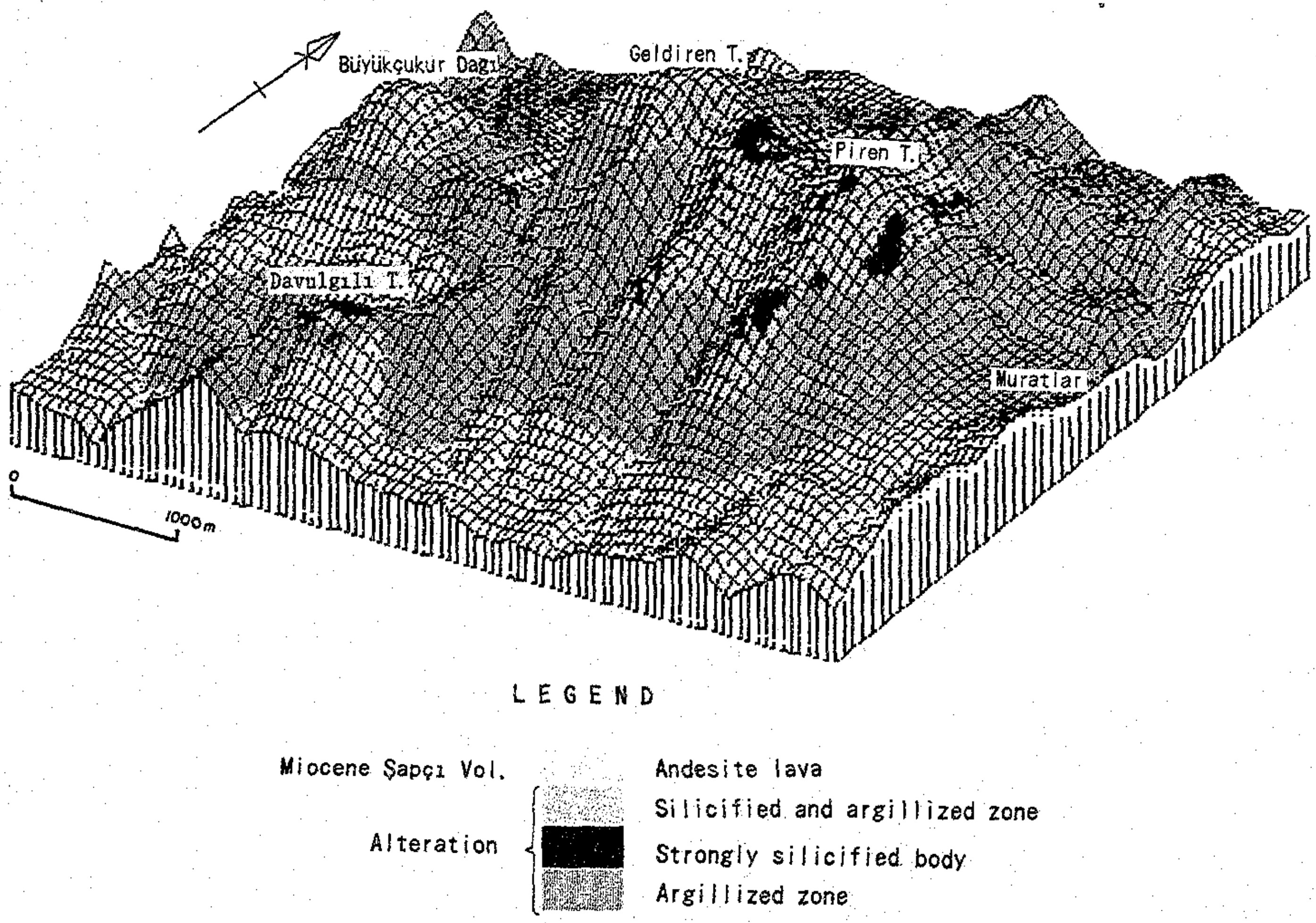


Figure 4 Topography and Geology of Piren Hill Area

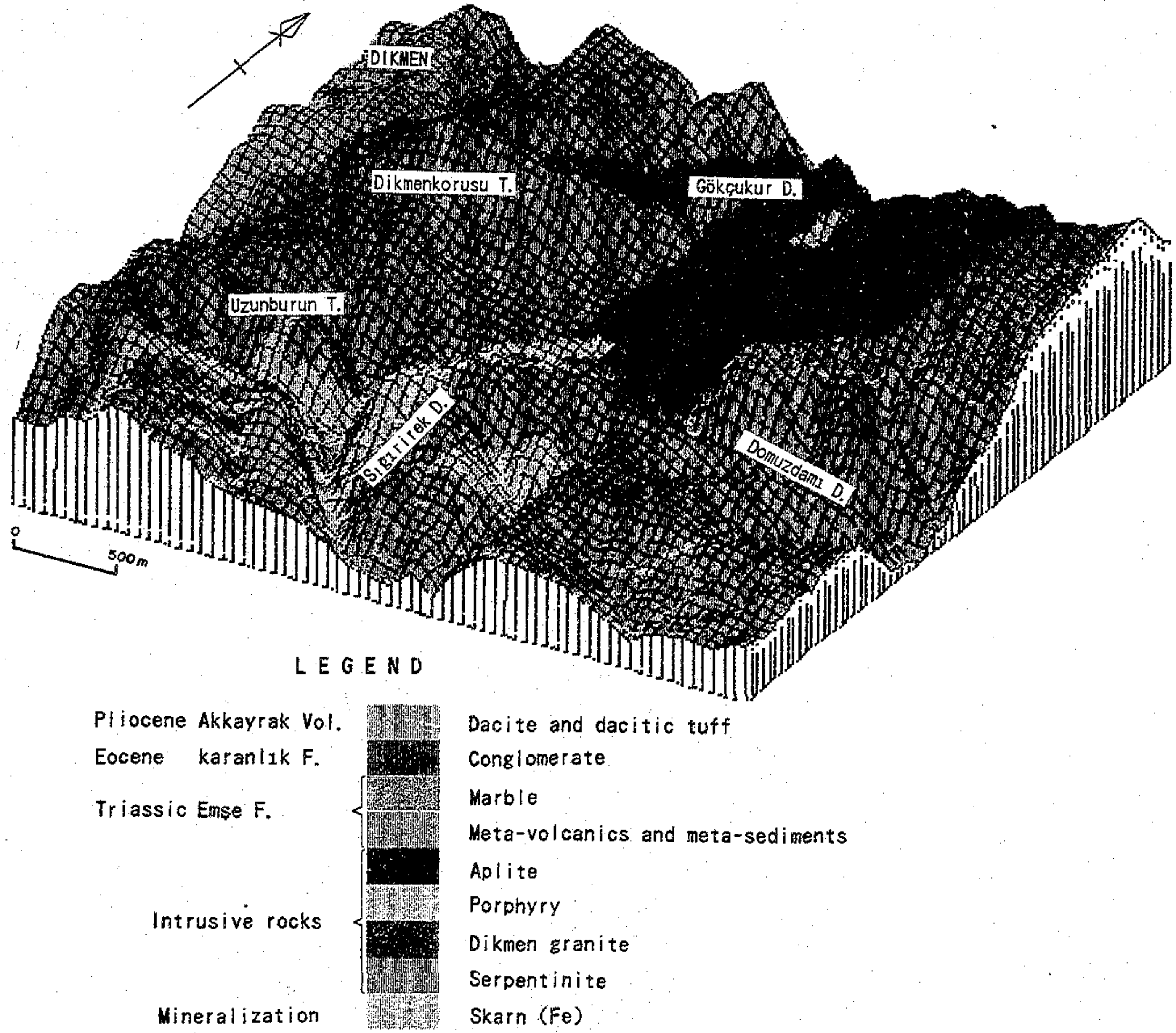


Figure 5 Topography and Geology of Dikmen Area