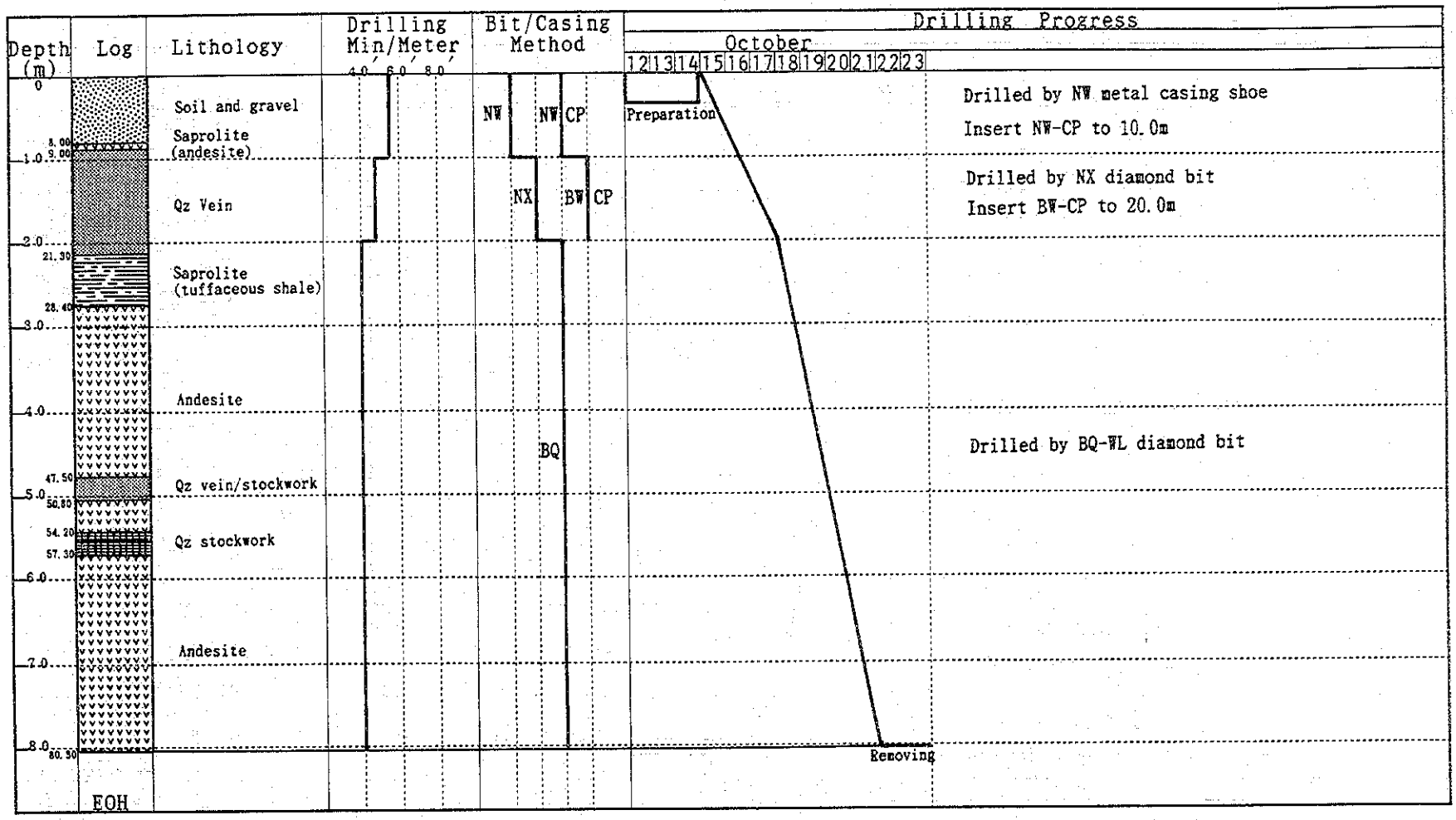


Fig.2-20 Chart of Drilling Progress (MJT-2)

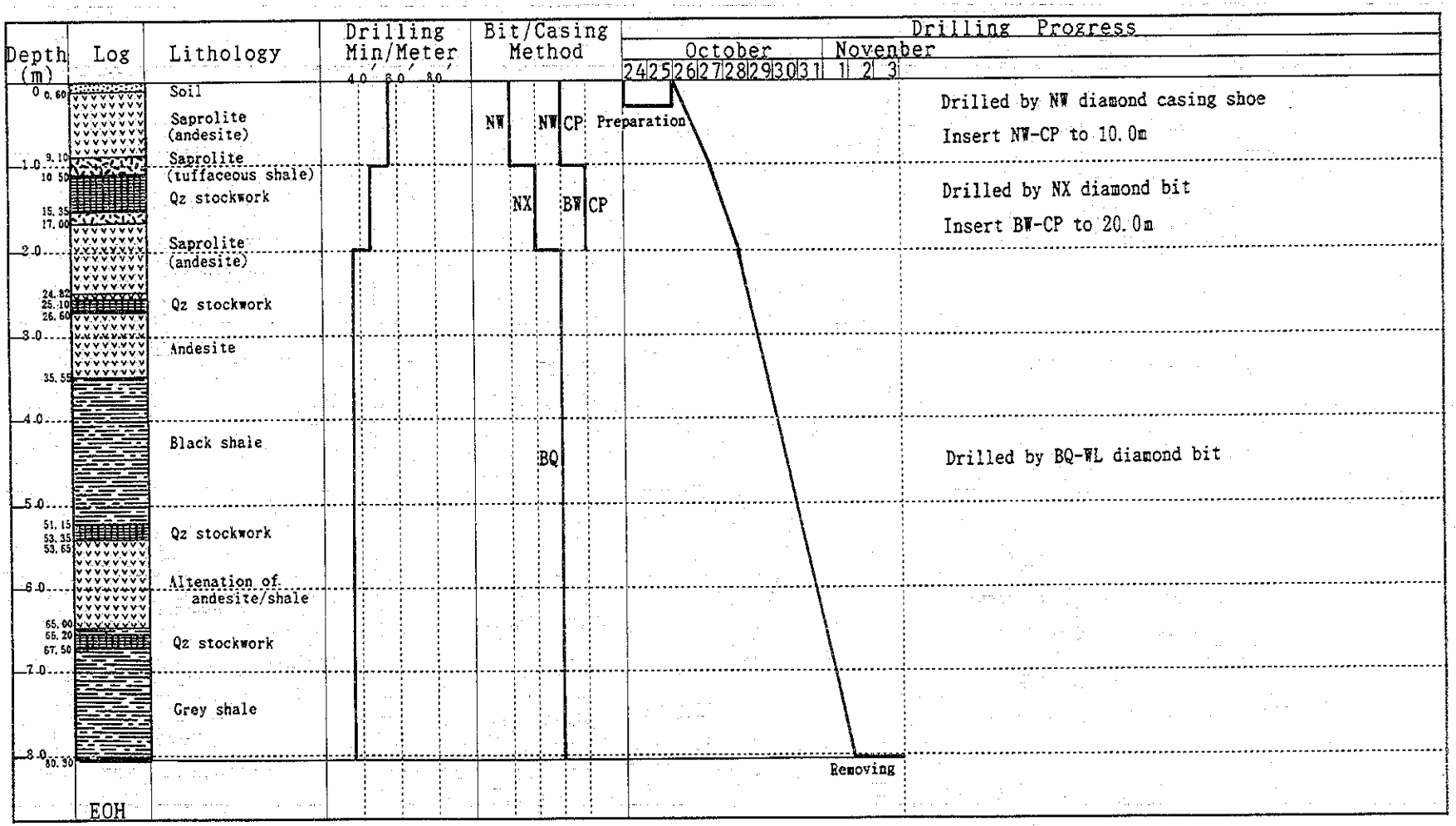


Fig.2-21 Chart of Drilling Progress (MJT-3)

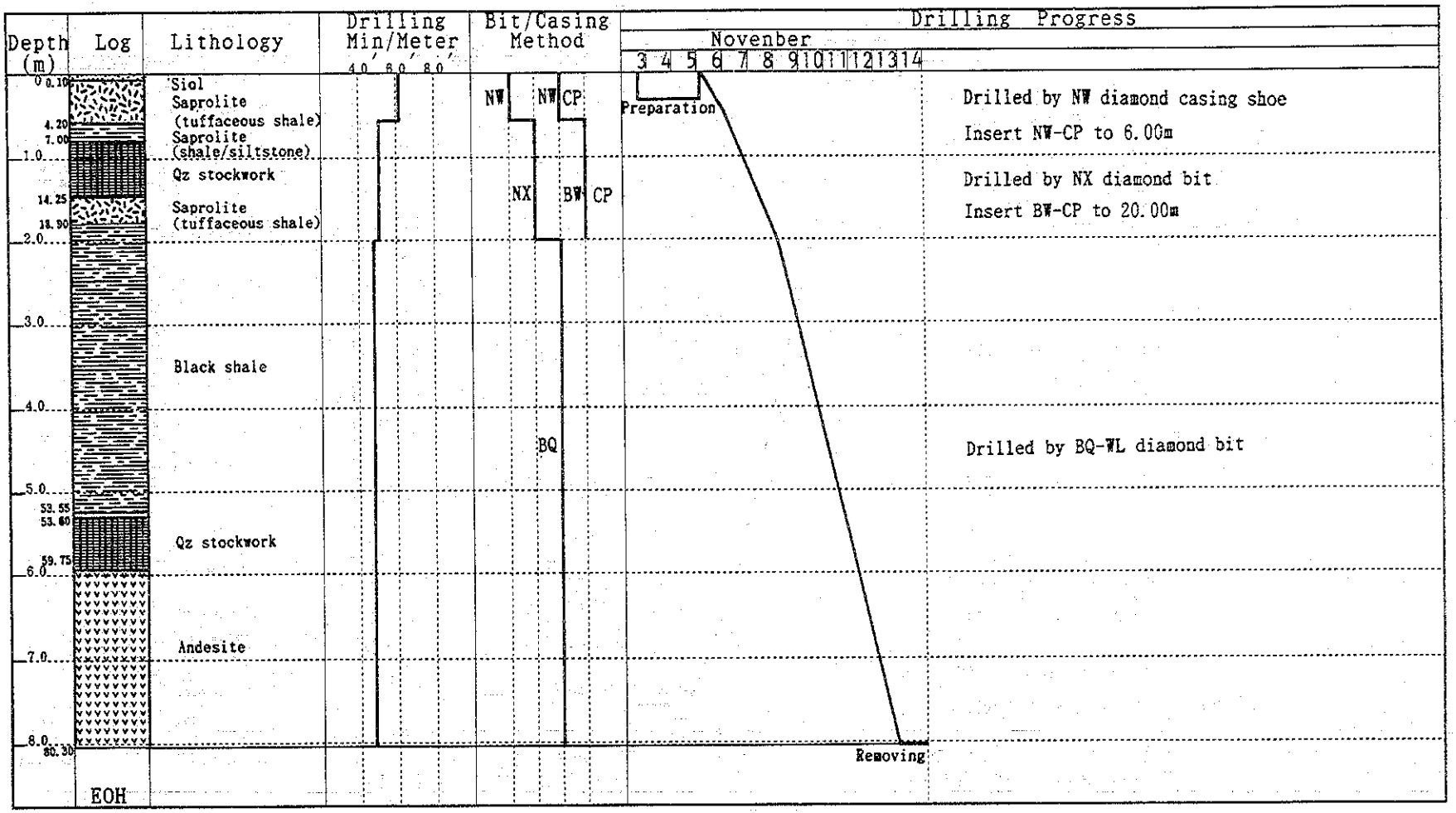


Fig.2-22 Chart of Drilling Progress (MJT-4)

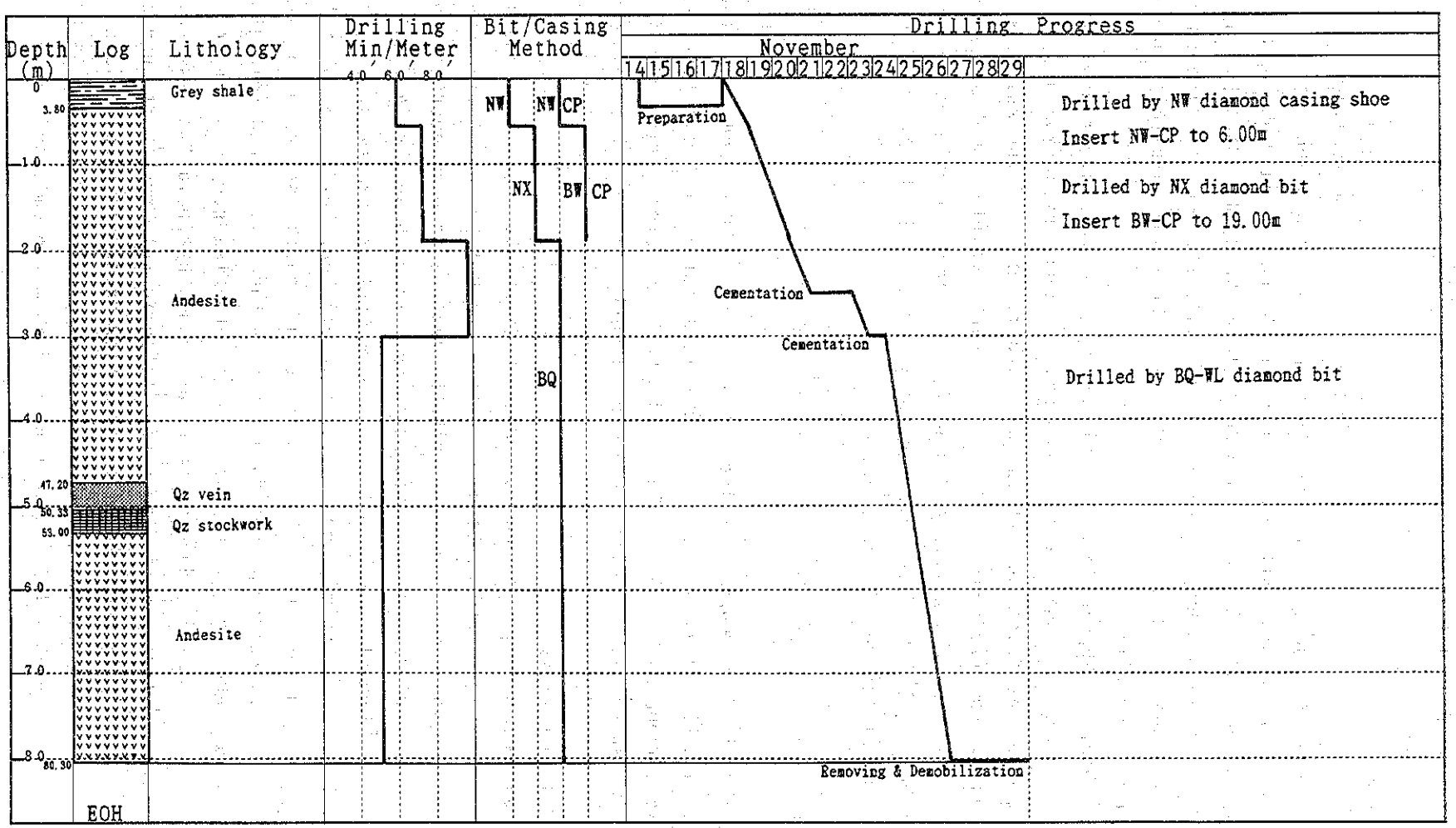


Fig.2-23 Chart of Drilling Progress (MJT-5)

6-3 Geology and Mineralization of Drill Holes

6-3-1 Geology

The geology of the area where drilling exploration was carried out this year is composed of shale, siltstone, tuffaceous shale and andesite.

Saprolite of shale, tuff and lava occurs below the surface soil (10 to 80 cm thick), and extends to nearly 30 m deep along the drill hole (its inclination is -60 degrees in common). Saprolite of andesitic rocks frequently shows lateritic features. It means leaching of silica and alumina, and relative enrichment of iron oxides.

Fresh bedrock appears below 20 to 30 m in depth. Although the bedrock itself shows fresh features below the saprolite zone, oxidation process spreads over along numerous fractures within the bedrock. Most of the sulphide minerals such as pyrite and chalcopyrite filled in quartz veinlets and millimeter size fractures have been changed into limonite and malachite even at the bottom of the drill hole. In that meaning, the entire drill hole is situated within the oxidized zone of the weathering profile.

6-3-2 Drill hole description

MJT-1 : The drill hole MJT-1 is located at 15 m at 120 degrees from the NE end of the trench T-3. It is aimed at examining the lower extension of quartz stockworks encountered in T-3. The geology of the area around the drill hole consists of andesite. Geology and mineralization in MJT-1 are described as follows:

0 ~ 0.20 m Brown soil.

0.20 ~ 33.10 m Saprolite which is composed of the alternation of andesite, shale and siltstone. Several thin layers of tuffaceous shale are intercalated within the shale. Several quartz veins and stockworks were caught in this zone; 6.00 ~ 6.14 m (14 cm, quartz vein), 8.20 ~ 11.30 m (310 cm, quartz stockwork), 17.36 ~ 17.40 m (4 cm, quartz veinlet), and 30.72 ~ 30.80 m (8 cm, quartz veinlet). Kaoline occurs partly accompanied by quartz. Limonite was commonly found in these veins and veinlets.

33.10 ~ 76.45 m Andesite. It shows green to greenish grey massive features in general. However some part shows hyaloclastic texture. Flow structure is also recognizable in this rock. It suggests that it is composed of several flow units of andesite lava. Three distinctive quartz veins were caught in the rock; 59.60 ~ 60.85 m (125 cm), 66.65 ~ 67.40 m (75 cm), and 68.15 ~ 76.45 m

(830 cm). These veins exhibit massive features. They are composed of white translucent (sometimes opaque) quartz. Small scale cracks of millimeter thickness are developed in quartz. They are filled by limonite. A small amount of pyrite, chalcopyrite and malachite were also observed in the cracks.
Quartz stockworks were caught in three zone; 51.35 ~ 53.66 m (231 cm), 53.90 ~ 54.70 m (80 cm), and 55.40 ~ 57.30 m (190 cm). Limonite was commonly found in these stockworks. Silicification and chloritization (of moderate degree) were recognized in the country rock.

76.45 ~ 80.30 m (EOH) Black shale.

MJT-2 : The drill hole MJT-2 is located at 12 m at 120 degrees from the NE end of the trench T-2. It targets the lower extension of quartz veins and stockworks caught in T-2. The geology around the drill hole consists of andesite. Description of the drill hole is recorded as follows:

0 ~ 8.00 m Soil and gravel zone. The upper 6 m consists of brown to khaki soil. The lower 2 m consists of gravel zone comprising andesite and dacite gravels and quartz fragments.

8.00 ~ 28.40 m Saprolite. The upper part is yellowish brown to brown saprolite of andesite. Whereas the lower part changes into brownish grey saprolite of tuffaceous shale. Very thick massive quartz veins were caught in this saprolite (from 9.00 m to 21.30 m) with intercalation of several andesitic parts (now intensely weathered into clay). Quartz shows white to light grey color, translucent, and of medium to coarse grain. Some part shows sugary features, probably resulted from strong weathering. Limonite was found in quartz. A couple of quartz veinlets is associated in both hanging wall and foot-wall.

28.40 ~ 80.30 m (EOH) Andesite. This zone is divided into two; the upper brecciated andesite and the lower massive andesite. From 28.40 m to 56.60 m, the andesite shows brecciated texture. It has greenish grey color. Whereas the lower part shows green massive appearance. Numerous quartz veins and stockworks were caught in the andesite. The major quartz veins and stockworks are; 35.06 ~ 35.23 m (17 cm, quartz vein), 36.29 ~ 36.40 m (11 cm, quartz vein), 38.00 ~ 38.40 m (40 cm,quartz stockwork), 39.85 ~ 40.55 m (70 cm, quartz stockwork), 47.50 ~ 50.80 m (330 cm, quartz veins and associated stockworks), 54.20 ~

54.85 m (65 cm, quartz stockwork), 56.60 ~ 57.30 m (70 cm, quartz stockwork), 59.25 ~ 59.50 m (25 cm, quartz vein), 61.14 ~ 61.32 m (18 cm, quartz stockwork), and 66.50 ~ 67.20 m (70 cm, quartz stockwork). These quartz veins and stockworks commonly contain limonite. In the massive andesite zone, pyrite occurs together with limonite. A small amount of chalcopyrite was also detected in quartz.

MJT-3 : This hole was drilled at 7 m at 60 degrees from the NE end of the trench T-1. The target of this hole is the lower extension of quartz veins and stockworks found in T-1. The geology around the drill hole consists of andesite and tuffaceous shale. Description of the drill hole is explained as follows:

0 ~ 0.60 m Brown soil.

0.60 ~ 24.82 m Saprolite. This saprolite zone is divided into three; reddish brown saprolite of andesite (0.60 ~ 9.10 m), alteration of greyish tuffaceous shale and reddish brown andesite (9.10 ~ 17.00 m), and reddish brown andesite (17.00 ~ 24.82 m). Two significant zones of quartz stockworking were caught in this zone. One quartz stockwork of 360 cm in zone width (10.50 ~ 14.10 m), and another quartz stockwork of 65 cm in zone width (14.70 ~ 15.35 m). Microfractures of 0.5 to 3.0 mm wide were recognized in the depths between 7.10 m and 16.70 m. They are filled by quartz and limonite. Tuffaceous shale around the fractures is silicified.

24.82 ~ 35.55 m Andesite. It generally shows grey massive appearance. Some of the lower parts, however, exhibit brecciated texture. Thin layers of shale are intercalated in this part. It changes gradually into black shale. Quartz veins and stockworks occur from 25 m to 30 m. A quartz stockwork of 150 cm in zone width (25.10 ~ 26.60 m), a quartz vein of 10 cm wide (27.45 ~ 27.55 m),and a quartz stockwork of 15 cm in zone width (29.75 ~ 29.90 m). A small amount of pyrite and chalcopyrite were observed in quartz.

35.55 ~ 80.30 m (EOH) Black shale. Black massive shale occurs from 35.55 m till the end of hole. Pyrite is disseminated in black shale. Andesitic layers are intercalated within black shale (53.35 ~ 65.00 m). Several minor quartz stockworks with weak pyrite-chalcopyrite impregnation were caught in this zone.

MJT-4 : The drill hole MJT-4 is located at 11 m at 90 degrees from the NE end

of the trench T-4. It targets to the lower extension of quartz veins and silicified zone found in T-4. The geology around the drill hole consists of shale and andesite. Geology and mineralization in MJT-4 are described as follows:

0 ~ 0.10 m Brown soil.

0.10 ~ 18.90 m Brown to brownish grey saprolite. It is composed of the alteration of tuffaceous shale and siltstone. Two zones of intensive quartz stockworking were caught in the saprolite; 4.80 ~ 5.50 m (70 cm) and 9.85 ~ 14.25 m (440 cm). The quartz shows white to light grey, translucent or milky features. It is 2 to 5 mm in thickness. Limonite, and in some part, pyrite were recognized in quartz. Tuffaceous shale around the stockworks is silicified and/or clayey. Microfractures filled with limonite were observed in such zones. These zones were correlated to the silicified zones in T-4.

18.90 ~ 53.60 m Black shale. Massive. Any significant indication of mineralization was not encountered in this zone except a few thin quartz veinlets.

53.60 ~ 80.30 m (EOH) Andesite. Grey to greenish grey, commonly massive and aphanitic. Intense brecciation and limonitization were observed near the boundary to black shale. One wide zone of quartz veining/stockworking and several minor quartz veins and stockworks were found; 53.55 ~ 59.75 m (620 cm, quarts veins and stockworks), 63.60 ~ 64.00 m (40 cm, quartz vein), and 79.27 ~ 79.55 m (28 cm, quartz stockwork). Quartz shows white to light grey color, and translucent features. Vein quartz is brecciated, and the cracks are filled by limonite.

MJT-5 : One hole was drilled at the northern flank of S. Bone. The drill hole MJT-5 is located at 47 m at 213 degrees from the SW end of the trench T-6. The purpose of this hole is to examine the lower extension of quartz vein caught in both T-5 and T-6. Surface of the steep creek was cut, and soil was removed for the preparation of drilling site. The drill hole is geologically situated in grey shale. Geology and mineralization in MJT-5 are described as follows:

0 ~ 3.80 m Light grey shale.

3.80 ~ 80.30 m (EOH) Andesite. Light greenish grey to green, generally massive and aphanitic. Several zones of brecciated and hyaloclastic texture were recognized in this rock. The extension of quartz vein of trenches were caught just at the programmed depth -- 47.20 ~ 50.33 m. The vein, 313 cm in width, is

Table2-42 Results of Microscopic Observation of Thin Sections(Drilling)

Sample No.	Location		Rock Name	Formation	Texture	Phenocryst/Crystal Fragment									Groundmas/Matrix						Alteration
	Hole No.	Depth				Qz	Kf	Pl	Bi	Hb	Px	Ol	Ep	Op	Qz	Kf	Pl	Hb	Px	Gl	
BD1-14T	MJT-1	57.28m	Qz vein	-	Fractured & filled by Qz	●								·							Se·Ch·Op in matrix
BD1-22T	MJT-1	69.45m	Qz vein	-	Fractured & filled by Qz-Op	●								·							Se in micro-fracture
BD1-26T	MJT-1	72.90m	Qz vein	-	Fractured & filled by Op	●	·							·							Ch in matrix
BD2-26T	MJT-2	39.90m	Qz stockwork	-		○								·							Silicified
BD3-13T	MJT-3	52.00m	Andesitic tuff	Klv	Clastic	○		△													Se·Ch in matrix. Qz veinlet
BD3-25T	MJT-3	15.80m	Qz veinlet	-		○	·							·							Se·Ch in matrix
BD4-22T	MJT-4	62.85m	Tuffaceous shale	Klv	Clastic	○								·							Qz·Se·Ch crosscut by Ca-Qz-Ch veinlet
BD5-3T	MJT-5	47.20m	Qz vein	-	Fractured $ filled by Qz-Op	●								·							Se·Ch in matrix

Abundance of Minerals : ●;Abundant, ○;Common, △;Rare, ·;Trace
Abbreviations
Formation Names: Kl;Latimojong For., Tmb;Beropa Tuffs, Qt;Barupu Tuffs, Tmg;Mamasa granite, Tmd;Diorite, Kv;Andesitic volcanic neck, Tv;Andesite(dyke)
Texture : Hol;Holocrystalline, Hypd-gr;Hypidiomorphic-granular
Minerals : Qz;Quartz, Kf;Potash feldspar, Pl;Plagioclase, Bi;Biotite, Hb;Hornblende, Px;Pyroxene, Ol;Olivine, Ep;Epidote, Op;Opaque Minerals, Gl;Glass, Ch;Chlorite, Se;Sericite, Ca;Carbonates

Table 2-43 Results of Ore Microscopy (Drilling)

Sample No.	Location	Minerals								Remarks
		Py	As	Cp	Sp	Ga	Cv	Cc	Io	
	MJT-1									
BD1-7K	38.60m	○							·	Quartz stockwork
BD1-10K	52.45m	·		·					·	Quartz stockwork. Trace of azurite
BD1-16K	60.15m	·		·			·	·	·	Quartz vein (Wd=125cm)
BD1-20K	67.00m	·							·	Quartz vein (Wd=75cm)
BD1-26K	72.90m	·							·	Quartz vein (Wd=830cm)
	MJT-2									
BD2-2K	9.75m	·							·	Quartz vein (Wd=80cm).Trace of azurite
BD2-5K	13.15m								·	Quartz vein (Wd=40cm)
BD2-18K	20.25m	·							·	Quartz vein (Wd=145cm)
BD2-24K	36.35m	·							·	Quartz vein (Wd=11cm)
BD2-26K	39.90m	·		·			·		·	Quartz stockwork
BD2-34K	61.25m	△	·	·						Quartz stockwork
	MJT-3									
BD3-2K	11.85m	·							·	Quartz stockwork
BD3-5K	15.15m	○							·	Quartz stockwork
BD3-9K	27.50m	·		·	·		·			Quartz vein (Wd=10cm)
BD3-11K	40.75m	·		·					·	Py imp in black shale.Trace of ilmenite
BD3-15K	67.45m	○	·	·	△		·			Quartz stockwork
BD3-16K	77.85m	△	·							Quartz stockwork
	MJT-4									
BD4-7K	14.05m	·							·	Quartz vein (Wd=35cm)
BD4-13K	54.40m	·							·	Quartz vein (Wd=10cm)
	MJT-5									
BD5-5K	49.05m	·		·			·	·	·	Quartz vein (Wd=313cm)

Abundance of Minerals: ○;Common, △;Rare, · ;Trace
Abbreviation : Py;Pyrite, As;Arsenopyrite, Cp;Chalcopyrite
Sp;Sphalerite, Ga;Galena, Cv;Covelline
Cc;Chalcocite, Io;Iron Oxide

Table2-4 4 Results of X-ray Diffraction Analysis(Drilling)

No.	Sample No.	Altered Rock	Rock unit	Location	Clay Mineral							Sulfate m.			Carbonate			Silicate			Feld.		Miscellaneous m.					
					Mo	Ch	Se	Mu	Ka	Ha	Mx	Al	Gy	Ja	Ca	Ak	Si	Cr	Tr	Qz	Pl	Kf	Py	Go	He	Im	Ho	At
1	BD1-3	Qz s in andesite	Klv	MJT-1, 9.20~10.20m	○				○											◎	○							
2	BD1-15	Silicified andesite (HW of Qz vein)	Klv	MJT-1, 53.90~59.60m	○	○														◎	○							
3	BD1-18	Silicified andesite (FW of Qz vein)	Klv	MJT-1, 60.85~61.05m		○														◎								
4	BD1-20	Qz vein	—	MJT-1, 66.65~67.40m		●														◎								
5	BD2-22	Qz veinlets in andesite	Klv	MJT-2, 33.80~33.84m	○															◎	○							
6	BD2-25	Qz stockwork in andesite	Klv	MJT-2, 38.00~38.40m	○											○				◎	○			●		●		
7	BD2-29	Qz stockwork in andesite	Klv	MJT-2, 49.20~50.00m	○	○														◎	○	○						
8	BD2-33	Qz vein	—	MJT-2, 59.25~59.50m					○						◎	◎				○	○							
9	BD2-35	Qz stockwork in andesite	Klv	MJT-2, 66.50~67.20m		○									○	○				○	◎							
10	BD3-1	Qz stockwork in tf-shale	Klv	MJT-3, 10.50~11.50m		●	○													◎								
11	BD3-4	Qz stockwork in tf-shale	Klv	MJT-3, 13.55~14.10m		○	○													◎	○							
12	BD3-6	Qz stockwork in andesite	Klv	MJT-3, 25.10~25.50m	○	○														○	○	○						
13	BD3-10	Qz stockwork in andesite	Klv	MJT-3, 29.75~29.90m		○														○	◎	○						
14	BD3-11	Py impregnated in bk-shale	Kls	MJT-3, 40.65~40.75m		○	○													◎	○		●					
15	BD4-6	Qz stockwork in tf-shale	Klv	MJT-4, 13.15~13.90m		○														◎	○							
16	BD4-8	Qz veinlets in bk-shale	Kls	MJT-4, 18.95m		○	○								○					◎	○							
17	BD4-14	Qz stockwork in andesite	Klv	MJT-4, 54.45~55.45m		○									◎					○	○							
18	BD4-19	Qz stockwork in andesite	Klv	MJT-4, 57.70~58.70m		○									◎					◎	○							
19	BD5-1	Silicified andesite	Klv	MJT-5, 8.55~8.80m	●	○									●	○				◎	○							
20	BD5-2	Silicified andesite	Klv	MJT-5, 46.5~47.20m		○									○					◎	●							

Abbreviations: ◎:Abundant, ○:Common, ○:Few, ●:Rare, Mo:Montmorillonite, Ch:Chlorite, Se:Sericite, Mu:Muscovite, Ka:Kaoline, Mx:Mixed layer, Ha:Halloysite, Al:Alunite, Gy:Gypsum, Ja:Jarosite, Ca:Calcite, Ak:Ankerite, Si:Siderite, Cr:α-Cristobalite, Tr:Tridymite, Qz:Quartz, Pl:Plagioclase, Kf:Potash feldspar, Py:Pyrite, Go:Goethite, He:Hematite, Im:Ilmenite Ho:Hornblende, At:Anatase.

Table 2-45 Assay Results of Ore Samples (1)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD1-2	8.20	9.20	1.00	<0.06	<2	0.008	<0.001	0.009	6.86	Quartz stockwork
BD1-3	9.20	10.20	1.00	<0.06	2	0.003	<0.001	0.009	5.76	Quartz stockwork
BD1-4	10.20	11.30	1.10	<0.06	2	0.002	<0.001	0.010	6.35	Quartz stockwork
BD1-7	38.35	38.60	0.25	<0.06	2	0.007	<0.001	0.005	5.10	Quartz stockwork
BD1-9	51.35	52.35	1.00	<0.06	2	0.006	<0.001	0.008	6.23	Quartz stockwork
BD1-10	52.35	53.00	0.65	<0.06	2	0.004	<0.001	0.006	6.09	Quartz stockwork
BD1-11	53.00	53.66	0.66	<0.06	2	0.004	<0.001	0.007	6.39	Quartz stockwork
BD1-12	53.90	54.70	0.80	<0.06	2	0.004	<0.001	0.007	5.85	Quartz stockwork
BD1-13	55.40	56.40	1.00	<0.06	2	0.003	<0.001	0.009	4.88	Quartz stockwork
BD1-18	60.85	61.05	0.20	<0.06	2	0.527	<0.001	0.022	3.61	Silicified zone
BD2-7	13.55	13.70	0.15	0.12	2	0.092	<0.001	0.020	4.08	Quartz vein
BD2-27	47.50	48.74	1.24	<0.06	<2	<0.001	<0.001	0.007	5.71	Quartz stockwork
BD2-29	49.20	50.00	0.80	<0.06	2	0.002	<0.001	0.008	6.66	Quartz stockwork
BD2-33	59.25	59.50	0.25	<0.06	2	0.008	<0.001	0.006	4.67	Quartz vein
BD2-35	66.50	67.20	0.70	<0.06	2	0.007	<0.001	0.006	4.94	Quartz stockwork
BD3-1	10.50	11.50	1.00	0.44	<2	0.017	0.004	0.019	4.63	Quartz stockwork
BD3-2	11.50	12.50	1.00	0.40	<2	0.014	0.003	0.016	5.00	Quartz stockwork
BD3-3	12.50	13.55	1.05	0.25	<2	0.012	<0.001	0.012	4.34	Quartz stockwork
BD3-4	13.55	14.10	0.55	0.12	<2	0.014	0.001	0.012	4.37	Quartz stockwork
BD3-5	14.70	15.35	0.65	0.12	<2	0.007	<0.001	0.016	5.22	Quartz stockwork
BD3-6	25.10	25.50	0.40	<0.06	<2	0.010	<0.001	0.014	5.66	Quartz stockwork
BD3-8	25.59	26.60	1.01	<0.06	<2	0.002	<0.001	0.008	7.01	Quartz stockwork
BD3-10	29.75	29.90	0.15	<0.06	<2	0.007	<0.001	0.010	5.78	Quartz stockwork
BD3-18	7.50	8.50	1.00	<0.06	2	0.076	0.012	0.020	8.87	Quartz stockwork
BD3-19	8.50	9.50	1.00	0.31	2	0.048	0.048	0.028	6.64	Quartz stockwork
BD3-20	9.50	10.50	1.00	0.40	2	0.054	0.026	0.024	6.04	Quartz stockwork
BD3-21	11.50	12.00	0.50	0.50	2	0.010	0.001	0.015	5.23	Quartz stockwork
BD3-22	12.00	12.50	0.50	0.22	2	0.007	0.001	0.013	4.05	Quartz stockwork
BD3-23	14.70	14.90	0.20	0.16	<2	0.007	<0.001	0.019	5.83	Quartz stockwork
BD3-24	14.90	15.35	0.45	0.12	<2	0.008	<0.001	0.017	6.18	Quartz stockwork
BD3-25	15.80	16.70	0.90	0.22	2	0.007	<0.001	0.011	5.45	Quartz stockwork

Table 2-45 Assay Results of Ore Samples (2)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD4-1	4.80	5.50	0.70	<0.06	2	0.008	0.003	0.018	5.59	Quartz stockwork
BD4-2	9.85	10.85	1.00	0.19	2	0.007	0.001	0.034	4.66	Quartz stockwork
BD4-3	10.85	11.85	1.00	<0.06	2	0.007	0.001	0.051	4.71	Quartz stockwork
BD4-4	11.85	12.85	1.00	0.37	<2	0.007	<0.001	0.062	4.72	Quartz stockwork
BD4-5	12.85	13.15	0.30	0.12	<2	0.008	0.001	0.092	5.87	Quartz stockwork
BD4-7	13.90	14.25	0.35	0.37	2	0.003	0.001	0.008	1.34	Quartz vein
BD4-8	18.90	19.20	0.30	<0.06	<2	0.006	0.004	0.018	5.15	Quartz stockwork
BD4-10	53.55	53.65	0.10	<0.06	2	0.001	<0.001	0.012	6.05	Quartz stockwork
BD4-12	53.75	54.35	0.60	<0.06	2	0.005	<0.001	0.010	5.35	Quartz stockwork
BD4-14	54.45	55.45	1.00	<0.06	2	0.006	<0.001	0.010	6.09	Quartz stockwork
BD4-15	55.45	56.45	1.00	<0.06	2	0.005	<0.001	0.008	5.13	Quartz stockwork
BD4-16	56.45	56.85	0.40	<0.06	2	0.008	<0.001	0.012	6.23	Quartz stockwork
BD4-18	56.95	57.70	0.75	<0.06	2	0.003	<0.001	0.010	5.27	Quarzt stockwork
BD4-19	57.70	58.70	1.00	<0.06	<2	0.004	<0.001	0.010	5.64	Quarzt stockwork
BD4-20	58.70	59.75	1.05	<0.06	<2	0.003	<0.001	0.012	5.52	Quarzt stockwork
BD4-26	7.00	7.90	0.90	0.53	<2	0.008	0.004	0.011	5.34	Quartz stockwork
BD4-27	5.50	6.00	0.50	<0.06	<2	0.008	0.002	0.017	6.01	Quartz stockwork
BD4-28	6.00	7.00	1.00	0.06	2	0.008	0.003	0.016	5.78	Quartz stockwork
BD4-29	13.15	13.30	0.15	<0.06	<2	0.008	<0.001	0.061	4.65	Quartz stockwork
BD4-31	17.10	17.30	0.20	<0.06	<2	0.006	0.002	0.016	5.70	Quartz stockwork
BD5-3	47.20	47.60	0.40	<0.06	2	0.507	<0.001	0.021	3.47	Quartz vein
BD5-5	49.05	49.25	0.20	0.19	2	0.932	<0.001	0.038	3.36	Quartz vein

composed of white massive quartz. A small amount of chalcopyrite, malachite, pyrite and limonite were found in quartz. These minerals occur in cracks within massive quartz. Silicified zones were accompanied both at the hanging wall and foot wall of the quartz vein. Several minor quartz stockworks were also caught in andesite.

6-3-3 Mineralization

The mineralization of quartz and sulphides caught in drill holes can be divided into two categories; ① massive quartz veining with the dissemination of pyrite and chalcopyrite, and ② quartz stockworking which accompanies the impregnation of pyrite and chalcopyrite.

Quartz veins of the first category are composed mainly of white to light grey translucent quartz. They show no particular inner texture (such as banded texture). They have massive features. A small amount of pyrite and chalcopyrite are disseminated in quartz. Traces of sphalerite, covelline, chalcocite and azurite were observed under the microscope (Table 2-43). This sort of quartz vein was caught at the deep part of MJT-1, at the shallow part of MJT-2 and in MJT-5.

Extensive development of quartz stockworking was encountered in every drill hole this year. The width of quartz in this category varies from a few centimeters up to tens of centimeters. Quartz stockworks are composed mainly of white to light grey translucent quartz. Silicification, chloritization, sericitization and carbonitization were recognized within the quartz stockwork zone. Kaoline of probably a supergene origin and montmorillonite were detected mainly in the shallow part of some of the drill holes through the X-ray diffraction analysis. Pyrite and chalcopyrite were recognized in quartz. Traces of arsenopyrite, sphalerite, covelline and azurite were observed under the microscope. Fractures of millimeter scale in thickness were sometimes observed in quartz and in the silicified rock, both of which belong to the quartz stockwork zone. Such fractures are filled by the later stage microcrystalline quartz. Tiny spots of pyrite (limonite), and in some cases, chalcopyrite were recognized in the fracture.

Gold was detected at several localities in drill holes.

A series of significant Au values were obtained from a bunch of quartz stockworks caught at the shallow part of MJT-3. Assay results of Au are anomalous to some extent from 8.50 m down to 16.70 m. The best result of 0.50 g/t Au was returned from a part of quartz stockwork zone (11.50 ~ 12.00 m). Pyrite and limonite are comparatively rich in these zone (Fe > 4 %).

Significant assay results of Au were also obtained from quartz veins/ stockworks caught at the shallow part of MJT-4 (from 6.00 m down to 14.25 m). The best result is 0.53 g/t Au (7.00 ~ 7.90 m). It corresponds to the part where pyrite and limonite are intensively impregnated.

A group of massive quartz veins caught at the lower part of MJT-1 has shown no Au value at all. The similar quartz veins at the shallow part of MJT-2 also carry no gold exept a very limited part (13.20 ~ 13.70 m) where a low level of Au up to 0.12 g/t was obtained. It corresponds to a part of the quartz vein which contains sulphide minerals -- pyrite and chalcopyrite.

A value of low level Au was returned from a part of massive quartz vein in MJT-5. It is 0.19 g/t Au (49.05 ~ 49.25 m) from a part of quartz vein which is relatively rich in pyrite and chalcopyrite (0.932 % Cu).

Gold was also detected from some sludges of drilling. Sludges were collected from a ditch of drilling site, then panned out, and examined under the microscope. Gold grains of very fine to fine carat were recognized from the following part of the drill holes; shallow part (depth unknown) of MJT-1, 20 ~ 40 m and 40 ~ 60 m of MJT-2, and 25 ~ 50 m of MJT-3.

It is identical that some of the quartz veins/stockworks carry gold. The major assay results of drill cores are listed in Table 2-45.

The major results of fluid inclusion study are briefly summarized as follows:

① Values of homogenization temperature of each fluid inclusion range from 180°C to 280°C.

② The temperature difference between massive quartz and stockwork quartz is not significant.

③ Any significant tendency has not been recognized in the vertical distribution of homogenization temerature.

Correlation among each vein caught in drill holes and trenches is, in most cases, difficult because of its stockwork nature in this area. The preliminary interpretation has been made.

A group of quartz veins caught at the lower part of MJT-1 is correlated to the similar quartz at the shallow part of MJT-2. Both have a massive nature in

common. Only a small part of the massive veins has been caught in T-2 (quartz veins at around 79 m position). The other part can probably be correlated to the quartz floats and outcrops in the surrounding area. It is interpreted that this zone has the strike direction of NW to NNW and gentle E dip. Massive quartz vein in MJT-5 is correlated to the quartz vein/lens in T-5 and T-6 as expected originally.

Quartz stockworks caught at the shallow part of MJT-1 are correlated to two zones of quartz stockworks in T-3. Quartz stockworks at the shallow part of MJT-3 are correlated to the three zones of quartz veins/stockworks found in T-1. These extensions are probably connected with the quartz veins/stockworks at around 50 m of MJT-2. Quartz veins/stockworks at the shallow part of MJT-4 are correlated to the quartz veins and quartz stockworks in T-4. It is interpreted that the major zones of quartz veins/stockworks caught in drill holes (except MJT-5) have a general trend of NW to NNW strike and gentle E dip. The preliminary interpretation of correlation among each vein are shown in the geologic section along the drill holes (Fig.2-24).

6-4 Discussions

The geology of the drilling area is composed of the alternating beds of shale, siltstone, tuff and andesite of the Latimojong Formation. The geologic profile of drill holes consists of surface soil and gravel zone, saprolite zone, and fresh bedrock. Weathering process was recognized pervasively in the drilling profile. Saprolite sometimes shows reddish lateritic features especially around quartz stockworks in andesite. Quartz veins in saprolite are broken and sugary ("Bossa quartz"). Most of sulphide minerals filled in quartz veins and disseminated in country rocks have been changed into oxide minerals such as limonite and malachite. This phenomenon was observed even at the bottom of the drill hole. In that meaning, the entire drill hole has been affected by the oxidation of weathering process

Many quartz veins and quartz stockworks were caught in drill holes. The mineralization of quartz and sulphides was categorized into two -- massive quartz veins and quartz stockworks. These two styles of mineralization occur together on this part of the Batuisi prospect. The major trend of quartz veins/stockworks caught in drill holes except MJT-5 is interpreted as NW-SE to NNW-SSE with gentle E dip. Assay results, ore mineral association, alteration and results of fluid inclusion study of drill cores are briefly summarized in Table 2-46.

Significant gold values, though low grade, were returned from the shallow part of quartz stockworks in MJT-3 (0.50 g/t Au at 50 cm) and MJT-4 (0.53 g/t Au at 90 cm). The width of quartz stockwork zone in which some gold values were detected is more than 8 m along the hole. Limonite after pyrite was found commonly in the zone. Traces of chalcopyrite also observed in the zone. Chlorite, sericite and calcite are associated with the quartz stockwork zone as alteration minerals.

Assay results of low grade gold were also obtained from some part of massive quartz veins. A value of 0.12 g/t Au at 15 cm in width was detected from the shallow part of quartz veins in MJT-2. A value of 0.19 g/t Au at 20 cm in width was obtained in MJT-5. A small amount of pyrite and chalcopyrite (and their oxidized spacies) are disseminated in such part of quartz veins. Alteration minerals which are related with low level gold mineralization are chlorite, sericite, calcite, and ankerite.

Kaoline and montmorillonite were found from some of the drill holes. They are interpreted as a product of weathering process. There is no distinctive change of primary mineral association in the depth of drill holes. Any change has not been observed in the vertical profile of fluid inclusions data.

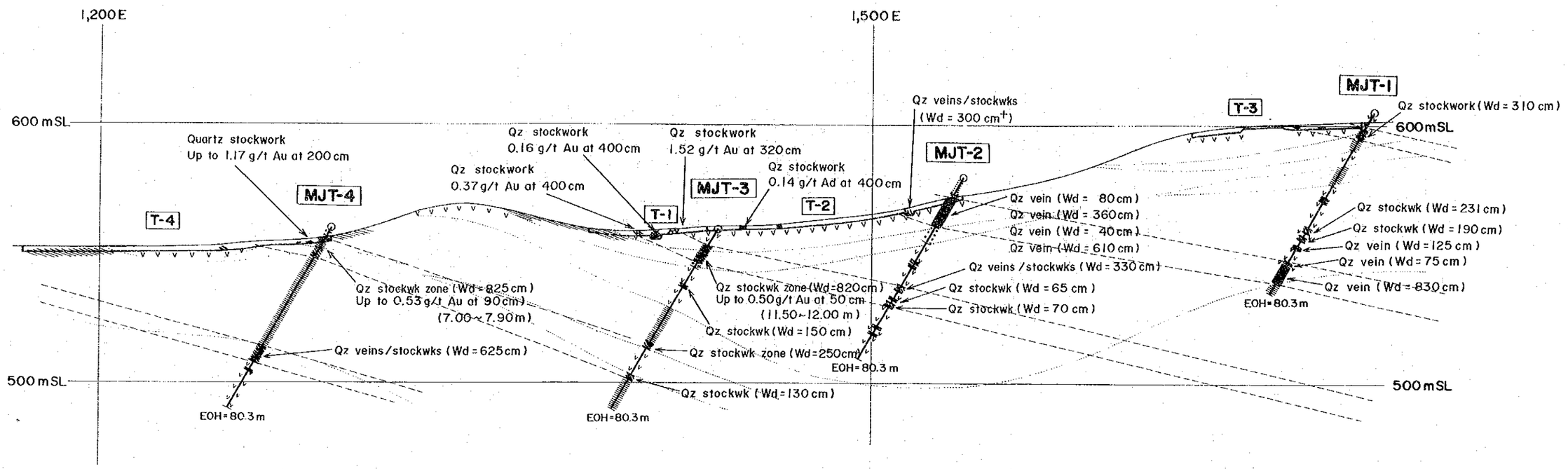
Mineralized zones of low grade gold have been discovered in this part of the prospect. Ore grade zone is expected to exist somewhere within the Batuisi prospect.

Table 2-46 Summary of Assay Results and Labo Studies of Drill Cores

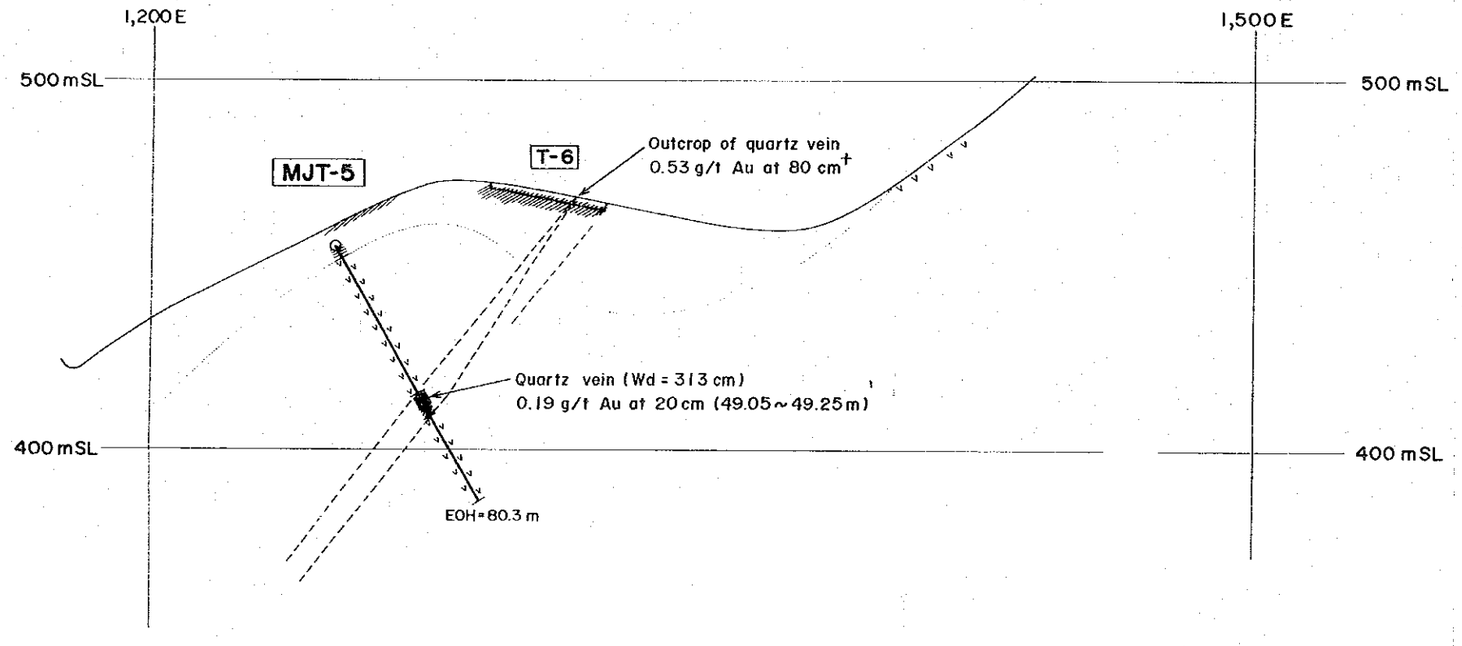
Category	Hole	Major Intersections	Ore Minerals	Alter'n Minerals	F.Incl Temp(°C)
Quartz Stockwork	MJT-1	8.20~11.30m		Mo,Ca	
		51.35~53.66m	Py,Cp,Io,Az		
		55.40~57.30m		Se,Ch	
	MJT-2	47.50~50.80m		Ch,Mo	186
	MJT-3	7.10~16.70m (Up to 0.50g/t Au at 50cm)	Py,Io	Ch,Se	247
		25.10~26.60m		Mo,Ch	
		66.20~67.50m	Py,As,Cp,Sp,Cv		
	MJT-4	6.00~14.25m (Up to 0.53g/t Au at 90cm)	Py,Io	Ch	235
		53.55~59.75m	Py,Io	Ca,Ch	211,224 238
Massive Quartz Vein	MJT-1	59.60~60.85m	Py,Cp,Cv,Cc,Io	Ch,Mo	
		68.15~76.45m	Py,Io	Ch,Se	236,237
	MJT-2	9.00~21.30m (Up to 0.12g/t Au at 15cm)	Py,Io,Az		214,225
	MJT-5	47.20~50.33m (Up to 0.19g/t Au at 20cm)	Py,Cp,Cv,Cc,Io	Ch,Se,Ca	189,220

※ Abbreviations same as in the previous tables.

HILL NORTHWEST OF S.TARAWA



NORTH OF S.BONE

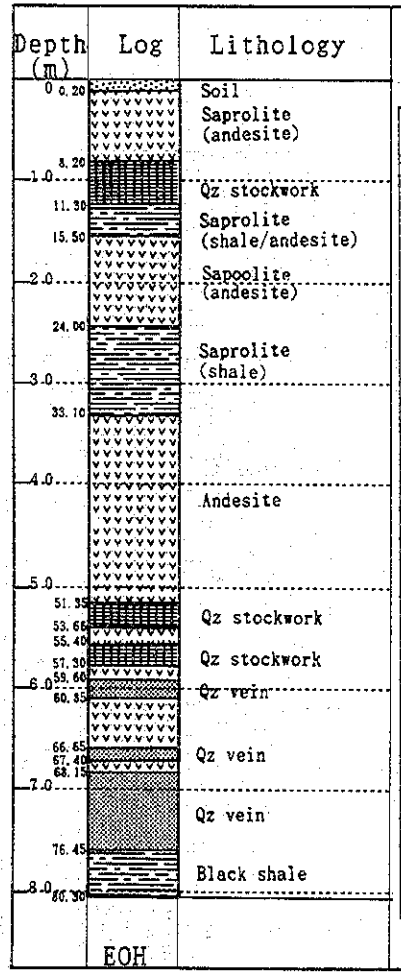


LEGEND

- Surface Soil
- Tuffaceous Shale
- Andesite
- Black Shale
- Quartz Vein
- Quartz Stockwork
- Mineralized Zone

0 50 100m

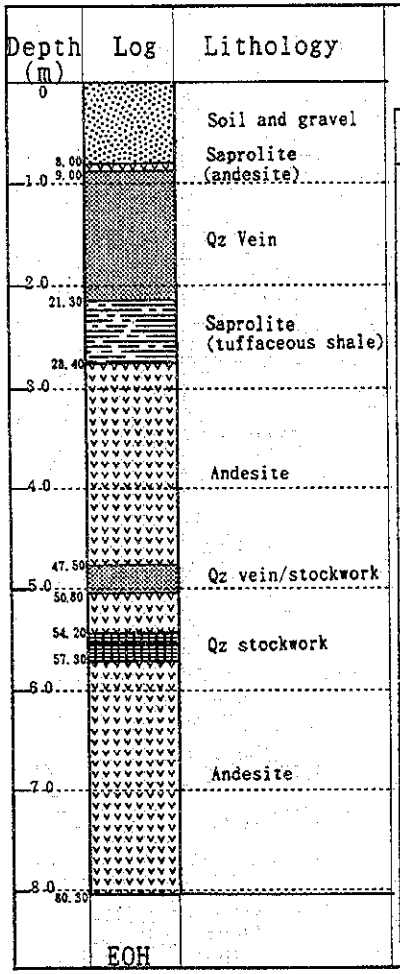
Fig.2-24 Geologic Section along the Drill Holes



ASSAY RESULTS OF ORE SAMPLES (MJT-1)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD1-2	8.20	9.20	1.00	<0.06	<2	0.008	<0.001	0.009	6.86	Quartz stockwork
BD1-3	9.20	10.20	1.00	<0.06	2	0.003	<0.001	0.009	5.76	Quartz stockwork
BD1-4	10.20	11.30	1.10	<0.06	2	0.002	<0.001	0.010	6.35	Quartz stockwork
BD1-5	17.36	17.40	0.04	<0.06	<2	0.003	<0.001	0.012	3.08	Qz-kaolinite veinlet
BD1-7	38.35	38.60	0.25	<0.06	2	0.007	<0.001	0.005	5.10	Quartz stockwork
BD1-9	51.35	52.35	1.00	<0.06	2	0.006	<0.001	0.008	6.23	Quartz stockwork
BD1-10	52.35	53.00	0.65	<0.06	2	0.004	<0.001	0.006	6.09	Quartz stockwork
BD1-11	53.00	53.66	0.66	<0.06	2	0.004	<0.001	0.007	6.39	Quartz stockwork
BD1-12	53.90	54.70	0.80	<0.06	2	0.004	<0.001	0.007	5.85	Quartz stockwork
BD1-13	55.40	56.40	1.00	<0.06	2	0.003	<0.001	0.009	4.88	Quartz stockwork
BD1-14	56.40	57.30	0.90	<0.06	2	0.034	<0.001	0.011	3.27	Quartz stockwork
BD1-16	59.60	60.25	0.65	<0.06	<2	0.040	<0.001	0.004	1.85	Quartz vein
BD1-17	60.25	60.85	0.60	<0.06	2	0.078	<0.001	0.024	2.61	Quartz vein
BD1-18	60.85	61.05	0.20	<0.06	2	0.527	<0.001	0.022	3.61	Silicified zone
BD1-20	66.65	67.40	0.75	<0.06	2	0.040	<0.001	0.015	1.25	Quartz vein
BD1-21	68.15	69.15	1.00	<0.06	2	0.016	<0.001	0.002	0.78	Quartz vein
BD1-22	69.15	70.15	1.00	<0.06	2	0.014	<0.001	0.002	0.52	Quartz vein
BD1-23	70.15	71.15	1.00	<0.06	2	0.011	<0.001	0.001	0.38	Quartz vein
BD1-24	71.15	72.15	1.00	<0.06	<2	0.013	<0.001	0.001	0.45	Quartz vein
BD1-25	72.15	72.70	0.55	<0.06	<2	0.036	<0.001	0.003	0.93	Quartz vein
BD1-26	72.70	73.10	0.40	<0.06	2	0.089	<0.001	0.012	3.41	Quartz vein
BD1-27	73.10	74.10	1.00	<0.06	2	0.021	0.001	0.004	1.71	Quartz vein
BD1-28	74.10	75.10	1.00	<0.06	2	0.009	<0.001	0.001	0.40	Quartz vein
BD1-29	75.10	76.20	1.10	<0.06	4	0.036	<0.001	0.005	1.14	Quartz vein
BD1-30	76.20	76.45	0.25	<0.06	<2	0.031	<0.001	0.012	3.11	Quartz vein
BD1-31	72.70	72.90	0.20	<0.06	2	0.079	<0.001	0.011	3.33	Quartz vein
BD1-32	72.90	73.10	0.20	<0.06	4	0.072	<0.001	0.013	3.17	Quartz vein

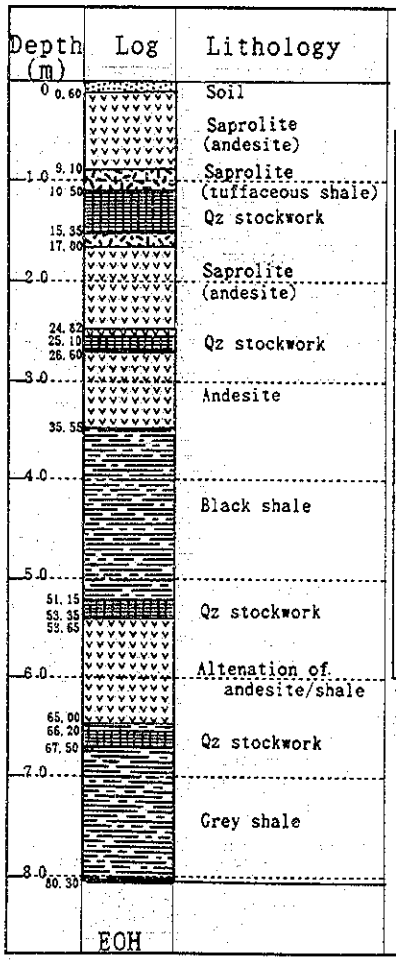
Fig. 2-25 Summary of Drill Logs and Assay Results of Core Samples(MJT-1)



ASSAY RESULTS OF ORE SAMPLES (MJT-2)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD2-2	9.00	9.80	0.80	<0.06	4	0.009	0.001	0.002	1.21	Quartz vein
BD2-3	10.10	11.50	1.40	<0.06	2	0.020	0.001	0.009	1.87	Bosa quartz
BD2-4	11.50	12.80	1.30	<0.06	2	0.018	0.002	0.008	1.29	Bosa quartz
BD2-5	12.80	13.20	0.40	<0.06	2	0.014	<0.001	0.003	1.67	Quartz vein
BD2-6	13.20	13.55	0.35	0.06	2	0.030	0.001	0.010	2.87	Bosa quartz
BD2-7	13.55	13.70	0.15	0.12	2	0.092	<0.001	0.020	4.08	Quartz vein
BD2-8	14.15	14.55	0.40	0.06	2	0.029	<0.001	0.006	1.43	Quartz vein
BD2-9	15.20	15.92	0.72	<0.06	2	0.024	0.001	0.012	1.77	Bosa quartz
BD2-10	15.92	16.00	0.08	<0.06	4	0.014	<0.001	0.006	1.62	Quartz veinlet
BD2-11	16.00	16.65	0.65	<0.06	4	0.022	0.001	0.011	1.55	Bosa quartz
BD2-12	16.65	16.70	0.05	<0.06	2	0.008	<0.001	0.002	0.54	Quartz veinlet
BD2-13	16.70	17.25	0.55	<0.06	2	0.017	0.001	0.008	1.36	Bosa quartz
BD2-14	17.25	17.30	0.05	<0.06	2	0.007	0.001	0.002	1.52	Quartz veinlet
BD2-15	17.87	18.00	0.13	<0.06	4	0.005	0.001	0.002	0.82	Quartz vein
BD2-16	18.00	19.35	1.35	<0.06	2	0.017	0.001	0.011	1.62	Bosa quartz
BD2-17	19.35	20.10	0.75	<0.06	2	0.009	<0.001	0.001	0.92	Quartz vein
BD2-18	20.10	20.80	0.70	<0.06	2	0.010	0.001	0.002	1.00	Quartz vein
BD2-19	20.80	21.10	0.30	<0.06	2	0.020	<0.001	0.008	1.04	Bosa quartz
BD2-20	21.10	21.30	0.20	<0.06	2	0.017	0.001	0.004	0.87	Quartz vein
BD2-22	33.80	33.84	0.04	<0.06	2	0.006	0.001	0.016	2.30	Quartz veinlet
BD2-23	35.06	35.23	0.17	<0.06	<2	<0.001	<0.001	<0.001	1.17	Quartz vein
BD2-24	36.29	36.40	0.11	<0.06	2	0.002	<0.001	0.004	3.26	Quartz vein
BD2-27	47.50	48.74	1.24	<0.06	<2	<0.001	<0.001	0.007	5.71	Quartz stockwork
BD2-28	48.74	49.20	0.46	<0.06	<2	<0.001	<0.001	0.001	0.92	Quartz vein
BD2-29	49.20	50.00	0.80	<0.06	2	0.002	<0.001	0.008	6.66	Quartz stockwork
BD2-30	50.00	50.80	0.80	<0.06	2	0.002	<0.001	0.005	4.47	Quartz stockwork
BD2-33	59.25	59.50	0.25	<0.06	2	0.008	<0.001	0.006	4.67	Quartz vein
BD2-35	66.50	67.20	0.70	<0.06	2	0.007	<0.001	0.006	4.94	Quartz stockwork

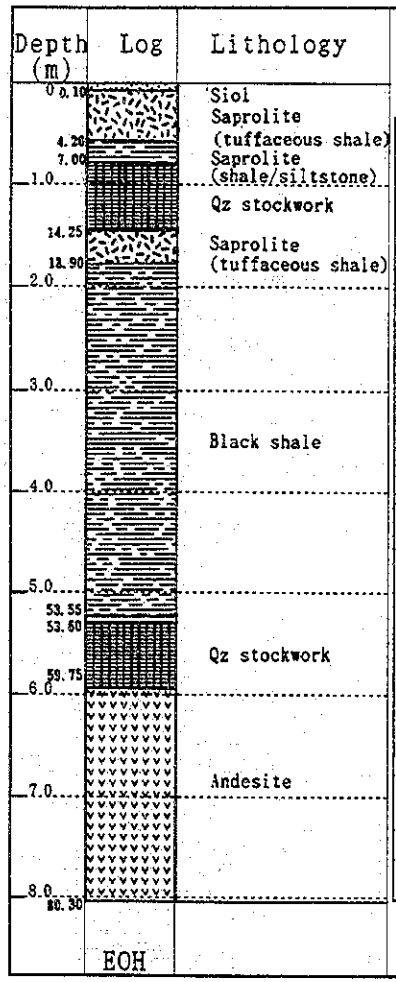
Fig. 2-25 Summary of Drill Logs and Assay Results of Core Samples(MJT-2)



ASSAY RESULTS OF ORE SAMPLES (MJT-3)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD3-1	10.50	11.50	1.00	0.44	<2	0.017	0.004	0.019	4.63	Quartz stockwork
BD3-2	11.50	12.50	1.00	0.40	<2	0.014	0.003	0.016	5.00	Quartz stockwork
BD3-3	12.50	13.55	1.05	0.25	<2	0.012	<0.001	0.012	4.34	Quartz stockwork
BD3-4	13.55	14.10	0.55	0.12	<2	0.014	0.001	0.012	4.37	Quartz stockwork
BD3-5	14.70	15.35	0.65	0.12	<2	0.007	<0.001	0.016	5.22	Quartz stockwork
BD3-6	25.10	25.50	0.40	<0.06	<2	0.010	<0.001	0.014	5.66	Quartz stockwork
BD3-7	25.50	25.59	0.09	<0.06	<2	0.003	<0.001	0.001	1.36	Quartz veinlet
BD3-8	25.59	26.60	1.01	<0.06	<2	0.002	<0.001	0.008	7.01	Quartz stockwork
BD3-9	27.45	27.55	0.10	<0.06	2	0.149	<0.001	0.039	1.85	Quartz vein
BD3-10	29.75	29.90	0.15	<0.06	<2	0.007	<0.001	0.010	5.78	Quartz stockwork
BD3-18	7.50	8.50	1.00	<0.06	2	0.076	0.012	0.020	8.87	Quartz stockwork
BD3-19	8.50	9.50	1.00	0.31	2	0.048	0.048	0.028	6.64	Quartz stockwork
BD3-20	9.50	10.50	1.00	0.40	2	0.054	0.026	0.024	6.04	Quartz stockwork
BD3-21	11.50	12.00	0.50	0.50	2	0.010	0.001	0.015	5.23	Quartz stockwork
BD3-22	12.00	12.50	0.50	0.22	2	0.007	0.001	0.013	4.05	Quartz stockwork
BD3-23	14.70	14.90	0.20	0.16	<2	0.007	<0.001	0.019	5.83	Quartz stockwork
BD3-24	14.90	15.35	0.45	0.12	<2	0.008	<0.001	0.017	6.18	Quartz stockwork
BD3-25	15.80	16.70	0.90	0.22	2	0.007	<0.001	0.011	5.45	Quartz stockwork

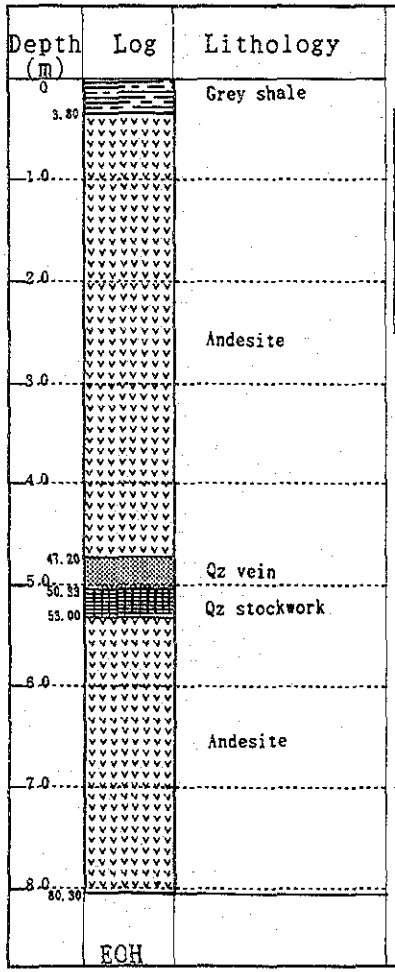
Fig. 2-25 Summary of Drill Logs and Assay Results of Core Samples(MJT-3)



ASSAY RESULTS OF ORE SAMPLES (MJT-4)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD4-1	4.80	5.50	0.70	<0.06	2	0.008	0.003	0.018	5.59	Quartz stockwork
BD4-2	9.85	10.85	1.00	0.19	2	0.007	0.001	0.034	4.66	Quartz stockwork
BD4-3	10.85	11.85	1.00	<0.06	2	0.007	0.001	0.051	4.71	Quartz stockwork
BD4-4	11.85	12.85	1.00	0.37	<2	0.007	<0.001	0.062	4.72	Quartz stockwork
BD4-5	12.85	13.15	0.30	0.12	<2	0.008	0.001	0.092	5.87	Quartz stockwork
BD4-6	13.15	13.90	0.75	<0.06	2	0.007	<0.001	0.050	3.68	Quartz stockwork
BD4-7	13.90	14.25	0.35	0.37	2	0.003	0.001	0.008	1.34	Quartz vein
BD4-8	18.90	19.20	0.30	<0.06	<2	0.006	0.004	0.018	5.15	Quartz stockwork
BD4-10	53.55	53.65	0.10	<0.06	2	0.001	<0.001	0.012	6.05	Quartz stockwork
BD4-11	53.65	53.75	0.10	<0.06	<2	0.003	<0.001	0.008	4.00	Quarzt vein
BD4-12	53.75	54.35	0.60	<0.06	2	0.005	<0.001	0.010	5.35	Quartz stockwork
BD4-13	54.35	54.45	0.10	<0.06	2	0.005	<0.001	0.005	2.84	Quartz vein
BD4-14	54.45	55.45	1.00	<0.06	2	0.006	<0.001	0.010	6.09	Quartz stockwork
BD4-15	55.45	56.45	1.00	<0.06	2	0.005	<0.001	0.008	5.13	Quartz stockwork
BD4-16	56.45	56.85	0.40	<0.06	2	0.008	<0.001	0.012	6.23	Quartz stockwork
BD4-17	56.85	56.95	0.10	<0.06	2	0.007	<0.001	0.009	2.14	Quartz vein
BD4-18	56.95	57.70	0.75	<0.06	2	0.003	<0.001	0.010	5.27	Quarzt stockwork
BD4-19	57.70	58.70	1.00	<0.06	<2	0.004	<0.001	0.010	5.64	Quarzt stockwork
BD4-20	58.70	59.75	1.05	<0.06	<2	0.003	<0.001	0.012	5.52	Quarzt stockwork
BD4-23	63.60	64.00	0.40	<0.06	2	0.002	<0.001	0.003	2.02	Quartz vein
BD4-26	7.00	7.90	0.90	0.53	<2	0.008	0.004	0.011	5.34	Quartz stockwork
BD4-27	5.50	6.00	0.50	<0.06	<2	0.008	0.002	0.017	6.01	Quartz stockwork
BD4-28	6.00	7.00	1.00	0.06	2	0.008	0.003	0.016	5.78	Quartz stockwork
BD4-29	13.15	13.30	0.15	<0.06	<2	0.008	<0.001	0.061	4.65	Quartz stockwork
BD4-30	13.30	13.90	0.60	0.06	<2	0.007	<0.001	0.048	3.58	Quartz stockwork
BD4-31	17.10	17.30	0.20	<0.06	<2	0.006	0.002	0.016	5.70	Quartz stockwork

Fig. 2-25 Summary of Drill Logs and Assay Results of Core Samples(MJT-4)



ASSAY RESULTS OF ORE SAMPLES (MJT-5)

SAMPLE NO	DEPTH FROM	DEPTH TO	WIDTH m	AU g/t	AG g/t	CU %	PB %	ZN %	FE %	DESCRIPTION
BD5-2	46.50	47.20	0.70	<0.06	<2	0.065	<0.001	0.079	4.44	Silicified zone
BD5-3	47.20	47.60	0.40	<0.06	2	0.507	<0.001	0.021	3.47	Quartz vein
BD5-4	48.20	49.05	0.85	<0.06	<2	0.055	<0.001	0.013	1.08	Quartz vein
BD5-5	49.05	49.25	0.20	0.19	2	0.932	<0.001	0.038	3.36	Quartz vein
BD5-6	49.25	50.33	1.08	<0.06	2	0.161	<0.001	0.014	1.64	Quartz vein
BD5-7	47.60	48.20	0.60	<0.06	2	0.050	<0.001	0.013	0.97	Quartz vein

Fig. 2-25 Summary of Drill Logs and Assay Results of Core Samples(MJT-5)

PART Ⅲ CONCLUSIONS & RECOMMENDATIONS

PART Ⅲ CONCLUSIONS AND RECOMMENDATIONS

Chapter 1 Conclusions

Batuisi prospect

On the basis of the results of the second phase exploration comprising detailed geological survey, grid soil survey, geochemical rock-chip sampling, shallow trenching and reconnaissance drilling, the following conclusions are obtained.

(1) The geology of the prospect is composed of black shale, siltstone, tuff, and andesite of the Cretaceous Latimojong Formation. The Mamasa granite batholith is exposed several kilometers to the south of the prospect. Small stocks of diorite which are inferred to be related to the granite body occur within the prospect. From the structural point of view, the prospect is located on the western flank of an anticlinorium (whose axis is N-S) formed by the emplacement of the Mamasa granite.

(2) Extensive development of quartz veins and quartz stockworks was confirmed in the prospect. Several vein systems were distinguished, and the formation of the vein pattern was discussed. The most dominant vein system -- NNW system -- is interpreted to be formed as a normal fault in the direction of compression probably generated by the emplacement of a granite body. The other major two systems -- N-S system and NW system -- may correspond to the synthetic-antithetic strike-slip faults formed by the compression.

(3) Two styles of quartz and sulphide mineralization were found mainly along S. Tarawa, S. Bone, S. Malela and S. Pongo in the prospect. One is massive quartz veins with dissemination of pyrite and chalcopyrite mainly found at the middle reaches of S. Tarawa and S. Malela. Another is quartz stockworks which accompany an impregnation of pyrite and chalcopyrite within the zone. The stockwork system was caught mainly at the area extending from the upper reaches of S. Tarawa to the upper reaches of S. Bone.

(4) Significant gold values were returned from outcrops, floats, rock-chips and trench samples within the area. An assay result of 1.34 g/t Au at 7 cm in width was obtained from a part of a massive quartz vein at the middle reaches of S. Tarawa. A quartz rock-chip of 1,685 ppb Au was found at the middle reaches of

S. Bone. A value of 0.53 g/t at 80+ cm in width was obtained from an outcrop of massive quartz vein at the northern side of the upper reaches of S. Bone. The best result of channel samples in trenches is 1.52 g/t Au at 3.2m in width. A value of 0.40 g/t Au was obtained from a quartz float zone at the S. Pongo area.

(5) The type and condition of gold mineralization in the prospect was discussed on the basis of petrology, mineralogy, hydrothermal alteration and fluid inclusion studies. It is interpreted that the gold-bearing quartz veins and quartz stockworks were formed under mesothermal conditions. The similarity of the mineralization to the gold-bearing quartz veins of the Oya deposit in northern Japan is considered. This type of ore deposit sometimes shows a large fluctuation of gold grade within the vein. This nature needs to be considered in the evaluation of mineralization.

(6) Three distinctive Au anomalies and several minor anomalies were delineated from grid soil survey and rock-chip geochemistry. The major anomalies are located at the upper reaches of S. Tarawa, S. Malela and the middle reaches of S. Bone. These anomalies are distributed within an area of 2,500 m (NE-SW) × 1,500 m (NW-SE) centered at the top of the ridge. They are composed of significant Au values of soil samples. The maximum value is 1,340 ppb Au. Anomalies of Cu and Zn almost overlap on the Au anomalies. The geochemical anomalies are well correlated to the areas where intensive quartz veins/stockworks were found. The size and magnitude of gold mineralization are estimated to be medium from the geochemical features.

(7) The result of drilling in 1992 was disappointing. Low-grade gold mineralization was found in two holes (0.50 g/t Au at 50 cm in MJT-3 and 0.53 g/t Au at 90 cm in MJT-4). No ore-grade value has been returned. However, only limited part of the mineralized zone was investigated. It was confirmed that the outcrops of quartz veins/stockworks and geochemical anomalies were the indicator of gold mineralization. There is a possibility of finding ore-grade parts within the zone. Some evidences of gold depletion by the lateritic weathering process, though circumstantial, are pointed out. Further drilling is necessary for the full-evaluation of this zone.

Bau prospect

(1) Two styles of mineralization were distinguished through detailed geological survey in the prospect. One consists of fissure filling quartz veins, and another is pyrite dissemination near dioritic stocks. The geologic environment is interpreted to be similar to that of the Batuisi prospect.

(2) Some of the quartz veins showed significant Au assay results. Each of the veins is small and discontinuous. Soil anomalies of Au and Cu obtained in the area are of low level and sporadic. From these evidences, it is concluded that the gold mineralization of this style had no sign of extensive development.

(3) Pyrite dissemination was found at the northern part of the prospect. Assay results were discouraging. Au anomalies of soil and rock-chip samples found near the pyrite dissemination are of low level and patchy. This style of mineralization probably has low potential.

S. Lebutang prospect

(1) Gold mineralization associated with pyrite dissemination or stringers in massive andesite was found at S. Taroto. A series of Au anomalies of moderate to low degrees was found to extend from S. Kanan through S. Taroto and S. Peko up to S. Talodo Basisi. Although the surface indications of this zone are significant, the assay result of ore samples is disappointing. It is believed to be a gold mineralization probably associated with pyrite dissemination within shear zones. The details of mineralization have not been fully investigated. It is presumed to be a low-grade gold mineralization on the basis of the data obtained during 1992.

(2) The other outcrops of quartz veins and geochemical anomalies found in the prospect are estimated to be of minor importance.

Kariango prospect

A limonite network zone and the subordinate Au anomaly of low level were found near S. Suluan. It is interpreted to be the product of small scale hydrothermal activity by a subsurface igneous intrusion. Other indications of gold mineralization have not been discovered in the prospect. The potential of this prospect appears to be very small.

Chapter 2 Recommendations for the Third Phase

Batuisi prospect

It is recommended that the mineralized zone delineated by the second phase survey in the prospect be fully drill-tested during the third phase. The major promising locations for drilling to be carried out during the third phase are listed below. The depth of drill holes must be deep enough (around 200m) to penetrate through the oxidized zone.

① South of the second phase drill line at the upper reaches of S. Tarawa
② North of the second phase drill line at the upper reaches of S. Bone
③ Area between S. Pongo and S. Malela
④ S. Malela
⑤ Near the top of the ridge
⑥ Middle reaches of S. Bone
⑦ NW extension of the "Old Dutch Pit" vein.

Bau prospect

No further work is recommended in the Bau prospect.

S. Lebutang prospect

No further work is recommended in the S. Lebutang prospect.

Kariango prospect

No further work is recommended in the Kariango prospect.

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REFERENCES

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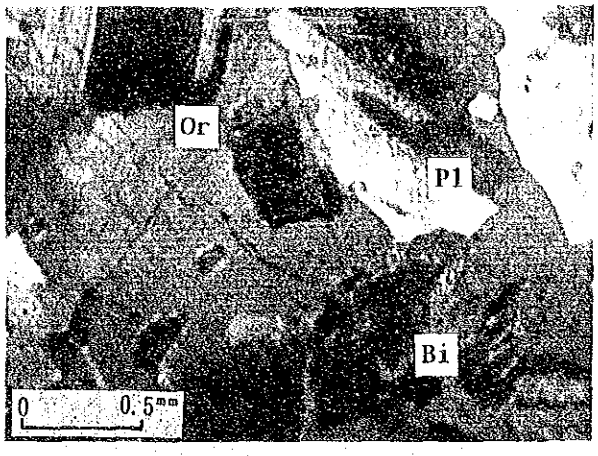
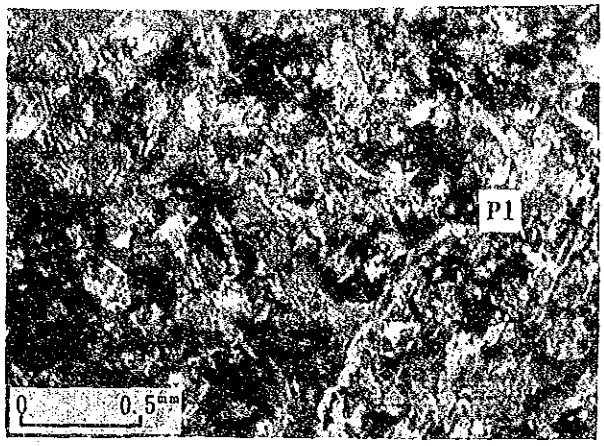
PHOTOGRAPHS

Photo.1 Photomicrographs of Thin Sections



Rock Name : Granite (Tmg)
Sample No : LEB5T
Locality : S. Lebutang
(Crossed Nicol)



Rock Name : Andesite (Kv)
Sample No : LEB8T
Locality : S Lebutang
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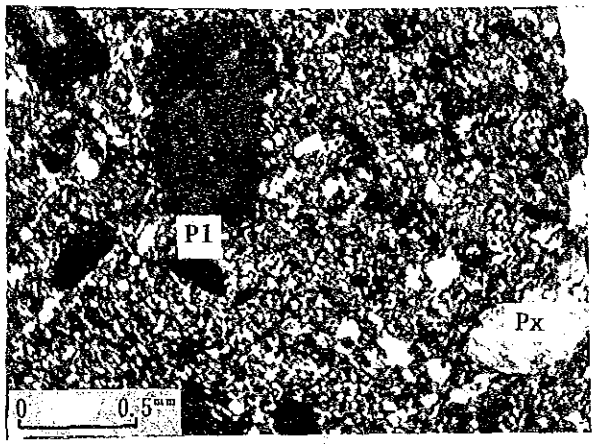
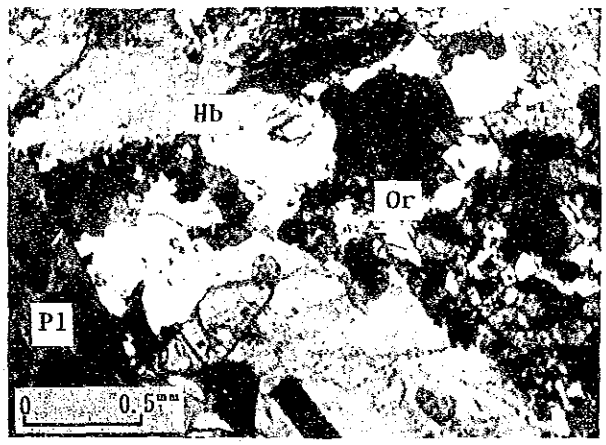


Rock Name : Dacite (Qt)
Sample No : LED12T
Locality : S. Petangunan
(Crossed Nicol)



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Sample No : LED26T
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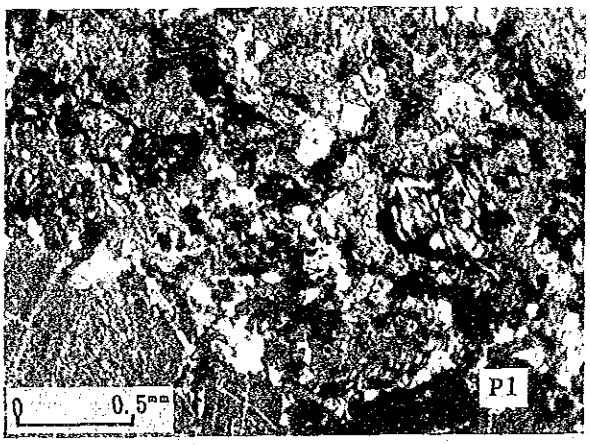
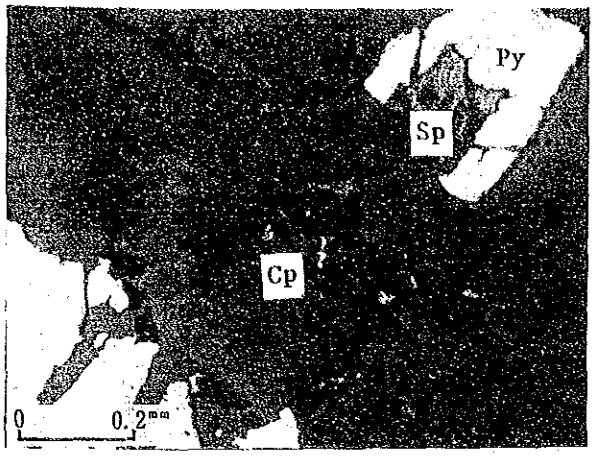


Rock Name : Andesite (Tv)
Sample No : KAD3T
Locality : S. Uroh
(Crossed Nicol)

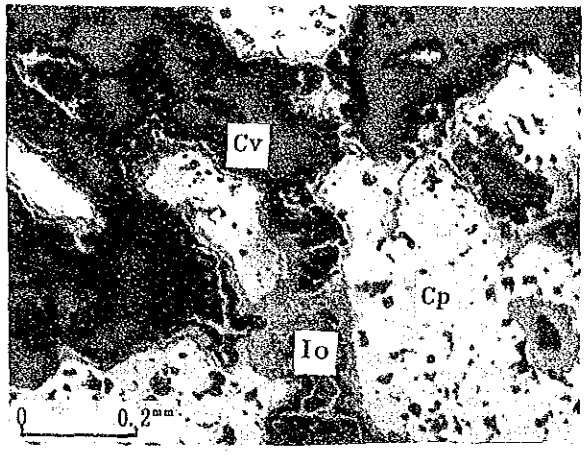
Rock Name : Andesite (Tmv)
Sample No : KAD12T
Locality : S. Uroh
(Crossed Nicol)

Abbreviations: Qz;Quartz, Pl;Plagioclase, Or;Orthoclase, Bi;Biotite
Hb;Hornblende, Px;Pyroxene; Ch;Chlorite

Photo.2 Photomicrographs of Ores



Minerals : Py-Sp-Cp
Sample No : BAA99K
Locality : T-6 (22m)
(Open Nicol)



Minerals : Cp-Cv-Io
Sample No : BTF16K
Locality : S. Malela
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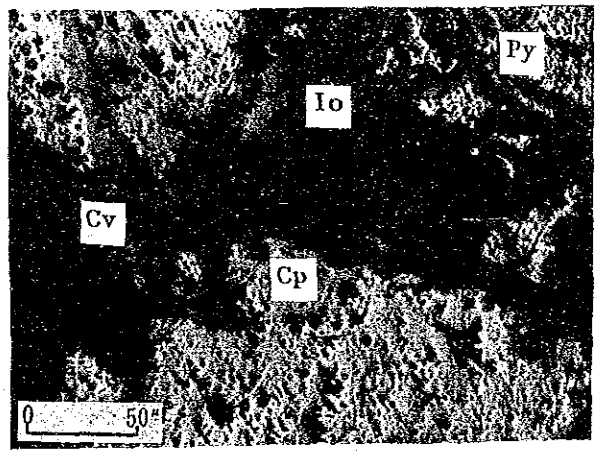

Minerals : Cp-Cv-Py-Io
Sample No : BD2-26K
Locality : MJT-2 (39.90m)
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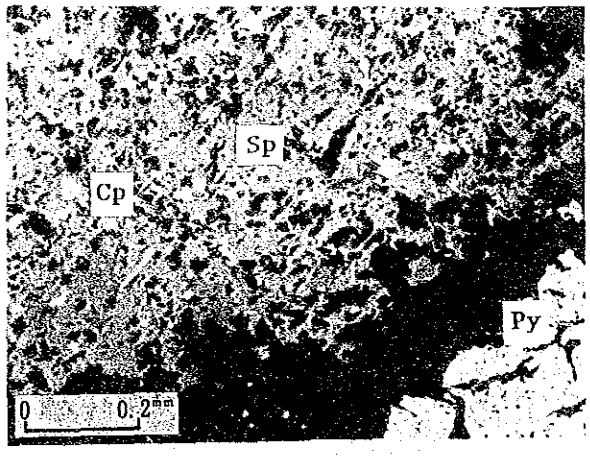

Minerals : Sp-Cp-Py
Sample No : BD3-15K
Locality : MJT-3 (67.45m)
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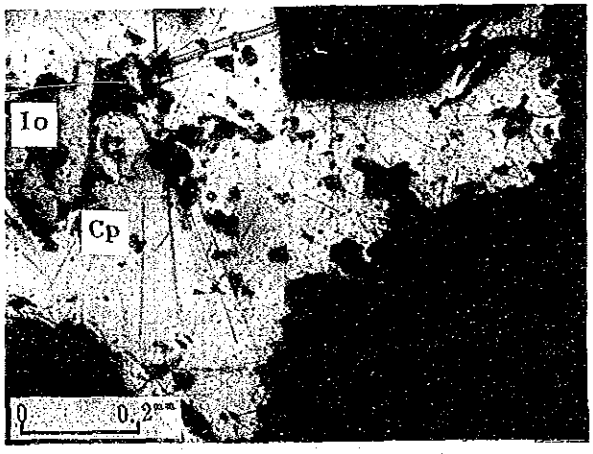

Minerals : Cp-Io
Sample No : BAC17K
Locality : S. Salubongi
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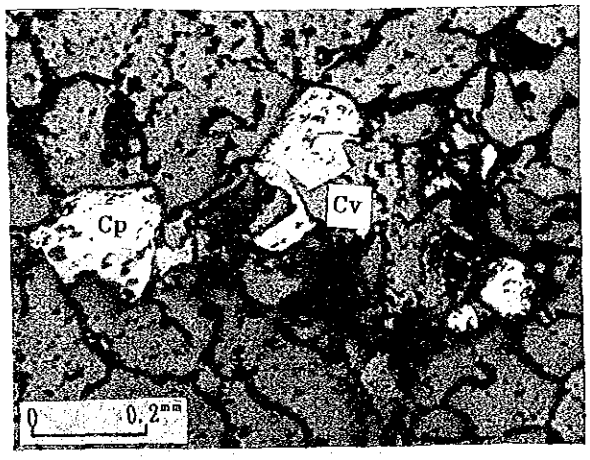
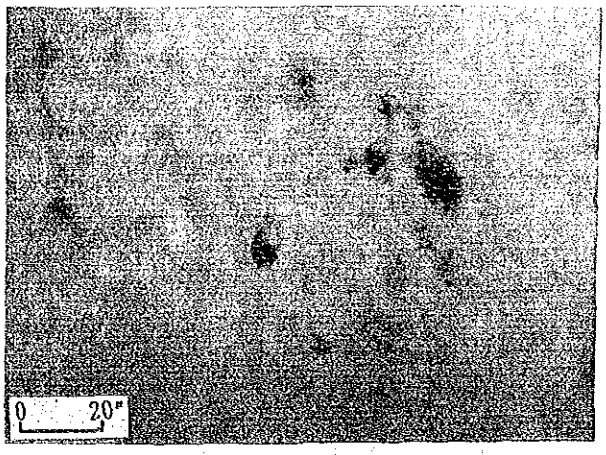


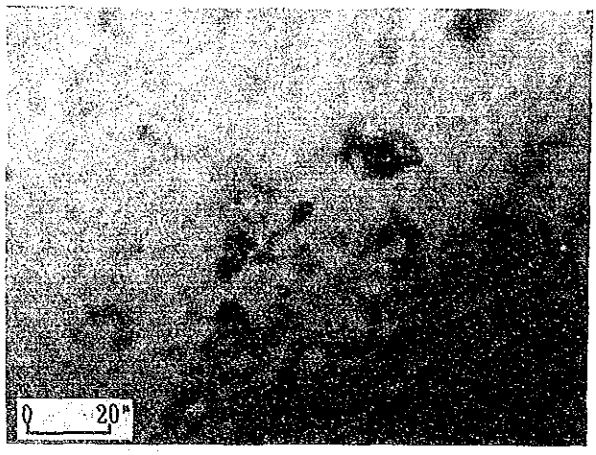
Minerals : Cp-Cv
Sample No : LEB25K
Locality : S. Lebutang
(Open Nicol)

Abbreviations: Py;Pyrite, Cp;Chalcopyrite, Sp;Sphalerite, Cv;Covelline
Io;Iron Oxide

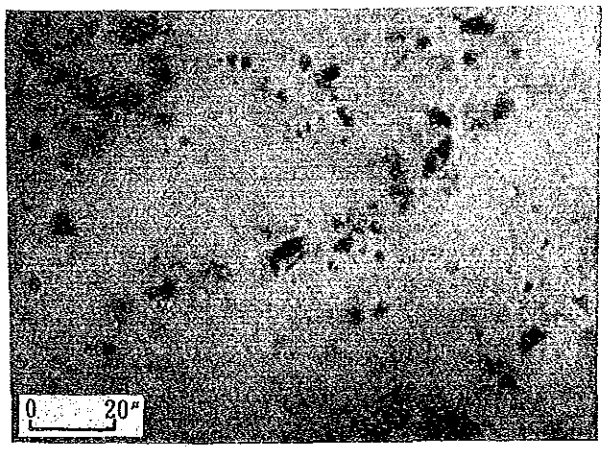
Photo.3 Photomicrographs of Fluid Inclusions



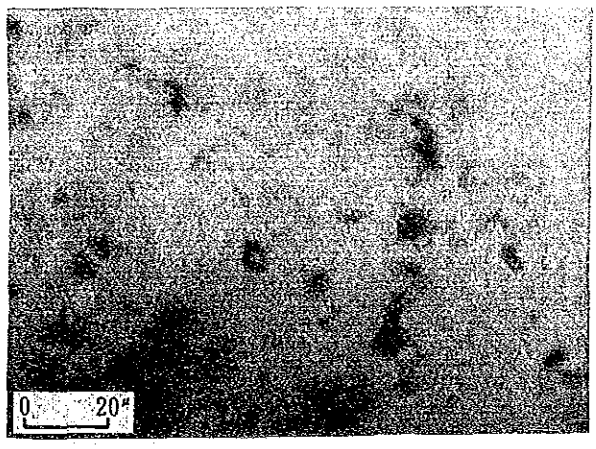
Inclusion : Two-phase
Sample No : BAA92F
Locality : S. Tarawa (Upper)



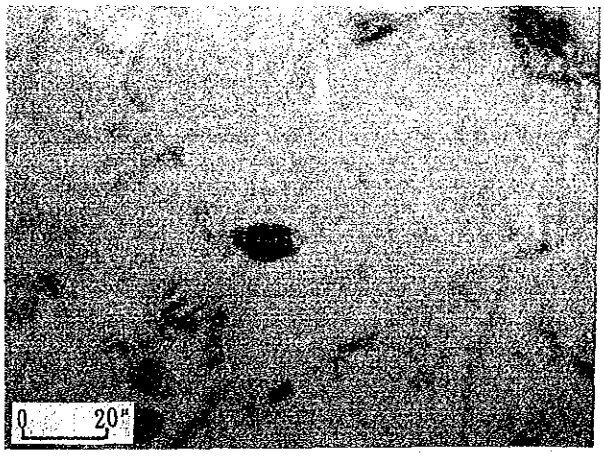
Inclusion : Poly-phase
Sample No : BAA92F
Locality : S. Tarawa (Upper)



Inclusion : Two-phase
Sample No : BTK33F
Locality : S. Panunukan



Inclusion : Two-phase
Sample No : BD3-4F
Locality : MJT-3 (13.90m)



Inclusion : Two-phase
Sample No : LEB3F
Locality : S. Taroto

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
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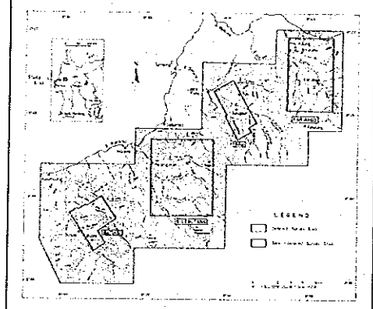
PHASE II

GEOLOGIC MAP AND GEOLOGIC PROFILE OF THE BATUISI PROSPECT



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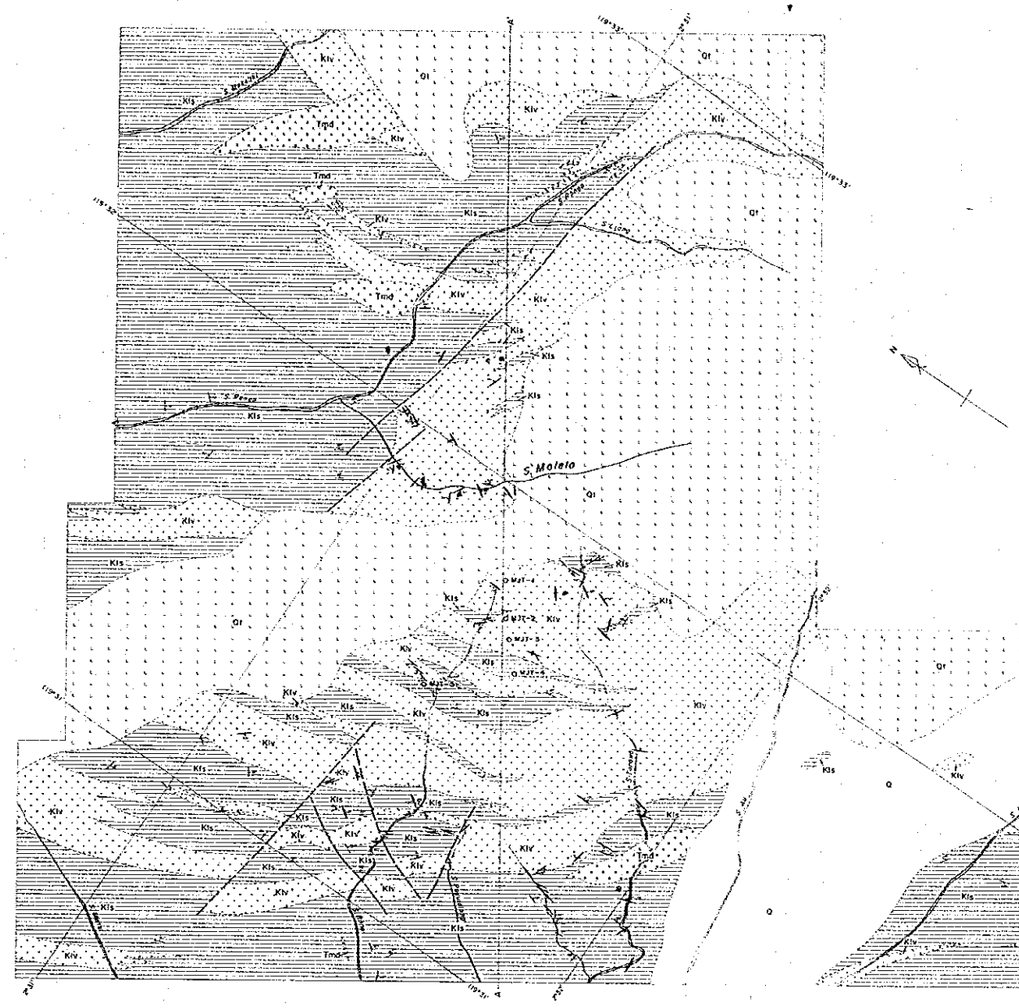

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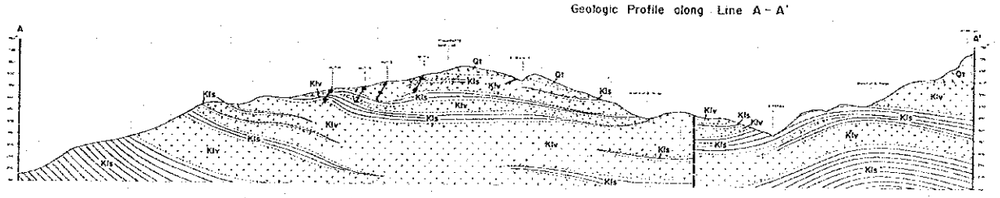
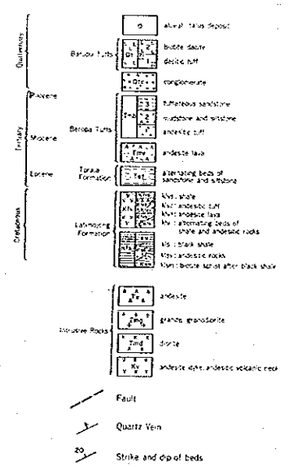
Geologic Profile along Line A – A'



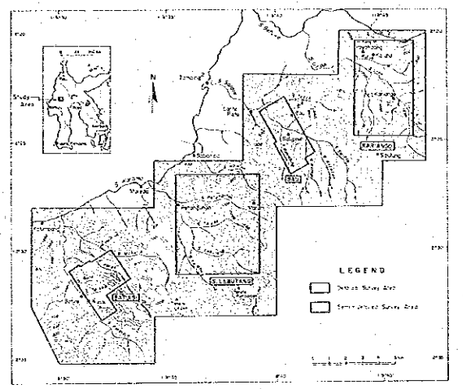
LEGEND



REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE TORAJA AREA, THE REPUBLIC OF INDONESIA

PHASE II

LOCATION MAP OF SOIL SAMPLES IN THE BATUISI PROSPECT



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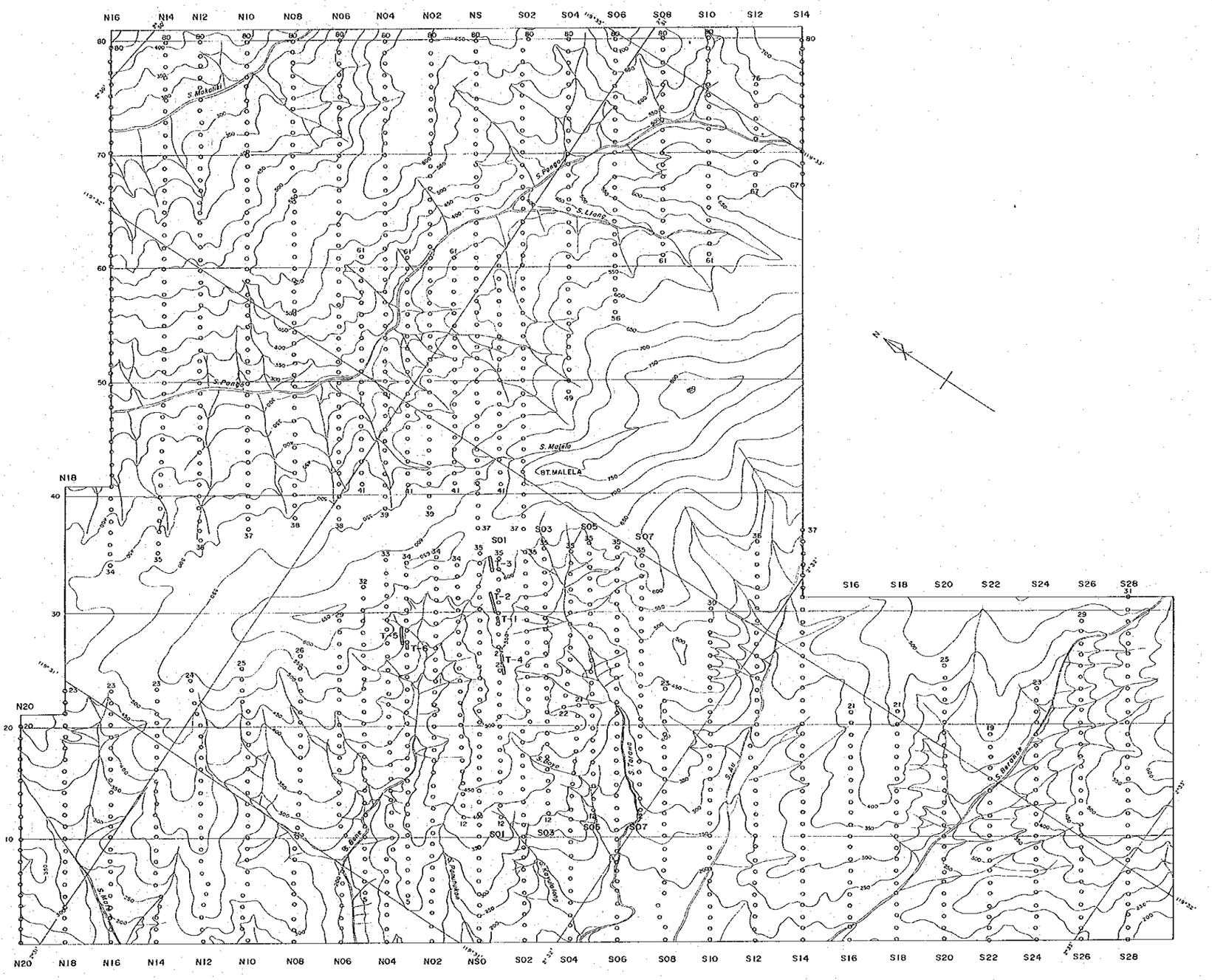

0 200 400 600 800 1000m

Scale 1 : 10,000

LEGEND

- Location of Soil Sample
- Sample Number : N20-001 ~ N20-020, N18-001 ~ N18-023, S28-001 ~ S28-031
- T-1 Location of Trench

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
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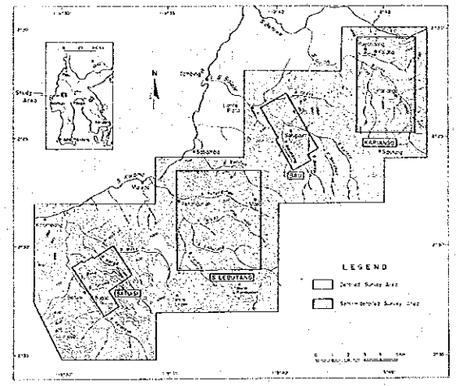
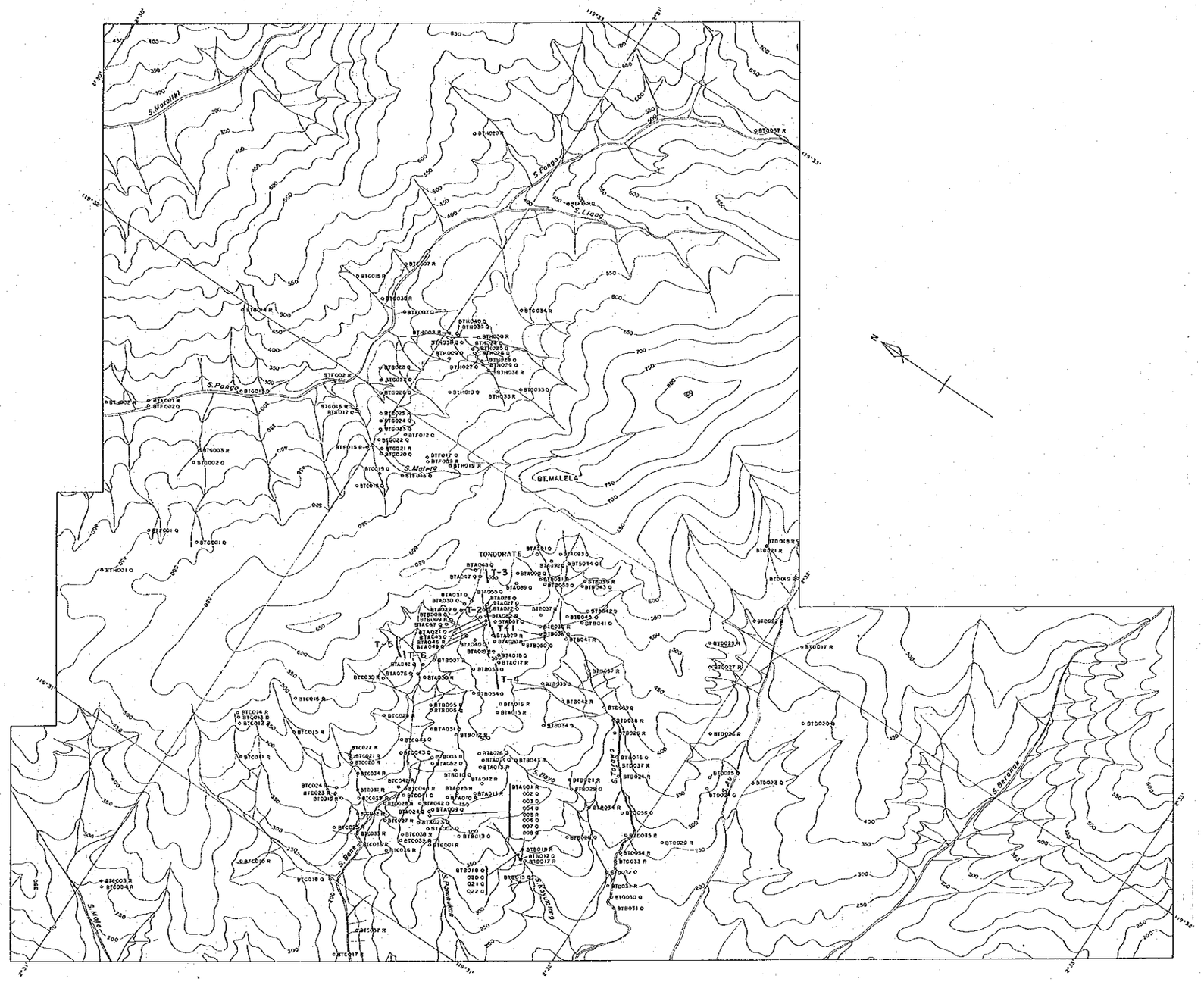
PHASE II

LOCATION MAP OF ROCK-CHIP SAMPLES IN THE BATUISI PROSPECT





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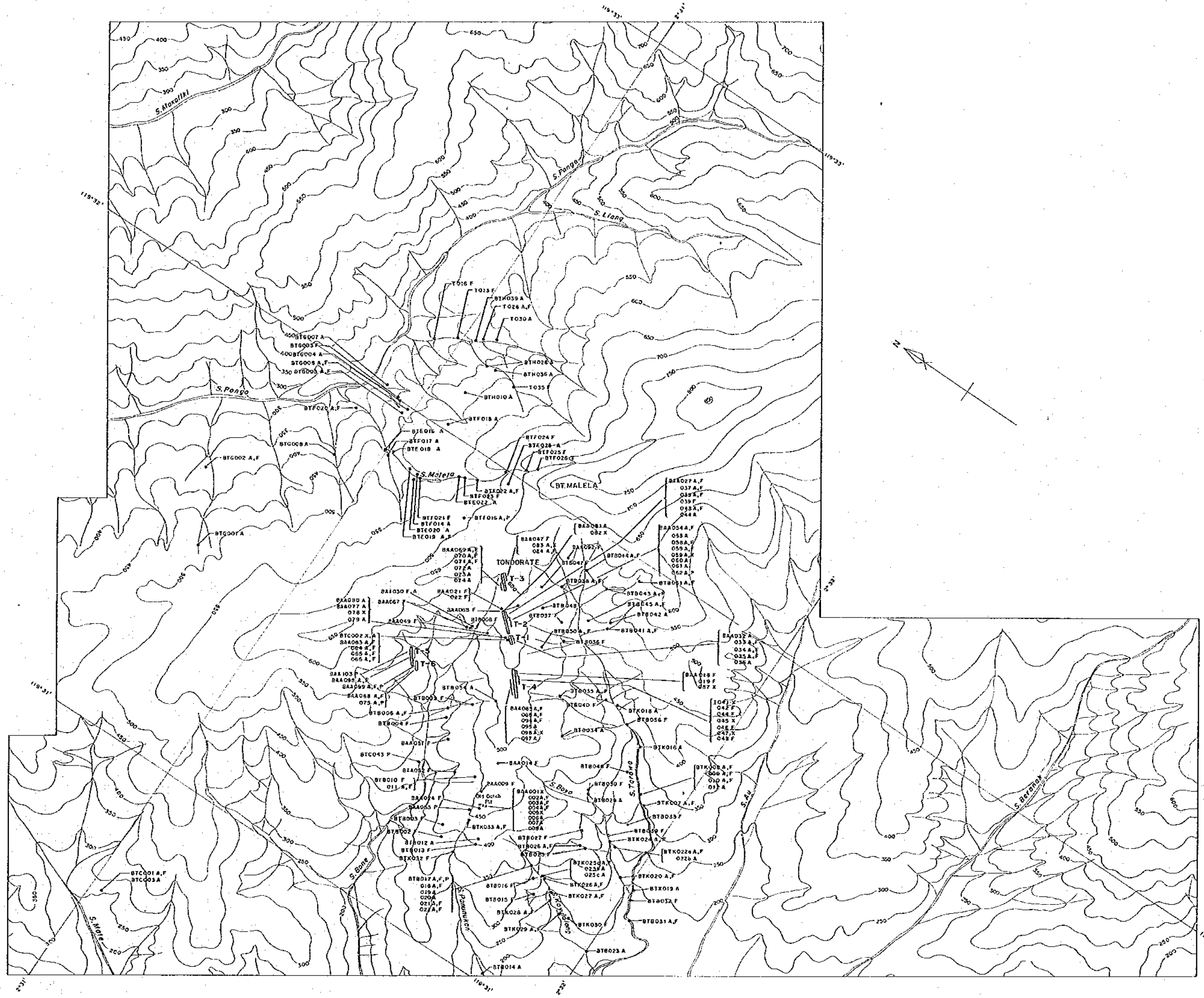
0 200 400 600 800 1000m

Scale 1 : 10,000

LEGEND

- o Location of Rock-chip Sample
- BTA001 Sample Number
- R : Rock-chip
- Q : Quartz-chip
- T-1 Location of Trench

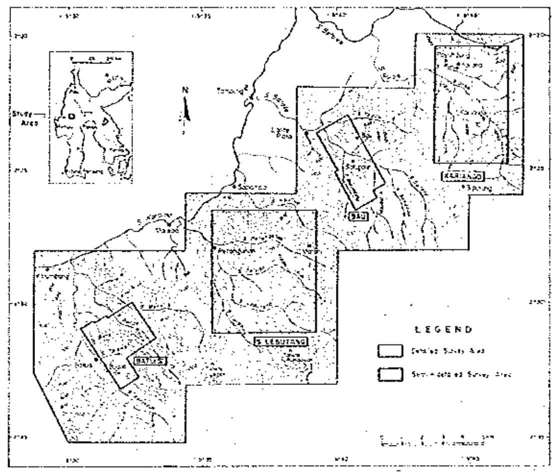


PL. 4

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE TORAJA AREA, THE REPUBLIC OF INDONESIA

PHASE II

LOCATION MAP OF ROCK AND ORE SAMPLES IN THE BATUISI PROSPECT



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METAL MINING AGENCY OF JAPAN

0 200 400 600 800 1000m

Scale 1 : 10,000

LEGEND

Abbreviation of Laboratory Works

●—— Location of Sample

BAA001 Sample Number

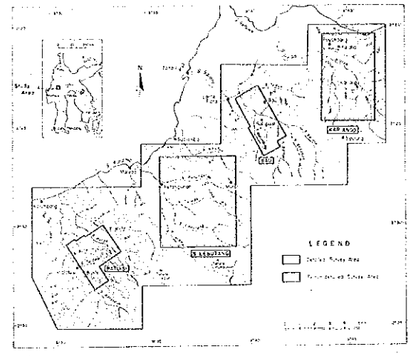
- A : Ore Assay
- F : Fluid Inclusion
- P : Polished Section
- T : Thin Section
- X : X-ray Diffraction Analysis

T-1 Location of Trench

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE TORAJA AREA, THE REPUBLIC OF INDONESIA

PHASE II

SURVEY RESULTS OF TRENCHES IN THE BATUISI PLOSPECT



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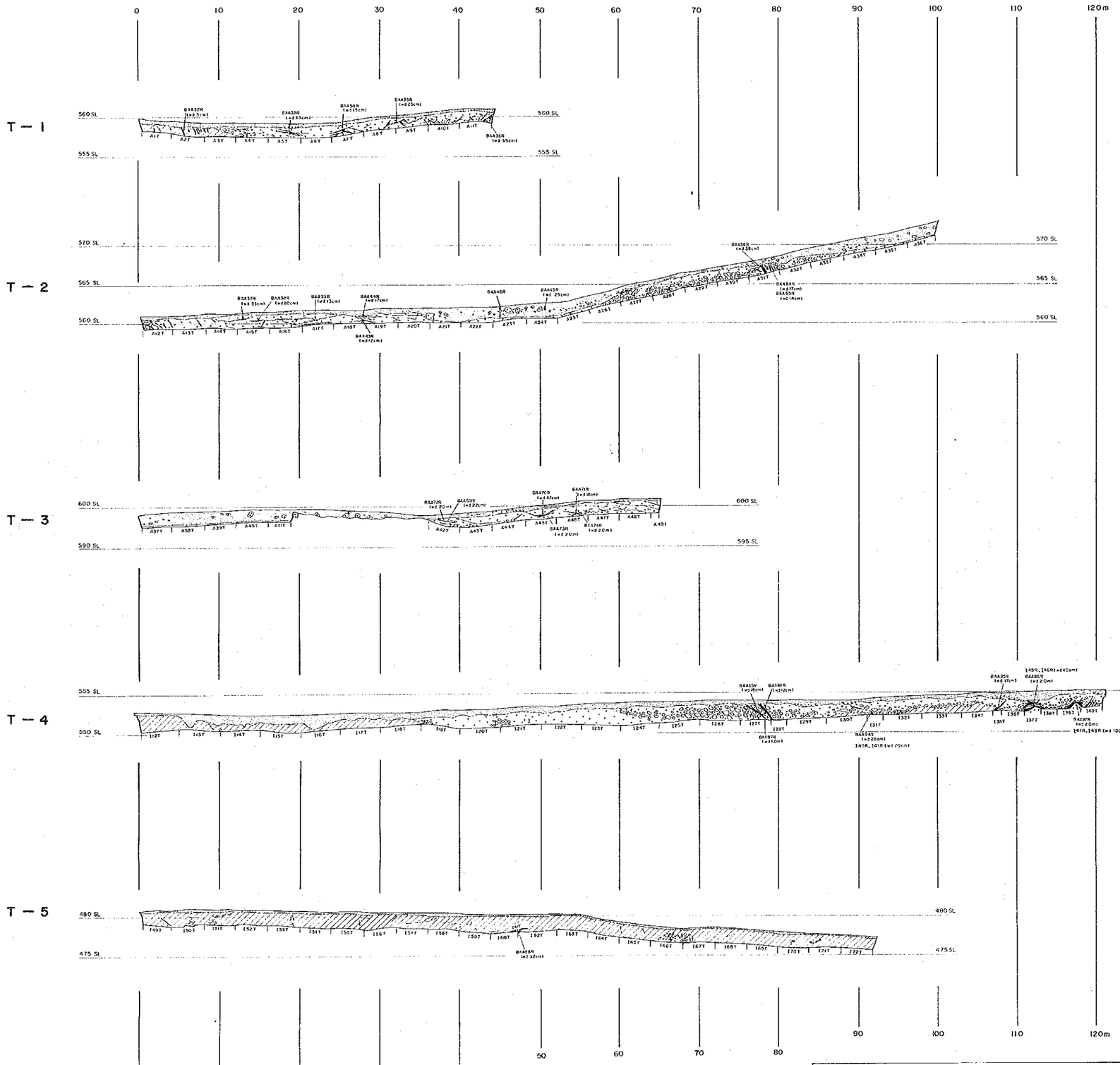
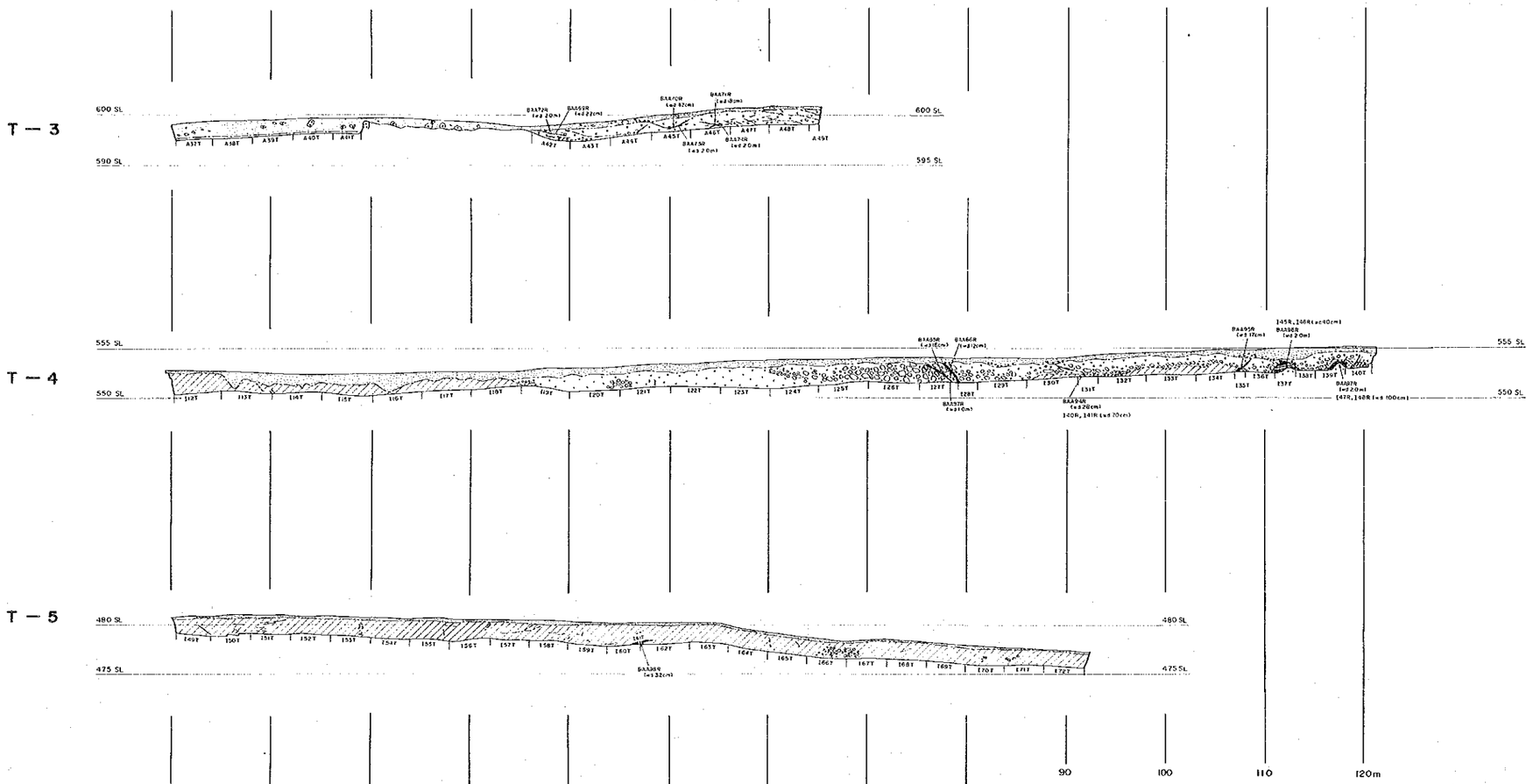
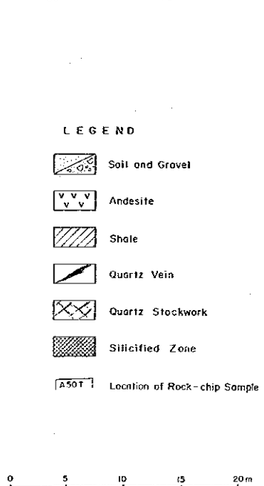
Scale 1 : 10,000

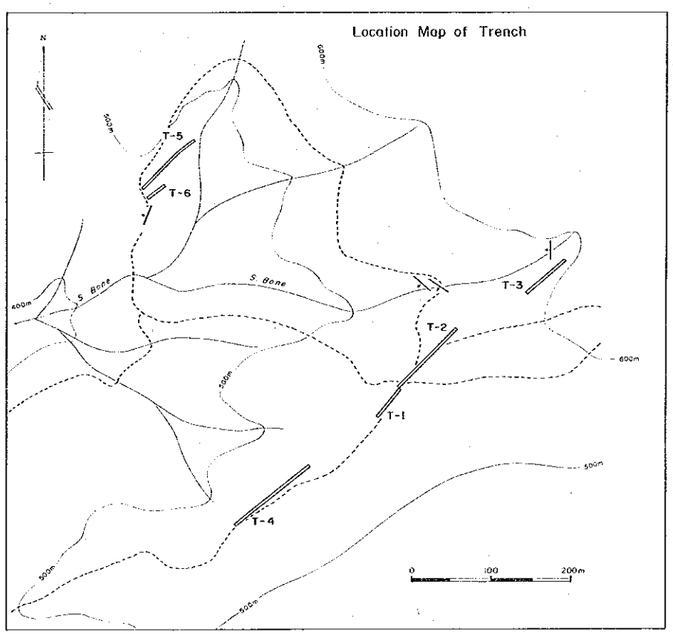


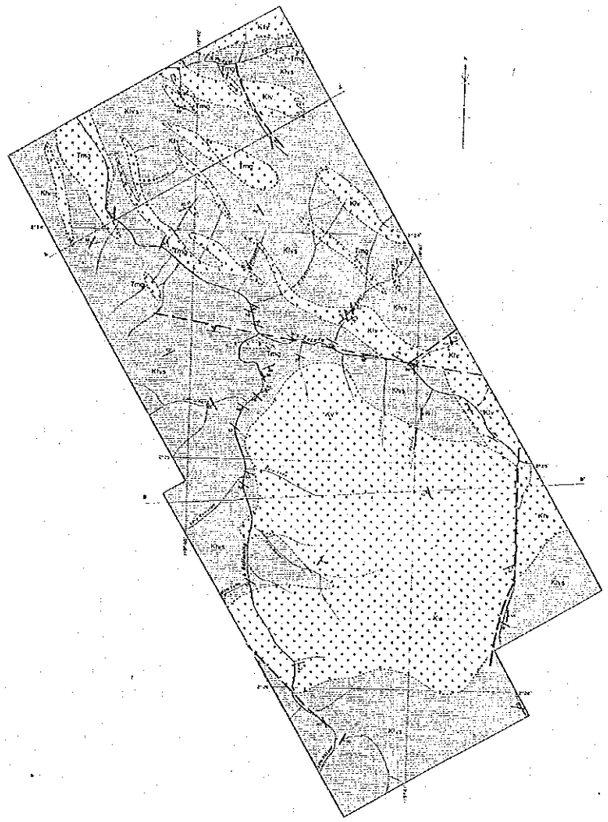
Location Map of Trench

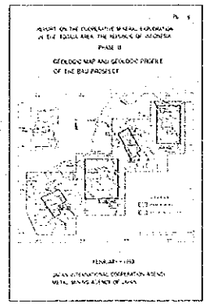

T — 3
600 SL
595 SL
T — 4
555 SL
550 SL
T — 5
480 SL
475 SL
T — 6
470 SL
465 SL
0
10
20
30
40
50
60
70
80
90
100
110
120m

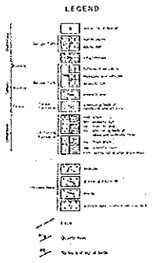

0
200
400
600
800
1000m
Scale 1 : 10,000


LEGEND
Soil and Gravel
Andesite
Shale
Quartz Vein
Quartz Stockwork
Silicified Zone
Location of Rock-chip Sample
0
5
10
15
20m
Scale 1: 250


Location Map of Trench
N
T-1
T-2
T-3
T-4
T-5
T-6
S Bone
S Bone
600m
500m
400m
0
100
200m

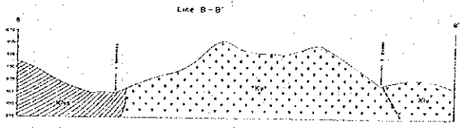


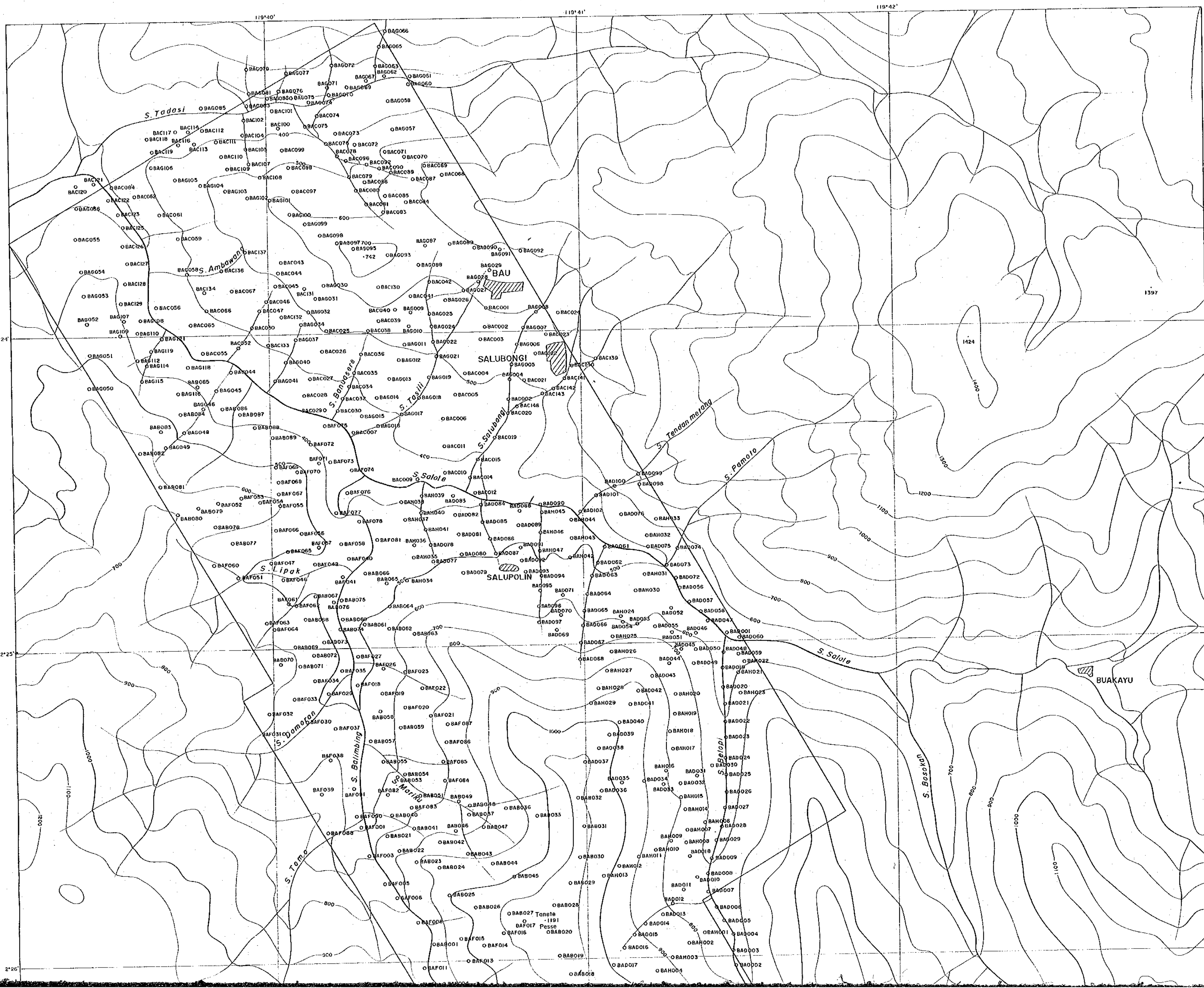




Geologic Profile along Line A – A'

Line B – B'

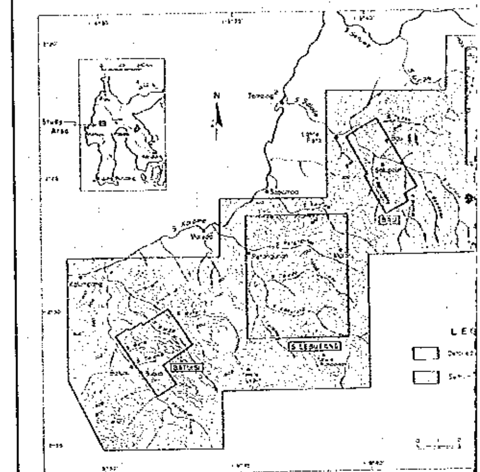




REPORT ON THE COOPERATIVE MINERAL EXPLORA
IN THE TORAJA AREA, THE REPUBLIC OF INDONE

PHASE II

LOCATION MAP OF SOIL SAMPLES
IN THE BAU PROSPECT



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METAL MINING AGENCY OF JAPAN

Scale 1 : 10,000

LEGEND

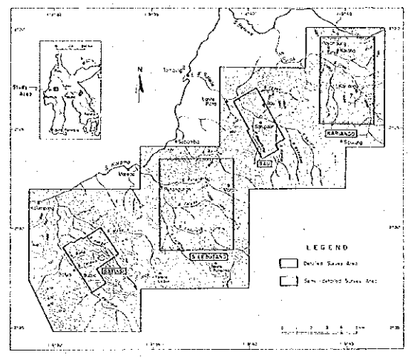
○BAB001 : Location of Soil Sample

PL. 7

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE TORAJA AREA, THE REPUBLIC OF INDONESIA

PHASE II

LOCATION MAP OF SOIL SAMPLES IN THE BAU PROSPECT



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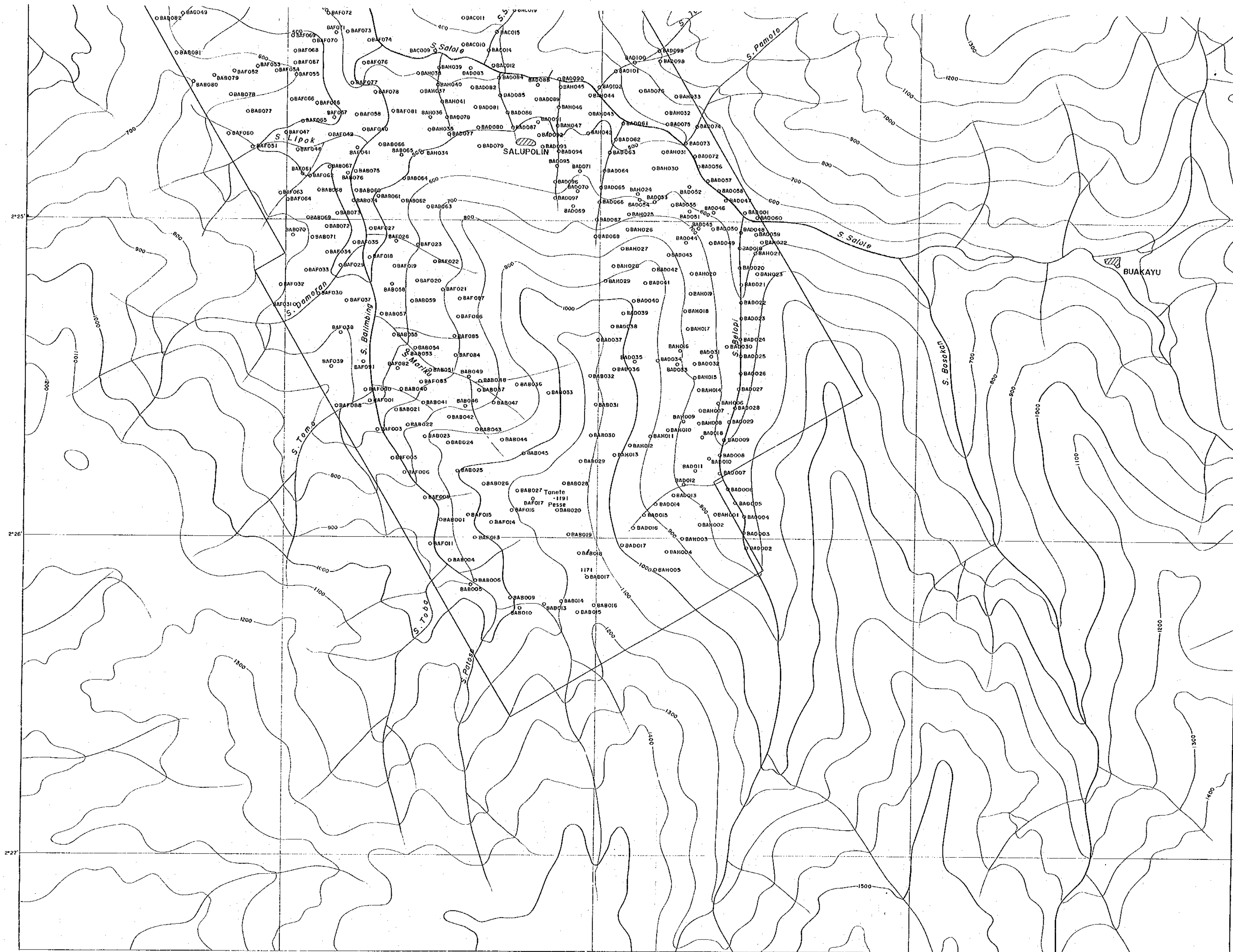
JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1 : 10,000

LEGEND

BAB001 : Location of Soil Sample



Scale 1

LEGEND

○BAB001 : Location of Soil S

Scale 1 : 10,000

LEGEND

○BAB001 : Location of Soil Sample

SALUPOLIN

BUAKAYU

Tonsie -1191

Pesse

1171

S. Lipak

S. Damoran

S. Balimbing

S. Marikit

S. Tamo

S. Todo

S. Patoso

S. Salole

S. Pamolo

S. Bosokan

S. Salopi

700 800 900 1000 1100 1200 1300 1400 1500

2°25'

2°26'

2°27'

119°40'

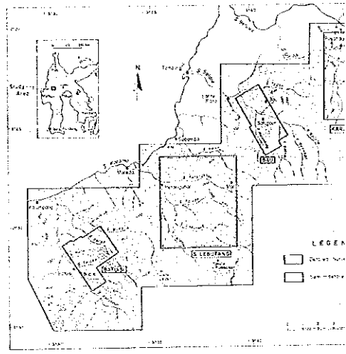
119°41'

119°42'

REPORT ON THE COOPERATIVE MINERAL EXPLORATI
IN THE TORAJA AREA, THE REPUBLIC OF INDONES

PHASE II

LOCATION MAP OF ROCK-CHIP SAMPLES IN THE BAU PROSPECT



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METAL MINING AGENCY OF JAPAN

Scale 1 : 10,000

LEGEND

- BAB001 — Location of Rock-chip Sample
- R — Rock-chip Sample
- Q — Quart-chip Sample

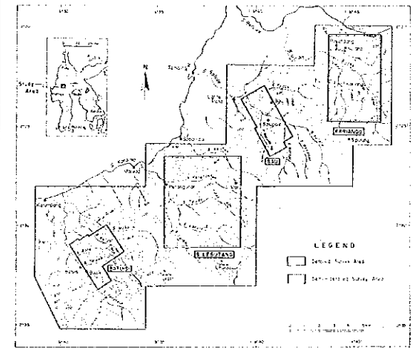
BAU
SALUBONGI
SALUPOLIN
BUAKAYU
Tonele
1191
Pesse
S. Tadasi
S. Ambawang
S. Banuasare
S. Tasili
S. Saluang
S. Tendan metang
S. Pamato
S. Salole
S. Lipak
S. Damaran
S. Balimbing
S. Mariku
S. Toma
S. Beloppi
S. Basokan
1397
1424
1171

PL. 8

REPORT ON THE COOPERATIVE MINERAL EXPLORATION
IN THE TORAJA AREA, THE REPUBLIC OF INDONESIA

PHASE II

LOCATION MAP OF ROCK-CHIP SAMPLES IN THE BAU PROSPECT



FEBRUARY, 1993

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

Scale 1 : 10,000

LEGEND

- BAB001 Location of Rock-chip Sample
- R Rock-chip Sample
- Q Quart-chip Sample