Fig. II-1-9 Distribution Map of Alteration Zones of the Murgul Area

The alteration minerals assemblages of the lower Murgul Formation shows following zones. The quartz-kaolinite-sericite zone extends from the central part of the Kabaca area through the Çakmakkaya Deposit to the Ardiç area in the southwest to northeast direction. The quartz-sericite-chlorite zone appears in the western side of above mentioned alteration zone. The quartz-sericite- (sericite/smectite mixed layer mineral) zone is in the eastern side. The volcanogenic massive sulphide deposits are presumed to embedded in the quartz-kaolinite-sericite zone, because this assemblage of alteration minerals is identified from the stockwork mineralization of the Damar pit. The same zone is identified in the vicinities of granitic intrusive in the east of the Kokolet area, this zone is estimated to have formed when granitic rock intruded.

Quartz, sericite, chlorite, smectite, and sericite/ smectite mixed layer mineral are detected from the upper Murgul Formation, and kaolinite is detected from the K085 specimen collected in the Çakmakkaya pit. The quartz-chlorite zone is related to the basic volcanic activities identified from the L026 specimen of the Kabaca Formation.

(ii) Alteration Index

Alteration indexes (AI) of the lower Murgul Formation are calculated to determine the alteration intensity. Table II-1-4 and Fig. II-1-10 shows the results. The alteration intensity zone, 90 % <AI, is distributed extensively from the Lepüskür River basin in the Kabaca area to the south of the Çakmakkaya Deposit, and in the Ardiç area apart from the Murgul Deposit swarm. It is thought that these zone continuously connect. In the northern Kokolet area, the high intensity zone over, 80 to 90 % AI, extends to the western zone, where the Ardiç Formation overlies. It is said that the alteration intensity zone in the Ardiç area extends toward the Kokolet area. It is, therefore, presumed that the strong alteration intensity zone extends continuously from the Lepüskür River basin to the mountain between the Ardiç area and Kokolet area, trending northeast to southwest. The intensity abruptly changes (J019:98%→ J035:61%, K058:96% → K057:70%) in short distance, it is presumed that the alteration indexes reflecting intensity of the mineralization.

(c) Geochemical Survey

Geochemical survey has been carried out for rock chips to understand

Table II-1-4 Alteration Index of the Murgul Area

Sample	Coodinates UTM-E	Coodinates UTM-N	Rock Type	Alteration Index(AI)	Ca %	K %	Mg %	Na %
J003	721060	4573629	Mdcl	35	10.50	0.31	4.58	0.30
J006	721238	4573448	Mdcl	81	0.30	1.40	2.54	0.73
J017	715201	4568484	Mdcl	98	0.02	1.57	0.94	0.04
J019	715002	4568629	Mdcl	98	0.05	0.37	2.76	0.02
J030	715126	4567868	Mdcl	95	0.03	1.96	0.23	0.07
J034	714785	4568031	Mdcl	42	0.10	0.18	0.88	1.64
J035	714568	4568290	Mdcl	61	0.08	0.83	1.76	1.78
J037	714013	4568555	Mdcl	55	0.08	0.94	1.52	2.15
J042	719038	4568035	Mdcl	51	0.96	0.53	1.32	0.98
J053	713263	4567594	Mdcl	71	0.11	0.90	2.51	1.44
J062	713373	4567959	Mdcl	59	0.08	1.54	1.32	2.00
J069	720885	4570465	Mdu	88	0.46	1.29	4.85	0.47
K001	721510	4569990	Mdcl	49	0.22	0.55	2.53	3.57
K006	720990	4571010	Mdcl	89	0.02	1.84	0.26	0.22
K010	720250	4571370	Mdcl	69	0.78	1.68	1.12	0.46
K014	720360	4571945	Mdcl	44	0.06	1.32	0.15	1.69
K021	720755	4571730	Mdcl	62	0.10	1.36	1.06	1.42
K025	720730	4572560	Mdcl	83	0.10	2.09	0.19	0.34
K030	721340	4572835	Mdcl	32	0.09	1.43	0.11	2.91
K031	721420	4572700	Mdcl	53	0.08	1.40	0.59	1.68
K038	721300	4573975	Mdcl	42	0.28	1.18	0.92	2.77
K046	713635	4570300	Mdlt	51	0.15	0.20	1.18	1.44
K050	713745	4569915	Mdcl	31	0.07	0.77	0.58	3.02
K054	718170	4568600	Mdcl	55	1.45	2.53	0.69	1.02
K057	718280	4567980	Mdcl	70	0.10	0.89	0.12	0.30
K058	718225	4567705	Mdcl	96	0.01	1.23	0.11	0.04
K060	718380	4567260	Mdcl	94	0.02	1.30	1.18	0.15
K061	718380	4567000	Mdcl	95	0.02	1.43	0.15	0.05
K071	717590	4571980	Mdcl	98	0.02	1.75	0.25	0.02
K085	716030	4568680	Mdcl	93	0.30	0.10	3.60	0.03
K109	717500	4571040	Mdcl	97	0.08	1.66	1.68	0.04
K110	717440	4571300	Mdcl	97	0.01	1.22	0.14	0.03
K111	717200	4571585	Mdcl	44	0.34	0.16	0.13	0.03
K150	717940	4570815	Mdcl	97	0.01	1.18	0.12	0.03
K153	717790	4571465	Mdcl	97	0.01	0.90	0.14	0.02
K165	720510	4570170	Mdu	36	0.07	1.52	0.23	2.84
L005	721968	4572367	Mdcl	16	0.49	0.34	0.51	4.26
L010	713559	4568493	Mdcl	54	0.08	1.02	1.29	2.02
L011	713609	4568721	Mdcl	65	0.03	1.49	1.12	1.44
L014	721978	4571396	Mdcl	89	0.08	2.53	0.73	0.29
L015	716346	4567335	Mdcl	95	0.02	1.72	0.17	0.07
L019	717485	4566819	Mdcl	97	0.06	1.61	2.09	0.07
L020	716949	4567035	Mdcl	97	0.01	2.61	0.28	0.06
L023	717371	4567815	Mdcl	98	0.04	0.88	2.94	0.07
L031	713787	4566923	Mdcl	92	0.04	1.74	0.21	0.12
L039	714412	4569857	Mdlt	40	1.44	0.69	1.51	2.18
L050	713757	4570827	Mdu	25	0.62	0.95	0.56	4.03
L074	713768	4569007	Mdcl	59	0.07	1.16	0.76	1.31
L092	721297	4571843	Mdcl	65	0.02	1.71	0.24	0.95
L097	721843	4571987	Mdcl	26	0.57	0.49	0.90	3.86