Chapter 3 Salopa Area

3-1 Outline of the Survey Area

The Salopa area is located about 20 km southeast of Tasikmalaya. The area lies along the upper reaches of S. (Sungai) Ciwulan and S. Cimedang in the central part of the study area. The altitude of the area ranges from 300 m up to 1,144 m (G. Bongkok). Most of the area is situated on the hilly lands between 300 and 400 m above sea level.

The area lies geologically among the wide exposure of alternations of volcanics/pyroclastics and sediments of the Jampang Formation. Calcareous sandstone of the Bentang Formation and turbidity sediments and pyroclastics of the Halang Formation partly covers the Jampang Formation in the western part of the area. The Kalipucang limestone occurs mainly in the southwestern part of the Salopa area. Structurally the area lies on the wing of a gentle anticlinorium whose axis is WNW-ESE.

On the basis of the results of the existing geological information together with the results of the photogeological analysis on the JERS-1 SAR images, this area was selected for the field survey area in the first phase. The survey covered over a rectangular area of 518 km^2. The field works in the first phase were composed of geological survey, stream sediment sampling, panning survey and reconnaissance soil survey.

3-2 Geological Survey

3-2-1 Survey Method

The first phase field works in the Salopa area were consisted of geological survey and geochemical exploration. The area was selected based on the analysis of existing geological information and photogeological interpretation on the JERS-1 SAR images, through which the geological setting of the survey area was defined.

Prior to the field work, a series of drainage system maps of 1:10,000 scale was prepared from the compilation of existing topographic maps (1:50,000 and 1: 25,000) and satellite images. Several sets of GPS instruments were employed for locating major surveying points in the field.

In the course of the geological survey, panning survey and stream sediment sampling, a couple of mineralized areas was found. Combined these field results with the existing information of alteration and mineralization on the area, semi-detailed geological survey and soil survey were carried out in two areas; Ciniru and Cikuya. The route maps of 1:10,000 scale were produced during these surveys, using 50-meter tape with a Brunton-type compass. The important mineral showings and old workings were studied in much detail (sketches of 1:100 to 1:200), and samples were taken for laboratory analysis.

During the field works, geology and degrees of hydrothermal alteration were investigated. The degrees of silicification, sericitization and pyritization were carefully judged and recorded on the field note by geologists. Other features of mineralization and hydrothermal alteration such as sulfide dissemination, clay alteration (montmorillonitization, kaolinitization, etc.), carbonitization and quartz networking were also checked in the survey.

A total length of more than 344 km was explored during the survey in the Salopa area, and the geological information was compiled into geological maps of 1:25,000 scale. The geology and geologic profile of the Salopa area are shown in Fig. 2-5.

The numbers of samples collected in the survey are: 744 stream sediment samples, 315 pan concentrate samples, 179 soil samples, more than 30 rock samples for thin sections and for whole rock analysis, 46 altered rock and clay samples for X-ray diffraction analysis and more than 80 ore samples for assay and polished sections. The results of the laboratory works are briefly summarized in Tables 2-4 to 2-11.

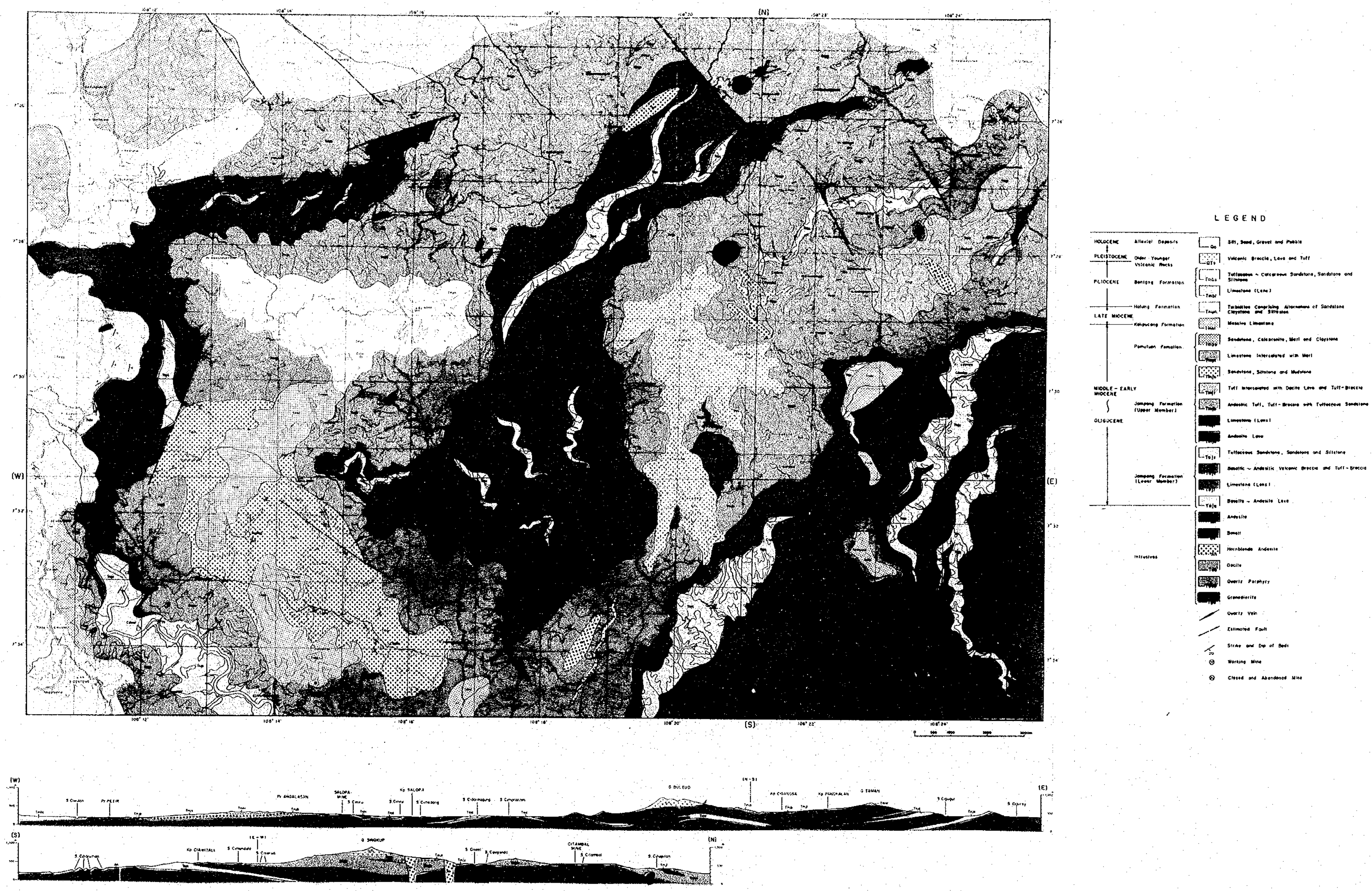


Fig. 2-5 Geology and Geologic Profile of the Salopa Area

Table 2-4 Results of Whole Rock Analysis

Sample	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Cr_2O_3	LOI	Total	Fe/Mg	Con.P	Rock	Locality
No.	%	%	%	%	%	%	%	%	%	%	%	%	%	%		%		
(Salopa)																		
AA2W	53.85	0.66	16.04	4.92	2.13	0.15	2.77	7.54	2.25	1.15	0.18	0.02	8.54	100.20	2.37	51.53	Tan	S.Cipinaha
AA8W	53.52	0.55	17.92	2.74	3.37	0.15	3.67	8.46	3.14	0.57	0.14	0.01	5.94	100.18	1.59	44.14	Tan	S.Ciseel
AA9W	50.79	0.68	16.97	4.10	2.57	0.15	3.67	9.03	2.56	0.89	0.16	0.01	8.82	100.40	1.71	46.80	Tan	S.Ciseel
AHS1W	52.58	1.16	20.14	5.88	0.98	0.13	1.60	8.35	4.24	2.03	0.26	<.01	2.74	100.09	3.92	44.35	Tomj	S.Ciwulan
AS1W	50.64	0.86	20.69	4.22	3.22	0.13	3.08	10.65	2.95	0.55	0.15	<.01	2.91	100.05	2.28	51.62	Tan	S.Ciwaraku
AS2W	56.39	0.48	18.61	3.76	1.10	0.11	3.42	7.51	3.82	1.09	0.23	0.01	3.36	99.89	1.31	34.98	Tgd	S.Cihapitan
AS3W	54.15	0.69	18.48	3.75	3.07	0.19	4.22	9.04	2.98	0.83	0.16	0.01	2.59	100.16	1.53	44.52	Tan	S.Cisarua
AS4W	52.61	0.78	15.38	3.47	4.80	0.15	2.58	7.68	2.79	0.98	0.21	0.03	8.39	99.85	3.07	55.50	Tan	S.Cihapitan
AS5W	52.93	0.80	17.91	5.21	3.39	0.23	2.66	9.98	3.12	0.98	0.19	<.01	2.70	100.10	3.04	54.45	Tan	S.Cihapitan
AD99W	49.23	0.64	17.08	3.61	4.05	0.21	4.13	8.64	2.83	0.63	0.12	0.01	9.10	100.28	1.77	49.02	Tomj	S.Ciharuman
AK1W	52.79	0.85	16.78	4.75	3.52	0.14	5.22	9.60	2.68	0.80	0.15	0.02	3.31	100.61	1.49	47.25	Tan	S.Cimedang
AK2W	45.46	0.83	17.06	5.57	4.46	0.21	5.35	11.31	1.93	0.20	0.07	0.02	7.14	99.61	1.77	55.89	Tan	S.Cimedang
AK3W	51.35	0.79	17.96	4.51	3.13	0.17	4.71	10.21	2.49	0.75	0.12	0.01	3.99	100.19	1.53	47.49	Tomj	S.Cimedang
AK4W	48.72	0.73	18.28	4.62	3.43	0.16	5.27	11.61	2.21	0.54	0.09	0.01	4.91	100.58	1.44	48.61	Tomj	S.Cimedang
AK5W	42.64	0.78	16.97	3.99	2.16	0.19	1.79	16.98	2.24	0.53	0.11	0.04	12.13	100.55	3.21	55.77	Tan	S.Cikuya
AK6W	56.70	0.56	16.78	4.01	3.43	0.17	3.43	6.77	2.96	0.71	0.11	<.01	4.07	99.72	2.05	49.78	Tan	S.Cikuya
AK7W	50.47	0.68	16.51	4.51	3.76	0.19	5.63	8.88	2.59	0.30	0.14	0.02	5.93	99.61	1.39	47.86	Tan	S.Cikuya
AK8W	47.98	0.76	14.49	4.11	4.44	0.14	7.94	9.43	2.12	0.40	0.09	0.15	7.49	99.54	1.03	43.75	Tan	S.Citatah
AK9W	52.91	0.69	14.94	5.56	2.75	0.18	3.17	6.75	1.59	1.56	0.13	0.01	9.03	99.27	2.45	55.11	Tan	S.Ciseel
AK10RW	53.09	0.71	17.66	4.39	3.51	0.17	4.24	8.76	3.08	1.31	0.17	0.01	3.10	100.20	1.76	46.37	Tan	Gn.Lubuk
AK10W	46.22	0.97	18.03	4.54	4.29	0.16	6.57	11.63	2.34	0.73	0.09	0.02	4.79	100.38	1.28	46.50	Tgd	S.Ciseel
AK11W	47.19	0.41	17.39	2.34	2.64	0.14	1.89	10.31	2.29	1.11	0.13	<.01	14.71	100.55	2.51	47.27	Tomj	S.Ciseel
AK12W	54.12	0.44	17.43	2.77	3.19	0.18	2.57	7.62	3.06	1.06	0.17	0.01	7.28	99.90	2.21	45.91	Tomj	S.Ciseel
AH2W	49.74	1.19	17.84	5.33	4.20	0.22	3.74	10.15	3.39	0.73	0.84	<.01	2.79	100.16	2.41	53.38	Tomj	S.Ciwulan
AH3W	50.29	1.21	19.49	6.16	3.76	0.43	3.45	7.57	3.21	0.57	0.21	<.01	4.09	100.44	2.70	56.28	Tomj	S.Ciwulan
AH5W	56.51	0.92	17.43	4.22	1.96	0.06	1.61	7.74	3.35	1.26	0.18	0.01	4.96	100.21	3.58	48.08	Tomj	S.Ciwulan
AH6W	54.08	0.97	16.44	3.76	4.95	0.20	3.78	6.98	3.11	0.71	0.25	<.01	3.82	99.05	2.20	52.30	Tomj	S.Ciwulan
AH7W	56.86	0.83	17.19	3.28	3.42	0.14	2.40	6.21	3.53	1.46	0.26	<.01	4.24	99.84	2.66	46.30	Tomj	S.Ciwulan
AH8W	50.45	0.67	17.30	3.61	2.60	0.13	3.86	8.90	2.77	0.88	0.16	0.01	8.65	99.99	1.52	43.79	Tomj	S.Ciwulan
AH 9W	55.04	0.82	17.50	4.69	2.59	0.15	2.89	7.86	3.72	0.85	0.23	0.01	3.48	99.83	2.38	47.73	Tomj	S.Ciwulan
AH10W	48.10	0.87	19.63	4.46	3.62	0.23	3.83	11.91	2.52	0.46	0.16	<.01	4.07	99.86	1.99	52.84	Tomj	S.Ciwulan
AH25W	48.65	0.89	18.13	4.74	3.97	0.22	5.89	7.66	2.12	0.89	0.16	0.01	6.98	100.31	1.40	48.06	Tomj	S.Ciseel
AH27W	58.49	0.46	18.23	3.32	1.14	0.11	2.53	7.96	3.65	1.31	0.17	0.01	2.00	99.40	1.63	35.55	Tgd	Gn.Payung
AH28W	54.48	0.72	16.89	3.73	3.82	0.14	5.57	8.58	3.08	0.98	0.16	0.02	2.07	100.24	1.29	42.69	Tomj	S.Ciseel
(Sidamulih)																		
BA6W	46.03	0.88	19.84	6.48	1.74	1.48	4.11	8.80	3.67	0.99	0.10	<.01	6.70	100.82	1.84	46.32	Tan	S.Ciawitali
BH2W	51.22	0.87	17.75	4.91	4.38	0.15	4.65	9.35	2.89	0.62	0.40	0.01	2.33	99.53	1.89	51.89	Tan	S.Cladiloka
BH3W	60.13	0.48	18.47	2.92	1.97	0.14	1.86	6.86	3.28	1.54	0.22	<.01	2.33	100.20	2.47	40.77	Tda	S.Cisawangan
(Cisasah)																		
CA5W	55.15	0.60	16.18	1.70	0.99	1.70	3.56	7.38	3.10	0.93	0.17	0.01	5.28	96.75	1.74	44.96	Tgd	S.Cikoplok
CA8W	50.41	1.41	17.33	4.50	4.98	0.15	4.43	7.82	3.32	0.27	0.21	<.01	5.46	100.29	2.04	52.95	Tomj	S.Cigorowong
CA9W	47.25	0.90	18.53	2.33	6.21	0.18	6.62	9.61	2.38	0.33	0.16	0.01	5.47	99.98	1.26	47.10	Tgd	S.Cijalu
CD316W	63.97	0.33	16.63	1.98	1.12	0.08	0.84	5.32	3.41	0.34	0.08	<.01	5.75	99.85	3.45	38.70	Tgd	S.Cijambehaseum
CD323W	64.79	0.66	14.16	2.93	2.78	0.12	2.13	4.99	4.13	1.10	0.17	<.01	1.47	99.43	2.54	42.40	Tgd	Pr.Tenjolaut
CD351W	49.07	0.72	19.37	3.22	5.33	0.24	3.86	8.74	3.15	0.50	0.08	0.01	4.96	99.25	2.13	52.27	Tgd	S.Cijolang
CK2W	50.56	0.74	18.01	4.34	4.74	0.40	5.11	9.65	2.35	0.66	0.12	0.01	3.15	99.84	1.69	51.57	Tomj	S.Ciwulan
CK3W	52.26	0.74	14.94	6.55	2.19	0.16	5.55	6.36	2.89	1.36	0.09	0.02	6.22	99.33	1.46	45.20	Tan	S.Cibutuireng
CK4W	50.27	0.73	16.25	4.73	3.78	0.13	7.46	10.27	2.10	0.55	0.10	0.02	4.15	100.54	1.08	44.29	Tomj	S.Cikancung
CK5W	53.59	0.84	16.05	4.70	3.84	0.24	5.59	5.70	3.54	1.00	0.14	<.01	5.04	100.27	1.44	44.35	Tan	S.Cilangla
CS3W	47.68	0.83	21.80	3.47	4.78	0.50	3.86	10.89	2.25	0.27	0.08	<.01	4.05	100.46	2.05	55.33	Tgd	S.Cipanawar
CS4W	55.21	0.88	15.98	2.44	4.93	0.27	3.84	7.23	3.00	1.14	0.18	0.01	5.20	100.31	1.86	47.18	Tan	S.Cilangla
CS6W	66.52	0.42	13.66	1.47	3.02	0.23	1.34	2.03	3.02	2.95	0.10	<.01	4.32	99.08	3.24	37.29	Tgd	S.Cilangla
CH10W	64.94	0.94	14.46	3.57	1.88	0.26	1.81	5.33	3.41	1.05	0.30	<.01	2.37	100.32	2.81	44.82	Tda	Cikelirleutik
CH20W	57.57	0.45	17.28	3.33	1.72	0.27	2.25	6.47	1.72	2.83	0.13	<.01	6.13	100.15	2.10	40.95	Tgd	S.Cipunduan
CH22W	65.82	0.65	14.61	4.77	0.86	0.10	1.34	2.87	3.47	2.44	0.15	0.01	3.67	100.76	3.85	41.56	Tda	S.Cicadas

Table 2-4 Results of Whole Rock Analysis

Sample No.	Q %	C %	or %	ab %	an %	wo %	di-wo %	di-en %	di-fs %	hy-en %	hy-fs %	ol-fo %	ol-fa %	mt %	hm %	il %	ap %	Total %
[Salopa]																		
AA2W	17.88	0.00	6.80	19.03	30.28	0.00	2.49	2.15	0.00	4.75	0.00	0.00	0.00	5.44	1.17	1.25	0.43	91.66
AA8W	10.10	0.00	3.37	26.55	33.13	0.00	3.31	2.24	0.81	6.89	2.49	0.00	0.00	3.96	0.00	1.05	0.33	94.23
AA9W	10.42	0.00	5.26	21.65	32.19	0.00	4.83	4.01	0.21	5.13	0.27	0.00	0.00	5.95	0.00	1.29	0.38	91.58
AHS1W	2.74	0.00	12.00	35.86	29.93	0.00	4.09	3.54	0.00	0.45	0.00	0.00	0.00	0.22	5.73	2.20	0.62	97.37
AS1W	6.06	0.00	3.25	24.95	41.59	0.00	4.28	3.29	0.54	4.38	0.71	0.00	0.00	6.12	0.00	1.63	0.36	97.15
AS2W	10.63	0.00	6.44	32.31	30.42	0.00	2.23	1.93	0.00	6.59	0.00	0.00	0.00	2.51	2.02	0.91	0.55	96.53
AS3W	9.64	0.00	4.91	25.20	34.60	0.00	3.84	2.94	0.49	7.56	1.26	0.00	0.00	5.43	0.00	1.31	0.38	97.57
AS4W	12.88	0.00	5.79	23.59	26.55	0.00	4.25	2.32	1.78	4.11	3.16	0.00	0.00	5.02	0.00	1.48	0.50	91.44
AS5W	9.29	0.00	5.79	26.39	31.98	0.00	6.80	5.26	0.82	1.36	0.21	0.00	0.00	7.56	0.00	1.52	0.45	97.42
AD99W	6.49	0.00	3.72	23.93	32.05	0.00	4.19	2.83	1.04	7.46	2.75	0.00	0.00	5.23	0.00	1.22	0.28	91.18
AK1W	8.89	0.00	4.73	22.66	31.40	0.00	6.36	5.08	0.55	7.91	0.85	0.00	0.00	6.88	0.00	1.62	0.36	97.29
AK2W	4.25	0.00	1.18	16.32	37.30	0.00	7.66	5.76	1.13	7.56	1.48	0.00	0.00	8.08	0.00	1.58	0.17	92.46
AK3W	8.06	0.00	4.43	21.06	35.62	0.00	5.95	4.82	0.42	6.91	0.61	0.00	0.00	6.54	0.00	1.50	0.28	96.20
AK4W	4.65	0.00	3.19	18.69	38.37	0.00	7.78	6.16	0.74	6.96	0.84	0.00	0.00	6.69	0.00	1.39	0.21	95.66
AK5W	0.00	0.00	3.13	18.94	34.69	15.23	5.16	4.46	0.00	0.00	0.00	0.00	0.00	5.32	0.32	1.48	0.26	88.98
AK6W	16.94	0.00	4.20	25.03	30.41	0.00	1.03	0.73	0.20	7.81	2.15	0.00	0.00	5.81	0.00	1.10	0.26	95.66
AK7W	8.44	0.00	1.77	21.90	32.54	0.00	4.42	3.38	0.58	10.64	1.83	0.00	0.00	6.54	0.00	1.29	0.33	93.67
AK8W	4.38	0.00	2.36	17.93	28.84	0.00	7.24	5.47	1.04	14.30	2.73	0.00	0.00	5.95	0.00	1.44	0.21	91.90
AK9W	19.66	0.00	9.22	13.45	29.02	0.00	1.51	1.30	0.00	6.59	0.00	0.00	0.00	7.45	0.42	1.31	0.31	90.24
AK10RW	7.24	0.00	7.74	26.05	30.50	0.00	4.95	3.75	0.70	6.81	1.27	0.00	0.00	6.36	0.00	1.35	0.40	97.10
AK10W	0.00	0.00	4.31	19.79	36.54	0.00	8.58	6.56	1.13	5.47	0.94	3.03	0.58	6.58	0.00	1.84	0.21	95.58
AK11W	7.50	0.00	6.56	19.37	33.90	0.00	6.85	4.21	2.24	0.49	0.26	0.00	0.00	3.39	0.00	0.78	0.31	85.85
AK12W	12.45	0.00	6.27	25.88	30.70	0.00	2.50	1.57	0.78	4.83	2.40	0.00	0.00	4.01	0.00	0.84	0.40	92.62
AH2W	4.41	0.00	4.31	28.67	31.31	0.00	5.68	4.29	0.81	5.02	0.95	0.00	0.00	7.73	0.00	2.26	1.99	97.43
AH3W	8.40	0.33	3.37	27.15	36.18	0.00	0.00	0.00	0.00	8.59	0.62	0.00	0.00	8.93	0.00	2.30	0.50	96.37
AH5W	15.56	0.00	7.45	28.33	28.81	0.00	3.51	3.04	0.00	0.97	0.00	0.00	0.00	3.85	1.57	1.75	0.43	95.25
AH6W	12.14	0.00	4.20	26.30	28.81	0.00	1.75	1.09	0.55	8.32	4.20	0.00	0.00	5.45	0.00	1.84	0.59	95.25
AH7W	14.01	0.00	8.63	29.85	26.75	0.00	0.99	0.65	0.27	5.33	2.19	0.00	0.00	4.75	0.00	1.58	0.62	95.62
AH8W	8.55	0.00	5.20	23.43	32.18	0.00	4.56	3.67	0.36	5.94	0.57	0.00	0.00	5.23	0.00	1.27	0.38	91.34
AH 9W	11.60	0.00	5.02	31.46	28.55	0.00	3.74	3.23	0.00	3.97	0.00	0.00	0.00	6.46	0.23	1.56	0.55	96.36
AH10W	3.73	0.00	2.72	21.31	40.90	0.00	7.15	5.35	1.10	4.19	0.86	0.00	0.00	6.46	0.00	1.65	0.38	95.80
AH25W	7.13	0.14	5.26	17.93	36.95	0.00	0.00	0.00	0.00	14.66	2.32	0.00	0.00	6.87	0.00	1.69	0.38	93.33
AH27W	13.84	0.00	7.74	30.87	29.50	0.00	3.71	3.21	0.00	3.09	0.00	0.00	0.00	2.64	1.50	0.91	0.40	97.40
AH28W	7.85	0.00	5.79	26.05	29.37	0.00	5.07	3.76	0.82	10.11	2.19	0.00	0.00	5.40	0.00	1.37	0.38	98.15
[Sidamulih]																		
BA6W	0.00	0.00	5.85	31.04	34.75	0.00	3.45	2.98	0.00	0.57	0.00	4.68	0.00	7.89	1.03	1.67	0.24	94.14
BH2W	7.12	0.00	3.66	24.44	33.64	0.00	4.24	3.09	0.76	8.49	2.07	0.00	0.00	7.12	0.00	1.65	0.95	97.22
BH3W	18.33	0.00	9.10	27.74	31.13	0.00	0.61	0.48	0.07	4.15	0.60	0.00	0.00	4.23	0.00	0.91	0.52	97.89
[Cisasah]																		
CA5W	14.67	0.00	5.50	26.22	27.49	0.00	3.34	2.89	0.00	5.97	0.00	0.00	0.00	7.00	0.96	1.14	0.40	95.58
CA8W	7.04	0.00	1.60	28.08	31.59	0.00	2.44	1.71	0.52	9.32	2.86	0.00	0.00	6.52	0.00	2.68	0.50	94.84
CA9W	0.03	0.00	1.95	20.13	38.91	0.00	3.22	2.01	1.02	14.47	7.31	0.00	0.00	3.38	0.00	1.71	0.38	94.51
CD316W	30.41	1.18	2.01	28.84	25.87	0.00	0.00	0.00	0.00	2.09	0.03	0.00	0.00	2.86	0.00	0.63	0.19	94.10
CD323W	23.83	0.00	6.50	34.93	16.86	0.00	2.84	1.94	0.67	3.36	1.15	0.00	0.00	4.25	0.00	1.25	0.40	97.97
CD351W	2.90	0.00	2.96	26.64	37.24	0.00	2.33	1.34	0.89	8.27	5.50	0.00	0.00	4.66	0.00	1.37	0.19	94.28
CK2W	6.57	0.00	3.90	19.87	36.65	0.00	4.36	2.95	1.08	9.77	3.57	0.00	0.00	6.29	0.00	1.41	0.28	96.69
CK3W	10.17	0.00	8.04	24.44	23.78	0.00	3.00	2.59	0.00	11.23	0.00	0.00	0.00	5.44	2.80	1.41	0.21	93.09
CK4W	5.86	0.00	3.25	17.76	33.29	0.00	7.10	5.65	0.63	12.92	1.44	0.00	0.00	6.85	0.00	1.39	0.24	96.38
CK5W	8.55	0.00	5.91	29.94	24.96	0.00	1.00	0.77	0.12	13.14	2.10	0.00	0.00	6.82	0.00	1.60	0.33	95.24
CS3W	3.29	0.00	1.60	19.03	48.59	0.00	2.05	1.23	0.70	8.38	4.77	0.00	0.00	5.03	0.00	1.58	0.19	96.42
CS4W	11.65	0.00	6.74	25.37	26.78	0.00	3.31	1.93	1.23	7.64	4.86	0.00	0.00	3.54	0.00	1.67	0.43	95.12
CS6W	29.76	2.05	17.44	25.54	9.42	0.00	0.00	0.00	0.00	3.34	4.06	0.00	0.00	2.14	0.00	0.80	0.24	94.78
CH10W	28.57	0.00	6.21	28.84	21.06	0.00	1.44	1.24	0.00	3.27	0.00	0.00	0.00	4.18	0.68	1.79	0.71	97.97
CH20W	19.86	0.00	16.73	14.55	31.07	0.00	0.07	0.06	0.00	5.54	0.17	0.00	0.00	4.82	0.00	0.86	0.31	94.03
CH22W	28.59	1.40	14.42	29.35	13.26	0.00	0.00	0.00	0.00	3.34	0.00	0.00	0.00	1.21	3.94	1.24	0.36	97.09

Table 2-5 Results of Microscopic Observation of Thin Sections (1)

Sample No.	Locality	Rock Name	Formation	Texture	Phenocryst/Crystal Frag.									Groundmas/Matrix						Alteration
					Qz	Kf	Pl	Bi	Hb	Px	Ol	Ep	Op	Qz	Kf	Pl	Hb	Px	Gl	
	[Salopa]																			
AA2T	S. Cipinaha	Andesite	Tan	Porp			●			○			△			○		△		
AA8T	S. Ciseel	Andesite	Tan	Porp			●			△			△	·		○		·		Pl·Px→Ca·Se·Ch
AA9T	S. Ciseel	Hornblende Andesite	Tan	Porp			●		○							○	·			Pl→Ch·Se·Ca, Hb→Ch·Ca
AHS1T	S. Ciwulan	Andesite	Tomj	Porp-Ophi			○			△			·			△		·	·	
AS1T	S. Ciwaraku	Andesite	Tan	Porp			●			○			·			○		△		Pl→Ca
AS2T	S. Cihapitan	Granodiorite-Porphyry	Tgd	Hol-pp			●	△	●				·			○	△			
AS3T	S. Cisarua	Andesite	Tan	Porp			●			○			△			○		△		Pl·Hb→Ch
AS4T	S. Cihapitan	Andesite	Tan	Porp			●			△						○		·		Pl→Se
AS5T	S. Cihapitan	Hornblnde Andesite	Tan	Porp			●		○	△			·			○	△			
AS8T	Gulingmuding	Lapilli Tuff	Tomj	Pycl	●								·							Silicified
AS18T	S. Cibangbai	Limestone	Tmkl	Clas																Ca, Fossil
AS27T	S. Cimanjeti	Sandstone	Tomj	Clas			△		·	·			△							Fossil fragment
AD28T	S. Cipanawar	Andesite	Tomj	Porp-Ophi			△						·			△				Pl→Ca·Se, Qz veinlet
AD36T	S. Ciniru	Lapilli Tuff	Tomj	Pycl			△									△				Pl→Ca·Se, Qz veinlet
AD51T	S. Ciniru	Andesite	Tomj	Porp-Ophi			○			△			·			△		·		
AD83T	S. Cipagacian	Andesite	Tomj	Porp-Ophi			●			○			·			○		△	△	
AD99T	S. Ciharuman	Andesite	Tomj	Porp-Ophi			●			△			·			○		·		Pl→Ch·Se·Ca, Px→Ch·Ca
AK1WT	S. Cimedang	Andesite	Tan	Porp			○			△			·			△		·	·	
AK2WT	S. Cimedang	Basalt	Tan	Porp			○			○			·			△		△		
AK3WT	S. Cimedang	Andesite	Tomj	Porp			●			○						○		△	△	
AK4WT	S. Cimedang	Basalt	Tomj	Ophi			●			○			·			○		△		
AK5WT	S. Cikuya	Basalt	Tan	Porp			●									○				Pl→Ca·Ch
AK6WT	S. Cikuya	Hornblende Andesite	Tan	Porp			●		○					·	·	○				
AK7WT	S. Cikuya	Hornblende Andesite	Tan	Porp-Ophi			●		○	△			·			○	△	·	·	Pl·Hb→Ch

Abundance of Minerals: ●;Abundant, ○;Common, △;Rare, ·;Trace

Formation Names : Tomj;Jampang Formation, Tmkl;Kalipucang Formation, Tmpa;Pamutuan Formation, Tmbs;Bentang Formation, Tmph; Halang Formation, Qtv;Old Volcanic Rocks, Tgd;Granodiorite, Tda;Dacite, Tan;Andesite (dyke)

Textures : Pycl;Pyroclastic, Clas;Clastic, Porp;Porphyritic, Lepb;Lepidoblastic, Glom-gr;Glomerophyric granular, Hypd-gr;Hypidiomorphic-granular, Ophi;Ophitic, Int-gr;Inter-granular, Hol-pp;Holocrystalline-porphyritic

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 2-5 Results of Microscopic Observation of Thin Sections (2)

Sample No.	Locality	Rock Name	Formation	Texture	Phenocryst/Crystal Frag.									Groundmas/Matrix						Alteration
					Qz	Kf	Pl	Bi	Hb	Px	Ol	Ep	Op	Qz	Kf	Pl	Hb	Px	Gl	
AK8RT	S. Cigugur	Andesite	Tomj	Porp			○			△										Pl•Px→Ch•Se
AK10RT	Gn. Lubuk	Hornblende Andesite	Tan	Porp			●		○	△			·			○	△			
AK10WT	S. Ciseel	Gabbro	Tgd	Ophi			●		○				·							Pl•Hb→Ch
AK12WT	S. Ciseel	Hornblende Andesite	Tomj	Porp			○		○				·			△	△			Pl→Se•Ch•Ca
AK13RT	S. Ciseel	Calcareous Shale	Tomj	Clas										·		△				Ca, Fossil
AK14RT	Umar	Andesite	Tomj	Porp			△			·			·			·				Pl→Se
AH2T	S. Ciwulan	Andesite	Tomj	Porp-Ophi			●			○			△			○		△		
AH5T	S. Ciwulan	Andesite	Tomj	Porp			●			△			△			○		·		Pl→Ca•Ch
AH6T	S. Ciwulan	Andesite	Tomj	Porp			●			△			·			△		·		Pl→Ca•Ch
AH8T	S. Ciwulan	Andesite	Tomj	Porp-Ophi			●			○			·			○		△	·	Pl→Ca•Se•Ch
AH10T	S. Ciwulan	Basalt	Tomj	Ophi			○		△				△			△	·			Pl→Se
AH27T	Gn. Payung	Granodiorite-Porphyry	Tgd	Hol-gr	△		○	△	△	·			·			△	·	·		
	[Sidamulih]																			
BA6T	S. Ciawitali	Basalt	Tan	Porp-Ophi			●			△						○		·		Pl•Px→Ch•Se
BH2T	S. Ciadiloka	Andesite	Tan	Porp			●			●			·			○		○		Pl•Px→Ch
BH3T	S. Cisawangan	Dacite	Tda	Porp			●		△							○	·			Pl→Se•Ch
BHS1T	Gn. Karang	Limestone	Tmkl	Clas																Ca, Fossil
BS5T	S. Cinangkerok	Lapilli Tuff	Tmpa	Pycl			·			△										Px•Pl→Ch
	[Cisasah]																			
CA5T	S. Cikoplok	Granodiorite-Porphyry	Tgd	Hol-pp			●			△			·	·		○				Pl•Px→Ch•Ca•Se, Silicified
CD316T	S. Cijambehaseum	Quartz-Porphyry	Tgd	Hol-pp	●		○						·			○				Pl→Ch•Se
CD323T	Pr. Tenjolaut	Granodiorite	Tgd	Hypd-gr	○	○	●	△	○				·							
CD351T	S. Cijolang	Diorite	Tgd	Hol-pp			●			△			△			○				Pl•Px→Ca•Ch

Abundance of Minerals: ●;Abundant, ○;Common, △;Rare, ·;Trace

Formation Names : Tomj;Jampang Formation, Tmkl;Kalipucang Formation, Tmpa;Pamutuan Formation, Tmbs;Bentang Formation, Tmph; Halang Formation, Qtv;Old Volcanic Rocks, Tgd;Granodiorite, Tda;Dacite, Tan;Andesite (dyke)

Textures : Pycl;Pyroclastic, Clas;Clastic, Porp;Porphyritic, Lepb;Lepidoblastic, Glom-gr;Glomerophyric granular, Hypd-gr;Hypidiomorphic-granular, Ophi;Ophitic, Int-gr;Inter-granular, Hol-pp;Holocrystalline-porphyritic

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 2-5 Results of Microscopic Observation of Thin Sections (3)

Sample No.	Locality	Rock Name	Formation	Texture	Phenocryst/Crystal Frag.									Groundmas/Matrix						Alteration
					Qz	Kf	Pl	Bi	Hb	Px	Ol	Ep	Op	Qz	Kf	Pl	Hb	Px	Gl	
CK1WT	S. Ciwulan	Andesite	Tan	Porp			●			△				·		○				Pl·Px→Ch·Ca
CK2WT	S. Ciwulan	Hornblende Andesite	Tomj	Porp-Ophi			●		●				·			○	○		△	
CK3WT	S. Cibatuireng	Andesite	Tan	Porp			●			○						○		△		Pl·Px→Ch
CK4WT	S. Cikancung	Andesite	Tomj	Porp-Ophi			●			○			·	·					△	Pl·Px→Ch
CK5WT	S. Cilangla	Hornblende Andesite	Tan	Porp			●		△				·	○		○	·			Pl·Hb→Ch
CK6WT	S. Cilangla	Dacite	Tda	Porp	●		○		△					△		△	·			Pl·Hb→Se·Ch
CK7RT	S. Carongge	Dacite	Tda	Porp	●		○							△		△				Pl→Se·Ch, Silicified
CS1T	Lebak Gintung	Dacitic Tuff	Tomj	Pycl	○		△							△		·			△	Pl→Se·Ch
CS3T	S. Cipanawar	Diorite	Tgd	Hol-pp			●			○			△			△		·		Pl·Px→Ch
CH1T	S. Ciwulan	Granodiorite-Porphyry	Tgd	Hol-pp			●			△			·	△		○	·	·		Pl·Px→Ch·Se·Ca
CH10T	Cikelirleutik	Dacite	Tomj	Porp			○			△			·			△			△	Pl·Px→Ch·Ca
CH20T	S. Cipunduan	Quartz-Porphyry	Tgd	Hol-pp	△		○					·	·			△				Pl→Ch·Ep
CH22T	S. Cicadas	Dacite	Tda	Porp			●			△				△		○		·		Pl→Se, Silicified

Abundance of Minerals: ●;Abundant, ○;Common, △;Rare, ·;Trace

Formation Names : Tomj;Jampang Formation, Tmkl;Kalipucang Formation, Tmpa;Pamutuan Formation, Tmbs;Bentang Formation, Tmph; Halang Formation, Qtv;Old Volcanic Rocks, Tgd;Granodiorite, Tda;Dacite, Tan;Andesite (dyke)

Textures : Pycl;Pyroclastic, Clas;Clastic, Porp;Porphyritic, Lepb;Lepidoblastic, Glom-gr;Glomerophyric granular, Hypd-gr;Hypidiomorphic-granular, Ophi;Ophitic, Int-gr;Inter-granular, Hol-pp;Holocrystalline-porphyritic

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

Sample No.	Remarks	Rock Unit	Locality	Clay Minerals								Zeolites				S-Salts			Carbonates			Silicates			Fldsp		Miscellaneos Minerals								
				Mo	Ch	Se	Mu	Ka	Ha	Pr	Mx	Cp	Md	Lm	An	Al	Gy	Ja	Ca	Ak	Si	Cr	Tr	Qz	Pl	Kf	Py	Go	He	Mg	Ap	Ep	Rd	Ho	At
			[Salopa]																																
AA4X	Py-diss, Ka		S. Cipinaha	△				△													△			○	△										
AA8X	Py-diss, Ka		S. Cibenjor	○				△														◎			·		△								
AA12X	Py-diss, Ka		S. Cipinaha							○							·							○			△								
AA13X	Qz vein, Se		S. Cipinaha			·		△												○				◎			·								
AA18X	Qz vein, Py-Cp-Gn		S. Cimaranten			·																		◎			·								
AA23X	Py-diss, Ka		S. Ciseel	△		·		○																◎	△										
AA24X	Py-diss, Ka		S. Ciseel	△		·		·																◎	·										
AD6X	p-green clay		S. Ciniru					·												○				○	△		△								
AD21X	bl-white clay		S. Ciniru	○																					○										
AD25X	Py-diss, Se		S. Cipanawar			△																		◎											
AD113X	Qz vein, Lm		S. Cibatunglung			△		·																◎											
AD253X	Qz vein, Se-Ka		S. Citambal			·		·									·							◎			△								
AD255X	Qz vein, Se		S. Cikurawet	△		·		△																◎	·										
AD256X	Qz vein, Se		S. Cikurawet			△																		◎			△								
Ad257X	Qz vein, Se		S. Cikurawet			△																		◎			△								
AH3X	geothermal precipitates		S. Cigelap	△				·											◎																
AH4X	limestone	Tmkl	S. Cibunter													◎				△															
AH5X	jarosite or Py		S. Cicaruluk																					·			△								
AH9X	Phosphorite		S. Cigelap																												○				
AH10X	gossan		S. Cijalu			○													·								△	△							
AH11X	clayey zone		S. Cibayombong			○																					△								
AH14X	clayey zone		S. Citiis			·		◎																○			·								
AK7X	Qz float, Py-diss		S. Cikuya	△																	○			△											
AK7RX	tuff-breccia, clayey	Tomj	S. Cinunjan			△																		◎			·								
AK8X	clay, Lm		S. Cikuya	△				△																◎											
AK9X	waste		S. Cikuya			·																		◎											
AK10X	waste		S. Cikuya			△											·							◎											
AK11X	waste		S. Cikuya			·														△				◎		○									
AK12X	waste		S. Cikuya			△																		◎		△									
AK14X	waste		S. Cikuya			△											·							◎											
AK18X	Qz stockwork		S. Cimedang	△																				◎	○		△								
AK19X	Qz stockwork		S. Cimedang	△											·		△							◎	◎		△								
AK20X	Ca veinlet		S. Cijeruk	△															◎						·		·								
AK22X	Sil-clayey zone, Lm		S. Ciseel			·														○				◎	·										
AK23X	Sil-clayey zone, Lm		S. Ciseel					△									△			○				◎			·								

Abundance of Minerals: ◎;Abundant, ○;Common, △;Few, ·;Rare

Abbreviations : Mo;Montmorillonite, Ch;Chlorite, Se;Sericite, Mu;Muscovite, Ka;Kaolin, Pr;Pyrophyllite, Mx;Mixed-Layer Mineral, Ha;Halloysite, Cp;Clinoptilolite, Md;Mordenite, Lm;Laumontite, An;Analcime, Al;Alunite, Gy;Gypsum, Ja;Jarosite, Ca;Calcite, Ak;Ankerite, Si;Siderite, Cr;α-Cristobalite, Tr;Toridymite, Qz;Quartz, Pl;Plagioclase, Kf;Potash Feldspar, Py;Pyrite, Go;Goethite, He;Hematite, Mg;Magnetite, Ap;Apatite Ep;Epidote, Rd;Rhodochrosite, Ho;Hornblende, At;Anatase

Table 2-6 Results of X-Ray Diffraction Analysis (2)

Sample No.	Remarks	Rock Unit	Locality	Clay Minerals								Zeolites				S-Salts			Carbonates			Silicates			Fldsp		Miscellaneos Minerals								
				Mo	Ch	Se	Mu	Ka	Ha	Pr	Mx	Cp	Md	Lm	An	Al	Gy	Ja	Ca	Ak	Si	Cr	Tr	Qz	Pl	Kf	Py	Go	He	Mg	Ap	Ep	Rd	Ho	At
AK24X	Qz vein		Umar			△																		◎											
AK25X	waste		Umar			·		△																◎											
AK26X	Sil float		S. Ciseel			·		·																◎											
AK28X	Sil vein		S. Ciseel			△																		◎											
AS1X	geothermal precipitates		S. Ciwulan	△				△									○								·		·								
AS2X	clayey tuff, Py-diss	Tomj	S. Cimanggu			△											·							◎			·								
AS3X	Sil-clayey zone		S. Cimanggu			·																		○			○								
AS4X	clayey zone, Py-diss		S. Cibanjoran	△				△														○		△											
AS5X	tuff-breccia, clayey	Tomj	Salopa		·			○																○									·		
AS6X	clayey zone, Py-diss		Gulingmuding		△			△																◎			·								
AS7X	tuff, clayey	Tomj	Gulingmuding					○																◎											
			[Sidamulih]																																
BD408X	Sil float, Py-diss		S. Cipongol					◎																◎			·								
BD415X	clayey zone, Py-diss		S. Cipamutuan	·	△														△					○	◎										
BH1X	Sil tuff, Py-diss	Tomj	S. Cikawung		△	△													○					◎											
BH5X	Qz vein float, Py-imp		S. Cisonari					◎																◎	·		·								
BH6X	clayey zone, Py-diss		S. Cisonari		△	·													△					◎			△								
BK2X	Sil float, Py-diss		Sidamulih 2					△																◎			·								
			[Cisasah]																																
CD265X	pumice tuff	Tomj	S. Cisasah	○		·		·									·					○													
CD266X	Mn ore, Mo		S. Cisasah	○		·		·														△													
CD267X	Mn zone, Mo		S. Cisasah	○		△																													
CD268X	tuff	Tomj	S. Cisasah	◎		△																													
CD269X	Gy ore, Hm-imp		S. Cisasah														◎							△	△										
CD270X	pumice tuff, Gy	Tomj	S. Cisasah		△						△						◎																		
CD271X	Mn zone, Hm		S. Cisasah														△					△		◎	·			△							
CD279X	clay zone, Gy		Cidadap			△											·							○			○								
CD281X	Ah-Gy ore, Sp-diss		Cidadap			△											◎													·					
CD321X	clayey zone, Py-Ka		S. Cijambehaseum					△									△							◎											
CD346X	clayey zone, Py-Ka		S. Citisuk					·									△							◎	·		△								
CH3X	Mn ore, Hm-specularite		S. Cipunduan																					△			△	△					·		
CK1X	Mn ore		S. Ciwulan			·																		△				△							
CK3X	Sil tuff, Py-Sp-Ep	Tomj	S. Cibersih		△	·																·		◎						△		△			
CK4X	Py-Cp ore, Ch-Ep		S. Cibersih		◎	·													△	△		·		◎			△								

Abundance of Minerals: ◎;Abundant, ○;Common, △;Few, ·;Rare

Abbreviations : Mo;Montmorillonite, Ch;Chlorite, Se;Sericite, Mu;Muscovite, Ka;Kaolin, Pr;Pyrophyllite, Mx;Mixed-Layer Mineral, Ha;Halloysite, Cp;Clinoptilolite, Md;Mordenite, Lm;Laumontite, An;Analcime, Al;Alunite, Gy;Gypsum, Ja;Jarosite, Ca;Calcite, Ak;Ankerite, Si;Siderite, Cr;α-Cristobalite, Tr;Toridymite, Qz;Quartz, Pl;Plagioclase, Kf;Potash Feldspar, Py;Pyrite, Go;Goethite, He;Hematite, Mg;Magnetite, Ap;Apatite Ep;Epidote, Rd;Rhodochrosite, Ho;Hornblende, At;Anatase

Table 2-6 Results of X-Ray Diffraction Analysis (3)

Sample No.	Remarks	Rock Unit	Locality	Clay Minerals								Zeolites				S-Salts			Carbonates			Silicates			Fldsp		Miscellaneos Minerals								
				Mo	Ch	Se	Mu	Ka	Ha	Pr	Mx	Cp	Md	Lm	An	Al	Gy	Ja	Ca	Ak	Si	Cr	Tr	Qz	Pl	Kf	Py	Go	He	Mg	Ap	Ep	Rd	Ho	At
CK5X	clay vein		S. Cibersih			△																		◎			△								
CS3X	Gy ore, Ah		S. Cisasah			·											◎							◎											
CS4X	Gy ore, Hm		S. Cisasha			·											◎										△								
CS8X	soapy stone		S. Cigorowong	△		·																		◎											

Abundance of Minerals: ◎;Abundant, ○;Common, △;Few, · ;Rare

Abbreviations : Mo;Montmorillonite, Ch;Chlorite, Se;Sericite, Mu;Muscovite, Ka;Kaolin, Pr;Pyrophyllite, Mx;Mixed-Layer Mineral, Ha;Halloysite, Cp;Clinoptilolite, Md;Mordenite, Lm;Laumontite, An;Analcime, Al;Alunite, Gy;Gypsum, Ja;Jarosite, Ca;Calcite, Ak;Ankerite, Si;Siderite, Cr;α-Cristobalite, Tr;Toridymite, Qz;Quartz, Pl;Plagioclase, Kf;Potash Feldspar, Py;Pyrite, Go;Goethite, He;Hematite, Mg;Magnetite, Ap;Apatite Ep;Epidote, Rd;Rhodochrosite, Ho;Hornblende, At;Anatase

Table 2-7 Results of Ore Microscopy (1)

Sample No.	Locality	Minerals									Remarks
		Py	As	Cp	Sp	Gn	Cv	Ag	Sc	Io	
	[Salopa]										
AA6P	S. Cinunjang	·									Qz veinlet, Wd=1cm
AA7P	S. Cinunjang	△									Qz veinlet
AA9P	Gulingmuding	△									Qz vein
AA11P	Gulingmuding	△			·						Qz vein, Wd=7cm
AA18P	S. Cimaranten	△	△		·	·					Qz vein, Wd=8cm
AA21P	Nyalindung	△	·	·	·	·					Qz vein
AD20P	S. Ciniru	·	·								Qz veinlet, Wd=25cm(zone)
AD31P	S. Ciniru	△									Qz vein
AD118P	S. Cibatunglung	△	△								Qz vein
AD253P	S. Citambal	△	·								Qz vein
AD255P	S. Cikurawet	△	·								Qz vein
AD257P	S. Cikurawet	·	△								Qz vein
AD260P	S. Cikondang	△	·					?			Qz vein, Cinnabar
AD261P	S. Cikondang	·	·					·			Qz vein
AH2P	S. Ciwulan	·	△								Sulfide dissemination
AH7P	S. Cilawang	△									Qz vein
AK1MP	S. Cimedang	·	·								Py vein float
AK6MP	S. Cimedang	△	·								Mineralized rock float
AK7MP	S. Cikuya	△	△								Mineralized rock float
AK9MP	S. Cikuya	△	△								Qz vein
AK10MP	S. Cikuya	·	○								Mineralized rock
AK11MP	S. Cikuya	·		·	·	·					Qz vein
AK12MP	S. Cikuya	·	△								Silicified rock
AK13MP	S. Cikuya	·	△	·							Silicified rock
AK14MP	S. Cikuya	△	△								Qz vein, Wd=20cm
AK16MP	S. Citatah	△									Mineralized rock float
AK22MP	S. Ciseel	·	△								Qz-sulfide vein, Wd=8.5cm
AK25MP	Umar	△	○								Qz vein, Wd=4cm
AK26MP	S. Ciseel	·	·								Qz float
AS3P	S. Ciwarak	△									Silicified rock float

Abundance of Minerals: ○;Common, △;Rare, ·;Trace
Abbreviations : Py;Pyrite, As;Arsenopyrite, Cp;Chalcopyrite, Sp;Sphalerite, Gn;Galena
Cv;Covelline, Ag;Argentite, Sc;Specularite, Io;Iron Oxide

Table 2-7 Results of Ore Microscopy (2)

Sample No.	Locality	Minerals Py	As	Cp	Sp	Gn	Cv	Ag	Sc	Io	Remarks
AS6P	Gulingmuding	△	△								Silicified rock float
AS12P	S. Cihapitan	·	·								Silicified rock float
AS16P	S. Cihapitan	·	·	·				·	△		Silicified rock, Stibnite
AS17P	S. Cihapitan	·	·					·			Silicified rock, Stibnite & Cinnabar
	[Sidamulih]										
BA8RP	Karangjambe	△		·							Mineralized rock
BD408P	S. Cipongol	·								·	Qz float
BK2MP	Sidamulih 2	△									Qz float, Wd=30cm
BK5MP	S. Cigabang	·		·	·	·				·	Qz float
BK7MP	S. Lingga	△								·	Qz float
BS1P	S. Citandeng	·			·						Silicified rock float
BS2P	S. Cikaso	△									Qz float
BS4P	S. Cikaso	·								·	Qz float
	[Cisasah]										
CA9P	S. Cipatujah	·		·	·	·					Qz vein
CA10P	S. Cipatujah	△									Qz float
CD342P	S. Citisuk	○									Qz vein, Wd=25cm(zone)
CH3P	S. Cipunduan								○	·	Iron ore
CK4MP	S. Cibersih	○		·			·				Py ore, Wd=20cm
CK6MP	S. Cilangla	·							○		Iron ore float, Wd=30cm
CK7MP	S. Cipalalar	△		·	·	·	·				Silicified rock float
CS1P	Cisasah									△	Siliceous Hm zone
CS2P	Cisasah										Mn ore (Pyrolusite, Psilomelane)
CS3P	Cisasah	·								·	Gypsum ore
CS5P	Cisasah	△									Siliceous zone
CS13P	S. Cibengang								△	·	Siliceous zone
CS16P	S. Cikerepu	○		·			·				Qz vein
DD1P	Cibuniasih	·		·	·	△					Barite-Gn ore
DD2P	Cibuniasih	·		·	·	△					Barite-Gn ore

Abundance of Minerals: ○;Common, △;Rare, ·;Trace
Abbreviations : Py;Pyrite, As;Arsenopyrite, Cp;Chalcopyrite, Sp;Sphalerite, Gn;Galena
Cv;Covelline, Ag;Argentite, Sc;Specularite, Io;Iron Oxide

Table 2-8 Methods of Analysis and Limits of Detection of Ore Samples

Element	Methods of Analysis	Detection Limit	Upper Limit
Au	Fire assay with AA finish	5 ppb	10 ppm
Ag	Nitric aqua regia with ICP finish	2 ppm	0.05 %
Cu	ditto	0.001 %	2.5 %
Pb	ditto	0.001 %	2.5 %
Zn	ditto	0.001 %	2.5 %
Sb	$HCl/KClO_3$ extraction with AA finish	0.2 ppm	0.1 %
Cr	Total digestion with AA finish	2 ppm	1 %
Mn	Nitric aqua regia with ICP finish	0.001 %	2.5 %
Ba	Total digestion with AA finish	10 ppm	1 %

* AA means Atomoc Absorption Method.

Table 2-9 Major Assay Results of Ore Samples (1)

Sample No.	Width cm	Au ppb (FA+AA)	Au g/t (FA)	Ag ppm	Cu %	Pb %	Zn %	Fe %	Sb %	Cr %	Mn %	Ba %	Locality and Remarks
(Salopa)										(Cr2O3 %)			
AA4M	grab	<5		2	0.002	0.001	0.019	5.03	<.01	0.02	0.277	<.1	S.Cipinaha
AA6M	1	210		<2	0.005	0.008	0.021	7.05	<.01	0.03	0.214	<.1	S.Cinunjang
AA7M	grab	755		2	0.004	0.003	0.009	5.49	<.01	0.01	0.143	<.1	S.Cinunjang
AA10M	grab	<5		<2	0.010	0.009	0.008	5.76	<.01	0.02	0.007	<.1	Gulingmuding
AA12M	grab	10		<2	0.006	0.004	0.003	7.93	<.01	0.02	0.006	<.1	S.Cipinaha
AA13M	grab	2,450		4	0.006	0.007	0.029	6.01	<.01	0.01	0.656	<.1	S.Cipinaha
AA14M	grab	1,280		4	0.028	0.449	0.899	2.74	<.01	0.07	0.009	<.1	S.Cipinaha
AA15M	grab	140		2	0.002	0.009	0.018	6.10	<.01	0.03	0.060	<.1	S.Cipinaha
AA17M	4	195		<2	0.008	0.006	0.027	5.45	<.01	0.03	0.079	<.1	S.Cimaranten
AA18M	8	710		4	0.011	0.081	0.270	5.63	<.01	0.02	0.013	<.1	S.Cimaranten
AA19M	2	1,520		4	0.024	0.234	0.756	4.04	<.01	0.02	0.015	<.1	S.Cimaranten
AA21M	grab	>10,000	18.65	26	0.020	0.021	0.090	3.87	0.01	0.01	0.463	<.1	Nyalindung
AA22M	4	>10,000	17.00	80	0.023	0.036	0.052	6.58	0.02	0.01	0.025	<.1	S.Ciseel
AA23M	grab	175		<2	0.008	0.003	0.016	3.15	<.01	0.02	0.023	<.1	S.Ciseel
AA24M	grab	45		2	0.004	0.007	0.016	6.19	<.01	0.01	0.014	<.1	S.Ciseel
AS01M	grab	<5		4	0.004	0.003	0.008	9.99	<.01	0.04	0.074	<.1	S.Ciwulan, float
AS02M	grab	600		2	0.004	0.002	0.003	4.45	0.08	0.01	0.012	<.1	S.Ciwarak
AS04M	grab	355		<2	0.001	<.001	0.002	6.17	0.14	0.01	0.052	<.1	S.Ciwarak
AS06M	grab	90		<2	0.007	0.004	0.002	7.64	<.01	0.02	0.008	<.1	Gulingmuding
AS09M	grab	45		2	0.005	0.004	0.003	6.46	<.01	0.01	0.004	<.1	Gulingmuding
AS10M	grab	<5		2	0.003	0.001	0.002	18.15	<.01	0.03	0.014	<.1	Gulingmuding
AS12M	grab	4,230		134	0.003	0.017	0.104	3.06	0.04	0.01	0.034	<.1	S.Cipangaras
AS14M	grab	2,230		4	0.004	0.002	0.002	4.32	<.01	0.03	0.007	<.1	S.Cihapitan
AS15M	grab	3,020		6	0.002	0.002	0.004	6.36	<.01	0.06	0.015	<.1	S.Cihapitan
AS16M	grab	>10,000	27.15	82	0.012	0.003	0.010	1.98	4.83	0.02	0.009	<.1	S.Cihapitan
AS17M	grab	>10,000	17.07	38	0.007	0.004	0.007	1.87	1.63	0.05	0.011	<.1	S.Cihapitan
AD3M	30	10		4	0.004	<.001	0.012	8.36	<.01	0.01	0.244	<.1	S.Cimedang
AD20M	25	2,760		20	0.001	0.005	0.011	4.35	0.01	0.02	0.222	<.1	S.Ciniru
AD30M	20	290		16	0.004	0.013	0.042	5.66	<.01	0.03	1.325	<.1	S.Ciniru
AD31M	grab	395		58	0.006	0.008	0.027	3.90	<.01	0.03	0.497	<.1	S.Ciniru
AD38M	1.5	135		6	0.002	<.001	0.006	5.55	<.01	0.03	0.309	<.1	S.Ciniru
AD42M	2	<5		4	<.001	<.001	0.006	5.67	<.01	0.01	0.221	0.2	S.Ciniru
AD46M	25	<5		2	0.003	0.001	0.009	5.42	<.01	0.01	0.124	<.1	S.Ciniru
AD97M	2.5	420		4	0.003	0.002	0.022	4.91	<.01	0.01	0.082	<.1	S.Ciharuman
AD112M	grab	40		<2	0.006	0.001	0.004	5.55	<.01	0.01	0.011	<.1	S.Cibatunugrung
AD118M	grab	540		12	0.004	0.053	0.014	15.05	<.01	0.02	0.030	<.1	S.Cibatunugrung
AD253M	grab	825		8	0.006	0.013	0.035	3.56	<.01	0.02	0.039	<.1	S.Citambal
AD254M	grab	310		2	0.019	0.001	0.010	5.13	<.01	0.02	0.298	<.1	S.Citambal
AD255M	grab	4,810		4	0.004	0.002	0.011	5.64	<.01	0.01	0.216	<.1	S.Cikurawet
AD256M	grab	5,050		10	0.006	0.101	0.766	5.02	0.01	0.02	0.035	<.1	S.Cikurawet
AD257M	grab	3,380		4	0.006	0.024	0.053	4.90	<.01	0.02	0.060	<.1	S.Cikurawet
AK1M	grab	5		<2	0.002	<.001	0.003	2.54	<.01	0.01	0.309	<.1	S.Cimedang, float
AK3M	2	260		4	0.015	<.001	0.014	17.95	<.01	0.04	0.516	<.1	S.Cimedang
AK4M	2	<5		2	0.009	<.001	0.011	11.45	<.01	0.03	0.291	<.1	S.Cimedang
AK5M	5	195		4	0.011	<.001	0.008	12.00	<.01	0.01	0.537	<.1	S.Cikuya
AK6M	grab	70		<2	0.007	0.001	0.001	5.99	<.01	0.04	0.009	<.1	S.Cimedang
AK7M	grab	1,560		30	0.002	0.005	0.067	6.82	<.01	0.01	0.012	<.1	S.Cimedang, float
AK8M	grab	135		<2	0.001	0.001	0.001	2.66	<.01	<.01	0.012	<.1	S.Cikuya
K9M	grab	2,960		10	0.002	0.004	0.001	8.62	0.01	<.01	0.026	<.1	S.Cikuya
K10M	grab	970		8	0.002	0.002	0.004	2.78	<.01	<.01	0.045	<.1	S.Cikuya
K11M	grab	4,670		330	0.002	0.004	0.015	1.84	0.01	<.01	0.014	<.1	S.Cikuya
K12M	grab	3,690		134	0.002	0.009	0.009	1.84	0.01	<.01	0.018	<.1	S.Cikuya
K13M	grab	4,630		32	0.003	0.011	0.024	3.27	<.01	<.01	0.015	<.1	S.Cikuya
K14M	20	285		8	<.001	0.001	0.002	1.14	<.01	<.01	0.011	<.1	S.Cikuya
K16M	grab	155		<2	0.006	0.020	0.004	6.26	0.02	0.02	0.071	<.1	S.Citatah
K17M	grab	<5		<2	0.009	0.001	0.008	5.53	<.01	0.04	0.088	<.1	S.Citatah
K18M	grab	<5		<2	0.002	0.001	0.008	5.22	<.01	0.01	0.135	<.1	S.Cimedang
K19M	grab	<5		<2	0.002	0.001	0.009	5.18	<.01	0.02	0.148	<.1	S.Cimedang
K20M	3	20		4	0.002	<.001	0.003	6.39	<.01	<.01	1.425	<.1	S.Cijeruk
K21M	2.5	105		2	0.002	0.001	0.009	3.31	<.01	<.01	0.226	<.1	S.Ciseel
K22M	8.5	75		2	0.001	0.001	0.009	6.05	0.04	0.01	0.078	<.1	S.Ciseel
K23M	4	255		4	0.001	0.001	0.011	5.08	0.03	<.01	0.106	<.1	S.Ciseel
K24M	30	7,470		28	0.006	0.006	0.016	2.36	0.01	0.01	0.016	<.1	Umar
K25M	grab	9,190		42	0.004	0.022	0.025	2.63	0.02	0.01	0.017	<.1	Umar
K26M	grab	2,180		8	0.003	0.003	0.017	2.79	0.01	<.01	0.020	<.1	S.Ciseel, float
K28M	6	215		2	0.001	0.005	0.003	4.14	<.01	0.01	0.026	<.1	S.Ciseel
H4M	grab	<5		<2	0.016	0.001	0.071	2.60	<.01	0.01	0.159	<.1	S.Cibunter
H5M	30	35		<2	0.002	0.001	0.011	22.40	<.01	0.01	0.070	<.1	S.Cicaruluk
H9M	grab	130		2	0.013	<.001	0.146	1.57	0.01	0.01	0.936	<.1	S.Cigelap
H10M	grab	425		<2	0.021	0.001	0.018	45.40	<.01	0.03	0.279	<.1	S.Cijalu
H11M	10	4,120		6	0.014	0.008	0.006	8.81	0.01	0.07	0.011	<.1	S.Cibayombong
H12M	5	>10,000	35.31	18	0.007	0.002	0.006	2.80	<.01	0.02	0.019	<.1	S.Ciseel
H13M	10	2,620		74	0.033	0.188	0.071	4.11	0.05	0.02	0.006	<.1	S.Ciseel
H14M	grab	90		4	0.010	0.010	0.005	5.34	<.01	0.08	0.002	<.1	S.Citiis

Table 2-9 Major Assay Results of Ore Samples (2)

Sample No.	Width cm	Au ppb (FA+AA)	Au g/t (FA)	Ag ppm	Cu %	Pb %	Zn %	Fe %	Sb %	Cr %	Mn %	Ba %	Locality and Remarks
[Sidamulih]									(Sb ppm)	(Cr ppm)		(Ba ppm)	
BD398M	grab	40		2	0.001	<.001	0.001	2.18	0.2	40	0.026	160	Karangpari
BD401M	grab	200		6	0.015	0.020	0.006	4.83	2.2	55	0.019	160	S.Cipongol, float
BD408M	grab	1,590		20	0.020	0.010	0.002	2.67	8.8	100	0.017	160	S.Cipongol, float
BD423M	grab	10		2	0.001	0.004	0.001	9.21	0.2	15	0.015	300	S.Cipamutuan
BD426M	grab	<5		<2	0.007	0.009	0.004	6.13	0.6	10	0.010	140	S.Cipamutuan
BA2M	grab	<5		2	0.003	0.019	0.054	4.00	0.4	25	0.082	140	Karangjambe
BH1M	grab	205		<2	0.003	0.007	0.024	5.60	1.2	35	0.203	240	S.Cikawung
BH4M	grab	<5		2	0.026	0.018	0.001	11.55	7.2	70	0.009	780	S.Cisonari, float
BH5M	grab	100		<2	0.013	0.009	0.003	4.04	2.0	85	0.016	60	S.Cisonari, float
BH6M	grab	<5		<2	0.006	0.002	0.009	5.67	0.4	20	0.097	190	S.Cisonari
BHS1M	grab	<5		<2	<.001	0.006	0.004	0.61	2.0	5	>2.50	8,500	Gn. Karang
BS2M	grab	640		11	0.012	0.013	0.002	6.37	2.4	10	0.028	80	S.Citenbeng, float
BS3M	grab	25		<2	0.009	0.001	0.014	3.39	<.2	55	0.084	190	S.Cilerujek, float
BS4M	grab	60		<2	0.008	0.281	0.014	0.83	0.6	15	0.130	70	S.Cileniek, float
BS5M	3	<5		2	0.002	0.003	0.013	3.23	0.8	20	0.097	200	S.Cisumurbandung, float
BS6M	grab	25		<2	0.001	0.003	0.001	1.13	2.0	25	0.012	20	S.Cinangkerok, float
BK1M	grab	<5		<2	0.023	0.003	0.036	6.63	<.2	105	0.047	200	Banjarsari
BK2M	30	480		2	0.020	0.009	0.007	2.91	5.6	35	0.046	80	Sidamulih 2
BK3M	60	360		<2	0.004	0.001	0.002	3.68	9.8	15	0.012	1,200	Sidamulih 2
BK4M	30	840		2	0.005	0.017	0.047	0.94	0.8	15	0.008	20	S.Cigabang
BK5M	grab	100		16	0.083	0.439	1.380	1.11	2.6	15	0.018	40	S.Cigabang, float
BK6M	grab	430		2	0.004	0.004	0.009	1.83	0.6	25	0.043	80	Lingga, float
BK7M	grab	620		4	0.001	0.004	0.008	5.58	50.0	15	0.005	760	Lingga, float
[Cisasah]													
CD295M	grab	60		2	0.208	0.518	>2.50	0.87	2.4	10	0.010	480	S.Cidadap
CD329M	grab	<5		<2	0.014	0.004	0.025	7.91	42.0	10	0.069	60	S.Cidarawati
CD342M	25	<5		<2	0.001	0.018	0.025	11.95	0.8	15	0.150	20	S.Citisuk
CD343M	20	<5		<2	0.001	0.008	0.028	6.43	3.4	10	0.077	20	S.Citisuk
CD353M	22	<5		<2	0.129	0.048	0.007	3.54	130.0	15	0.032	20	S.Cijulang
CK1M	grab	<5		<2	0.004	0.024	0.010	3.38	30.0	10	>2.50	8,500	S.Ciwulan, float
CK2M	3	<5		<2	<.001	0.001	0.002	2.72	0.4	10	0.120	260	S.Cibutuireng
CK3M	30	<5		<2	0.056	0.003	1.780	6.47	4.4	25	>2.50	920	S.Cibersih
CK4M	20	<5		4	2.030	0.001	0.057	15.80	1.2	25	0.273	20	S.Cibersih
CK5M	15	<5		<2	0.044	0.003	0.369	6.84	5.8	15	0.179	340	S.Cibersih
CK6M	30	<5		<2	0.052	<.001	0.007	25.03	2.6	10	0.038	20	S.Cilangla
CK7M	grab	30		46	0.638	0.990	0.365	4.50	4.8	25	0.066	100	S.Cipalalar, float
CA1M	grab	10		<2	0.066	0.005	0.100	6.90	0.6	35	0.126	120	S.Cijalu
CA2M	grab	<5		<2	0.023	0.002	0.286	2.98	0.6	10	0.096	400	S.Cijalu
CA3M	3	<5		<2	0.010	0.011	0.051	2.67	2.0	10	0.451	190	S.Cijalu
CA5M	15	30		4	0.002	0.008	0.009	8.03	0.2	5	0.103	50	S.Cidarawati
CA7M	15	<5		<2	0.008	0.047	0.012	5.45	0.4	5	0.035	100	S.Cidarawati
CA8M	5	<5		<2	0.002	0.001	0.010	7.21	<.2	50	0.093	40	S.Cipatujah
CA9M	grab	3,490		16	0.381	2.210	0.376	2.09	15.0	5	0.011	50	S.Cipatujah
CA10M	grab	110		4	0.016	0.066	0.016	3.75	1.8	5	0.009	20	S.Cipatujah, float
CA11M	8	50		10	1.325	0.031	0.013	7.55	2.4	10	0.015	20	S.Cipatujah
CA12M	8	20		4	0.148	0.029	0.012	7.86	0.8	10	0.008	30	S.Cipatujah
CS1M	grab	10		<2	0.006	0.021	0.009	9.38	34.0	10	>2.50	4,500	S.Cisasah
CS2M	grab	<5		16	0.002	0.051	0.050	0.30	<.2	5	>2.50	5,000	S.Cisasah
CS3M	grab	270		6	0.002	0.348	0.006	0.90	7.8	10	0.345	140	S.Cisasah
CS4M	grab	1,310		124	0.006	0.189	0.452	14.60	32.0	15	0.036	300	S.Cisasah
CS5M	grab	260		6	0.013	0.043	0.114	4.48	1.2	10	0.033	150	S.Cisasah
CS8M	grab	<5		2	0.010	0.004	0.017	6.31	4.8	25	0.198	220	S.Cilangla
CS11M	grab	10		2	0.026	0.043	0.026	10.20	1.6	10	0.013	120	S.Cibengang
CS12M	grab	<5		2	0.033	0.018	0.008	29.90	0.6	10	0.031	40	S.Cibengang
CS13M	grab	<5		<2	0.026	0.013	0.009	23.80	0.6	10	0.071	100	S.Cibengang
CS14M	grab	<5		2	0.025	0.034	0.014	34.70	1.2	10	0.050	60	S.Cibengang
CS15M	grab	<5		2	0.038	0.035	0.026	10.85	1.0	10	0.059	40	S.Cibengang
CS16M	grab	<5		16	1.620	0.054	0.040	15.00	1.4	10	0.015	20	S.Cibengang
CS17M	grab	10		30	0.442	>2.50	>2.50	2.88	3.2	15	0.206	100	S.Cilangla
CS18M	grab	<5		18	0.687	0.359	0.251	4.32	1.8	20	0.072	70	S.Cilangla
CH3M	grab	<5		2	0.036	0.019	0.057	39.20	1.0	10	0.142	60	S.Cipunduan
DD1M	grab		0.71	634	2.030	34.630	9.090					(%)23.87	Cibuniasih
DD2M	grab		2.17	662	0.830	38.640	16.940					(%)16.29	Cibuniasih

Table 2-10 Methods of Analysis and Limits of Detection of Soil and Stream Sediment Samples

Element	Methods of Analysis	Detection Limit	Upper Limit
Au	Fire assay with NAA finish	1 ppb	10 ppm
Ag	$HCl/KClO_3$ extraction with ICP finish	0.02 ppm	0.02 %
Cu	ditto	0.2 ppm	0.5 %
Pb	ditto	0.5 ppm	0.5 %
Zn	ditto	1 ppm	0.5 %
As	ditto	0.2 ppm	0.5 %
Sb	ditto	0.2 ppm	0.1 %
Hg	ditto	0.1 ppm	0.5 %
P	Total digestion with ICP finish	10 ppm	1 %
Cr	Total digestion with ICP finish	1 ppm	1 %
Mn	Total digestion with ICP finish	5 ppm	1 %
Ba	Total digestion with ICP finish	10 ppm	1 %

* AA means Atomoc Absorption Method.

** NAA means Neutron Activation Analysis.

Table 2-11 Major Analytical Results of Soil and Stream Sediment Samples 1

Stream Sediment

Sample No.	Au (NAA) ppb	Au (FA) g/t	Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Sb ppm	Hg ppm	P ppm	Cr ppm	Mn ppm	Ba ppm
AD007 ST	217	---	7.80	50.0	15.0	172	131.5	10.2	1.8	450	520	1,355	90
AD008 ST	3,450	---	15.30	44.4	28.0	272	209.0	21.6	20.8	320	851	1,420	60
AD009 ST	2,950	---	20.70	39.6	25.0	241	181.5	23.4	10.3	320	679	1,380	60
AD010 ST	129	---	0.60	36.2	5.5	131	19.8	1.2	<.1	280	948	1,175	70
AD011 ST	1,400	---	20.20	41.8	21.5	190	192.5	12.6	0.7	340	428	1,035	70
AD012 ST	905	---	11.75	37.2	20.0	173	193.5	9.2	3.5	300	360	990	80
AD013 ST	452	---	0.02	40.6	9.5	282	7.6	<.2	<.1	260	563	1,370	40
AD014 ST	2,400	---	14.60	45.4	37.5	215	283.0	22.8	0.6	320	442	1,140	70
AD015 ST	9,090	---	34.90	43.8	79.0	389	301.0	44.2	28.2	350	762	1,625	50
AD018 ST	112	---	10.90	41.8	37.0	222	388.0	28.2	1.9	340	371	1,110	80
AD019 ST	599	---	29.80	43.8	82.5	288	642.0	45.8	4.3	320	276	1,360	90
AD022 ST	855	---	26.70	32.4	79.0	201	975.0	62.2	5.2	310	88	2,220	150
AD023 ST	5,660	---	47.00	22.4	144.5	392	1,750.0	249.0	7.6	450	42	1,475	190
AD024 ST	1,580	---	8.04	23.6	33.5	136	620.0	17.0	8.8	280	135	1,450	150
AD026 ST	1,055	---	8.72	27.0	54.0	136	485.0	32.8	10.1	340	228	1,035	150
AD029 ST	1,985	---	15.20	58.4	157.5	512	329.0	25.4	22.8	360	355	1,415	80
AD057 ST	101	---	1.74	28.4	15.5	228	30.8	1.4	0.2	320	543	1,980	50
AD058 ST	112	---	1.56	28.2	11.5	218	24.6	0.2	0.2	330	513	1,985	60
AD066 ST	125	---	<.02	32.0	7.5	201	2.2	<.2	0.2	330	438	1,635	60
AD136 ST	384	---	0.02	54.2	9.5	122	11.8	<.2	<.1	280	439	1,315	80
AD137 ST	204	---	3.60	45.2	10.5	159	27.6	4.6	0.3	360	307	1,570	60
AD138 ST	6,990	---	0.92	39.0	10.5	212	32.0	0.8	0.1	420	442	2,010	60
AD139 ST	6,330	---	5.44	26.6	16.0	239	25.4	12.0	0.7	350	576	2,080	30
AD143 ST	4,070	---	<.02	36.6	8.5	78	18.8	<.2	5.4	350	215	1,610	60
AD144 ST	2,390	---	0.08	37.2	8.5	158	6.2	<.2	0.4	340	549	1,305	70
AD217 ST	252	---	<.02	27.8	10.0	168	3.2	<.2	<.1	430	198	1,625	110
AD242 ST	651	---	4.30	94.2	374.0	1,675	115.0	8.4	7.7	600	227	1,885	170
AD243 ST	621	---	4.72	106.5	406.0	1,965	147.5	11.0	10.2	560	157	1,890	190
AD244 ST	527	---	6.24	123.0	566.0	2,240	160.0	11.6	10.8	600	165	1,785	200
AD245 ST	326	---	5.08	96.2	379.0	1,785	126.5	8.0	7.5	570	167	1,660	180
AD246 ST	702	---	4.52	94.2	358.0	1,540	128.0	9.6	7.2	650	219	1,965	190
AD247 ST	603	---	7.90	162.0	832.0	2,240	199.5	18.2	12.8	540	273	2,220	170
AD248 ST	808	---	11.80	227.0	1,295.0	2,230	258.0	29.6	20.8	510	179	1,960	240
AD249 ST	1,190	---	6.76	123.5	495.0	2,220	196.0	15.0	9.5	530	354	2,390	160
AD250 ST	1,330	---	14.00	334.0	2,000.0	2,210	324.0	48.2	32.0	480	142	1,970	250
AD251 ST	>10,000	5.3	15.65	301.0	1,780.0	2,210	280.0	42.2	28.0	490	249	2,340	230
AD252 ST	1,455	---	15.90	364.0	1,760.0	2,210	269.0	49.0	34.0	500	148	2,240	160
AD258 ST	901	---	0.72	33.0	33.0	222	26.4	1.2	3.7	490	123	1,320	100
AD262 ST	>10,000	12.9	33.60	64.6	93.5	374	2,990.0	392.0	281.0	490	73	895	100
AD263 ST	158	---	0.16	22.6	10.0	127	18.0	1.8	19.7	670	57	1,050	190
AD264 ST	140	---	0.02	48.2	10.0	187	8.2	<.2	37.0	620	279	1,750	110
AH007	2,300		<.02	29.2	6.5	267	4.8	<.2	<.1	390	360	2,320	40
AH018	165		0.02	23.4	6.0	82	17.0	<.2	<.1	530	206	1,075	80
AH035	378		0.02	47.6	10.0	84	37.2	<.2	<.1	380	183	1,340	110
AH061	493		<.02	21.0	6.5	63	24.4	<.2	<.1	630	345	1,040	60
AH078	510		<.02	19.4	9.5	112	8.8	<.2	0.1	490	105	1,300	90
AH114	1,020		1.38	34.6	14.0	222	15.0	<.2	1.8	430	210	1,640	130
AH123	276		6.06	57.2	36.5	384	106.0	9.4	7.4	530	215	1,770	150
AH126	101		1.20	38.6	19.0	163	49.4	3.4	0.8	430	126	1,335	190
AH129	289		0.18	87.6	21.5	162	32.2	<.2	0.2	460	49	1,475	100
AK003	5	---	8.40	25.8	7.5	230	7.8	1.2	<.1	550	543	2,100	60
AK008	153	---	2.12	25.8	9.0	264	7.6	0.2	<.1	250	639	2,220	40
AK011	940	---	8.08	27.4	7.5	192	15.8	4.0	0.2	300	389	1,885	40
AK012	320	---	0.06	28.4	8.0	212	9.2	<.2	<.1	540	540	1,805	80
AK016	142	---	2.38	27.2	9.5	257	7.2	1.4	<.1	580	523	2,190	60
AK030	1,435	---	23.70	34.6	17.5	284	101.5	21.0	15.9	290	348	1,255	60
AK031	2,080	---	34.90	30.6	17.0	132	329.0	41.4	16.4	320	159	815	100
AK032	>10,000	15.2	99.40	23.0	153.0	374	1,415.0	443.0	45.3	430	12	385	150
AK033	1,110	---	16.70	29.2	14.0	281	139.0	14.4	18.9	350	482	2,660	40
AK034	1,190	---	2.60	32.6	8.0	191	42.2	4.0	4.5	270	663	2,060	40
AK035	1,425	---	18.05	30.0	9.0	179	59.6	12.6	2.4	310	399	1,175	60
AK036	1,585	---	12.60	29.4	7.5	210	38.0	6.8	4.0	300	508	2,160	40
AK040	530	---	3.84	60.4	18.5	109	36.0	6.6	1.0	290	873	585	90
AK041	860	---	7.42	30.8	25.0	285	44.0	4.4	24.7	270	590	1,935	40
AK042	527	---	7.56	35.8	8.5	202	13.2	4.0	2.8	290	259	1,490	70
AK044	132	---	7.12	24.8	8.0	131	10.6	3.0	8.2	300	231	1,890	70
AK092	297	---	<.02	21.8	15.0	210	2.8	<.2	<.1	470	283	2,330	60
AK095	888	---	0.08	47.6	18.5	247	30.4	<.2	1.2	680	276	4,370	150
AK096	294	---	1.46	47.4	87.0	223	25.2	0.6	12.5	460	560	1,505	80
AK103	1,110	---	0.08	48.2	8.0	222	23.4	<.2	1.6	370	546	2,020	80
AK127	218	---	<.02	25.0	7.5	194	3.2	<.2	<.1	450	175	1,980	130
AK134	1,570	---	6.88	70.8	63.0	392	23.8	20.2	26.2	500	160	1,940	200
AK135	127	---	1.26	43.6	32.5	268	7.4	4.0	3.3	780	136	2,150	130
AK150	385	---	4.96	63.8	53.0	429	17.4	11.4	4.5	610	197	2,070	170
AK158	562	---	0.98	46.4	22.5	179	285.0	4.8	8.2	420	111	2,070	210
AS045 ST	1,490		<.02	12.0	6.5	137	9.6	<.2	<.1	400	282	1,715	40
AS111 ST	9,360		27.40	56.0	25.0	205	2,340.0	208.0	138.5	550	202	1,350	140
AS112 ST	2,490		6.32	42.2	13.5	154	1,100.0	178.5	53.9	530	454	1,335	180
AS113 ST	385		1.74	33.6	10.5	139	111.0	6.0	8.6	500	320	1,445	130
AT022	<1	---	<.20	73.0	12.0	58	8,270.0	<2.0	<1.0	560	99	855	40
AT104	350	---	<.02	30.6	8.0	102	14.8	<.2	<.1	300	225	1,210	100
AT137	242	---	4.84	52.2	119.0	766	83.8	2.8	2.2	560	222	1,840	140
AT138	276	---	5.86	106.0	525.0	1,570	135.0	10.6	8.8	540	153	1,650	200
AT141	1,250	---	3.88	90.2	378.0	1,275	103.0	9.0	6.9	510	143	1,525	170
AT146	509	---	6.26	56.2	44.5	312	82.8	12.0	9.7	580	149	1,455	170
AT147	149	---	1.32	45.2	22.5	164	253.0	5.2	5.5	550	82	2,040	230

Table 2-11 Major Analytical Results of Soil and Stream Sediment Samples 2

Stream Sediment

Sample No.	Au (NAA) ppb	Au (FA) g/t	Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Sb ppm	Hg ppm	P ppm	Cr ppm	Mn ppm	Ba ppm
AT150	>10,000	16.6	34.10	61.6	107.0	322	2,830.0	423.0	301.0	470	83	950	20
AT152	228	---	0.24	32.4	10.5	87	172.0	3.8	1.1	640	113	1,055	220
BH020 ST	164		0.02	22.8	9.5	142	3.0	<.2	<.1	300	470	1,435	70
CD282	268		0.48	5.6	13.5	113	55.4	1.4	<.1	210	13	335	1,230
CD338	188		0.06	48.8	24.5	157	6.4	<.2	0.1	340	90	1,450	90
CK001	197		28.00	41.0	332.0	726	522.0	26.6	1.1	400	63	>10,000	130
CT001	450		0.04	18.0	10.5	108	22.6	<.2	<.1	210	150	1,965	110
CS001 ST	708		49.60	51.4	615.0	1,235	356.0	75.2	0.6	480	32	>10,000	90
CH016 ST	101		<.02	27.6	12.5	355	3.4	<.2	0.1	370	288	2,720	40

Soil

Sample No.	Au (NAA) ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Sb ppm	Hg ppm	P ppm	Cr ppm	Mn ppm	Ba ppm
AS002 S	21	0.76	46.8	4.0	63	10.4	<.2	0.5	220	197	975	120
AS003 S	120	3.92	54.0	8.0	65	60.0	3.6	2.0	330	49	1,320	80
AS004 S	278	19.10	41.8	13.0	100	142.0	18.6	10.2	230	136	1,000	80
AS005 S	45	2.16	41.2	9.0	66	78.4	3.4	2.6	280	108	1,035	90
AD154 S	2	0.58	60.4	8.0	52	8.4	0.2	<.1	250	115	215	60
AD184 S	8	0.02	75.6	5.5	125	1,895.0	97.2	<.1	1,610	165	865	100
AD202 S	2	0.02	66.2	6.0	89	235.0	15.0	<.1	430	141	660	40
AK001 S	410	1.32	15.2	13.0	16	1,440.0	30.4	<.1	240	16	355	210
AK002 S	68	0.46	15.2	13.0	18	352.0	15.8	0.4	230	14	440	100
AK018 S	375	1.22	16.8	9.0	13	1,785.0	22.0	<.1	370	18	235	140
AK020 S	58	0.14	7.0	10.5	15	592.0	18.0	<.1	300	10	155	60
AK021 S	31	0.30	24.8	12.0	23	242.0	8.8	<.1	310	60	265	110
AH001 S	13	0.72	45.2	10.5	61	23.8	0.4	<.1	380	104	1,045	100

3-2-2 Geology and Geologic Structure

(1) Introduction

The geology of the Salopa area is composed of the following five stratigraphic units:

·Andesitic to basaltic lava, volcanic breccia, tuff breccia and tuff (Jampang Formation)
·Massive limestone (Kalipucang Formation)
·Calcareous sandstone with limestone lenses (Bentang Formation)
·Tuffaceous sandstone and turbidites (Halang Formation)
·Volcanic breccia (Older Volcanic Rocks)

Intrusive bodies of andesite, dacite and quartz-porphyry occur in these rock units.

The general trend of these formations is ENE-WSW. They form a gentle anticlinorium with the axis of WNW-ESE direction. NW and E-W trending fault systems which cut Neogene volcanic-sedimentary sequences occur.

Based on the photogeological analysis on the SAR images, the geologic structure of the Salopa area is characterized by the existence of a couple of circular structures and the development of lineaments trending mainly NNE direction.

(2) Stratigraphy

Jampang Formation

It is the oldest rock in the Tasikmalaya area. It is composed of basaltic to andesitic volcanic breccia and lava (Lower Member), andesitic tuff and lava, and dacitic tuff and lava (Upper Member).

The alternation of volcanic breccia and lava of basaltic to andesitic composition is the representative facies of the Lower Member of the Jampang Formation. Volcanic breccia sometimes shows a polymictic feature, consisting of various kinds of rock fragments of breccia to boulder size. It crops out widely in the Salopa area. Lava is commonly brecciated. Sandstone lenses are intercalated in volcanic breccia and lava. Some parts of volcanic breccia and andesite lava show propylitic alteration.

The chemical composition of the Jampang Formation changes into andesitic/acidic in the Upper Member. The lower part of the Upper Member is composed of andesitic pyroclastic rocks with a few thin units of andesite lava. Tuff-breccia and tuff are the major constitutes. Thin limestone lenses occur within the lower to middle parts of the Upper Member.

The upper part of the Upper Member is composed of acidic pyroclastics (dacitic tuff and tuff-breccia of greenish color) and lava. Thin clastic sediments (tuffaceous sandstone, siltstone and mudstone) occur at the upper-most part of the Upper Member.

The Jampang Formation is overlain comformably by the Kalipucang Formation.

Kalipucang Formation

The Kalipucang Formation is composed of massive, crystalline reef limestone. It is distributed mainly in the western to southern parts of the Salopa area. It is overlain uncomformably by the Bentang Formation.

Bentang Formation

It is composed mainly of calcareous sandstone, siltstone, shale and tuffaceous sandstone. Calcareous sandstone is the representative facies of the Bentang Formation in the Salopa area. It is well-bedded. It sometimes contains thin limestone lenses. The Bentang Formation is distributed mainly in the western part of the Salopa area.

Halang Formation

The Halang Formation is composed of tuffaceous sandstone with intercalation of turbidites. This sandstone sometimes shows graded bedding, parallel lamination, convolute lamination and load cast. These sedimentary structures suggest that the sandstone was deposited by turbidity currents.

The major occurrence of the Halang Formation is to the north of the Tasikmalaya area. It occurs locally at the western part of the Salopa area.

Older Volcanic Rocks

It is composed of andesitic to basaltic volcanic breccia and lava. These rocks occur at the top of the mountains, forming steep topography. It was derived from the volcanic products of Gn. Cikuray, Gn. Sawal, etc. at the Plio-Pleistocene time.

(3) Intrusive Rocks

Andesite

Several andesite dikes are intruded in the Jampang Formation. Most of them are hornblende andesite, while some are pyroxene andesite. These andesite dikes are composed mainly of plagioclase, hornblende and pyroxene. They show porphyritic texture. Chloritization, sericitization and carbonitization were sometimes observed in these rocks.

Dacite

Intrusive bodies of dacite were found at Pr. Bengkok and other localities within the Jampang Formation in the Salopa area. Dacite is composed of such minerals as plagioclase, K-feldspar, quartz and hornblende.

Granodiorite-Porphyry

Small stocks of granodiorite-porphyry occur within tuff-breccia and lava of the Jampang Formation in the northeastern part of the survey area.

Granodiorite-porphyry is a holocrystalline porphyritic igneous rock, consisting of plagioclase, hornblende, quartz and biotite as phenocrysts.

Whole Rock Analysis

Thirty-four rock samples were provided for whole rock analysis. Twelve major components including Cr_2O_3 and LOI were analyzed at Chemex Labs Ltd. Results of chemical analysis and CIPW norm calculation are shown in Table 2-4. Rock names of igneous and volcanic rocks identified from field observations and thin sections were checked through the analysis.

(4) Geologic Structure

Fold Structure

Several fold systems, from regional anticline to local minor foldings, were observed in the survey area. They are generally gentle structures.

Regional anticlinal structure was observed in the northwestern to southern areas within tuff and sandstone of the Jampang Formation. This anticlinorium has an axis of approximately WNW-ESE direction.

Local anticlines and synclines of similar trend were observed in some areas in the Salopa area.

Fault

A series of NW fault systems was found within the Jampang Formation in the northeastern part of the survey area. The trend of these faults coincides with the gold-bearing quartz veins in this area.

Faults of NNE to ENE systems occur within the Jampang Formation in the western part of the survey area. These fault systems, which were picked up through the satellite image photogeological interpretation, are not so extensive in the field. This type of fractures probably exists as igneous joints and/or minor faults of small displacement.

3-2-3 Mineralization and Associated Alteration

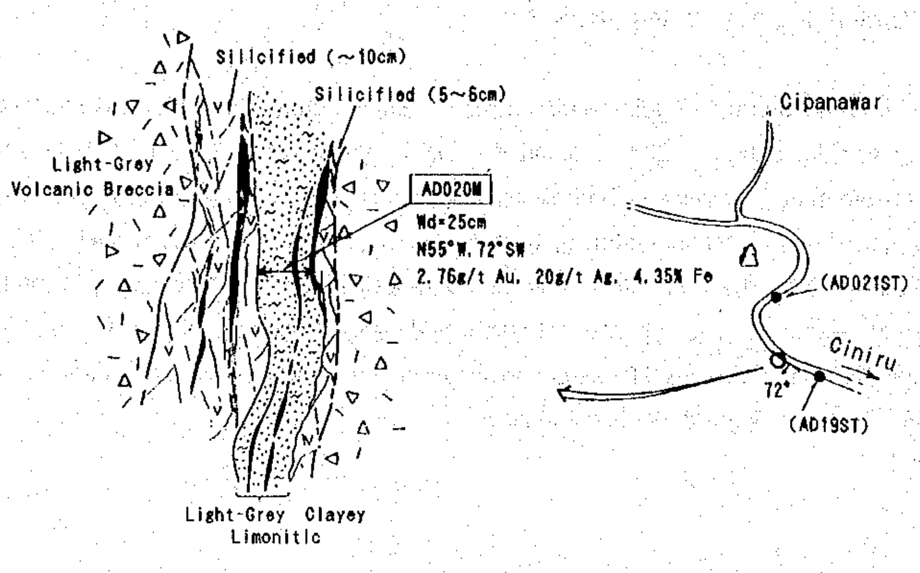
The significant development of gold-bearing quartz veins and quartz networks was observed at S. Ciniru, S. Cikuya, Cikondang, S. Citambal and the upper reaches of S. Ciseel. Quartz veins and networks are hosted mainly by volcanic breccia and tuff-breccia of the Jampang Formation. The width of each vein ranges from a few centimeters up to 1 m. The major trend of vein systems is NW. Gold is accompanied by some sulfide minerals. Pyrite and arsenopyrite are the two most common sulfide minerals; a small amount of chalcopyrite, sphalerite and galena were found in a bonanza of gold. Associated alteration is characterized by strong silicification and sericitization. The major occurrences of gold-bearing quartz veins are described as follows.

Ciniru

Gold-bearing quartz veins and network veins were found at the junction of S. Ciniru (a branch of S. Cimedang) and S. Cipanawar in the central part of the Salopa area. The geology of the prospect is composed of volcanic breccia and andesite lava of the Jampang Formation (Lower Member). Gold was recognized in a series of quartz veins/networks of NW direction. Silicification and sericitization were observed in and around veins. Pyrite and arsenopyrite are disseminated within quartz veins and in silicified country rock. A small amount of manganese minerals was found within quartz veins. Montmorillonite, kaolin and ankerite were detected in and around the veins by X-ray diffraction analysis. Fig. 2-6 shows the mode of occurrence of one of the quartz vein outcrops along the river-bed of S. Ciniru. Significant gold and silver grades up to 2.76 g/t Au and 20 g/t Ag at 25 cm in width (AD20M) were obtained from this vein.

Mining activity by local prospectors started in 1960's. More than 10 old mining tunnels are distributed in the vicinity of the junction of S. Ciniru and S. Cipanawar. One mining concession (Kuasa Pertambangan) of 20 ha was registered at the end of 1980's.

During panning survey this phase, many gold grains were detected along S. Cimedang and its branch rivers together with some cinnabar and sulfide minerals. Remarkable Au, Ag, As and Sb anomalies were caught along S. Ciniru and S. Cimedang by stream sediment geochemistry. Reconnaissance soil survey in this prospect also revealed the existence of gold anomalies of NW-SE direction. On the basis of these results, it is considered that the gold mineralization may extend to the south and to the southeast.



River-Bed Out Crop, Ciniru

Fig. 2-6 Sketch of Quartz Veins in the Ciniru Prospect

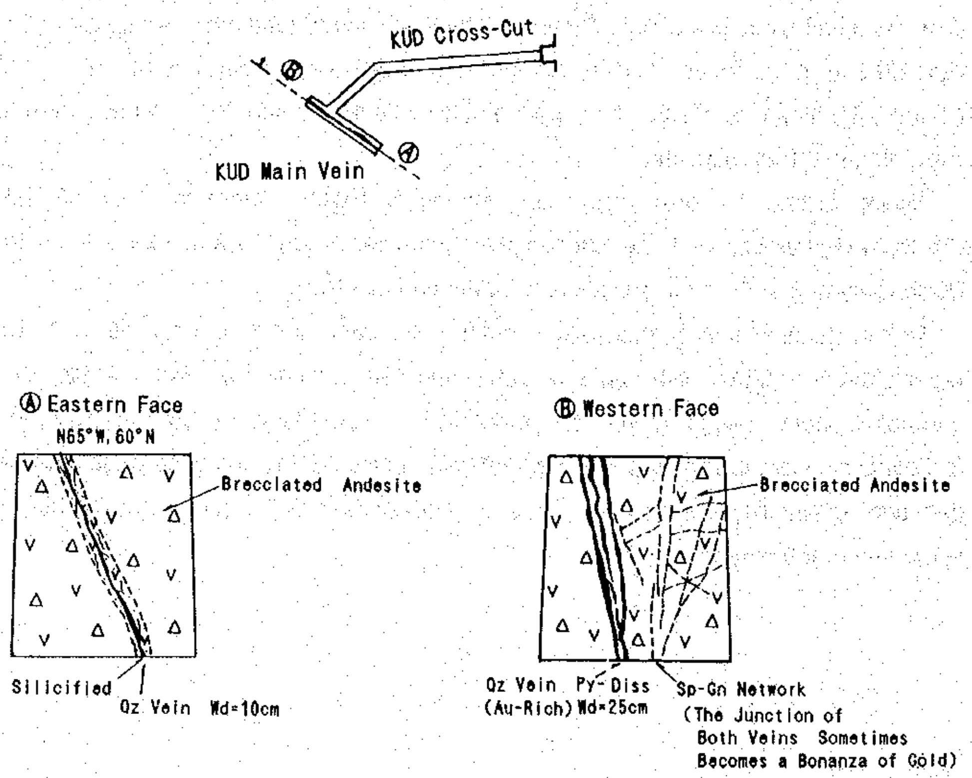


Fig. 2-7 Sketch of Quartz Veins in the Citambal Prospect

Cikuya

A group of quartz veins/networks is developed at S. Cikuya (a branch of S. Cimedang) in the southern part of the Salopa area.

Quartz veins in Cikuya are generally thin, from a few centimeters up to 20 cm. Each vein shows various trends. Two major directions were recognized among them -- NW and NNE. Gold and silver grades up to 4.67 g/t Au and 330 g/t Ag (AK11M) were obtained from grab samples in the Cikuya prospect. Pyrite-arsenopyrite dissemination was observed in quartz. A small amount of chalcopyrite, sphalerite, galena and manganese minerals was observed in some parts of the ores. The surrounding rocks of quartz veins are strongly silicified and sericitized. Montmorillonite and kaolin were found in some parts of veins and surrounding rocks. A small amount of gypsum and ankerite were also detected by X-ray diffraction analysis.

Gold mining by local people was active in 1980's. Nearly 10 old tunnels were found at the flank of a small hill in this prospect. These are hosted by volcanic breccia and andesite lava of the Jampang Formation (Lower Member). It is located to the southeast of the Ciniru mineralized zone.

Cikondang

Two major gold-bearing quartz veins were caught at Cikondang prospect which is located along S. Cihapitan in the northeastern part of the Salopa area. Quartz veins are hosted mainly by volcanic breccia and tuff-breccia of the Jampang Formation.

The Yayat-Hadli vein strikes N45° to 60°W, and dips 30°SW. The width is about 20 cm. It has a branch of N50°W, 28°NE in the western part. Pyrite and arsenopyrite are disseminated in quartz vein. A patch of gold concentration, about several millimeters in diameter, was sometimes observed within quartz. A small amount of argentite and cinnabar was observed in such samples under the microscope. Country rocks near the veins are weakly silicified and moderately sericitized.

The Hamid vein occurs in the northeastern part of the Cikondang prospect. It shows the strike direction of E-W, and the dip of 10°N. The Hamid vein is thin -- generally 3 to 5 cm in width. A small amount of pyrite, arsenopyrite, chalcopyrite, stibnite, argentite and cinnabar was observed in some samples under the microscope. Gold and silver grades up to 27.15 g/t Au and 82 g/t Ag (AS16M) were returned from grab samples.

Nearly 20 mining shafts have been dug in the Cikondang prospect by local people. One mining concession (Surat Ijin Penambangan Rakyat) of 8 ha was applied recently for the Yayat-Hadli vein.

Citambal

In the Tasikmalaya area, gold mining is most active at Citambal. It is located at the middle reaches of S. Citambal in the northeastern part of the Salopa area. There are two major veins -- the KUD (Koperasi Unit Desa) main vein and Cikurawet vein, both are hosted in volcanic breccia and tuff-breccia of the Jampang Formation.

The KUD main vein is a gold-bearing quartz vein/network which strikes N 50° to 60°W, and dips 60° to 80°NE. The width ranges from 10 cm up to 1 m. The total length, which has not yet been confirmed by systematic exploration, is estimated to be 1,200 m. A branch vein occurs at the hanging-wall side in the southeastern part. Silicification and sericitization were observed in the country rocks near quartz vein. Traces of kaolin and gypsum were detected in and around quartz vein. Pyrite and arsenopyrite are commonly disseminated within quartz and the surrounding alteration zone. In some part of the KUD main vein, sphalerite-galena network vein occurs beside the main vein (see Fig. 2-7). The sphalerite-galena network vein was cut by the pyrite-arsenopyrite quartz vein. The junction of pyrite-arsenopyrite quartz vein and sphalerite-galena network vein sometimes forms a bonanza of gold.

The KUD main vein was discovered in 1968. KUD (corporation unit of village-people) Mekar Jaya was established, and the mining operation started on April 1993. Mining is carried out in two places - the main crosscut near KUD office, and the Tisna shaft which is located at the northwest of the main crosscut. The current production rate is 110 t/month of crude ore. Recovered gold grade is approximately 10 g/t Au by the traditional crushing and gold amalgamation method. One KP of 36.5 ha is registered under the name of KUD.

The KUD main vein extends to the southeast. Two small concessions (SIPR) and several old shafts exist at the southeastern part of the main vein system.

The Cikurawet vein occurs approximately 500 m west of the KUD main vein. It shows a strike direction of N 50°W with dipping 70° to 80°NE. Strike length is estimated to be about 600 m. A branch vein striking N-S with W-dip, is accompanied in the northwestern part. The vein exhibits a network nature of 10 cm to 1 m wide. Silicification and sericitization were recognized around quartz network. Weak montmorillonitization and kaolinitization were also observed. Pyrite and arsenopyrite are the major sulfide minerals contained in quartz veins. Sphalerite, galena and manganese minerals were observed in some parts of the vein. A patch of gold concentration was found at the northwestern end of this vein. Nearly 200 local people are currently working in the mining operation. Two crosscuts and more than 10 shafts were dug in this area. One SIPR of 5 ha is registered.

Ciseel

Gold mineralization was found at the upper reaches of Ciseel in the northeastern part of the Salopa area. It is situated at the southeastern extension of the Cikondang-Citambal gold prospects. Together with that of Cijurey (mentioned below), these occurrences are distributed in a line of NW-SE direction.

A series of gold-bearing quartz veins is mined by local people in Nyalindung. This is located at the southeastern extension of the KUD main vein. Gold grades up to 35.31 g/t Au at 5 cm in width (AH12M) were returned from thin quartz-clay veins in Nyalindung. The mode of occurrence of veins is shown in Fig. 2-8. Remarkable stream sediment anomalies up to 16.6 g/t Au and 34.10 ppm Ag (AT150ST) were obtained in this locality.

A couple of veins is also mined at a few kilometers upstream of Nyalindung. It is called the Umar vein. The Umar vein is hosted by andesite lava of the Jampang Formation. It is composed of vein systems of NW and N-S directions. Gold grades up to 7.47 g/t Au at 30 cm in width (AK24M) were obtained from samples in the Umar prospect.

The other localities where gold mineralization was detected through the first phase geological survey and panning survey are as follows:

*Cimaranten
*Gulingmuding
*Cigelap
*Cigugur
*Cijurey
*Cibatungurung
*Cipangesikan-Cijalu
*Cibeunying
*Cipinaha

The outline of these gold mineralization is summarized in Table 2-12.

Phosphate ores were found at two localities -- Cigelap and Lubanglalai in the Salopa area.

Cigelap, a branch of Ciwulan, is located in the western part of the Salopa area. Phosphorite occurs in a Kalipucang limestone cave of about 100 m deep. It shows a banded texture of phosphorite and limestone. It was mined at a small scale by local people in the past.

Phosphorite was also found at Lubanglalai, a branch of Cibunter, in the southwestern part of the

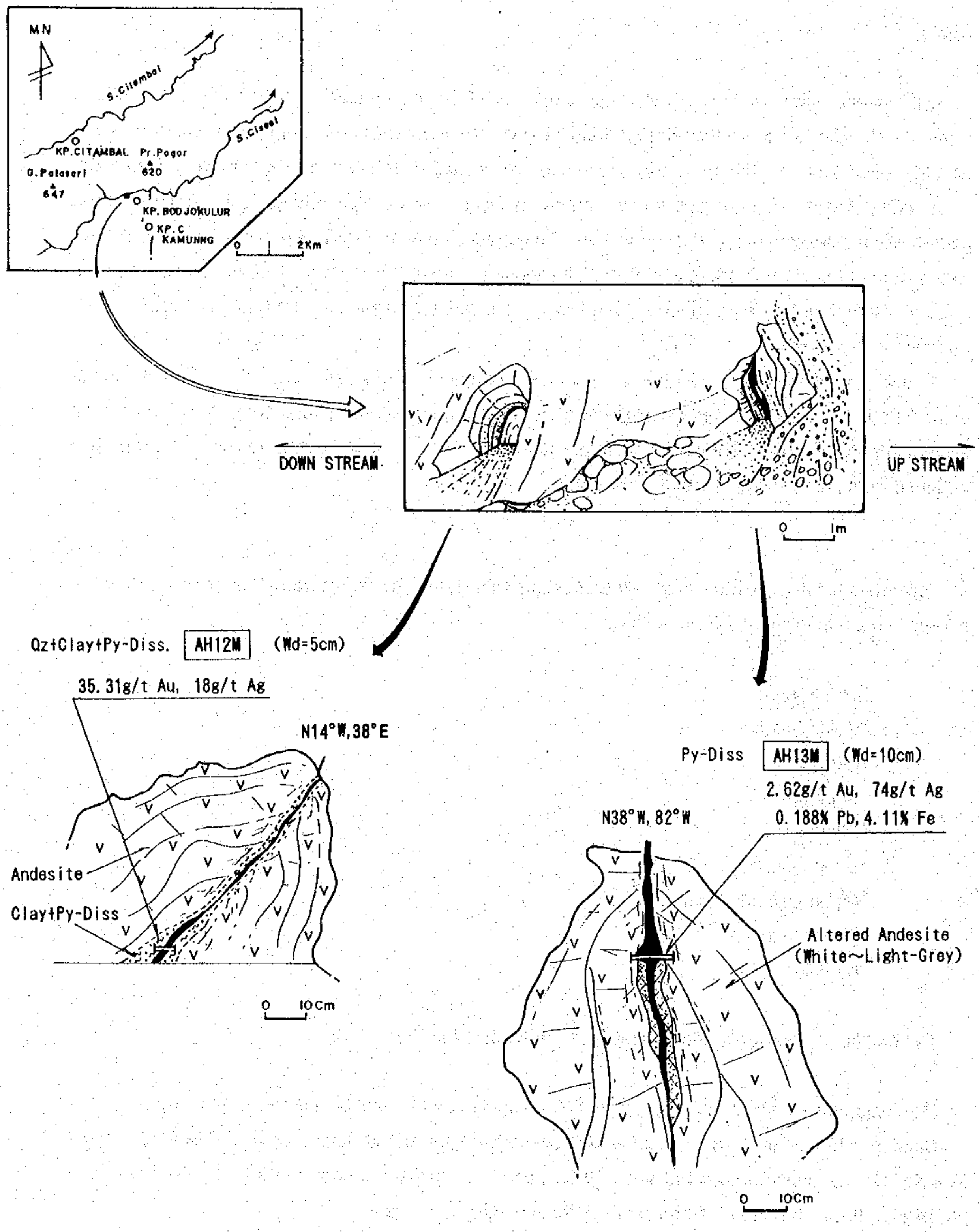


Fig. 2-8 Sketch of Quartz-Clay Veins in the Nyalindung Prospect

Salopa area. It occurs in a Kalipucang limestone cave of about 500 m deep. It has never been produced because the access was difficult.

3-3 Stream Sediment Geochemistry

3-3-1 Sampling and Chemical Analysis

Stream sediment geochemistry was carried out in the first phase for the purpose of defining hidden mineralized zones which would otherwise be undetected by geological survey, as well as for clarifying the extension of mineral occurrences known through the geological survey.

Fine sand samples of -80 mesh were collected from sediments in major channels and some of the bigger tributaries. The number of stream sediment samples collected was 744, which corresponds to a sampling density of approximately one sample per 0.7 km^2. The samples, after being air-dried in the field, were analyzed at Chemex Labs Ltd. for 12 elements; Au, Ag, Cu, Pb, Zn, As, Sb, Hg, P, Cr, Mn and Ba. The methods of analysis and limits of detection are shown in Table 2-10.

3-3-2 Anomalies of Stream Sediment Geochemistry

(1) Statistical Data Analysis

The distribution of geochemical data of some elements tends to show a close approximation to the logarithmic normal distribution, the common logarithmic conversion of the respective analytical values was adopted in the statistical data processing. When an analytical value was less than the detection limit, a value half of the lower limit was substituted in the calculation.

At first, statistical properties of geochemical data were checked. Basic statistical figures were calculated. Distribution histograms of each element were drawn out. Correlation coefficients among 12 elements were examined.

Then the selection of threshold values for anomalies was made. Cumulative frequency distribution of each element was plotted on the logarithmic probability graph using computer. If an element showed any significant curvature, then the threshold was determined from the corresponding value on the curve. If any specific curvature was not recognized on the curve, then the threshold was calculated by the value of twice the standard deviation added to the mean of the element. The thresholds of Ag, Cu, Zn, Mn and Ba were obtained on the logarithmic probability graphs. While those of Au, Pb, As, Sb, Hg, P and Cr were determined by the statistical calculation.

NAME	LOCATION	GEOCHEMISTRY		MINERALIZATION				ASSAY RESULT	MINING ACTIVITY
		PANNING	STREAM SEDIMENT	HOST ROCK	VEIN SYSTEM	ORE MINERALS	ALTERATION		
Ciniru	SW of Salopa (branch of Cimedang)	Many Au Some Cin	Many Au Ag,As,Sb	Vol-bre And lava (Jp)	Qz vein NW	Py,As	Sil, Ser (Mont, Kaol)	Au2.76g/t,Ag20g/t (Wd=25cm,AD20M)	Old tunnels(10) KP (20 ha)
Cikuya	Southern part (branch of Cimedang)	Many Au	Many Au Ag,As,Sb	Tuff-bre And-lava (Jp)	Qz vein NW & NNE	Py,As,Cp Sp,Gn	Sil, Ser (Chl, Mont, Kaol)	Au4.67g/t,Ag330g/t(AK11M) Au4.23g/t,Ag134g/t(AS12M)	Old tunnels(10)
Cimaranten	Central part (branch of Cimedang)	Some Au	—	Lap tuff (Jp)	Qz vein NW & NNE	Py,As,Sp,Gn	Sil (Ser)	Au1.52g/t,Pb0.23%,Zn0.76% (Wd=2cm,AA19M)	Old tunnels (Dutch time)
Gulingmuding	Northern part (branch of Cipinaha)	Gold not detected	Some Au Ag,As,Sb	Tuff (dacite) (Jp)	Qz vein NNE	Py,Sp	Sil, Kaol Chl	Au0.09g/t,Fe7.64%(AS6M)	Old tunnel, shaft
Cigelap	Western part (branch of Ciwulan)	Gold not detected	—	Lap tuff (Jp)	Carb vein NW (?)	Py,As	Carb (Mont, Kaol)	Au0.13g/t,Zn0.15%,Mn0.94% (AH9M)	Old tunnels
Cigugur	SE part (near the junction of Cijurey)	Some Au	—	And lava (Jp)	—	—	—	—	Nothing
Cijurey	Eastern part (upper reaches of Cijurey)	Some Au	Some Au As	Vol-bre, And lava, Tf (Jp)	—	—	—	—	Nothing
Cibatungurung	Southern part (branch of Ciharuman)	Some Au	—	And lava Tf (Jp)	Qz netwk NW	Py,As	Sil, Ser (Kaol, Chl)	Au0.54g/t,Ag12g/t,Fe15.05% (AD118M)	Old shaft & tunnel
Cipangesikan-Cijalu	SE part (branch of Cimandale)	Some Au	—	Tf-breccia (Jp)	Limo vein NE	Py	Sil (Carb)	—	Old tunnel (Cijalu)
Cibeunying	NE of Salopa (branch of Cimedang)	Some Au	—	—	—	—	Sil	Fe5.22%,Mn0.14%(AK18M)	Nothing
Cikondang	NE part (Cihapitan)	Some Au	Many Au Ag,As,Sb	Vol-bre Tf-bre (Jp)	Qz vein NW, 30 SW E-W, 10 N	Py,As,Cp,Sp Gn,Ag,Sc (Au)	Sil, Ser	Au27.15g/t,Ag82g/t,Sb4.83% (AS16M)	Shafts (20) SIPR (8 ha)
Citambal	NE part	Many Au	Many Au Ag,As,Sb	Vol-bre Tf-bre (Jp)	Qz vein NW	Py,As,Sp,Gn Sb,(Au)	Sil, Ser (Mont, Kaol)	Au5.05g/t,Ag10g/t,Pb0.10% Zn0.77%(AD256M)	Shafts (20) KP (36.5 ha)
Ciseel (Umar & Nyalindung)	NE part (upper reaches of Ciseel)	Many Au	Many Au Ag,As,Sb	Vol-bre (Jp) Tf-bre Lap tf	Qz vein NW, N-S	Py,As,Cp,Sp Gn,Sb	Sil, Ser Mont,Kaol Carb (Chl)	Au7.47g/t,Ag28g/t (Wd=30cm,Umar,AK24M) Au35.31g/t,Ag18g/t (Wd=5cm,Nyalindung,AH12M)	Shafts (10)
Cipinaha	Northern part (upper reaches of Cipinaha)	Gold not detected	—	Tf-bre (Jp)	Qz vein NW	Py,Sp	Sil, Mont Kaol	Au2.45g/t,Fe6.01%,Mn0.66% (AA13M)	Nothing
Cibunter-Cibaregbeg	SW part (branch of Ciwulan)	Gold not detected	Some Au As	—	—	—	—	—	Nothing
Citembang	Eastern part (branch of Ciseel)	Gold not detected	Some Au	—	—	—	—	—	Nothing
Ciwarak	Western part (branch of Ciwulan)	Gold not detected	Some Au	—	—	—	—	—	Nothing

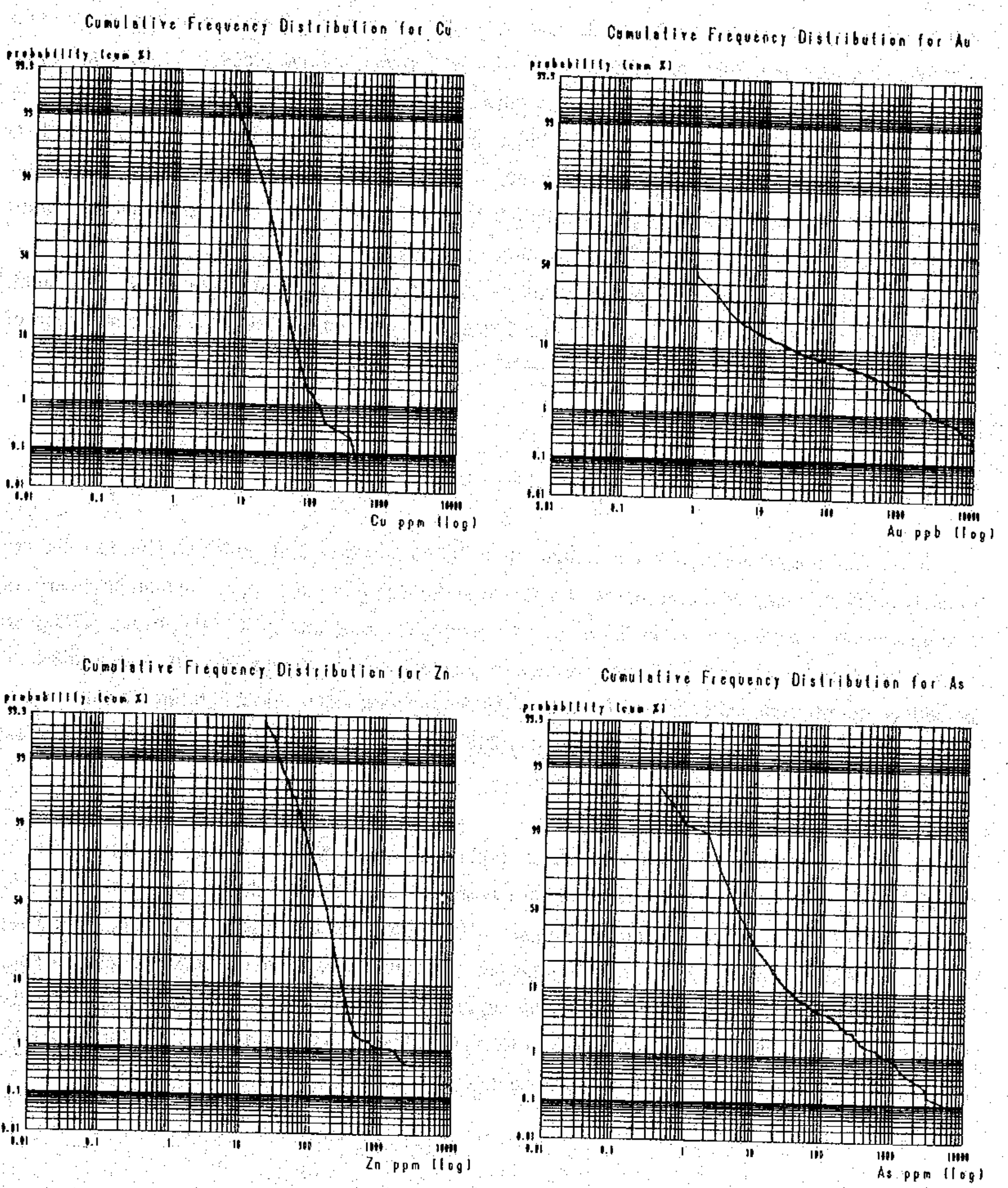


Fig. 2-9 Cumulative Frequency Distribution Graphs of Stream Sediment Geochemistry

(Cu and Zn have a distinctive curvature on the curve.
Au and As, on the other hand, show no such specific point.)

A series of maps showing geochemical anomalies of stream sediments for each element was produced. Values of each sample were expressed by one of three kinds of symbols on the map. Geochemical anomalies for each element were cross-checked on the maps. The results of panning survey were taken into consideration. The results of geological survey, especially those of the distribution of quartz veins, quartz floats and hydrothermal alteration, were also referred. Gold mineralization was primarily presented by the distribution of Au anomalies in stream sediment geochemistry. The Au anomalies of stream sediments were well-correlated with the occurrences of quartz veins and panning anomalies. The distributions of some other elements such as Ag, As and Sb also well-corresponded to the distribution of quartz veins and panning anomalies. The association of these geochemical elements was explained by ore mineral assemblage. Thus these elements were thought to be good indicators of gold mineralization in this area.

These results were integrated together, and several significant anomalous zones were outlined. Ten potential mineralized areas thus chosen are described in the next section. The distribution of geochemical anomalies was drawn by computer shown in the appendices.

(2) Anomalies of Stream Sediment Geochemistry

Ciniru: Au anomalies of stream sediments up to 9,090 ppb (AD15ST) and pan concentrates are densely arranged along S. Ciniru and S. Cipanawar in the Salopa area. Ag, As and Sb anomalies of stream sediments are located in the same area (for example: 5,660 ppb Au, 47.00 ppm Ag, 1,750 ppm As and 249 ppm Sb, AD23ST). Pb anomalies were also detected in some part. These anomalies are positioned not far from the localities of quartz veins and network veins. Most of them are within a few kilometer distance. It suggests that the quartz veins and their surrounding alteration zones are most likely the origin of these geochemical anomalies.

Cikuya: Au anomalies of stream sediments and pan concentrates are closely arranged along S. Cikuya. Ag, As and Sb anomalies of stream sediments are located within the same area. The representative value of stream sediment sample is 15.2 g/t Au, 99.40 ppm Ag, 1,415 ppm As and 443 ppm Sb (AK32ST). Occurrences of quartz veins and alteration zones were recognized in this prospect.

The middle reaches of S. Cimedang is situated at the middle of the Ciniru and Cikuya prospects. Significant Au anomalies up to 6,990 ppb (AD138ST) were found in this locality. Some Ag, As and Sb anomalies, mainly of the second order, also occur in this area.

Cibunter-Cibaregbeg: A series of Au anomalies of stream sediments up to 493 ppb (AH61ST) is sparsely distributed in this area, which lies to the southwest of the Ciniru prospect. Some significant gold anomalies of pan concentrates were observed in this area, although it has not been fully covered by the panning prospecting. As anomalies of the second order are also scattered in this area.

Cikondang: Several Au anomalies of stream sediments were detected along S. Cihapitan. Ag, As and Sb anomalies of stream sediments were also distributed in the area. The representative value of stream sediment is 9,360 ppb Au, 27.40 ppm Ag, 2,340 ppm As and 208 ppm Sb (AS111ST).

Citambal: Very distinctive Au, Ag, As and Sb anomalies of stream sediments were found in the Citambal prospect. The representative value is 12.9 g/t Au, 33.60 ppm Ag, 2,990 ppm As and 392 ppm Sb (AD262ST). Cu, Pb and Zn anomalies are overlapped on these anomalies. The representative value for Cu, Pb and Zn is 5.3 g/t Au, 15.65 ppm Ag, 301 ppm Cu, 1,780 ppm Pb and 2,210 ppm Zn (AD251ST).

Ciseel: Very distinctive Au and Ag anomalies of stream sediments accompanying with As and Sb anomalies were observed along the upper reaches of S. Ciseel. These anomalies were concentrated in two zones -- Umar and Nyalindung. The representative values of stream sediments are 1,570 ppb Au and 6.88 ppm Ag (AK134ST, Umar), and 16.6 g/t Au, 34.10 ppm Ag, 2,830 ppm As and 423 ppm Sb (AT150ST, Nyalindung). Some Pb data showed anomalous values as well.

Citembang: A small Au anomalous zone (up to 218 ppb)occurs along S. Citembang in the eastern part of the Salopa area. It is situated at the southeastern extension of the Ciseel mineralized zone.

Cijurey: A couple of weak Au (252 ppb) and As (31.2 ppm) anomalies was detected at the upper reaches of S. Cijuley and the upper reaches of S. Cigugur, where some gold anomalies were found by panning survey.

Gulingmuding: A couple of Au and Ag anomalies of the second order was detected at the Gulingmuding prospect. Sb anomalies of stream sediments up to 32 ppm (AS85ST) occur at the upper reaches of S. Gulingmuding. As anomalies accompanying the second order Cu anomalies also occur widely from S. Cipinaha up to S. Gulingmuding through S. Cibenjot.

Ciwarak: A small Au anomalous zone (up to 1,490 ppb, AS45ST) occur along S. Ciwarak (a branch of Ciwulan) in the western part of the Salopa area.

The other localities where some weak anomalies were detected by the stream sediment geochemistry are as follows:

·Cimaranten
·Cibatungurung
·Cipangesikan-Cijalu
·Cipinaha
·Cibangbai

3-4 Panning Survey

3-4-1 Sampling and Heavy Mineral Identification

Panning survey was carried out in the Salopa area in the first phase.

Pan concentrate samples were collected from trap sites in the active drainage channels. A bucketful of sand and gravel which was about 2 liters was gathered and carefully panned out. A panned sample of about 5 grams was obtained finally at every point. Fineness and number of gold grains were measured, and heavy mineral composition was examined roughly by loupe in the field and carefully under the microscope in the laboratory.

The procedures of gold and heavy minerals analysis were illustrated in Fig. 2-10. Three hundred and fifteen panned samples were checked in the Salopa area.

3-4-2 Anomalies of Panning

Gold was detected in 108 samples either by naked eye or under the microscope. It stands nearly one-third of the total amount of samples obtained in the Salopa area. It is composed of coarse to very fine carat gold of up to 1,200 microns in diameter (middle reaches of S. Cimedang). The major heavy minerals observed in pan concentrates are: garnet, epidote, zircon, ilmenite, corundum, magnetite and iron-oxide. Sulfide minerals such as pyrite, arsenopyrite, chalcopyrite, galena, sphalerite, stibnite, argentite, cinnabar and realgar were often found in pan concentrates near mineralized zones.

The major localities where gold and some indicator minerals for gold mineralization (cinnabar, realgar, argentite, etc.) were detected by panning survey are the following eleven places:

·Ciniru
·Cikuya
·Cimaranten
·Cigugur
·Cijurey
·Cibatungurung
·Cipangesikan-Cijalu
·Cibeunying
·Cikondang
·Citambal
·Ciseel

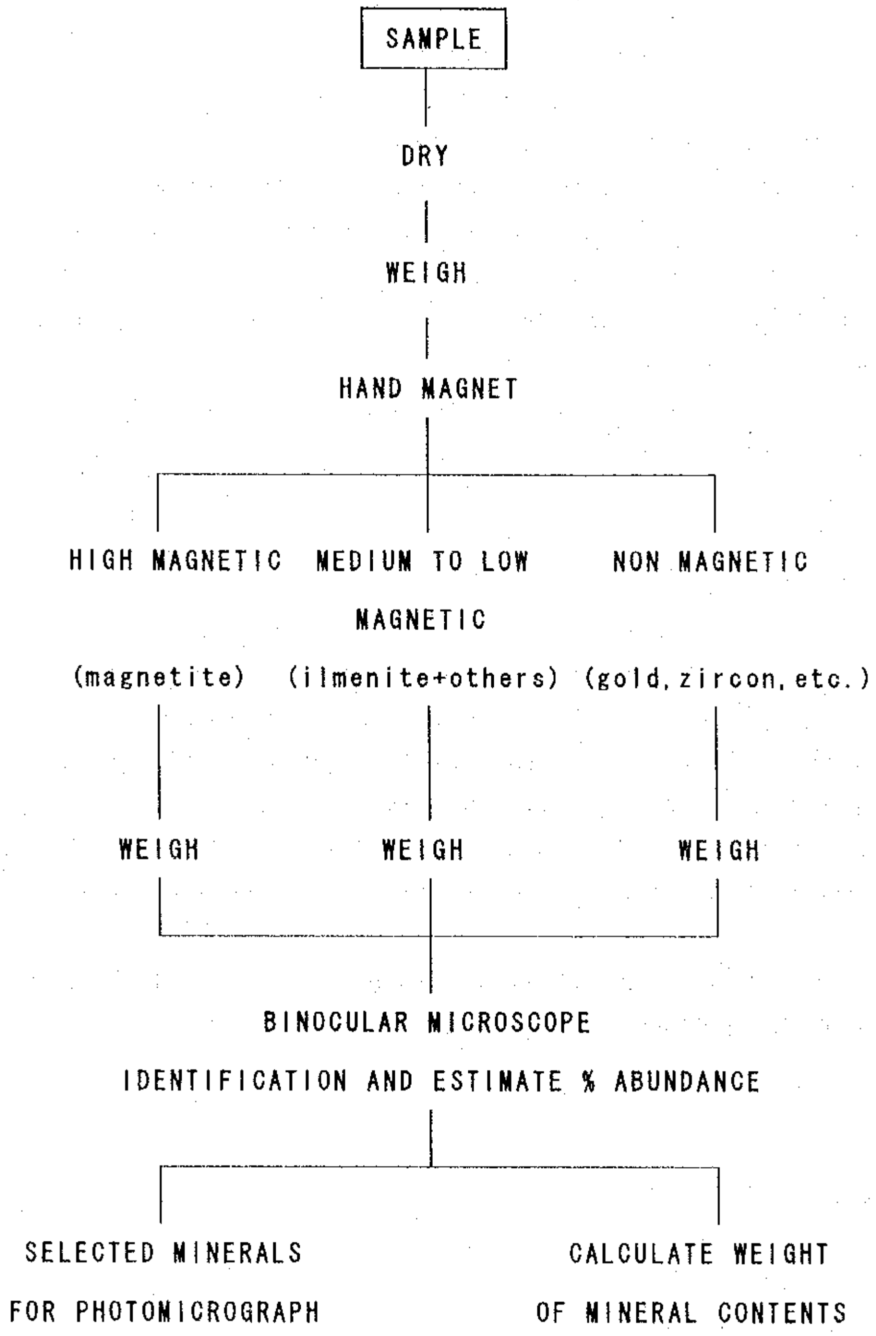


Fig. 2-10 Flow Chart of Gold and Heavy Mineral Analysis

3-5 Soil Survey

3-5-1 Sampling and Chemical Analysis

Soil sampling of the semi-detailed level was conducted in two prospects in the Salopa area.

Soil samples were taken from the B-layer of residual soil at a depth of 40 to 80 cm from the surface using hand-auger. The sampling points were arranged along creeks and ridge lines in the prospect.

The sampling was carried out generally by a team composed of one geologist, one surveyor and several field hands. While a hole was dug and a soil sample was picked up by surveyor, the observation of samples was made and it was recorded on the field note by geologist. The record form for soil samples consisted of the following descriptions:

·Location (grid coordinates)
·Sample number
·Sample type (residual, talus, alluvial or cultivated)
·Site topography (hill top, slope, base of slope, valley floor or level)
·Horizon (A, BF, BT, BM or C)
·Depth
·Color
·Texture (organic, sandy, silty, clay or gravel)
·Coarse fragment (lithic fragment, quartz, pisolite or others)
·Bedrock geology.

Soil samples were air-dried at the base camp, then crashed to -80 mesh. Chemical analysis was conducted at Chemex Labs Ltd. of Canada for 12 elements; Au, Ag, Cu, Pb, Zn, As, Sb, Hg, P, Cr, Mn and Ba. The analytical details are given in Table 2-10. A total of 179 soil samples was collected and provided for chemical analysis in the Salopa area.

On the assumption that the distribution of geochemical data of some elements shows a close approximation to logarithmic normal distribution, the common logarithmic conversion of the respective analytical values was adopted in the statistical data processing. When an analytical value was less than the detection limit, a value half of the lower limit was substituted in the calculation (same as in the stream sediment geochemistry).

At first, statistical properties of geochemical data were checked. Basic statistical figures were calculated. Distribution histograms of each element were drawn out. Correlation coefficients among 12 elements were examined. The threshold values were determined by the same way as in the stream sediment geochemistry. The thresholds of Cu, As, Sb, Hg, P, Cr and Ba were obtained on the logarithmic probability graphs. While those of Au, Ag, Pb, Zn and Mn were determined by the statistical calculation. Values of each sample were expressed by one of three kinds of symbols on the map. The soil anomaly maps drawn by computer are attached in appendices.

Several major anomalies and some minor anomalies of Au were distinguished in the prospect. Anomalies of Ag, As and Sb almost overlap on the Au anomalies. It is possible to explain this conformability by the mineral assemblage of gold-bearing quartz veins -- the occurrences of gold, argentite, arsenopyrite and stibnite. The mode of distribution of the other elements such as Cu, Pb, Zn and Hg, whose negative correlation to Au were indicated through the statistical analysis, is different from that of Au.

3-5-2 Anomalies of Soil Geochemistry

Ciniru: A series of soil anomalies was caught in the Ciniru prospect. It is composed of several anomalies of Au (up to 25ppb), Ag (up to 0.58 ppm), As (up to 1,895 ppm) and Sb (97.2 ppm). Each of them extends to the SE direction over 2 to 3 km.

Cikuya: This anomaly is located about 6 km southeast of the Ciniru anomaly. It is composed of a group of distinctive anomalies of Au (up to 410 ppb), Ag (19.10 ppm), As (up to 1,785 ppm) and Sb (30.4 ppm), arranging roughly in the NW-SE direction.

A hill lies between these two prospects. Some anomalies of panning survey and stream sediment geochemistry along the middle reaches of S. Cimedang were found at the downstream of it. These two prospects are located in a mineralized rectangular zone of 8 km (NW-SE) by 5 km (NE-SW).

3-6 Discussion

Gold-bearing quartz veins in the Salopa area are hosted by andesitic and dacitic volcanic and pyroclastic rocks of the Jampang Formation. The host rocks belong to the so-called "Old Andesites" (V. Benmellen, 1945). The rocks are considered to be formed by the Oligocene to Miocene submarine tholeiitic volcanic activity. Gold mineralization in this area is restricted within the Jampang Formation. There has been no gold mineralization found in the Kalipucang limestone or Bentang calcareous sandstone. The gold mineralization is, therefore, thought to be genetically related to the Miocene tholeiitic volcanism.

The NW system is dominant among the vein systems in this area. An area where quartz veins are developed is structurally situated on the wing of a regional anticlinorium (whose axis is WNW-ESE). Major veins of the NW system show the trend which crosscut the axes of the anticlines. Although the detailed structural analysis of the vein system has not been made, it can be interpreted to be controlled by the regional tectonics in the West Java district. On the basis of the results of photogeological interpretation on the JERS-1 SAR images, a series of complex circular structures whose diameter was approximately several tens of kilometers was distinguished near Salopa. The circular structure was interpreted to be formed before the activities of the Younger and Older Volcanic Rocks developed to the north and to the west of the survey area. It is probably a kind of volcanic depression caused by the volcanic activity of the Upper Member of the Jampang Formation. No geologic evidence that may indicate the volcanic depression structure has been found during the field survey in the Salopa area. The structural pattern and genesis of vein systems is an important matter for the exploration. It must be further studied in the next phase survey.

Characteristic features of ore minerals and hydrothermal alteration in the Salopa area are summarized as follows:

1. As ore minerals, a small amount of pyrite, arsenopyrite, galena, sphalerite and chalcopyrite are contained in quartz veins. Traces of argentite, stibnite, cinnabar, realgar and electrum were found under the microscope.

2. Regarding the vein mineralization, two stages were distinguished: quartz veins with a small amount of pyrite and arsenopyrite, and sulfide network veins consisting mainly of galena-sphalerite-chalcopyrite. The former is earlier than the latter. Some cases are known that a junction of these two mineralization forms a bonanza of gold.

3. Quartz is the major gangue mineral. A small amount of calcite and manganese minerals also occurs within veins.

4. The alteration is composed mainly of silicification and sericitization. Propylitic alteration was recognized in some veins near intrusive bodies.

These features are basically the characteristics of epithermal gold deposit. Gold-bearing quartz veins in the Salopa area are thought to belong to the aduralia-sericite type epithermal gold deposit categorized by Hayba, et al. (1985). Compared with the well-known epithermal gold deposits such as Cikotok and Pongkor in West Java, two things are different: (a) the occurrence of As-Sb minerals (arsenopyrite and stibnite), and (b) lack of adularia in the gangue mineral assemblage. They are probably caused from the differences of age and conditions of formation between them. (The radioactive age data show that the Cikotok and Pongkor deposits were formed in Plio-Pleistocene).

Chapter 4 Sidamulih Area

4-1 Outline of the Survey Area

The Sidamulih area is located about 40 km southeast of Tasikmalaya. The area lies along the upper reaches of S. Cijulang and S. Cikaso in the eastern part of the study area. The altitude of the area ranges from 250 m up to 594 m (Gn. Porang). Most of the area is situated on the hilly lands between 300 and 500 m above sea level.

The area lies geologically among the wide exposures of alternations of volcanics/pyroclastics and sediments of the Jampang Formation. The Kalipucang limestone occurs mainly in the northern and southern parts of the Sidamulih area. Tuffaceous and calcareous sandstone of the Pamutuan Formation partly occurs between the Jampang Formation and Kalipucang limestone mainly in the southwestern part of the area. The geology of the Sidamulih area corresponds to the eastern extension of the Salopa area.

Based on the results of the existing geological information and photogeological analysis on the JERS-1 SAR images, this area was selected for the field survey area in the first phase. The survey covered over a rectangular area of 170 km^2. The field works in the first phase were composed of geological survey, stream sediment sampling and panning survey.

4-2 Geological Survey

4-2-1 Survey Method

The first phase field works in the Sidamulih area consisted of geological survey and geochemical exploration. The area was selected based on the analysis of existing geological information and photogeological interpretation on the JERS-1 SAR images.

Prior to the field work, a series of drainage system maps of 1:10,000 scale was prepared from the compilation of existing topographic maps (1:50,000 and 1: 25,000) and satellite images. Several sets of GPS instruments were employed for locating major surveying points in the field.

In the course of the geological survey, panning survey and stream sediment sampling, a couple of mineralized areas was found. The route maps of 1:10,000 scale were produced during these surveys, using 50-meter tape with a Brunton-type compass. The important mineral showings and old workings were studied in much detail (sketches of 1:100 to 1:200), and samples were taken for laboratory analysis.

A total length of more than 105 km was explored during the survey in the Sidamulih area, and the geological information was compiled into geological maps of 1:25,000 scale. The geology and geologic profile of the Sidamulih area are shown in Fig. 2-11.

The numbers of samples collected in the survey are: 209 stream sediment samples, 54 pan concentrate samples, more than 5 rock samples for thin sections and for whole rock analysis, 6 altered rock and clay samples for X-ray diffraction analysis and 26 ore samples for assay and polished sections. The results of the laboratory works are briefly summarized in Tables 2-4 to 2-11.

4-2-2 Geology and Geologic Structure

(1) Introduction

The geology of the Sidamulih area is composed of the following three stratigraphic units:

·Andesite to basalt lava, volcanic breccia, tuff, sandstone, shale, chert and limestone (Jampang Formation)

·Tuffaceous and calcareous sandstone, tuff and alternations of limestone and sandstone (Pamutuan Formation)

·Massive limestone (Kalipucang Formation)

The general trend of these formations is nearly E-W. They form a gentle anticlinorium with the axis of E-W direction. NW and NE trending fault systems which cut Neogene volcanic-sedimentary sequences occur.

The occurrence of lineaments trending NE to ENE directions was observed on the SAR images in the Cisasah area.

(2) Stratigraphy

<u>Jampang Formation</u>

The Jampang Formation occupies in the central part of the Sidamulih area. It is divided into two members: the Lower and Upper.

The Lower Member of the Jampang Formation is composed mainly of volcanic breccia and lava of andesitic to basaltic composition. The volcanic breccia facies often shows a polymictic feature,

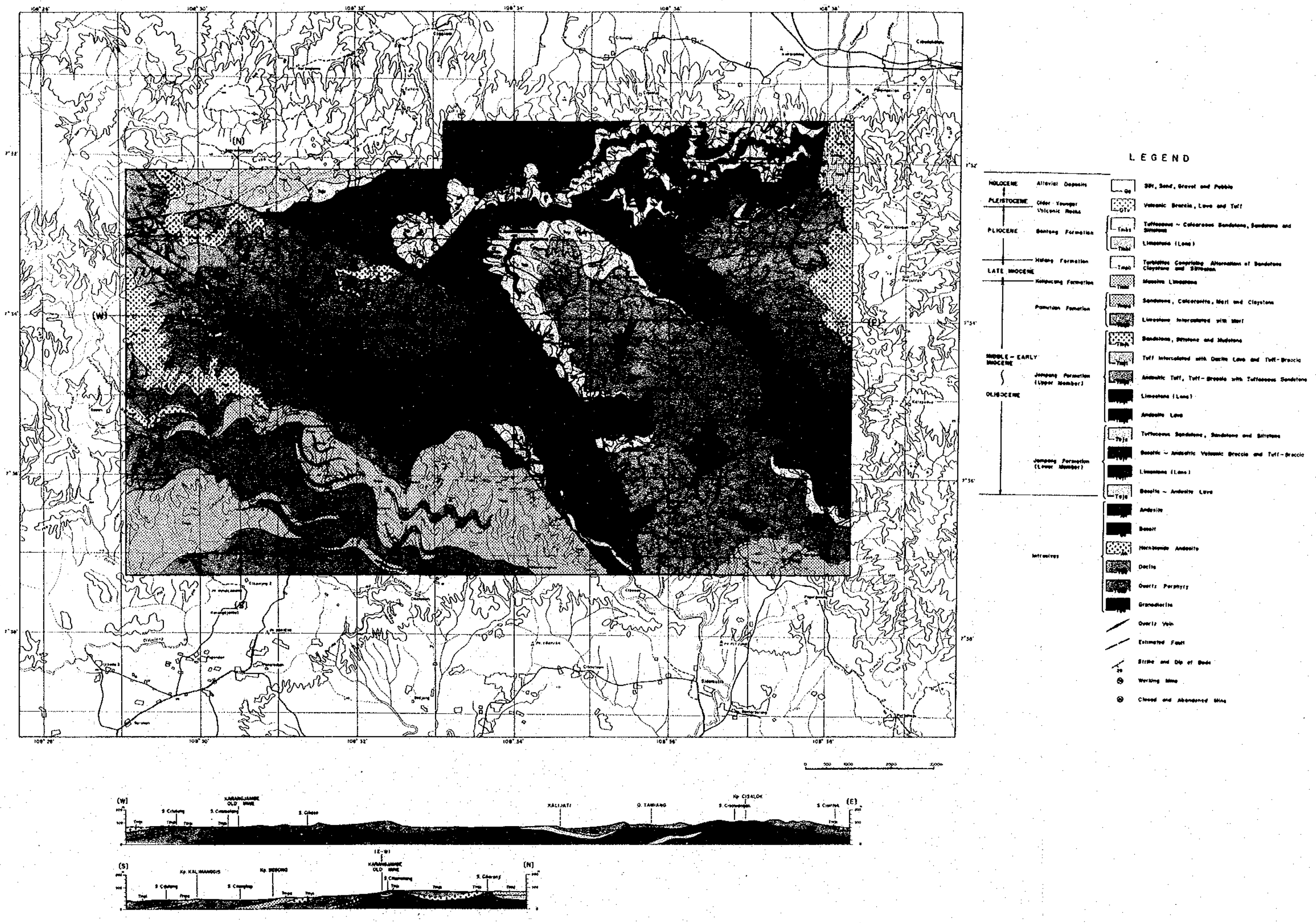


Fig. 2-11 Geology and Geologic Profile of the Sidamulih Area

consisting of various kinds of breccia such as basalt, andesite, limestone, siltstone, silicified tuff, etc. Several units of andesite to basalt lava are intercalated in the volcanic breccia. Several layers of tuffaceous -- andesitic -- sandstone are interbeded within volcanic members of the Jampang Formation.

The Upper Member is composed of andesitic tuff, tuff-breccia, tuffaceous sandstone and siltstone. Thin layers of mudstone and limestone are interbeded within sandstone and siltstone. The clastic facies is dominated at the uppermost part of the Upper Member.

Pamutuan Formation

The Pamutuan Formation is composed mainly of well-bedded tuffaceous and calcareous sandstone and siltstone. Thin limestone lenses are sometimes intercalated in calcareous sandstone. The Pamutuan Formation occurs in the central to the southwestern parts of the survey area.

Kalipucang Formation

The Kalipucang limestone -- massive, sometimes crystalline, reef limestone -- occurs in the northen and southern part of the Sidamulih area. Limestone caves are developed in this limestone. Phosphate ores were found in some of the limestone caves.

(3) Intrusive Rocks

Apart from a couple of small andesite dykes, no significant intrusive body was found in the Sidamulih area.

Whole Rock Analysis

Three igneous rock samples were provided for whole rock analysis. The same methods of analysis in the Salopa area were applied in the Sidamulih area.

(4) Geologic Structure

Fold Structure

The general trend of Neogene volcanic and sedimentary sequences is nearly E-W. Calcareous sandstone of the Pamutuan Formation dips gently to the south in the southern part of the survey area. Whereas the Kalipucang limestone dips to the north in the northwestern area. They form a gentle anticlinorium with the axis of E-W direction.

Fault

Two fault systems trending NW and NE were recognized in the Cisasah area. Neogene volcanic-sedimentary sequences were divided into several blocks by these crosscutting faults.

Faults of NW system occur among the Jampang and Pamutuan volcanic-sedimentary rocks mainly in the central to the western parts of the survey area.

Faults of NE to NNE trends occur within the Jampang Formation in the northeastern area. They are correlated to the lineaments observed on the SAR images.

4-2-3 Mineralization and Associated Alteration

The occurrences of gold and sulfide mineralization and associated alteration, though not so remarkable, were observed at several places in the Sidamulih area. The major localities are explained below. Manganese ore within the Kalipucang limestone was once mined at Gn. Karang in the northeastern part of the Sidamulih area. Phosphorite ores were found within the Kalipucang limestone at Karangpari and Banjarsari, both are located in the southwestern part of the area. The outline of gold and sulfide mineralization in the Sidamulih area is shown in Table 2-13.

Cipamutuan

A series of light grey clay zones with strong pyrite dissemination are distributed along S. Cipamutuan in the southern part of the Sidamulih area. These altered zones occur in volcanic breccia and andesite lava of the Jampang Formation. Chlorite, montmorillonite and calcite are detected by X-ray diffraction analysis. Gold has not been found through geological survey and panning survey in the first phase.

Sankanbawang

White to light grey clay zones were found at Sankanbawang (S. Cimaratiga) in the southern part of the Sidamulih area. Pyrite is strongly disseminated in the clay zone. The host rock is volcanic breccia of the Jampang Formation. Silicification, chloritization, sericitization and carbonitization were detected by X-ray analysis. Gold has not been detected in this place.

Many boulders of silicified rock with pyrite dissemination were found at the upstream of S. Sankanbawang. Kaolinitization was observed in such boulders.

Cimaratiga

Boulders of silicified rock are extensively distributed along S. Cimaratiga in the southern part of the area. Pyrite is sometimes disseminated in silicified rock. Kaolinitization was observed. Low grade gold (up to 0.84 g/t Au, BK4M) was detected in some silicified rock floats.

Boulders and floats of silicified rock were also found at Cipongol (the upper reaches of S. Cipakuhaji) and Karangjambu (the upper reaches of S. Cikaso) in the northern part of the Sidamulih area. Pyrite is disseminated in these floats. Silicified breccia was found within volcanic breccia of the Jampang Formation at Karangjambe (the upper reaches of S. Cijulang-Wetan) in the northwestern part of the area. These breccias contain pyrite. Gold was detected in some of these breccia (up to 1.59 g/t Au, BD408M). Kaolinitization was observed in breccia. This kind of reworked ore was mines by prospectors about 10 years ago.

Table 2-13 Summary of Geological and Geochemical Surveys in the Sidamulih Area

NAME	LOCATION	GEOCHEMISTRY		MINERALIZATION					ASSAY RESULT	MINING ACTIVITY
		PANNING	STREAM SEDIMENT	TYPE	HOST ROCK	STRUCTURE VEIN SYSTEM	ORE MINERALS	ALTERATION		
Cipamutuan	Southern part	Gold not detected	Some As (low)	Grey clay + Py	Vol-bre And lava (Jp)	----	Py	Chl, Carb (Mont)	Au0.01g/t,Fe9.21% (BD423M)	Nothing
Sankanbawang	Southern part (branch of Cima-ratiga)	Gold not detected	Some Au (low)	White clay + Py	Vol-bre (Jp)	----	Py	Chl, Ser Carb	Fe5.67%(BH6M)	Nothing
Cimaratiga	Southern part	Gold not detected	Some Au As(low)	Silicified & Py diss. (float)	----	----	Py,(Sp,Gn)	Sil	Au0.84g/t,Ag2g/t (BK4M)	Nothing
Cipongol	Northern part (upper reaches of Cipakuhaji)	Gold not detected	Some Au (low)	Silicified & Py diss. (float)	----	----	Py	Sil	Au1.59g/t,Ag20g/t (BD408M)	Nothing
Karangjambu	Northern part (upper reaches of Cikaso)	Gold not detected	Some As (low)	Silicified & Py diss. (float)	----	----	Py	Sil	Au0.64g/t,Ag11g/t (BS2M)	Nothing
Karangjambe	NW part (up-per reaches of Ciwulan Wetan)	Gold not detected	Some Au As(low)	Silicified & Py diss.	Vol-bre Tf-bre (Jp)	Breccia (reworked)	Py,Cp	Sil,Ser (Kaol)	Fe4.00%(BA2M)	Old tunnels
Gn. Karang	NE part	----	----	Mn pod in limestone	Limestone (Kalipucang)	Pod	Rd Mn-oxide	----	Mn>2.50%(BHS1M)	Old tunnel (Dutch time)

4-3 Stream Sediment Geochemistry

4-3-1 Sampling and Chemical Analysis

Stream sediment geochemistry was carried out in the first phase for the purpose of defining hidden mineralized zones which would otherwise be undetected by geological survey, as well as for clarifying the extension of mineral occurrences known through the geological survey.

Fine sand samples of -80 mesh were collected from sediments in major channels and some of the bigger tributaries. The number of stream sediment samples collected was 209, which corresponds to a sampling density of approximately one sample per 0.8 km^2. The samples, after being air-dried in the field, were analyzed at Chemex Labs Ltd. for 12 elements; Au, Ag, Cu, Pb, Zn, As, Sb, Hg, P, Cr, Mn and Ba. The methods of analysis and limits of detection are shown in Table 2-10.

4-3-2 Anomalies of Stream Sediment Geochemistry

(1) Statistical Data Analysis

The same methods and procedures of stream sediment geochemistry in the Salopa area were applied in the Sidamulih area.

These results were integrated together, and several anomalous zones, though not significant, were picked up. The distribution of geochemical anomalies was drawn by computer shown in the appendices.

(2) Anomalies of Stream Sediment Geochemistry

Cipamutuan: Au anomaly of stream sediments has not been found at this locality. Only one low level Zn anomaly was caught.

Sankanbawang: A couple of Au anomalies of stream sediments up to 58 ppb was caught at this locality. No other element has shown an anomalous value.

Cimaratiga: One Au anomaly (55 ppb) and some low level Cu anomalies of stream sediments were detected along S. Cimaratiga.

Cipongol: One low level Au anomaly was found at the upper reaches of S. Cipongol. It corresponds to the locality where silicified rock floats are distributed.

Karangjambu: Only a couple of low level As anomalies were found in this locality.

Karangjambe: Several low level Cu anomalies were distributed along the upper reaches S. Cijulang-Wetan. One low level Au anomaly was also found at this locality. These anomalies were interpreted to come from breccia ores contained in volcanic breccia of the Jampang Formation.

The other localities where some Au anomalies of stream sediments, though low level, were detected are as follows:

·A branch of S. Cijulang-Wetan
·Binangun (upper reaches of S. Cisandari)
·Upper reaches of S. Cinangkerok
·Cimonggu

All of these anomalies are low level and sporadic. No significant anomalous value of Ag and Sb has been detected in the Sidamulih area.

4-4 Panning Survey

4-4-1 Sampling and Heavy Mineral Identification

Panning prospecting was carried out in the Sidamulih area in the first phase. Fifty-four panned samples were checked in the Sidamulih area.

4-4-2 Anomalies of Panning

Gold has not been detected in pan concentrate samples in the Sidamulih area this phase. Heavy minerals observed in pan concentrates are: epidote, zircon, ilmenite, magnetite, pyrite and iron oxide.

Pyrite and limonite were frequently found in the following three localities:

·Cipamutuan
·Sankanbawang
·Cimaratiga

Clay alteration zones with pyrite dissemination occur in the former two localities. Pyrite and limonite were thought to be derived from these alteration zones.

4-5 Discussion

It became clear through the survey that the gold ores which had been known at Karangjambe and other localities in the Sidamulih area were ore breccias contained in the volcanic breccia of the Jampang Formation. They were mixed into the breccia when the host rock was formed. It means that the original ores were formed much older than the Jampang Formation. They are a kind of reworked ore. Geochemical gold anomalies which were deemed to be found in the past exploration in this area might come from such reworked origin. They are false ones consequently.

Grey to light grey clay zones occur in the central-southern part of the survey area. The results of geochemical survey in the first phase showed that the level of Au anomaly was very low. It was interpreted that the clayey alteration was formed by a geothermal activity.

Chapter 5 Cisasah Area

5-1 Outline of the Survey Area

The Cisasah area is located about 40 km south-southwest of Tasikmalaya. It is facing the Indian Ocean. The area lies along the lower reaches of S. Ciwulan and S. Cilangla in the southwestern part of the study area. The altitude of the area is not high; most of the area is situated between 50 and 250 m above sea level.

The area lies geologically among the distribution of volcanic rocks and pyroclastic rocks of the Jampang Formation. The Kalipucang limestone occurs locally among the Cisasah area. Calcareous sandstone of the Bentang Formation covers these rocks mainly in the western and eastern parts of the area. The general trend of these formations is nearly NE-SW with minor disorders.

Based on the results of the existing geological information and photogeological analysis on the JERS-1 SAR images, this area was selected for the field survey area in the first phase. The survey covered over a rectangular area of 312 km^2. The field works in the first phase were composed of geological survey, stream sediment sampling and panning survey.

5-2 Geological Survey

5-2-1 Survey Method

The first phase field works in the Cisasah area consisted of geological survey and geochemical exploration. The area was selected based on the analysis of existing geological information and photogeological interpretation on the JERS-1 SAR images.

Prior to the field work, a series of drainage system maps of 1:10,000 scale was prepared from the compilation of existing topographic maps (1:50,000 and 1: 25,000) and satellite images. Several sets of GPS instruments were employed for locating major surveying points in the field.

In the course of the geological survey, panning survey and stream sediment sampling, a couple of mineralized areas was found. The route maps of 1:10,000 scale were produced during these surveys, using 50-meter tape with a Brunton-type compass. The important mineral showings and old workings were studied in much detail (sketches of 1:100 to 1:200), and samples were taken for laboratory analysis.

A total length of more than 235 km was explored during the survey in the Cisasah area, and the geological information was compiled into geological maps of 1:25,000 scale. The geology and geologic profile of the Cisasah area are shown in Fig. 2-12.

The numbers of samples collected in the survey are: 401 stream sediment samples, 104 pan concentrate samples, more than 18 rock samples for thin sections and for whole rock analysis, 19 altered rock and clay samples for X-ray diffraction analysis and more than 45 ore samples for assay and polished sections. The results of the laboratory works are briefly summarized in Tables 2-4 to 2-11.

5-2-2 Geology and Geologic Structure

(1) Introduction

The geology of the Cisasah area is composed of the following three stratigraphic units:

- Andesitic to basaltic lava, volcanic breccia, tuff-breccia, dacitic tuff (Jampang Formation)
- Massive limestone (Kalipucang Formation)
- Calcareous sandstone with intercalations of tuff and limestone (Bentang Formation)

The general trend of these formations is NE-SW. They form a series of gentle foldings with the axes of NW-SE direction. Some faults which cut Neogene volcanic-sedimentary sequences are of the NE system. Intrusive bodies of granodiorite and quartz-porphyry occur in these formations.

On the basis of the photogeological analysis on the SAR images, the geologic structure of the Cisasah area is characterized by the development of lineaments trending NE direction.

(2) Stratigraphy

<u>Jampang Formation</u>

The Jampang Formation in the Cisasah area is composed of andesitic to basaltic volcanic rocks (Lower Member), and dacitic pyroclastic and volcanic rocks (Upper Member).

The Lower Member is mainly composed of volcanic breccia and lava of andesitic to basaltic composition. It occurs mainly along rivers. They are the oldest rocks in the study area. Volcanic breccia and andesite lava locally show propylitic alteration near intrusive bodies of granodiorite and quartz-porphyry.

The Upper Member of the Jampang Formation is widely distributed within and around the Cisasah area. It is composed of dacitic tuff, fine tuff, pumice tuff, tuff-breccia and dacite lava. They show green color, and are called green tuffs. Green tuffs sometimes show montmorillonite, chlorite and zeolite alteration, especially in the eastern part of the study area.

Kalipucang Formation

The Kalipucang Formation is represented by massive, sometimes crystalline, reef limestone in the Cisasah area. It is distributed in the central part of the survey area. It also occurs widely to the east of the Cisasah area. Karst topography is developed in the Kalipucang limestone area.

Bentang Formation

The Bentang Formation is mainly composed of calcareous sandstone, tuffaceous sandstone and siltstone. Thin lenses of limestone are interbedded within calcareous sandstone. The Bentang Formation occurs all over the area, covering hills in the Cisasah area. The Jampang green tuffs are sometimes overlain directly by the Bentang calcareous sandstone in the survey area.

(3) Intrusive Rocks

Granodiorite

A granodiorite stock occurs at Pr. Tenjolaut in the northern part of the Cisasah area. It is a hollocrystalline granitic rock. The phenocrysts are composed of plagioclase, K-feldspar, quartz, hornblende and biotite. In the vicinity of this stock, several small stocks of diorite and quartz-porphyry occur. These are thought to be derived from the Tenjolaut granodiorite.

Quartz-Porphyry

Several small stocks and dikes of quartz-porphyry are distributed in the central to the western parts of the Cisasah area. They occur within the Jampang Formation. Quartz-porphyry is a porphyritic rock of acidic composition. Under the microscope, phenocrysts of plagioclase, quartz and hornblende were observed. Some part of a quartz-porphyry body shows an aphanitic dacitic appearance.

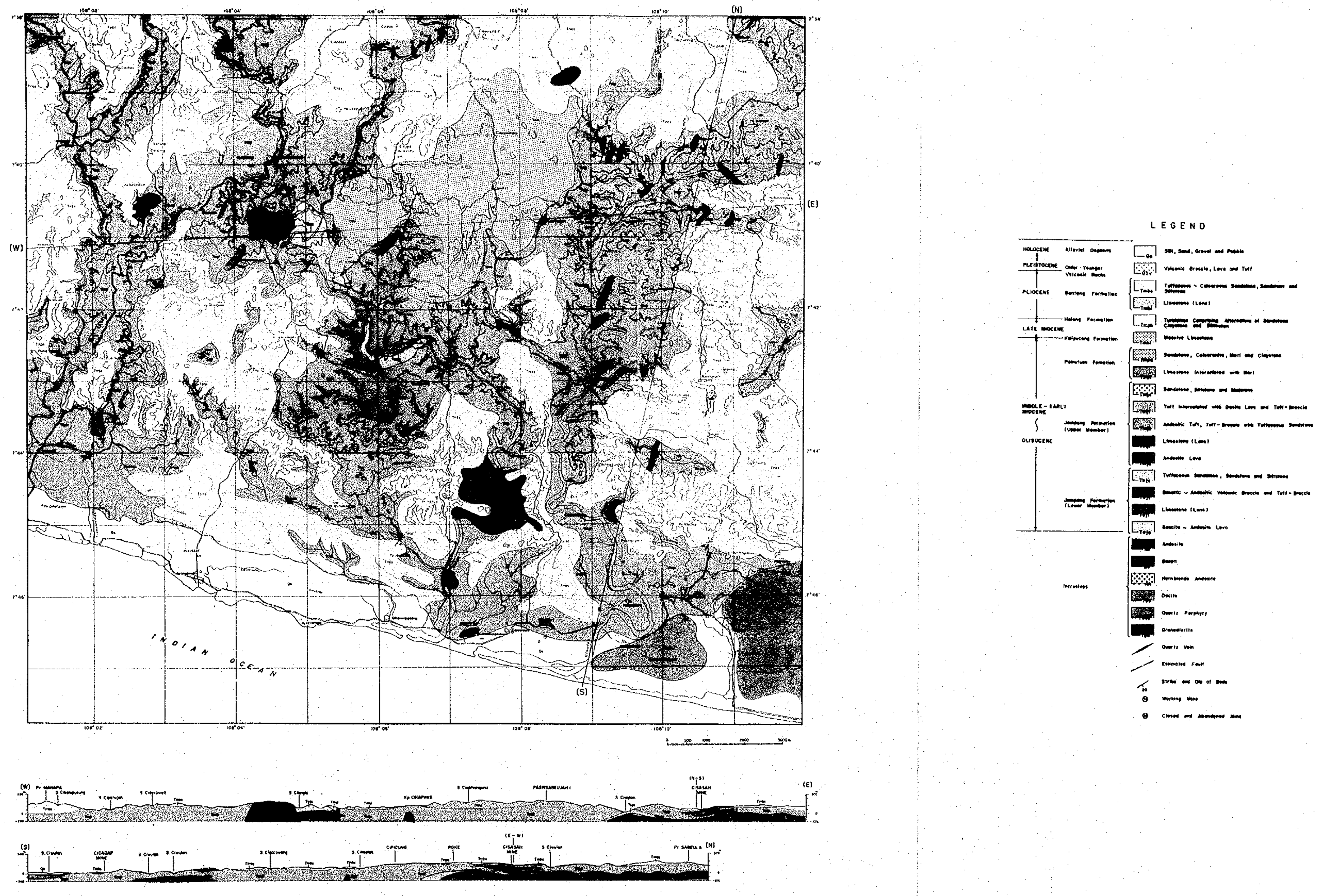


Fig. 2-12 Geology and Geologic Profile of the Cisasah Area

Whole Rock Analysis

Sixteen igneous rock samples were provided for whole rock analysis. The same methods of analysis in the Salopa area were applied in the Cisasah area.

(4) Geologic Structure

Fold Structure

The geologic structure of the Cisasah area shows monotonous, flat features. Only gentle foldings were observed in the survey area. They appear as the occurrences of volcanic breccia and andesite lava of the Lower Member of the Jampang Formation among the Upper Member along river beds. These foldings have a general axis of approximately NW-SE direction.

Fault

Faults of NW to NNW systems, though minor, were found within the Upper Member of the Jampang Formation in the eastern part of the survey area.

Faults of NE systems, which were picked up through the satellite image photogeological interpretation, have not been encountered during the geological survey. This type of fractures probably exists as igneous joints and/or minor faults of small displacement.