

Chapter 2 Method of the Survey

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2-1 Amount of Work

The survey of the first year of the project consisted of analysis of existing data, analysis of satellite images, and geological and geochemical surveys. Regarding the examination of existing data, available information concerning geology and mineral deposits were studied, summarized and guidelines and plans for field survey were prepared. JERS-1 SAR images were used for photogeological interpretation, the geology and geologic structure of the survey area were studied, and the relation between the existing data and mineralized zones was considered. Also DEM was prepared from 1:25,000 topographic maps, and a multi-directional light source image, a gradient anomaly image, and an altitudinal dispersion anomaly image were prepared. And lineaments (geologic structure) and intrusive bodies were extracted.

Geological survey and geochemical survey were carried out in the field. Of the 5,000km² survey area delineated for geological investigation, areas with mining concessions were excluded for traversing and geological survey covered an area of 2,000km² and total length of the survey route amounted to 500km. Stream sediments for geochemical survey were sampled simultaneously with the geological survey.

During the second year of the project, regional geochemical and semi-detailed geochemical surveys and geological survey were carried out over an area of 3, 6000km², 800km² and 70 km², respectively. Regarding the examination of existing data, available information concerning geology and mineral deposits of the previous concessions southeast of Ponorogo area were studied, summarized and guidelines and plans for field survey were prepared.

Regional geochemical survey were carried out in the field. Of the 3, 600km² survey area delineated for geological investigation, for traversing and geological survey covered an area of 70km² and total length of the survey route amounted to 100km. Soils for geochemical analysis were also sampled simultaneously with the geological survey

The amount of the work of each year is shown on Table 2-1

Table 2-1 (a) Amount of Work (Field Work)

Survey		Phase (year)					
		1	2-1	2-2	2-3	3-1	3-2
Existing data analysis	Area(km ²)	19,000					
Satellite image analysis		19,000					
SAR image analysis		5,000					
DEM analysis							
Geochemical survey	Total area(km ²)	5,000					
	Traversed area (km)	※2,000	3,600	1,000	70	260	—
	Traversed area (km)	500	—	—	100	350	—

Table 2-1 (b) Amount of Work (Laboratory Tests Carried Out)

Survey	Items	Amount (pcs)						
		1	2-1	2-2	2-3	3-1	3-2	Total
Geological & Geochemical Surveys	①Thin sections	50	50	3	50	50	24	227
	②Polished sections	50	50	33	50	40	24	247
	③X-ray diffractometry	100	50	32	100	80	90	452
	PIMA analysis	—	200					200
	④Chemical analysis (ore)	100	411	250	160	160	182	1,331
	Elements : Au,Ag,Cu,Pb,Zn,As, Hg,Sb	100	411	250	160	160		
	Elements : Au,Ag,Cu,Pb,Mo, Zn, As,Hg,S,Fe						182	
	⑤Stream sediments/Soil	857	2,045	497	200	1,447	0	5,046
	Elements : Au,Al,Ag,As,Ba,Be,Bi,Ca,Cd Cr,Co,Cu,Fe,K,Na,Ni,Mg,Mn,Mo P, Pb,Sb,Sr,Ti,V,W,Zn	857				1,419 28 (duplicate)		2,304
	Drilling	Elements : Au, Al, Ag, As, Ba, Be, Bi, Ca, Cd, Cr, Co, Cs, Cu, Fe, Ga, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn, Zr		1,660 83 duplicate 302 pan conc.	497	200		
	⑥Fluid inclusion (homegenization temperature and salnity)	5	5	24	5	10	14	63
	⑦Whole rock aalysis	20	20	0	20	50	0	60
	⑧Age determination (K-Ar method)	10	10	0	10	0	0	30

Table 2-1 (c) Amount of Work of Geophysical Survey and Drilling (Field Work)

Survey	District	Areal Extent		Survey lines	
Geophysical Survey	Tempursari	3.9km ²		10.4km	
	Seweden	7.9km ²		19.8km	
	Total	11.8 km ²		30.2km	
Drilling	District	Hole no.	Direction	Inclination	Length
	Prambon	MJIE-P1	N70° E	-60°	250m
		MJIE-P2	N70° E	-60°	253m
		MJIE-P3	S70° W	-60°	250m
		MJIE-P4	S70° W	-60°	250m
	Seweden	MJIE-S1	E	-80	400m
計				1,403m	

Table 2-1 (d) Amount of Work of Geophysical Survey and Drilling (Laboratory Work)

Survey	Items	Amount
Geophysical	Resitivity chargeability	21 pcs
Drilling	①Thin sections	24 pcs
	②Polished sections	24 pcs
	③X-ray diffractometry	90 pcs
	④Chemical analysis	180 pcs
	Element: Au,Ag,Cu,Pb,Mo,Zn,As,Hg,S,Fe	
	⑤Fluid inclusion (homegenization temperature and salnity)	14 pcs

2-2 Duration of Survey and Survey Participant

Duration and survey participants are shown in Table 2-2

Six scientists from Japan and seven scientists from Indonesia formed the field survey team during regional geochemical surveys and geochemical surveys. Four scientists from Japan and four scientists from Indonesia formed the field survey team during semi-detailed geochemical survey and geophysical surveys , while two geologists from Japan and two geologists from Indonesia formed the field survey team during drilling survey.

Table 2-2 Duration of Survey and Participants

Phase	Mission Survey	Duration	Participants	
			Japanese side	Indonesian side
	Mission for Scope of Work	17 Sept. 2001- 22 Sept. 2001	Shigeru Yokoyama* Sumito Kurokawa** Keita Koda* Eishi Endo*	Abdrurrohman Bambang Setiawan Koswara Yudawinata Bambang Pardiarto
Phase 1	Supervising Tsuyoshi Sakata	21-22 Nov. 2001 11-13 Dec. 2001	Keita Koda* Takeshi Sakata	-
	Exsiting Data Analysis	18 Oct. 2001-15 Mar 2002	Osamu Miyaishi	Dwi Nugroho S.
	Satelite Data Analysis Regional Geochemical Survey		Masataka Ochi Tetuo Sato Nobuya Tamamoto Kazuhiro Yamamoto Norio Tsushima	Bambang Nugroho Widi Sahato Simanguntak Wahyu Widodo Iwan Nursahan Moctamar Prima Hirman Wahyu Supriadi Elisa Parkit
	Data Analysis and Report making			
Phase 2	Regional Geochemical Survey	26 Aug.-13 Nov. 2002	Osamu Miyaishi Tetuo Sato Koji Hamano Tadanori Iwasaki Ken Obara Masahiro Suzuki	Wahyu Widodo Hotoma Simangunsong Sahato Simanguntak Zulkifuli, MD Sayhya Sudarya Iwan Nursahan Rachmat Effendi
	Semi-detailed geochemical Survey (Supervising)	26 Aug.- 19 Oct. 2002	Tetsuo Suzuki* Koji Yamamoto* Kazuhiro Miyake*	Atok Sukandar Prapto Bambang Nugroho Widi Sukmana
	Geological Survey	26 Jan.- 28 Feb. 2003	Osamu Miyaishi Susumu Takeda Tetuo Sato Koji Hamano Tadanori Iwasaki Ken Obara	Wahyu Widodo Atok Sukandar Prapto Hotma Simangunsong Sahat Simanguntak Iwan Nursahan Sukmana Rachmat Effendi
	Data Analysis and Report making	20 Oct.2002-14 Mar.2003		
Phase 3	Supervising	15 Aug.-29 Aug. 2003 11 Dec.-17 Dec. 2003	Koji Yamamoto* Koji Yamamoto*	- -
	Geological Survey including Soil Geochemical Survey	30 June - 5 Sept. 2003	Osamu Miyaishi Masataka Ochi Susumu Takeda Tetuo Sato Norio Tsushima Toru Maruyama	Wahyu Widodo R.Simpwee Soeharto Atok Sukandar Prapto Sukmana Bambang Nugroho Widi Sayhya Sudarya Rachmat Effendi
	Geophysical Survey	9 Nov. - 18 Dec. 2003	Toshio Ishibashi Kazuyo Hirose Shinichi Sugiyama Tadanori Iwasaki	Atok Sukandar Prapto Bambang Nugroho Widi Sayhya Sudarya Sukmana
	Drilling	9 Nov.2003-18 Feb. 2004	Osamu Miyaishi Susumu Takeda	Wahyu Widodo R.Simpwee Soeharto
	Data Analysis and Report making	19 Dec.2003-19 Mar. 2004	Osamu Miyaishi Masataka Ochi Susumu Takeda Tetuo Sato Toshio Ishibashi Kazuyo Hirose Tadanori Iwasaki	

* : Metal Mining Agency of Japan, **: Japna International Cooperation Agency