sericitization. Alteration indexes of 3 specimens range from 94 to 96%, intensely mineralized and altered. The assay results of the pyrite dissemination specimens (K062, K063) are 0.004 - 0.12g/t Au, 0.06 - 20.00g/t Ag, 0.002 - 0.003% Cu, 0.001 - 0.01% Pb, <0.001 -0.01% Zn, 0.03 - 0.03% Ba, 13.60 - 15.80% S, 75 - 239 ppm As. The grade of Ag and As are high.

There is a old adit in the N60° W direction. The Mineralization condition in this mine is not clear because of the adit has collapsed, it is estimated that the mine had been operated for clay zone, being accompanied with pyrite dissemination.

Dardanel company had carried out IP, HLEM and drilling surveys in this area. They drilled 3.05 m thick disseminated ore (average grade 4.66 % Cu)

(iv) Lepüskür Occurrence

This occurrence is situated in the upper stream of the Lepüskür River, and about 1.5 km southeast of the Çakmakkaya Deposit. Dacitic pyroclastic rocks of the lower Murgul Formation have undergone silicification, producing quartz, sericite, and chlorite, being accompanied with pyrite dissemination. Alteration indexes of 3 specimens range from 95 to 97%, a very high percentage.

The assay result of the pyrite dissemination specimen (L015) is 0.01g/t Au, 0.15g/t Ag, 0.001% Cu, 0.001% Pb, 0.001% Zn, 0.03% Ba, and 1.36% S.

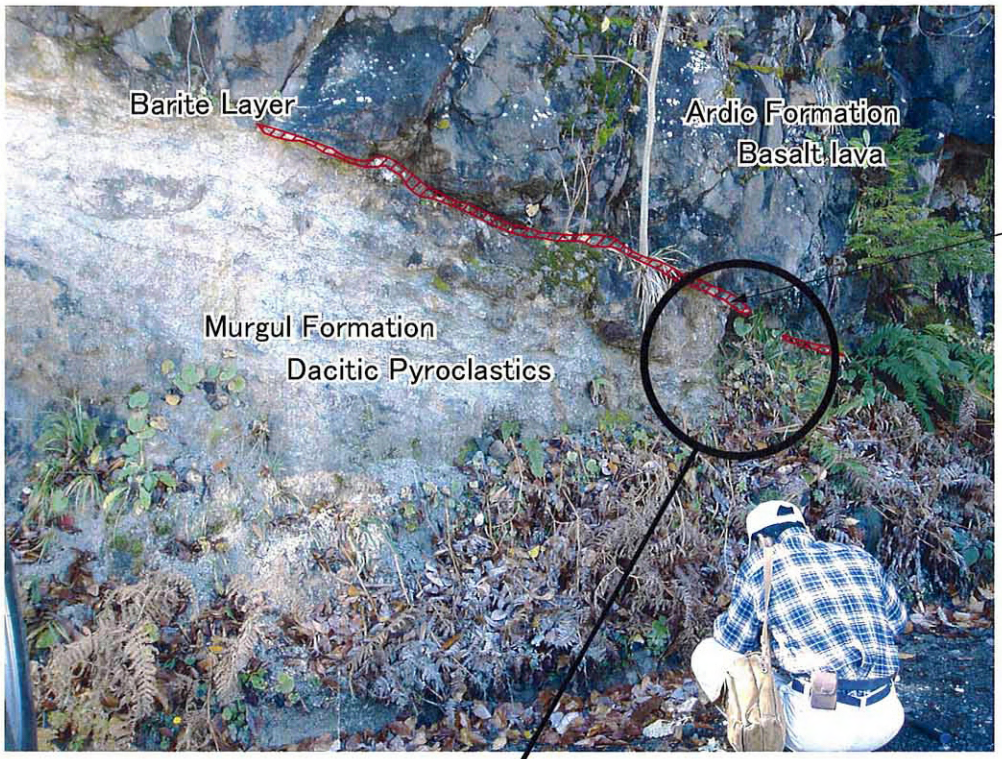
The result of geochemical survey indicates some points in this occurrence have $+1.5\sigma$ or higher values of Ba and S.

(v) Kokolet Occurrence

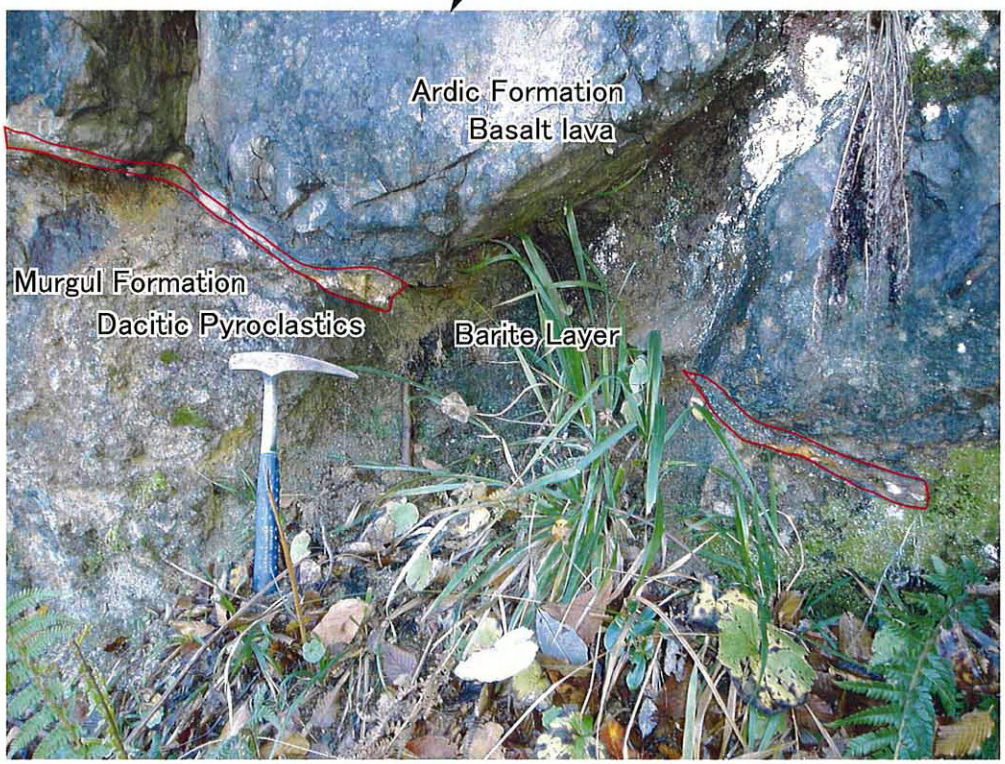
Two types of mineralization exist in the western bank of the Kokolet River. One is the upper Kokolet Occurrence, related to volcanogenic massive sulphide type mineralization, underlies the Ardiç Formation, and the other is the lower Kokolet Occurrence, related to the andesite intrusive.

1) Upper Occurrence

Stratiform shaped barite bearing zone, which is the upper most part of the lower Murgul Formation, underlies the Ardiç Formation. The zone has a thickness of 2 to 5 centimeters and a length of nearly 10 meters. Fig. II-1-13 shows photographs of the outcrop. Barite, dolomite, calcite and no sulphide minerals were identified by an



Enlargment



Barite Layer;

Width : 2～5cm

Mineral assemblages : Barite, Dolomite, Calcite, Quartz

Assay : 0.009g/t Au, 0.15g/t Ag, 0.05% Cu, <0.001% Pb, 0.005% Zn, 3.35% Ba

Fig. Ⅱ-1-13 Photographs of the Upper Kokolet Occurrence

X-ray diffraction. The assay result of ore analysis (J003) is 0.01g/t Au, 0.15g/t Ag, 0.01% Cu, <0.001% Pb, 0.01% Zn, 3.35% Ba, and 0.19% S. This zone is presumed to have formed by volcanogenic massive sulphide mineralization, however this zone is poor in Ag, being accompanied with dolomite and calcite, and the lower Kokolet Occurrence is close to this zone.

The result of geochemical survey indicates that this occurrence has many points where +1.5 σ or higher values of Ba are densely spotted, indicating possibility that barite bearing mineralization has occurred extensively.

2) Lower Occurrence

Andesite intruded into dacites of the lower Murgul Formation. Dissemination of pyrite, chalcopyrite, azurite, malachite and another secondary copper minerals are observable in the andesite over 700 m along with forestry road. The assay result of ore analysis (K034) is 0.040g/t Au, 0.05g/t Ag, < 0.001% Cu, 0.01% Ba, and 0.95% S.

(vi) Deposits in Surrounding Areas

1) Akarşen Deposit

This deposit is 5 km southwest of the Murgul Deposit swarm. The deposit is composed of massive sulphide and disseminated type mineralization related to dacitic tuff of the Murgul Formation. The massive sulphide consists of mainly pyrite, a small quantity of chalcopyrite and a minor sphalerite and galena. The stockwork ore mainly consists of pyrite and chalcopyrite. An average grade of Cu is around 1%. As a result of mineralization, dacitic tuff has undergone silicification and sericitization. About 0.5 millions ton of massive sulphide of 4.0% Cu (Cu equivalent) and 0.35 million tons of disseminated ore of 0.4% (Cu equivalent) were estimated from past surveys.

2) Hahur Deposit

This deposit is 5 km northwest of the Murgul Deposit swarm. The deposit is composed of massive sulphide and stockwork ore related to autobrecciated dacite of the Murgul Formation. The dacite of the host rocks form huge blocks taken into the Küre Formation. The blocks are presumed to have moved into the present place as a result of a gravity sliding caused by uplifting of the Murgul Deposit swarm. About 0.24 million tons of ore (proven and possible) of 2.5% Cu grade was estimated.

Chapter 2 Drilling Survey

2-1 Survey Method

2-1-1 Outline

Figure Ⅱ-2-1 shows the location of the drilling survey in this year's program.

MTA has been in charge of the drilling work itself, and provided all equipment and tools except wasting material. All cores have been observed, and summarized in columner sections, 1:200 in scale. The all cores have been taken in photos, and some adequate specimens have been provided for laboratory tests such as microscopic observation of rock thin-section and ore polished-section, whole-rock chemical analysis, powder X-ray diffraction analysis, and ore mineral chemical analysis. The geological survey has been performed around the drill holes, parallel to the observation of the cores, to make an integrated interpretation. The all cores have been stored in the east Black Sea branch office of MTA.

2-1-2 Drilling Method and Equipment

The drilling machines used for the work is Acker 5110 for MJTH-1 and MJTH-3, Longyear 38 for MJTH-2. The drilling has performed by the wire-line method. The bore holes have been protected by adjustment of mud density, and casing pipes have been inserted in cases necessary.

Tables Ⅱ-2-1 and Ⅱ-2-2 show the main tools and consumable supplies used for the drilling, and Table Ⅱ-2-3 shows the state of diamond bits and reamers.

2-1-3 Working Conditions

The setting and withdrawal have been done in one-shift system, and the drilling itself has been done in two-shift working system, eight hours for each shift. The members for a shift are two or three drillers and six helpers. The drillers have stayed a hotel in Arhavi, and commuted to the work site by car.

2-1-4 Transportation, Camp Setting, and Demobilization

The drilling machines and necessary material for the work have transported and moved by trucks. The base camp has been set by the existing road. The drilling water has used nearby streams or live-water source to the drill sites through water pipes. The mud water pit was prepared.

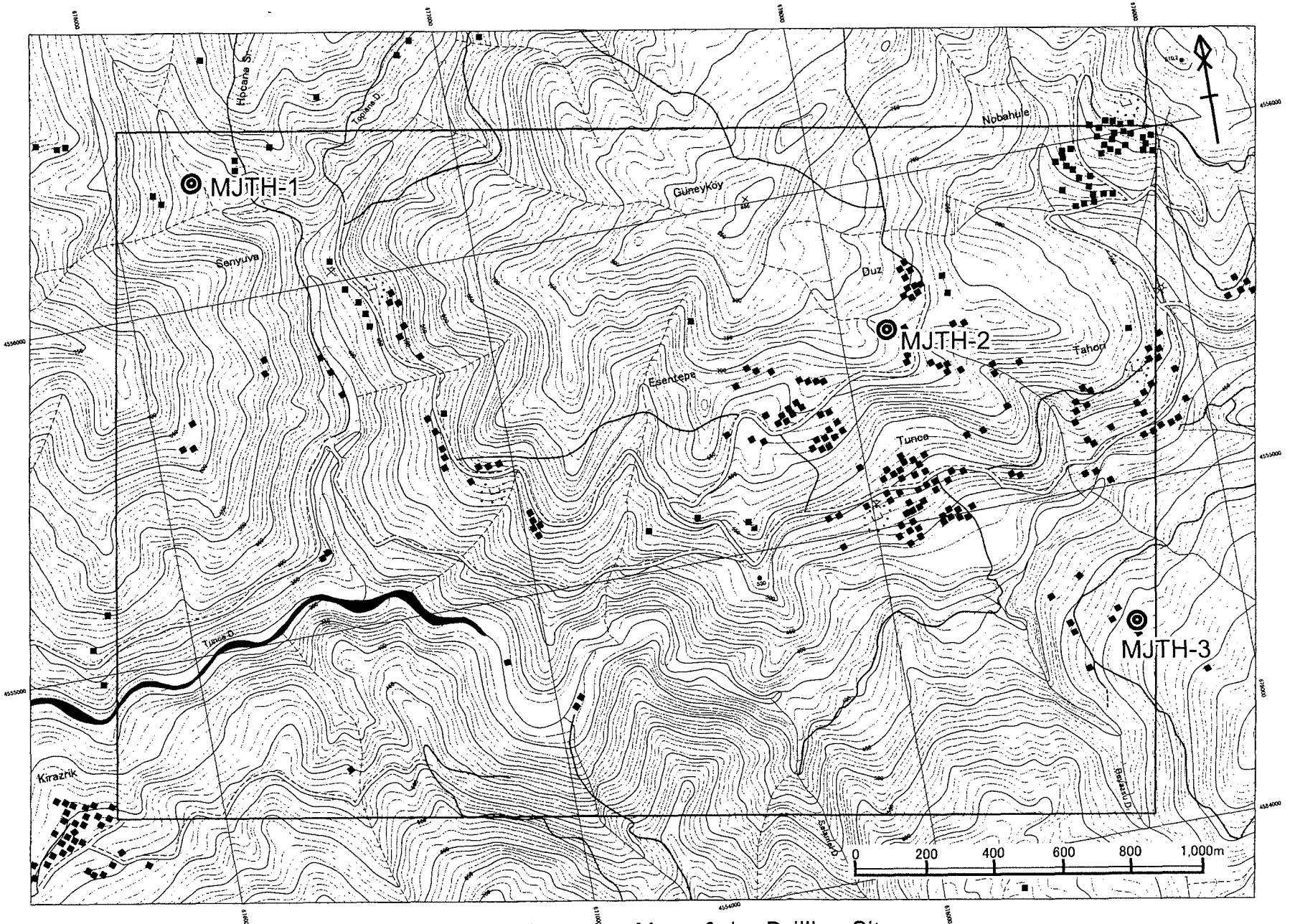


Fig. Ⅱ-2-1 Location Map of the Drilling Sites

Table Ⅱ－2－1 List of Main Drilling Equipment

Drilling Machine Specifications Capacity Dimention L ×W ×H Hoisting Capacity Spindle Speed Engine Model	ACKER 5110 : 1 set 640m(NQ), 762m(BQ) 2,310 X 1,070 X 1,850mm 8,727kg Fw:234rpm, 485rpm, 887rpm, 1500rpm Rw:192rpm Deutz F4L912 58hp, 2300rpm	Longyear 38 250m(HQ), 500m(NQ), 725m(BQ) 55hp, 2200rpm
Drilling Pump Specifications Piston Diameter Stroke Capacity Engine Mode	BR-535 : 1 set 70mm 70mm 37.5liter/min., 7liter/min. 81.4liter/min, 132.5liter/min. Deutz Diesel 17.8hp, 3000rpm	BR-535 : 1 set 70mm 70mm 37.5liter/min., 7liter/min. 81.4liter/min, 132.5liter/min. Deutz Diesel 17.8hp, 3000rpm
Generators Specifications Capacity	1 set 3KW, 5KW, 380, 220Volt, 50Hz	1 set 3KW, 5KW, 380, 220Volt, 50Hz
Derrick Specifications Hight	1 set 6.10m	1 set

Table Ⅱ-2-2 List of Drilling Equipment and Consumption Goods

Description	Specification	Unit	Quantity		
			MJTH-1	MJTH-2	MJTH-3
Drilling rod HQ	3.05m	pc	52	60	39
Drilling rod NQ	3.05m	pc	103	131	101
Outer tube	HQ	pc	2	2	2
Outer tube	NQ	pc	2	2	2
Inner tube	HQ	pc	2	2	2
Inner tube	NQ	pc	2	2	2
Inner tube head	HQ	pc	2	2	2
Inner tube head	NQ	pc	2	2	2
overshot	HQ	pc	1	2	1
overshot	NQ	pc	2	2	2
Wireline rope	6mm	m	318	407	312
Casing pipe(HW)	3.05m	pc	1	2	9
Casing pipe(NW)	3.05m	pc	53	60	42
Core lifter	HQ	pc	3	5	3
Core lifter	NQ	pc	4	5	4
Core lifter case	HQ	pc	3	5	3
Core lifter case	NQ	pc	4	5	4
Bentonite		kg	1,300	39,850	6,350
Cement		kg	1,600	2,500	1,800
Light oil		ℓ	1,755	3,582	1,978
Engine oil		ℓ	68	80	60
Gear oil		ℓ	16	16	16
Hydraulic oil		ℓ	100	80	92
Core box	4-6m	pc	73	79	67
Pipe for water		m	75	200	150
Bor oil		kg	-	48	-

Table Ⅱ-2-3 List of Used Diamond Bits and Reaming Shells

Description	Specification	Unit	Quantity		
			MJTH-1	MJTH-2	MJTH-3
HQ-WL BITT	Emprenye 5 adet Diamonds 3 adet	pc	2	3	3
NQ-WL BITT	Emprenye 12 adet Diamonds 4 adet	pc	4	7	5
HQ-REAMING SHELL		pc	-	1	1
NQ-REAMING SHELL		pc	1	3	1
CASING SHOE BITT(HW)		pc	1	1	1
CASING SHOE BITT(BW)		pc	1	1	1

2-1-5 Progress of Drilling

Tables Ⅱ-2-4 and Ⅱ2-5 show the drilling summary and schedule.

(1) MJTH-1

The drilling period was October 31 through November 19.

The HQ wire-line method has been applied down to 159.60m, hereafter NQ wire-line method down to the bottom. The hole has generally been drilled smoothly, but encountered collapse in the deep part. The hole has been equipped HW casing down to 3.05m, and NW casing down to 159.60m.

(2) MJTH-2

The drilling period was October 5 through November 17.

The HQ wire-line method has been applied down to 181.10m, hereafter NQ wire-line method down to the bottom. The hole is in very bad condition, and mud-water run out from everywhere in the hole, especially large amounts from reddish calcareous mudstone zones. Cementing has been done to stop running water, but any good result has not been gain from this countermeasure. From 322m, the hole has got in the dacitic tuff breccia (Adlf) of the Alemağaç Formation, the footwall of the ore horizon, and the condition of the borehole has been well improved. But, the drilling speed has got down significantly due to its hardness. The hole has equipped HW Casing down to 6.00m, hereafter NW casing down to 181.10m.

(3) MJTH-3

The drilling period was October 5 through 27.

The HQ wire-line method has been applied down to 118.9m, hereafter NQ wire-line method down to the bottom. The hole is in a landslide area, and whole mud water ran out down to 16m due to the talus. But after this, the drilling has well proceeded in good condition down to the bottom, except some mechanical trouble. The hole equipped HW casing down to 27.45m, and NW casing down to 118.90m.

2-2 Survey Result

The drilling logs are shown in the data-5. Figure Ⅱ-2-2 shows the geological

Fig Ⅱ-2-4 Drilling Summary of MJTH-1

WORKING PERIOD						
CLASS	WORKING PERIOD	DAY BREAK DOWN			WORKERS	
	PERIOD	TOTAL DAYS	ACTUAL WORKING	DAY OFF		
RIG UP	28/10/03 - 30/10/03	3 days	3 days	0 days	72 workers	
DRILLING	31/10/03 - 19/10/03	20	DRILLING 20	0	240	
			REPAIR etc. 0	0	0	
TEAR DOWN	20/11/03 - 21/11/03	2	2	0	24	
TOTAL	28/10/03 - 21/11/03	25	25	0	336	

DRILLING DEPTH etc.			
PLOPOSED DEPTH	300.00 m	OVERBURDEN	1.0 m
ADDITIONAL DEPTH	14.15 m	CORE LENGTH	313.15 m
INSPECTED DEPTH	314.15 m	RECOVERY	99.68 %

TIME ANALYSIS			
CATEGORY	(hr.)	(%)	(%)
DRILLING	196	65.8	57.0
TRIP, CORE RECOVER, CASING, etc	90	30.2	26.2
REPAIR, FISHING	12	4.0	3.5
SUB TOTAL	298	100.0	-
RIG UP	30		8.7
TEAR DOWN	16		4.7
TOTAL	344		100.0

CASING			
SIZE	SET DEPTH (m)	B/A X 100 (%)	RECOVERY (%)
HW	3.05	0.97	100
NW	159.60	50.80	100

CORE RECOVERY PER EACH 100m			
DEPTH (m)	CORE LENGTH (m)	CORE RECOVERY(%) SECTION	CUMULATIVE
0 - 102.20	101.20	99.0	99.0
102.20 - 204.40	102.20	100.0	99.5
204.00 - 303.75	99.35	100.0	99.7
303.75 - 314.15	10.40	100.0	99.7

TOTAL DEPTH/TOTAL WORKING DAYS	15.71 m/day
TOTAL DEPTH/ACTUAL WORKING DAYS	15.71 m/day
TOTAL DEPTH/ACTUAL DRILLING DAYS	15.71 m/day
ACTUAL DRILLING WORKERS/TOTAL DEPTH	1.07 worker/m

REMARKS

A: TOTAL DEPTH

B: SET DEPTH

Table Ⅱ-2-4 Drilling Summary of MJTH-2

WORKING PERIOD

CLASS	WORKING PERIOD	DAY BREAK DOWN			WORKERS
	PERIOD	TOTAL DAYS	ACTUAL WORKING	DAY OFF	
RIG UP	01/10/03 - 04/10/03	4 days	4 days	0 days	48 workers
DRILLING	05/10/03 - 17/11/03	44	DRILLING 43	0	516
			REPAIR etc. 1	0	2
TEAR DOWN	18/11/03 - 20/11/03	3	3	0	36
TOTAL	01/10/03 - 20/11/03	51	51	0	602

DRILLING DEPTH etc.

PLOPOSED DEPTH	400.00 m	OVERBURDEN	2.40 m
ADDITIONAL DEPTH	1.00 m	CORE LENGTH	398.6 m
INSPECTED DEPTH	401.00 m	RECOVERY	99.4 %

TIME ANALYSIS

CATEGORY	(hr.)	(%)	(%)
DRILLING	419	54.6	51.4
TRIP, CORE RECOVER, CASING, etc	286	37.2	35.1
REPAIR, FISHING	63	8.2	7.7
SUB TOTAL	768	100.0	-
RIG UP	32		3.9
TEAR DOWN	16		2.0
TOTAL	816		100.0

CASING

SIZE	SET DEPTH (m)	B/A X 100 (%)	RECOVERY (%)
HW	6.00	1.50	100
NW	181.10	45.16	100

CORE RECOVERY PER EACH 100m

DEPTH (m)	CORE LENGTH (m)	CORE RECOVERY(%) SECTION	CUMULATIVE
0.00 - 101.30	98.90	97.6	97.6
101.30 - 205.70	104.40	100.0	98.8
205.70 - 300.35	94.65	100.0	99.2
300.35 - 401.00	100.65	100.0	99.4

TOTAL DEPTH/TOTAL WORKING DAYS	9.11 m/day
TOTAL DEPTH/ACTUAL WORKING DAYS	9.33 m/day
TOTAL DEPTH/ACTUAL DRILLING DAYS	9.33 m/day
ACTUAL DRILLING WORKERS/TOTAL DEPTH	1.50 worker/m

REMARKS

A: TOTAL DEPTH

B: SET DEPTH

Table Ⅱ-2-4 Drilling Summary of MJTH-3

WORKING PERIOD					
CLASS	WORKING PERIOD	DAY BREAK DOWN			WORKERS
	PERIOD	TOTAL DAYS	ACTUAL WORKING	DAY OFF	
RIG UP	01/10/03 - 04/10/03	4 days	4 days	0 days	48 workers
DRILLING	05/10/03 - 27/10/03	23	DRILLING 23	0	276
			REPAIR etc. 0	0	0
TEAR DOWN	28/10/03 - 30/10/03	3	3	0	36
TOTAL	01/10/03 - 30/10/03	30	30	0	360

DRILLING DEPTH etc.			
PLOPOSED DEPTH	300.00 m	OVERBURDEN	11.10 m
ADDITIONAL DEPTH	8.40 m	CORE LENGTH	297.30 m
INSPECTED DEPTH	308.40 m	RECOVERY	96.40 %

TIME ANALYSIS			
CATEGORY	(hr.)	(%)	(%)
DRILLING	246	61.5	54.9
TRIP, CORE RECOVER, CASING, etc	130	32.5	29.0
REPAIR, FISHING	24	6.0	5.4
SUB TOTAL	400	100.0	-
RIG UP	32		7.1
TEAR DOWN	16		3.6
TOTAL	448		100.0

CASING			
SIZE	SET DEPTH (m)	B/A X 100 (%)	RECOVERY (%)
HW	27.45	8.90	100
NW	118.90	38.55	100

CORE RECOVERY PER EACH 100m			
DEPTH (m)	CORE LENGTH (m)	CORE RECOVERY(%) SECTION	CUMULATIVE
0.00 - 100.10	89.00	88.9	88.9
100.10 - 201.90	101.80	100.0	94.5
201.90 - 301.00	99.10	100.0	96.3
301.00 - 308.40	7.40	100.0	96.4

TOTAL DEPTH/TOTAL WORKING DAYS	13.41 m/day
TOTAL DEPTH/ACTUAL WORKING DAYS	13.41 m/day
TOTAL DEPTH/ACTUAL DRILLING DAYS	13.41 m/day
ACTUAL DRILLING WORKERS/TOTAL DEPTH	1.17 worker/m

REMARKS

A: TOTAL DEPTH

B: SET DEPTH

Table Ⅱ-2-5 Drilling Schedule

ITEM	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Mobilization to Hopa	24—30			
MJTH-1 Rig up		28—30		
MJTH-1 Drilling			31—19	
MJTH-1 Tear down			20—21	
MJTH-2 Rig up		1—4		
MJTH-2 Drilling		5—17		
MJTH-2 Tear down			18—20	
MJTH-3 Rig up		1—4		
MJTH-3 Drilling		5—27		
MJTH-3 Tear down		28—30		
Demobilization to Ankara			28—2	

cross sections through the holes. The Appedix-1, 2, 3, and 4 show the results of the microscopic observation for the rocks, reflection microscopic observation for the ore, chemical assay for the ore, and rock geochemical assay respectively. Table Ⅱ-2-6 shows the result of the X-ray diffraction analysis. Table Ⅱ-2-7 shows the alteration index.

(1) MJTH-1 (Drill length: 314.15m)

1) Geology

0-1.0 m: Surface soil

1.0-112.2m: Dark olive gray basalt lava (Cbs) of the Çağlayan Formation. Amygdaloidal texture is dominant. Cavities filled by calcite, zeolite, and chlorite. Calcite networks containing pyrite dissemination is seen overall. Yellowish green bleaching surrounds calcite networks. Sheared zone contains clay band, 5cm width, at 31.0m. Dolerite intrudes from 87.0 to 88.0m. Argillization become stronger from 110m, containing the purple dacite pebbles. Under microscope, small amounts of plagioclase phenocrysts, intersertal texture in groundmass consisting of plagioclase, augite, and iron minerals. Intense alteration causes chlorite, calcite, zeolite, and clay minerals.

112.2-235.0m: Mainly purple dacite (Adcp). Dolerite (Dol) intrudes purple dacite. Fresh part of the Purple dacite is purple gray in colors and massive, generally crashed, weak argillization, olive-green to greenish gray in many places. Olive-gray banded texture, 70° , in some places. Boundary with overlying basalt lava of the Çağlayan Formation is of significant argillization and pyrite dissemination. Under microscope, purple dacite contains small amounts of quartz and plagioclase phenocrysts, cryptocrystalline groundmass consisting of mainly microlite of quartz and feldspar, and glass. Strong silicification produces quartz, sericite, calcite, and clay minerals.

Thin dolerite dykes, several cm in width, intrude purple dacite in many places. Under microscope, not porphyritic, and rarely olivine and plagioclase phenocrysts seen. Groundmass is intergranular to sub-ophitic texture, consisting mainly of plagioclase, augite, and iron minerals, and a little olivine and glass.

235.0-239.8m: Pale purplish gray tuff breccia, containing sub angular pebbles of dacite and andesite. Groundmass is volcanic ash including a little plagioclase. Intense alteration causes quartz, sericite, chlorite, calcite, and clay minerals. Rocks resemble dacitic tuff-breccia (Atf) of the lower Alemağaç Formation.

Table Ⅱ-2-6 Results of X-ray Diffraction (Drilling Survey)

No.	Sample	Drilling No.	Depth (m)	ROCK TYPE	Alteration zone	MINERALS																									Remarks
						Quartz	Plagioclase	K-Feldspar	Hornblende	Clinopyroxene	Albite	Smectite	Sericite/Smectite	Sericite	Kaolin Minerals	Chlorite	Hematite	Laumontite	Analcime	Gypsum	Barite	Pyrite	Chalcopyryte	Sphalerite	Siderite	Magnesite	Dolomite	Calcite	Apatite		
1	XA-1	MJTH-1	180.00	Adcp	Kl	26					9			<1	<1?							<1									
2	XA-2	〃	194.00	Adcp	Kl	34				2	6			<1	<1							<1									
3	XA-3	〃	210.00	Adcp	Ser-Ch	17				1	5			1								<1									
4	XA-4	〃	228.00	Adcp	Ser-Ch	28				<1	2			1																	
5	XA-5	〃	237.00	Atf	Ser-Ch	21					7		<1	1													2				
6	XA-6	〃	244.50	Adcp	Kl	17					6			<1	1												14				
7	XA-7	〃	256.00	Adcp	Kl	26					7	<1			1?							<1					3	<1			
8	XA-8	〃	265.00	Adlv	Kl	34				1	4			<1	<1							<1									
9	XA-9	〃	280.00	Adlv	-	26					12			<1													3				
10	XA-10	〃	290.00	Adcp	Kl	24								<1	<1												3				
11	XB-1	MJTH-2	315.00	Adlh	Zeo	24					5					<1		<1	3												
12	XB-2	〃	325.00	Adlf	-	19		3			12					1												<1			
13	XB-3	〃	330.00	Adlf	-	26					25					1		<1													
14	XB-4	〃	335.00	Adlf	-	13					30					2												<1			
15	XB-5	〃	340.00	Adlf	Ser-Ch	27		<1			3			<1		1												<1			
16	XB-6	〃	345.00	Adlf	-	24					13					1												<1			
17	XB-7	〃	350.00	Adlf	-	28					18					1												<1			
18	XB-8	〃	355.00	Adlf	-	19		1			13					1		<1													
19	XB-9	〃	373.00	Adlf	-	32					15			<1		1		<1										<1			
20	XB-10	〃	397.00	Adlf	-	18					14					2		1													
21	XC-1	MJTH-3	258.00	Attf	Ser-Ch	13					2			<1		1												6			
22	XC-2	〃	262.00	Adcl	Ser-Ch	22					4			1		<1												2			
23	XC-3	〃	267.00	Adcl	Ser-Ch	24					7			<1		1		<1										<1			
24	XC-4	〃	272.00	Atf	Ser-Ch	10					<1?			1								<1									
25	XC-5	〃	277.00	Adcl	Ser-Ch	22					9			<1		1												<1			
26	XC-6	〃	282.00	Adcl	-	28					18			<1		<1												<1			
27	XC-7	〃	287.00	Adcl	Ser-Ch	26					7			<1		1				<1		<1						<1			
28	XC-8	〃	292.00	Adcl	Ser-Ch	18					5			<1		1				<1								2			
29	XC-9	〃	297.00	Adcl	Ser-Ch	26					10			<1		<1				4											
30	XC-10	〃	302.00	Ats	Ser-Ch	32					10		<1			<1				<1								<1			

Ser-Ch : Quartz-Sericite-Chlorite-(Serisite/Smectite mixed layer), Zeo : Quartz-(Sericite)-Laumontite, Kl : Quartz-Kaolin-Sericite

Table Ⅱ-2-7 Alteration Index of Drilling Core

No.	Sample	Drilling No.	Depth (m)	Rock Type	Alteration Index(AI)	Ca %	K %	Mg %	Na %	Remarks
1	WA-1	MJTH-1	180	Adcp	19	0.31	0.68	0.29	3.77	intrusive
2	WA-2	〃	194	Adcp	23	1.69	0.46	0.80	2.92	〃
3	WA-3	〃	210	Adcp	29	1.54	1.26	0.82	3.54	〃
4	WA-4	〃	228	Adcp	42	0.69	1.48	0.59	2.08	〃
5	WA-5	〃	237	Atf	31	1.00	1.38	0.63	3.37	hootwall
6	WA-6	〃	245	Adcp	25	3.53	0.65	1.58	3.75	intrusive
7	WA-7	〃	256	Adcp	26	1.70	0.64	0.87	2.91	〃
8	WA-8	〃	265	Adlv	40	0.83	1.60	0.38	1.94	hootwall
9	WA-9	〃	280	Adlv	19	0.93	0.72	0.38	3.73	hootwall
10	WA-10	〃	290	Adcp	63	2.06	3.06	1.18	0.28	intrusive
11	WB-1	MJTH-2	315	Adlh	49	1.73	1.51	1.32	1.36	hanging wall
12	WB-2	〃	325	Adlf	22	1.39	0.54	0.86	4.02	hootwall
13	WB-3	〃	330	Adlf	24	1.22	0.38	1.09	4.10	〃
14	WB-4	〃	335	Adlf	13	0.47	0.07	0.73	5.68	〃
15	WB-5	〃	340	Adlf	71	0.59	2.07	1.74	1.04	〃
16	WB-6	〃	345	Adlf	28	0.43	1.46	0.46	4.28	〃
17	WB-7	〃	350	Adlf	20	0.29	0.87	0.39	4.66	〃
18	WB-8	〃	355	Adlf	40	0.61	2.11	0.47	3.11	〃
19	WB-9	〃	373	Adlf	34	0.57	0.55	1.03	2.89	〃
20	WB-10	〃	397	Adlf	37	0.78	1.28	0.91	3.03	〃
21	WC-1	MJTH-3	258	Attf	68	2.69	5.27	2.33	0.85	hanging wall
22	WC-2	〃	262	Adcl	34	0.49	0.91	0.68	2.65	hootwall
23	WC-3	〃	267	Adcl	52	0.58	2.25	1.13	2.48	〃
24	WC-4	〃	272	Atf	90	0.25	4.84	0.94	0.33	〃
25	WC-5	〃	277	Adcl	38	0.44	1.30	0.89	3.24	〃
26	WC-6	〃	282	Adcl	27	0.47	1.04	0.37	3.33	〃
27	WC-7	〃	287	Adcl	29	0.91	1.06	0.62	3.22	〃
28	WC-8	〃	292	Adcl	32	1.28	1.26	0.61	2.70	〃
29	WC-9	〃	297	Adcl	40	1.30	1.58	0.98	2.58	〃
30	WC-10	〃	302	Adcl	43	1.26	1.30	0.84	1.62	〃

239.8-264.9m: Purple dacite and dolerite dykes, 238.8 to 244.6m, 253.7 to 254.7m, and 258.1 to 264.9m. Purple dacite affects weak to moderate argillization.

264.9-288.3m: Pale gray porphyritic dacite (Adlv) containing quartz and plagioclase phenocrysts. It has undergone weakly argillization, 264.9 to 268.4m and 278.1 to 282.0m. Under microscope, porphyritic texture, containing 20% of quartz and plagioclase phenocrysts. Groundmass is vitric to cryptocrystalline texture, consisting of mylonite of quartz and feldspar, and glass. Strong silicification causes quartz, calcite, sericite, chlorite, and clay minerals. Rocks resemble dacitic tuff-breccia (Adlf) of the Alemağaç Formation in MJTH-2. Presumably being captured when purple dacite intruded. Green dolerite dyke, 268.4 to 278.1m.

288-314.15m: Purple dacite and intrusive dolerite. The purple dacite affected argillization.

2) Alteration and Mineralization

The basalt lava has undergone intense alteration, and all minerals except iron minerals have altered to chlorite, calcite, and clay minerals. Under the microscope, only pyrite is seen as to sulphide mineral. The assay result of the pyrite dissemination zones is as follows: 0.01 g/t Au, 0.90 g/t Ag, 0.02 % Cu, 0.01 % Zn, 0.06 % Ba, and 3.84 % S in the highest values.

The laboratory test result has revealed that the purple dacite has slightly undergone silicification, producing quartz, sericite, calcite, clay minerals, and chlorite. Kaolinite is commonly seen in the hole, but dolomite is seen below 235m. The alteration index is low, 19 to 63%, because a large amount of unaltered albite causes high content of Na, 2.08 to 3.75%. Pyrite is impregnated in general, and marcasite is seen in small amount under the microscope, other than pyrite.

The argillite parts and pyrite dissemination zones are seen in the boundary with the basalt lave of the Çağlayan Formation, and it is possible that the alteration zone continues to the Senyuva North mineral occurrence. The assay result of the pyrite dissemination zone is 0.05 - 0.15 % Ag, <0.001 - 0.001 % Cu, 0.002 - 0.009 % Zn, 0.01 - 0.02 % Ba, and 1.18 - 3.40 % S.

The dacite (Adlv) and dacitic tuff-breccia (Atf) of the Alemağaç Formation have undergone slightly intense silicification as well as the purple dacite, producing quartz, sericite, calcite, clay minerals, and chlorite. It is presumed that the alteration zone has

undergone mineralization as well as the purple dacite. The alteration index is low, 19-40%. The ore minerals are composed of pyrite. The assay result of the mineralized parts in the dacite and dacitic tuff breccia is <0.001 - 0.023 g/t Au, <0.01 - 0.15 g/t Ag, 0.001 - 0.006 % Cu, 0.001 - 0.002 % Zn, 0.01 - 0.03 % Ba, and 0.38 - 2.18 % S.

(2) MJTH-2 (Drill length: 401.00m)

1) Geology

0-2.4m: Surface soil

2.4-36.4m: Dark green basalt lave (Cbs) of the Çağlayan Formation. Amygdaloidal texture filled by calcite. Thin veinlet and network of calcite appear whole part.

36.4-39.6m: Reddish brown calcareous mudstone being accompanied with olive fine-grained tuff. Bedding plane is almost horizontal, 5 to 10°

39.6-93.0m: Dark green basalt lava being accompanied with irregular-shape mud-ball. Presumably mud ball was taken in basalt while unconsolidated. Under microscope, specimen taken at 52.8m shows intersertal texture, its groundmass consists of plagioclase, augite, and brown glass. Alteration intensity is low. Reddish brown calcareous mudstone is from 70.5 to 71.7m. Dark olive-green dacite dyke containing quartz and plagioclase phenocrysts is from 61.6 to 70.0m and from 82.8 to 93.0m. Under microscope, specimen taken at 66.8m shows phenocrysts of quartz, plagioclase, augite, and magnetite, and groundmass consisting microlite of quartz and feldspar, and glass shows cryptocrystalline felsic texture. The rock is correlated with the porphyritic dacite (Dcp) distributed around Esentepe.

93.0-119.8m: Mainly basalt lava. Basaltic lapilli-tuff is from 93.0 to 94.5m. Lapilli-tuff is dark green, containing rounded pebbles of basalt and calcareous mudstone, 0.5 to 1cm in size. Basalt lava is scarcely accompanied by mud-ball. Thin calcite veinlet exists from 100m. Thin layers of reddish brown calcareous mudstone exist from 106.1 to 107.0m.

119.8-157.7m: Thick reddish brown calcareous mudstone (Cms), intercalating thin layers of basalt lava and acidic tuff. Reddish brown calcareous mudstone is compact showing 20 to 30° bedding. Under microscope, mainly mud containing carbonate, containing large amounts of fossil of foraminifera. Compact basalt thin layers intercalation from 122.5 to 123.7m and from 128.6 to 130.0m. Characteristic dark-green banded acidic tuff from 143.0 to 144.0m, and olive gray fine-grained tuff

from 145.6 to 148.0 m. Bluish green sandstone to silt stone increases from 155m.

157.5-211.4m: Basalt lava. Dark green basaltic tuff contains pebbles of basalt and mudstone from 157.2 to 163.7m. Black to dark green basalt is from 163.5m, containing mud-balls from 170.5 to 185m. Compact from 189m, grading into dolerite around 189m.

211-211.7m: Pale olive gray mudstone.

211.7-238.5m: Reddish brown to dark green basic tuff-breccia (Cbtf). Pebble is angular to sub-angular, basal (dominant), mudstone, and dacite. Under microscope, specimen taken at 221.0m is of intense alteration. Groundmass altered to calcite, zeolite, and clay minerals. Muddy material increases from 237m.

238.5-280.0m: Gray vitric dacite intrusive (Dpf). Quartz and plagioclase phenocrysts exist. Hematite network is from 243 to 246 and from 278 to 280m. Under microscope, specimen taken at 254.5m contains biotite and iron minerals other than quartz and feldspar. Cryptocrystalline felsic groundmass consists mainly of microlite of quartz and feldspar, and glass. Silicification produces quartz, sericite, and chlorite.

280-322.0m: Olive brown dacitic tuff-breccia (Adlh). Feldspar and small amounts of quartz grains, and mudstone and dacite pebbles exist. Weak argillization produces rarely dark green volcanic glass. Under microscope, specimen taken at 287.4m is rich in quartz and plagioclase phenocrysts, containing coarse-grained volcanic ash with small amounts of biotite. Weak silicification produces quartz, chlorite, and epidote. Hematite network exists from 321 to 322m. This part is correlated with uppermost of the Alemağaç Formation.

322.0-401.0 m: Rock is same as above, but generally silicified. Horizon is presumably in footwall. Rock (Adlf) is bluish, greenish gray to green, containing quartz (1 mm in diameter) and plagioclase phenocrysts. Under microscope, specimen taken at 334.2m is vitric dacite volcanic pebble to ash, rich in quartz and plagioclase phenocrysts, and no accidental fragment. Intense silicification produces quartz, sericite, and chlorite. Silicification increases its intensity toward low, seeing locally minor amounts of chalcopyrite and sphalerite impregnation at 330m, 342m, and 352.5m. Small dolerite dykes exist every where. Dolerite is black to dark green, massive fresh facies. Under microscope, specimen taken at 361.0m shows ophitic texture, and consists of plagioclase, augite, and iron minerals, with accessory quartz, glass, and alkali-feldspar.

2) Alteration and Mineralization

The hole enters in the dacitic tuff-breccia (Adlh) of the uppermost of the Alemağaç Formation at 280.0m, and seemingly enters into the dacitic tuff-breccia (Adlf) of the footwall horizon. The specimens for the X-ray diffraction test and whole-rock chemical assay have been taken almost every 10m from 325m in depth.

The laboratory test result has revealed that the hanging wall dacitic tuff-breccia (Adlh) has undergone weak silicification, producing quartz, chlorite, epidote, sericite, laumontite, and analcime. The alteration index is low, 49%. On the other hand, the footwall dacitic tuff-breccia (Adlf) shows same alteration mineral assemblage as that of the hanging wall tuff-breccia (Adlh), however has undergone farther intense alteration, producing quartz, chlorite, epidote, sericite, and laumontite. The alteration index is very low, 13 to 40%, except one sample. It is probably due to that the plagioclase of the footwall rock has not completely altered as well as that of the hanging wall rock, and Na content is high, 2.89 to 5.68%.

A small amount chalcopyrite and sphalerite are impregnated in the dacitic tuff-breccia (Adlf). The assay result of the sulphide impregnated samples is <0.001 - 0.046 g/t Au, 0.05 - 8.20 g/t Ag, <0.001 - 0.040 % Cu, 0.001 - 0.017 % Pb, 0.003 - 0.069 % Zn, 0.004 - 0.058 % Ba, and 0.01 - 3.20 % S.

(3) MJTH-3 (Drill length: 308.40m)

1) Geology

0-16.0m: Talus deposit consisting of weathered basalt pebbles.

16.0-58.6m: Basalt, basic tuff-breccia, and sandstone. Basalt is dominated by plagioclase phenocrysts, rich in amygdaloidal texture, and brecciated. Basaltic lapilli-tuff from21.5 to 30.6m, showing bedding plane, 10° . Basic sandstone and fine-grained tuff are from 30.6 to 33.5m and from 53.4 to 58.6m, intercalating reddish brown calcareous mudstone. Under microscope, specimen taken at 31.8m contains much basaltic pebbles to coarse-grained volcanic ash and plagioclase fragments, filled by fine-grained volcanic ash. Alteration intensity is high, producing chlorite, smectite, quartz, and clay minerals.

58.6-141.3 m: Dark green massive basalt. Partly compact doleritic facies. Hematite network exists everywhere. Reddish brown calcareous mudstone exists from 83.5 to

85.7 m.

141.3-172.0m: Mainly basic tuff and sandstone. Basic tuff is dark green to gray, containing siliceous black mudstone. Gray sandstone to coarse-grained tuff exists from 163.6 to 165.9m and from 165.9 to 168.0m. Under microscope, specimen taken at 143.0m is mud, quartz, and calcite, containing small amounts of plagioclase and opaque minerals.

172.0-193.9m: Dark green basalt, doleritic facies. Cavities filled by calcite.

193.9-247.2m: Alternation of basic tuff and mudstone. Basic tuff is dark green to gray, slightly coarse-grained, containing basaltic grains, < 2mm in diameter. Mudstone is gray, partly fine-grained tuff. Bedding plane 10 to 20° . Basalt lava from 217.7 to 224.0m. Under microscope, specimen taken at 222.2m contains plagioclase and augite phenocrysts, showing intergranular texture in groundmass consisting of plagioclase, augite, and glass.

247.2-260.2m: Uppermost of the Alemağaç Formation, acidic pumice tuff (Attf) of ore horizon. Flattened dark green pumice fragments show lamina-like appearance. Upper pumice altered to argillite minerals, showing pyrophyllite-like appearance. Lower part is compressed, showing different appearance, and contains dark brownish gray dacite pebbles. Under microscope, specimen taken at 254.3m consists of a little altered rock fragments and volcanic ash containing plagioclase fragments. Alteration produces large amounts of sericite, chlorite, and calcite. Several thin layers of reddish brown calcareous mudstone, 2 to 3cm, from 257 to 258m.

260.2-300.2m: Dacite lava and dacitic tuff-breccia of the Alemağaç Formation, footwall of ore horizon. Dark gray, autobrecciated, strongly silicified rock, containing pyrite dissemination. Sulphide minerals, mostly pyrite, are in clayey matrix part surrounding pebbles. Chalcopyrite and sphalerite are accompanied. Comparatively fresh aphyric massive part, olive gray, exists from 262.3 to 264.6m and 280.0 to 282.0m. Under microscope, specimen taken at 264.0m consists small amounts of plagioclase phenocrysts, and cryptocrystalline texture groundmass consisting of quartz, plagioclase, iron minerals, and alkali-feldspar. Alteration intensity is low, producing quartz, plagioclase, and chlorite. Gray dacitic tuff-breccia from 271.3 to 273.0m is rich in quartz and white cloudy plagioclase phenocrysts. It is different from surrounding dacite lava, presumably taken in as pebbles. Minor amounts of pyrite disseminates allover.

300.2-308.4m: Gray fine-grained massive tuff (Ats). No sulphide dissemination in silicified part. Under microscope, specimen taken at 303.5m consists of volcanic ash and calcite, containing plagioclase, chlorite, sericite, and clay minerals.

2) Alteration and Mineralization

The hole gets into the acidic pumice tuff (Attf) of the uppermost part of the Alemağaç Formation from 247.2m, and into the dacite lava (Adcl) of the footwall of the ore horizon from 260.2m. One specimen from the hanging wall acidic pumice tuff (Attf) and nine specimens from the footwall dacite lava (Adcl) have been taken to study the state of the mineralization and alteration. The sampling spacing is 5m. The specimens have been examined by the X-ray diffraction method and whole rock chemical analysis. It has been confirmed by the test that the alteration minerals are mainly quartz, sericite, and chlorite, being accompanied by sericite/smectite mixed layer minerals. The alteration minerals are classified as the quartz - sericite - chlorite - (sericite/smectite mixed layer minerals) zone. Only one specimen shows high alteration index, but other specimens show low values, 27 to 52%. This is due to the high Na content as well as the case of MJTH-2. No alteration difference is recognized between the hanging wall and footwall. Based on the study result, it is thought that the rocks in this drill hole have undergone the volcanogenic massive sulphide mineralization, but its intensity is slightly weak. The mineralization center might be out of the position, or the mineralization activity itself might be weak.

The assay result of the footwall dacitic rocks is <0.001 - 0.046 g/t Au, 0.05 - 2.75 g/t Ag, 0.002 - 0.014 % Cu, 0.001 - 0.014 % Pb, 0.003 - 0.026 % Zn, 0.01 - 0.06 % Ba, and 0.32 - 1.61 % S.