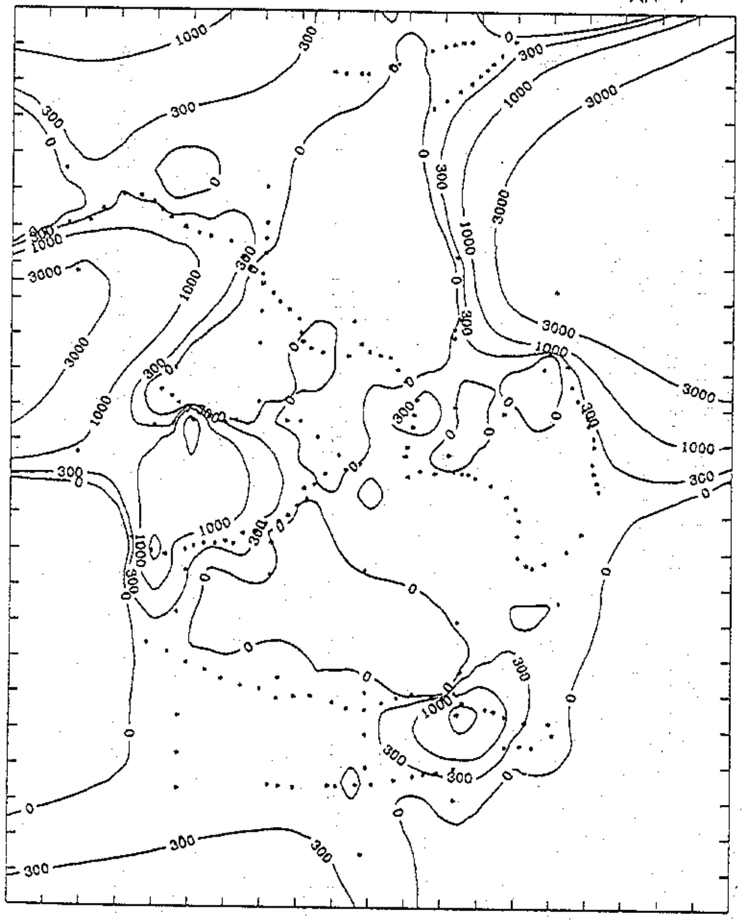
Tab.II–3–5 Results of normative chalcopyrite/pyrite ratio of rock geochemical data, Rio Magdalena zone, Cuellaje area

Sample No.	Cu (ppm)	Cu-cp (ppm)	Fe (%)	Fe-cp (ppm)	Fe-py (ppm)	S (ppm)	S-cp (ppm)	S-py (ppm)	cp/py Ratio	Fe-oxide (%)
B2001	243	121	1.67	107	30	180	123	57	2.14	1.65
B2003	315	158	2.20	139	27	190	159	31	5.14	2.18
B2004	809	405	2.41	356	-129	260	409	-149	-2.75	2.39
B2006	863	432	2.20	380	7451	9230	436	8794	0.05	1.40
B2007	332	166	2.55	146	150	340	168	172	0.97	2.52
B2008	326	163	1.45	143	5	170	165	5	30.66	1.44
B2009	668	334	2.57	294	-67	260	337	-77	-4.36	2.55
B2011	274	137	1.91	121	158	330	138	182	0.76	1.88
B2012	143	72	3.03	63	329	450	72	378	0.19	2.39
B2014	202	101	2.27	89	303	450	102	348	0.29	2.23
B2016	140	70	2.36	62	182	280	71	209	0.34	2.34
B2017	580	290	1.93	255	15	310	293	17	17.13	1.90
B2019	199	100	3.43	88	104	220	100	120	0.84	3.41
B2021	28	14	2.59	12	283	340	14	326	0.04	2.56
B2022	117	59	3.64	51	79	150	59	91	0.65	3.63
B2023	3011	1506	2.56	1325	-1123	230	1521	-1291	-1.18	2.54
B2024	433	217	2.26	191	27	250	219	31	6.98	2.24
B2025	738	369	2.83	325	-107	250	373	-123	-3.04	2.81
B2026	536	268	2.53	236	-70	150	271	-81	-3.35	2.51
B2027	655	328	2.60	288	-166	140	331	-191	-1.73	2.59
B2028	1574	787	1.32	693	239	1070	795	275	2.89	1.23
B2030	805	403	1.60	354	-145	240	407	-167	-2.44	1.58
B2031	18842	9421	1.89	8290	5248	15570	9515	6055	1.57	0.53
B2033	669	335	1.12	294	-129	190	338	-148	-2.29	1.10
B2034	1404	702	2.40	618	-417	230	709	-479	-1.48	2.38
B2035	1458	729	3.40	642	-414	260	736	-476	-1.55	3.38
B2036	1574	787	2.74	693	309	1150	795	355	2.24	2.64
B2038	488	244	1.79	215	238	520	246	274	0.90	1.74
B2039	390	195	1.91	172	55	260	197	63	3.12	1.89
B2040	481	241	1.83	212	-11	230	243	-13	-18.82	1.81
B2041	657	329	1.60	289	-80	240	332	-92	-3.61	1.58
B2042	481	241	2.31	212	58	310	243	67	3.62	2.20
B2043	510	255	2.02	224	-7	250	258	-8	-34.11	2.00
B2044	561	281	0.89	247	-12	270	283	-13	-21.29	0.87
B2045	2131	1066	1.63	938	369	1500	1076	424	2.54	1.50
B2047	349	175	1.78	154	64	250	176	74	2.39	1.76
B2048	816	408	2.01	359	877	1420	412	1008	0.41	1.89
B2050	381	191	1.92	168	285	520	192	328	0.59	1.87
B2051	504	252	2.67	222	718	1080	255	825	0.31	2.58
B2053	148	74	2.04	65	553	710	75	635	0.12	1.98
B2054	345	173	2.62	152	127	330	174	146	1.20	2.59
B2055	340	170	2.03	150	1008	1330	172	1158	0.15	1.91
B2056	340	170	2.13	150	146	340	172	168	1.02	2.10
B2057	1708	854	2.32	752	4713	6200	863	5417	0.16	1.77
B2059	119	60	2.53	52	296	400	60	340	0.18	2.50
B2060	371	186	1.49	163	46	240	187	53	3.56	1.47
B2061	193	97	1.11	85	115	230	97	133	0.74	1.09
B2062	861	431	1.05	379	-91	330	435	-105	-4.15	1.02
B2063	1268	634	1.32	558	687	1430	640	790	0.81	1.20
B2064	358	179	1.59	158	191	400	181	219	0.82	1.56
B2065	805	403	1.54	354	784	1310	407	903	0.45	1.43
B2067	422	211	0.60	186	-46	160	213	-53	-4.01	0.59
B2068	970	485	1.50	427	-200	260	490	-230	-2.13	1.48
B2069	2041	1021	0.98	898	-470	490	1031	-541	-1.91	0.94
B2070	111	56	1.48	49	56	120	56	64	0.88	1.47
B2071	728	364	1.59	320	-102	250	368	-118	-3.13	1.57
B2072	819	410	1.00	360	-177	210	414	-204	-2.03	0.98
B2074	260	130	1.06	114	86	230	131	99	1.33	1.04
B2075	104	52	0.95	46	137	210	53	157	0.33	0.93
B2076	447	224	0.99	197	4	230	226	4	52.93	0.97
B2077	377	189	1.50	166	8	200	190	10	19.80	1.48
B2078	592	296	0.79	260	-77	210	299	-89	-3.36	0.77
B2079	953	477	1.23	419	-210	240	481	-241	-1.99	1.21
B2080	634	317	1.56	279	-70	240	320	-80	-3.99	1.54
B2081	353	177	1.85	155	89	280	178	102	1.75	1.83
B2082	765	383	1.44	337	-49	330	386	-56	-6.86	1.41
C2001	309	155	2.25	136	99	270	156	114	1.37	2.23
C2002	46	23	2.32	20	223	280	23	257	0.09	2.30
C2003	3728	1864	1.32	1640	7880	10940	1883	9057	0.21	0.37
C2005	61	31	2.31	27	234	300	31	269	0.11	2.28
C2006	401	201	4.27	176	154	380	203	177	1.14	4.24
C2007	20	10	2.14	9	217	260	10	250	0.04	2.12
C2008	69	35	2.45	30	239	310	35	275	0.13	2.42
C2009	128	64	1.58	56	144	230	65	165	0.39	1.56
C2010	101	51	2.32	44	225	310	51	259	0.20	2.29
C2011	357	179	1.30	157	17	200	180	20	9.14	1.28
C2012	132	66	2.51	58	194	290	67	223	0.30	2.48
C2013	140	70	1.81	62	139	230	71	159	0.44	1.79
C2014	268	134	2.30	118	100	250	135	115	1.18	2.28
C2015	180	90	2.31	79	112	220	91	129	0.70	2.29
C2016	438	219	1.86	193	25	250	221	29	7.68	1.84
C2017	1198	599	1.79	527	-326	230	605	-375	-1.61	1.77
C2018	997	499	1.51	439	-212	260	503	-243	-2.07	1.49
C2020	492	246	1.30	216	-33	210	248	-38	-6.45	1.28
C2021	325	163	1.66	143	14	180	164	16	10.34	1.64
C2023	589	295	1.96	259	-41	250	297	-47	-6.27	1.94
C2024	341	171	1.62	150	24	200	172	28	6.20	1.60
C2025	363	182	2.29	160	67	260	183	77	2.39	2.27
C2026	125	63	1.95	55	197	290	63	227	0.28	1.92
C2027	221	111	2.20	97	216	360	112	248	0.45	2.17
C2028	19	10	2.24	8	261	310	10	300	0.03	2.21
C2029	5	3	2.23	2	294	340	3	337	0.01	2.20
C2031	149	75	2.50	66	152	250	75	175	0.43	2.48
C2032	250	125	2.09	110	99	240	126	114	1.11	2.07
C2033	95	48	2.47	42	219	300	48	252	0.19	2.44
C2034	123	62	2.41	54	216	310	62	248	0.25	2.38
C2035	633	317	2.18	279	-35	280	320	-40	-8.06	2.14
C2036	100	50	1.18	44	147	220	51	170	0.30	1.16
C2039	142	71	1.83	62	242	350	72	278	0.26	1.80
C2041	196	98	3.57	86	131	250	99	151	0.66	3.55
C2042	87	44	2.43	38	231	310	44	266	0.17	2.40
C2043	888	444	1.89	391	-147	280	448	-168	-2.66	1.87
C2044	228	114	0.32	100	91	220	115	105	1.10	0.30
C2045	254	127	1.57	112	123	270	128	142	0.91	1.55
C2046	150	75	2.42	66	212	320	76	244	0.31	2.39
C2047	185	93	2.19	81	110	220	93	127	0.74	2.17
C2048	477	239	2.07	210	17	260	241	19	12.60	2.05
C2049	176	88	1.40	77	149	260	89	171	0.52	1.38
C2050	216	108	2.17	95	210	350	109	241	0.45	2.14
C2051	116	58	1.20	51	158	240	59	181	0.32	1.18
C2052	340	170	2.34	150	146	340	172	168	1.02	2.31
C2053	85	43	2.49	37	224	300	43	257	0.17	2.46
C2054	327	164	2.01	144	126	310	165	145	1.14	1.98
C2055	102	51	2.19	45	190	270	52	218	0.24	2.17
C2056	316	158	2.56	139	113	290	160	130	1.22	2.53
C2057	243	122	2.54	107	59	190	123	67	1.82	2.52
C2058	157	79	2.05	69	201	310	79	231	0.34	2.02
C2060	535	268	2.54	235	122	410	270	140	1.93	2.50
C2061	81	41	1.64	36	243	320	41	279	0.15	1.61
C2062	617	309	2.91	271	-10	300	312	-12	-26.90	2.88
C2063	233	117	2.20	103	167	310	118	192	0.61	2.17
C2064	943	472	2.66	415	-162	290	476	-186	-2.56	2.63
C2065	459	230	2.65	202	68	310	232	78	2.96	2.62
C2066	140	70	1.97	62	182	280	71	209	0.34	1.95
C2067	231	116	2.57	102	107	240	117	123	0.95	2.55
C2068	191	96	1.70	84	134	250	96	154	0.63	1.68
D2001	1022	511	2.07	450	-232	250	516	-266	-1.94	2.05
D2002	791	396	1.89	348	-113	270	399	-129	-3.09	1.87
D2003	125	63	1.06	55	110	190	63	127	0.50	1.04
D2004	651	326	1.99	286	-69	250	329	-79	-4.17	1.97
D2005	414	207	0.92	182	-25	180	209	-29	-7.19	0.90
D2007	55	28	1.69	24	202	260	28	232	0.12	1.67
D2009A	861	431	2.17	379	3711	4700	435	4265	0.10	1.76
D2010	115	58	1.55	51	906	1100	58	1042	0.06	1.45
D2011	269	135	1.72	118	108	260	136	124	1.09	1.70
D2012	573	287	2.45	252	27	320	289	31	9.45	2.42
D2013	412	206	2.32	181	97	320	208	112	1.86	2.29
D2014	4537	2269	0.77	1996	2539	5210	2291	2919	0.78	0.32
D2016	1272	636	1.60	560	2608	3640	642	2998	0.21	1.28
D2017	119	60	2.42	52	200	290	60	230	0.26	2.39
D2018	222	111	2.35	98	181	320	112	208	0.54	2.32
D2019	818	409	2.09	360	-98	300	413	-113	-3.65	2.06
D2020	327	164	1.97	144	126	310	165	145	1.14	1.94
D2021	46	23	2.53	20	267	330	23	307	0.08	2.50
D2022	262	131	2.28	115	276	450	132	318	0.42	2.24
D2023	217	109	2.28	95	183	320	110	210	0.52	2.25
D2024	548	274	1.84	241	-15	260	277	-17	-16.53	1.82
D2025	189	95	2.37	83	169	290	95	195	0.49	2.36
D2026	99	50	2.38	44	200	280	50	230	0.22	2.36
D2027	65	33	2.42	29	285	360	33	327	0.10	2.39
D2028	211	106	2.48	93	99	220	107	113	0.94	2.46
D2029	47	24	1.81	21	206	260	24	236	0.10	1.79
D2030	241	121	2.06	106	120	260	122	138	0.88	2.04
D2031	210	105	2.26	92	134	260	106	154	0.69	2.24
D2032	1026	513	2.39	451	-68	440	518	-78	-6.63	2.35
D2033	551	276	0.50	242	236	550	278	272	1.02	0.45
D2034	1919	960	2.47	844	1036	2160	969	1191	0.81	2.28
D2036	1969	985	2.51	866	501	1570	994	576	1.73	2.37
D2037	2637	1319	2.12	1160	1164	2670	1332	1338	1.00	1.89
D2039	2423	1212	1.56	1066	275	1540	1224	316	3.87	1.41
D2041	1002	501	1.98	441	595	1190	506	684	0.74	1.88
D2042	323	162	2.24	142	76	250	163	87	1.88	2.22
D2043	63	32	0.92	28	112	160	32	128	0.25	0.91
D2044	240	120	2.34	106	356	530	121	409	0.30	2.29
D2045	112	56	2.49	49	177	260	57	203	0.28	2.47
D2046	148	74	2.46	65	161	260	75	185	0.40	2.44
D2047	87	44	2.14	38	205	280	44	236	0.19	2.12
E2001	310	155	2.95	136	90	260	157	103	1.51	2.93
E2002	77	39	3.08	34	227	300	39	261	0.15	3.05
E2003	372	186	2.38	164	63	260	188	72	2.60	2.36
E2004	178	89	1.75	78	104	210	90	120	0.75	1.73
E2005	6	3	2.16	3	232	270	3	267	0.01	2.14
E2006	50	25	2.31	22	178	230	25	205	0.12	2.29
E2007	78	39	2.28	34	166	230	39	191	0.21	2.26
E2008	569	285	2.31	250	-41	240	287	-47	-6.07	2.29
E2009	183	92	2.56	81	398	550	92	458	0.20	2.51
E2010	10	5	2.19	4	222	260	5	255	0.02	2.17
E2011	15	8	2.08	7	211	250	8	242	0.03	2.06
E2012	12	6	2.19	5	247	290	6	284	0.02	2.16
E2013	23	12	2.22	10	225	270	12	258	0.04	2.20
E2014	128	64	2.91	56	66	140	65	75	0.86	2.90
E2015	12	6	1.36	5	151	180	6	174	0.03	1.34
E2016	162	81	1.70	71	68	160	82	78	1.05	1.69
E2017	96	48	1.89	42	167	240	48	192	0.25	1.87
E2018	109	55	1.68	48	126	200	55	145	0.38	1.66
E2019	77	39	2.28	34	218	290	39	251	0.15	2.25
E2020	92	46	2.51	40	212	290	46	244	0.19	2.48
E2021	134	67	2.06	59	185	280	68	212	0.32	2.04
E2023	87	44	2.37	38	214	290	44	246	0.18	2.34
E2024	50	25	1.97	22	204	260	25	235	0.11	1.95
E2025	15	8	2.18	7	237	280	8	272	0.03	2.16
E2026	54	27	2.13	24	220	280	27	253	0.11	2.11
E2027	248	124	2.07	109	109	250	125	125	1.00	2.05
E2029	8	4	1.44	4	127	150	4	146	0.03	1.43
JC310A	494	247	1.76	217	9	260	249	11	23.69	1.74
JC310B	182	91	1.76	80	181	300	92	208	0.44	1.73
JC319	161	81	2.38	71	138	240	81	159	0.51	2.36
JC330	226	113	0.89	99	31	150	114	36	3.18	0.88
JC331	47	24	2.59	21	206	250	24	236	0.10	2.57
JC411	711	356	0.64	313	-164	170	359	-189	-1.90	0.63
JC432	87	44	2.51	38	223	300	44	256	0.17	2.48
JC436	125	63	2.56	55	232	330	63	267	0.24	2.53
JC507	726	363	0.94	319	-162	180	367	-187	-1.96	0.92
JC605	525	263	2.54	231	178	470	265	205	1.29	2.50
JC632	101	51	2.48	44	199	280	51	229	0.22	2.46
JC704	36	18	2.17	16	202	250	18	232	0.08	2.15

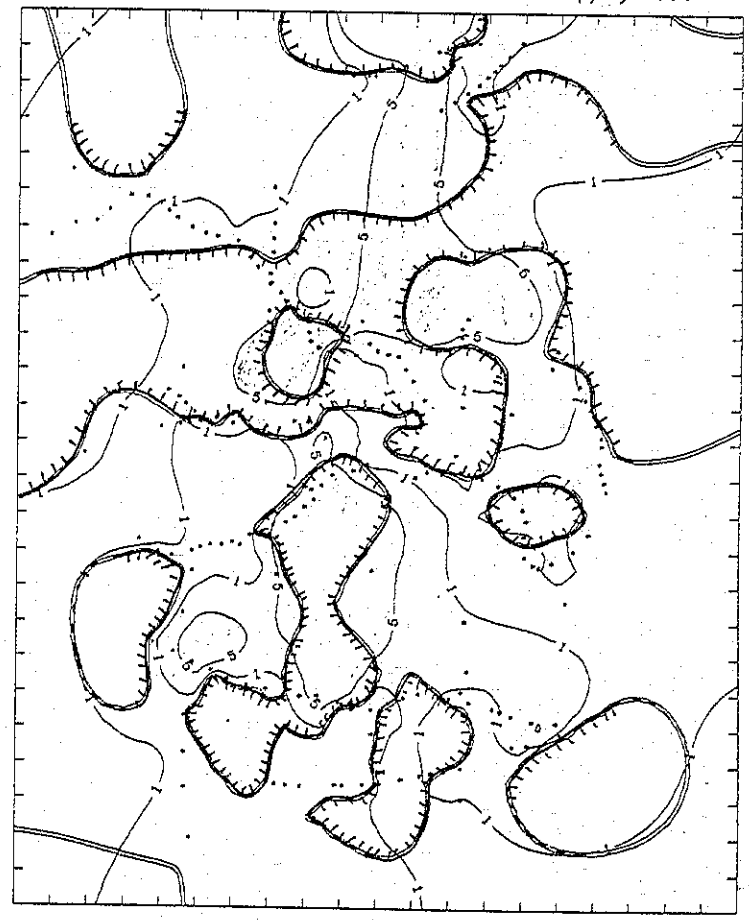
Contour Map of the Contents of Cu,Fe & S

Fe for Py(ppm)



Contour Map of the Contents of Cu,Fe & S

Cp/Py ratio



Double solid lines show negative Cp/Py ratio.

Fig.II–3–7 Distribution of normative chalcopyrite–pyrite

3-3 Geophysical Survey

3-3-1 Purpose of Survey and Survey Method

The purpose of this survey is to clarify the relation with the existing mineralization and the geochemical anomalies in the Rio Magdalena Zone, Cuellajc area. To meet the above, an investigation of the electrical structure of the area was carried out by clarifying the distribution of IP anomalies in the survey area by means of a conventional IP method.

The measurements were done by using the frequency-domain method at the frequencies of 3.0 Hz and 0.3 Hz, and adopting a dipole-dipole electrode configuration with a separation factor 'n' from 1 to 5.
Based upon the geological structure, seven survey lines of 2000 m each in length were set along a N-S direction with a 250 m line spacing. The numbering of the survey points were set one by one from 0 to 40 with a 50 m interval from the north end of each line. The IP field measurements were carried out every 100 m spacing with 100 m dipoles.

The locations of the survey lines are illustrated in Fig.II-3-8.
Instruments used for the conventional IP survey, manufactured in Japan, are shown below.

Equipment	Model	Specification	Quantity
IP Transmitter	CH-8104T	2.5A, 800V	1
IP Receiver	CH-8104R		1
IP Checker	522A		1
Engine Generator	GPU-2000	2KW, 150V, 400Hz	1
Electrode Remote Controller	CH-60A	64 ch	1
Transceiver	ICB-87	500 mW	6

3-3-2 Analysis Method

Fig.II-3-9 shows the procedure used for IP data analysis and interpretation.

(1) Calculation of apparent resistivity and percent frequency effect(PFE)

The field measurements were conducted by supplying electric current (I_{ac}) at 3.0 Hz into the ground through a pair of current electrodes (C1, C2) and detecting the corresponding potential difference (V_{ac}) with a pair of potential electrodes (P_1, P_2).

The apparent resistivity (ρ) of the ground is calculated by applying the measured potential difference to the following equation:

$$\rho = K \cdot \frac{V_{ac}}{I_{ac}} (\Omega \cdot m)$$

Where, K is a geometric factor which depends on the electrodic configuration utilized and given by the following formula:

$$K = \frac{2\pi}{\frac{1}{C_1P_1} - \frac{1}{C_1P_2} - \frac{1}{C_2P_1} + \frac{1}{C_2P_2}}$$

$C_iP_j(i,j=1,2)$ represents the distance between the current electrode C_i and the potential electode P_j.

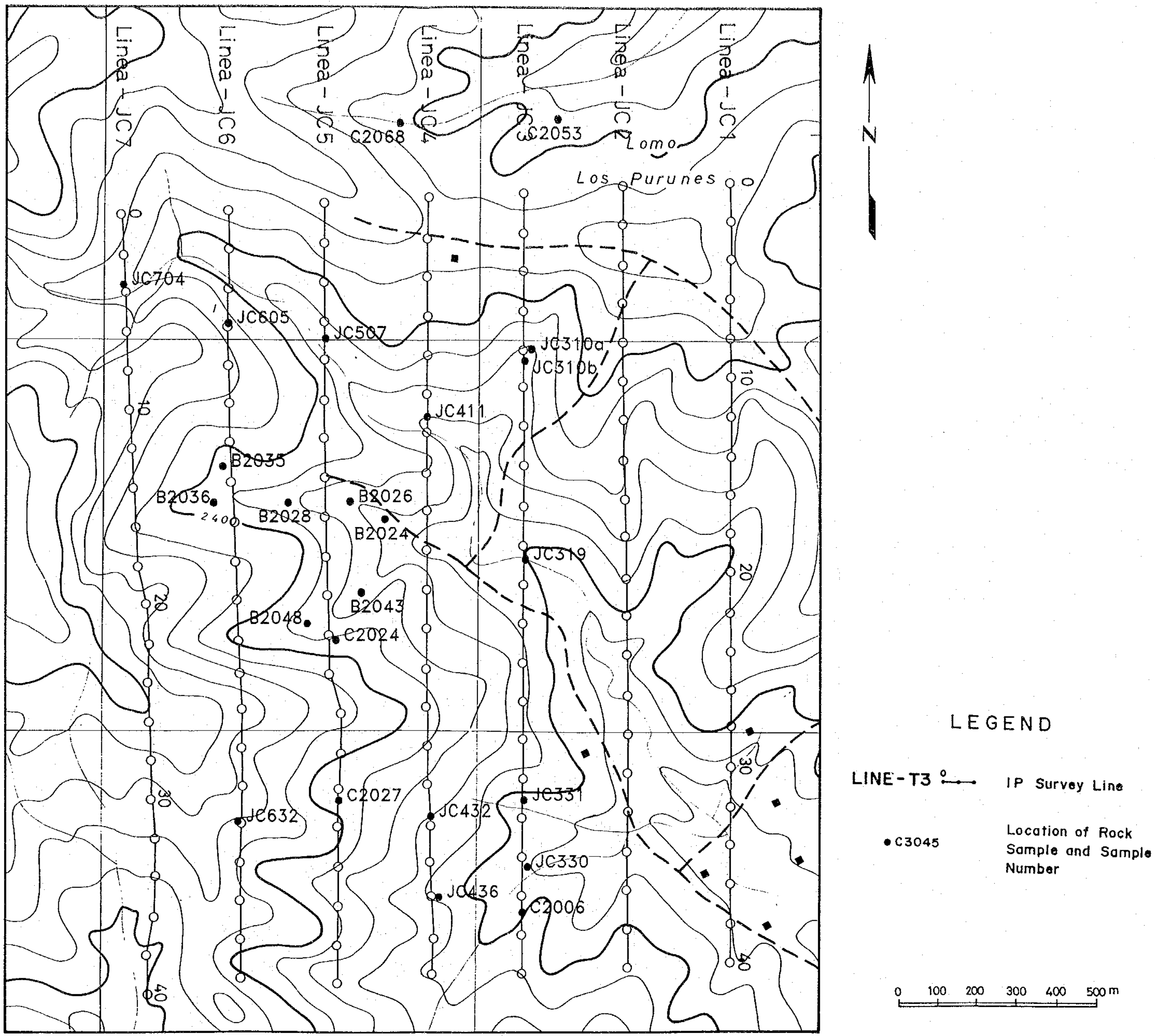


Fig.II-3-8 Location of Survey Lines and Rock Samples

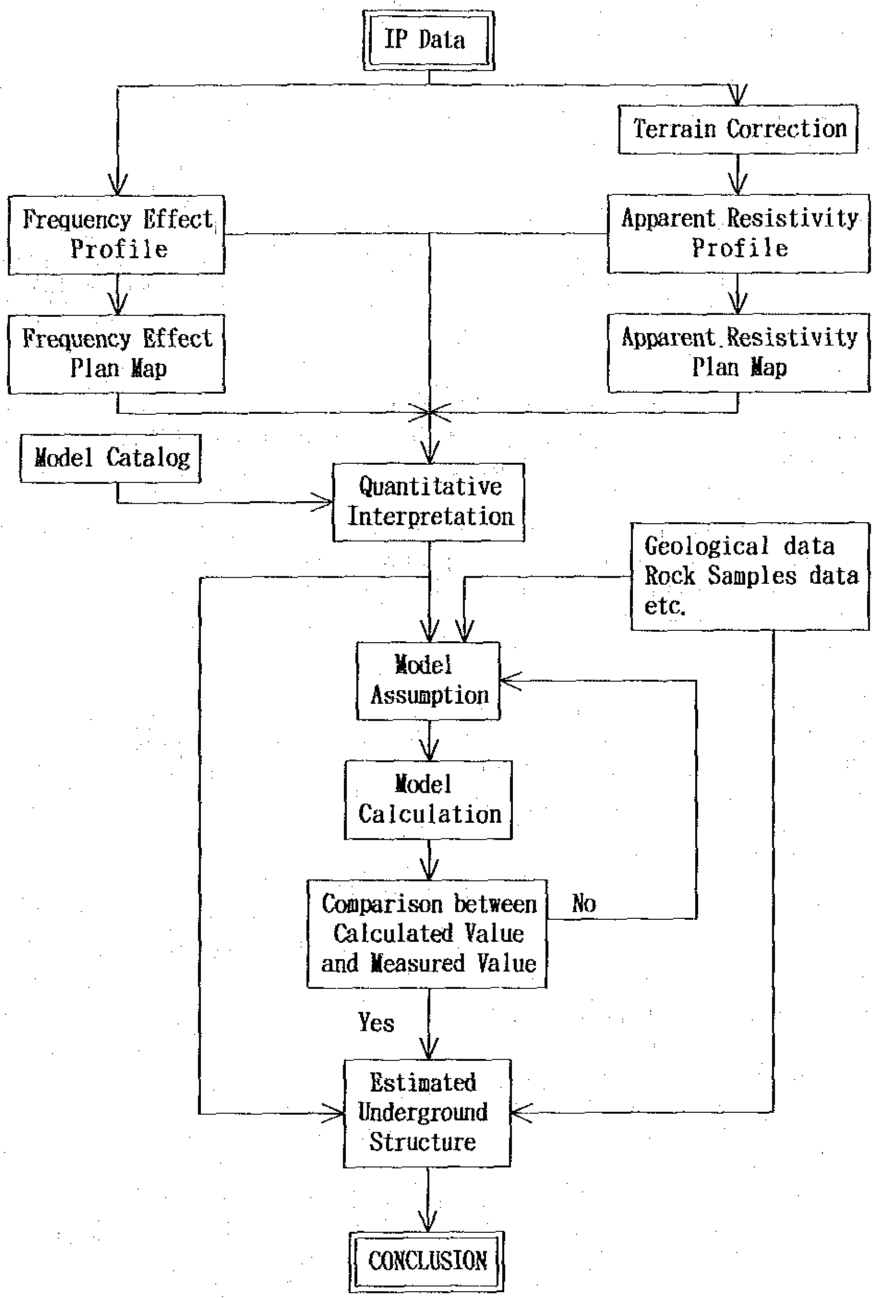


Fig. Ⅱ－3－9 Flow chart of IP data analysis

After reading the potential difference Vac at 3.0 Hz, the frequency is changed to 0.3 Hz while the current is kept constant. The percent frequency effect (PFE) can then be directly read by a meter on the receiver panel and calculated by the following formula, which is also a function of change in resistivity as the frequency is changed.

$$PFE=\frac{V_{dc}-V_{ac}}{V_{ac}}\times100=\frac{\rho_{dc}-\rho_{ac}}{\rho_{ac}}\times100(\%)$$

The value of the apparent resistivity (ρ_{app}) and PFE are plotted at the intersection of lines extending downward at 45° from the transmitter and receiver midpoints. Since the depth of plotting does not represent the physical property with depth, this pseudo-section does not give a true section of the surface distribution of the IP effect.

(2) Terrain correction

Since the geometrical factor K is calculated as a function of the location of the current and potential electrodes on half-infinite plane, ρ_{app} is affected by the topography depending on the location of electrodes, even if the terrain is homogeneous. For example, for the case of a dipole-dipole configuration, ρ_{app} appeares to be high beneath a hill and low beneath a valley. On the other hand, PFE is less affected by topography because it is rather proportional to the ratio of the resistivity difference at two frequencies.

Since the topography of the survey area is comparatively steep and rugged, the correction was performed for all survey lines by means of a finite element method assuming a two dimensional half space topography. The pseudo-sections and plane maps were drawn using the topographic corrected values.

(3) Electrical measurement of rock samples

Electrical measurements on rock samples were carried out in order to determine the actual electrical properties of rocks distributed on the survey area. The rocks collected from the surface were formed into a cubic shape. Their measurements were realized in water saturated condition after the rocks were soaked in water during ten days.

The resistivities of the rock samples are calculated by following equation:

$$\rho=\frac{a_1\times a_2}{l}\times\frac{V}{I}$$

where ℓ : thichness of the sample (cm)
a_1 & a_2 : width of the sample (cm)
V : potential difference (V)
I : electric current (A)

As same as for the case of field survey, the PFE calculations of the samples, were calculated by using the resistivity difference at 0.3 Hz and 3.0 Hz.

(4) Simulation analysis

For the analysis and interpretation of IP data, two methods are mainly used: one qualitative and another quantitative.

The qualitative method correlates the anomaly patterns of profile and plane map in reference to precomputed standard anomaly patterns derived from various simple physical structural models of the subsurface. The quantitative method compares the observed data with theoretical data calculated from the simulated physical structure.

These two methods were combined to obtain better results. Pseudo-sections were modeled by using meshes which assumed PFE and resistivity values on the basis of geology, standard models and results of electrical measurement of rock samples. The theoretical values were then calculated by numerical analysis using two-dimensional finite element techniques.

Further comparisons between the calculated values and observed data permitted to change the various parameters of the model in order to approach efficiently the observed values. By this iterative procedure and

guided by existing geoscientific information of the zone, it was possible to obtain the most reasonable model of the underground physical structure.
Simulation analysis were mostly carried out for the lines JC6 and JC7, to clarify the lateral (west ward) and vertical extension of the main mineralization.

3-3-3 Survey Results and Interpretation

(1) Results of rock sample measurements

Resistivity and PFE values were measured for 26 rock samples collected in Rio Magdalena Zone, Cuellaje area. The location of the collected samples are shown in Fig.II-3-8, and the corresponding measurement results are indicated in Table II-3-6.

The collected rock samples consisted of granodiorite (20 pieces), porphyric granodiorite (2 pieces), diorite porphyry (2 pieces) and andesite porphyry (2 pieces).

The resistivity of rock samples ranges from 605 to 14,182 Ω-m. Accordingly, it is difficult to identify the rock description from the resistivity. However, their values are indicative of the degree of alteration , i.e., the resistivity changes indicate tendencies, for instance, resistivity values of argillized (within chloritized) rocks are lower and silicified rocks are higher.

The PFE values, which are generally indicative of sulfide contents, range from 1.0 to 43.0 %, with changes that do not depend on the rock description. In the case of most of the samples, mainly granodiorite, their PFE values are inversely proportional to their resistivity values, i.e., low resistivity rocks indicate high PFE and high resistivity rocks indicate low PFE.

If in addition, mineralization and limonitization factors are taken into consideration, the results can be summarized as follow:

1) Rock samples were classified by using the boundary value of 2,000 Ω-m resistivity and 10% PFE. Mineralized (due mostly to pyritization) samples correspond to lower resistivity and higher PFE while weak mineralized and limonitized samples are related to higher resistivity and lower PFE.
2) Rock samples with chalcopyrite distribute around 2,000 Ω-m resistivity, and with a PFE range from 5.5 to 20.0%.
3) Rock samples with limonitization indicate high resistivity (3,363 to 7,903 ohm-m) and PFE less than 3.1%.

In Rio Magdalena Zone, it is therefore concluded that the argillization, chloritization and pyritization processes caused a decrease in resistivity and an increase in PFE. On the other hand, high resistivity with low PFE values are found to be due to silicification and limonitization. Moreover, it is considered that the mineralized zone with chalcopyrite seems to correspond to medium resistivity with high to very high PFE values.

(2) Distribution of apparent resistivity(ρ_{app}) and PFE (Fig.II-3-10, Fig.II-3-11 and Fig.II-3-12)

In Rio Magdalena Zone, apparent resistivity values were detected in the range from 16.5 to 4,239 Ω-m with a logarithmic average of 317 Ω-m. On this basis and in this report, ρ_{app} of more than or equal to 650 Ω-m are defined as high ρ_{app}; 250 to 650 Ω-m as medium ρ_{app}, and less than 250 Ω-m as low ρ_{app}.
On the other hand, the PFE values were obtained in the range from -0.5 to 12.5 % with an average of 5.1 %. Accordingly, PFE can be divided into four ranges: very high PFE: more than or equal to 7.0 %, high PFE: from 5.0 to 7.0 %, medium PFE: from 3.0 to 5.0 % and low PFE: less than 3.0 %.
On the basis of the above considerations, the distributions of apparent resistivity can be roughly described as high from west to south and low from east to north. Tendencies in PFE can be also roughly seen as high in the west and low in the east. High PFE is seen distributed as a C-shape.

Combining the above results, it can be stated that in the survey area, high ρ_{app} corresponds to a high PFE, while a low ρ_{app} corresponds also to a low PFE, which is actually in no agreement with the result obtained from the rock sample measurements. This fact can be partially explained by the low ρ_{app} with low PFE weathered layer found distributed surface in the south-eastern part of the survey area.
From the mineralization point of view, it can be stated that the high PFE tendency detected in western district, suggests a stronger mineralization than in eastern district. Moreover, the IP anomalies partially detected as low ρ_{app} with high PFE in the northeastern part and central western part correspond to the results of rock sample measurements.

In this area, the following types of IP Anomalies are seen:

IP Anomaly Type (1)

Low ρ_{app} with high to very high PFE corresponds to the mineralized zone which is rich in sulfide contents such as pyrite and chalcopyrite with strong argillization and chloritization. According to the geological and geochemical survey results obtained in this area, a porphyry copper type ore deposit is expected to be found. In this area, two IP anomalies of this type are seen:

<u>IP Anomaly A</u>: Detected around Lines JC2 and JC3 with No.7 as center on the northeastern part of this area.

<u>IP Anomaly B</u>: Detected on central part of Lines JC6 and JC7 in the western district.

IP Anomaly Type (2)

Mideum ρ_{app} with high to very high PFE correspond to the mineralized zone which is rich in sulfide as same as in the above mentioned Type (1). However, as the argillization and the chloritization are not as strong as in Type (1), this anomaly type is likely to be related to silicification.

In this area, the detected anomalies of this type are:

<u>IP Anomaly C</u>: Shallow anomaly detected in the northwestern part of this area, with center at No.7 on Line JC7.

<u>IP Anomaly D</u>: Detected in northern end of Line JC4, and likely to be extended to the north from survey area.

IP Anomaly Type (3)

High ρ_{app} with high to very high PFE corresponds to the mineralized zone which is rich in sulfide with a strong silicification similar to vein type ore deposits.

In this area, the detected anomaly of this type is:

<u>IP Anomaly E</u>: Detected from No.32 on Line JC3 to No.32 on Line JC6 in southern district.

(3) Simulation Analysis

Due to the strong pyritizated mineralization suggested by the results of geochemical survey in this year, the IP Anomaly A, mentioned above, is not considered in this report as an object for the simulation analysis, however, IP Anomaly B, which indicated a promissing high grade of copper was considered important for the simulation analysis.

The results of two dimensional model simulation for Line JC6 and JC7 are shown in Fig.II-3-13 and Fig.II-3-14.

The results of the simulation analysis can be briefly described as follow:

On Line JC6, six blocks (Nos. 16, 17, 18, 19, 20 and 21) are analized as high PFE bodies.

- Block No.16 is assumed medium resistivity with high PFE, corresponding to IP Anomaly C (mineralized zone E).
- Assumed high PFE blocks Nos.17, 18, 19 and 20 correspond to IP Anomaly B (mineralized zone A).
- Low resistivity with high PFE blocks No.17 and 19, suggest the surface mineralization seen around stations Nos.13 and 22.
- Block No.18 assumed among them suggests hidden mineralized zone under the ridge.
- Under the station No.28 unconfirmed mineralization, a hidden high PFE block No.21 is assumed which corresponds to the IP Anomaly E (southern mineralized zone).

On Line JC7, fourteen high PFE bodies are analized as blocks Nos.21 to 34.

- The high PFE results indicate that the scale of high PFE bodies are bigger than those of Line JC6.
- The IP Anomalies B, C and E contribute to the above mentioned scale, increasing the PFE values.
- Most of the high PFE bodies that correspond to the IP Anomalies B and E are analized deeper than the ones of Line JC6.

In consideration to the above, the mineralized zone that corresponds to the IP Anomalies B and E are interpreted as extended and expanded toward the western deep.

Table II-3-6 Resistivity and Percent Frequency Effect of Rock Samples

	Sample No.	AR (Ohm-m)	PFE (%)	Description	Alteration	MS (10 SIU)
1	B2024	2,067	7.8	gd	sil(2),arg(1)	7.82
2	B2026	915	20.0	and.por	sil(2)	7.82
3	B2028	2,132	5.5	gd, cp-bo-mala diss/ntwk, moly vlet	sil(3),arg(2)	4.10
4	B2035	605	23.0	gd, py-qtz vlet	sil(1),arg(2)	1.68
5	B2036a	1,584	8.0	gd, py-mala-cp diss	sil(2),arg(1)	9.80
6	B2036b	1,620	20.0	gd, py-mala-cp film/diss	sil(2),arg(1)	9.80
7	B2036c	2,065	16.0	ditto		9.80
8	B2043	5,436	2.5	gd, limo film	sil(2)	3.86
9	B2048	2,255	9.7	gd, py-cp-cc-bo diss/film	sil(3),arg(1)	3.84
10	C2006	1,305	6.1	and.por		15.20
11	C2024	7,903	1.4	por.gd, limo ntwk	sil(2)	6.70
12	C2027	4,476	4.2	gd	sil(2)	16.10
13	C2053	1,819	15.5	gd, py film		16.30
14	C2068	4,674	3.0	gd	sil(2)	10.80
15	JC310a	11,054	2.0	gd, limo film	sil(2),arg(1)	3.74
16	JC310b	988	43.0	gd, fine py film	chl(1),sil(2),epi(1),arg(1),Kf(1)	0.09
17	JC319	3,363	3.1	gd, fine py-limo	epi(1),chl(1)	17.40
18	JC330	14,182	2.0	gd, qtz vein	sil(3),arg(1)	0.05
19	JC331	2,113	11.5	gd	chl(1),epi(1)	38.20
20	JC411	3,723	9.7	dp, py-mala diss	sil(3),arg(3)	0.06
21	JC432	1,214	16.8	hb-bio-gd, fine py	chl(1),epi(1)	19.30
22	JC436	2,020	8.6	dp		21.10
23	JC507	4,174	2.7	gd, limo film	sil(2),arg(1)	3.32
24	JC605	1,142	15.5	gd, py film	sil(1),chl(1),epi(1)	16.50
25	JC632	7,617	1.0	por.hb-bio-gd	chl(1),epi(1)	23.20
26	JC704	1,513	13.0	gd, bio-chl-fine py ntwk	chl(1),epi(1)	24.60

AR : Apparent Resistivity   PFE: Percent Frequency Effect
MS : Magnetic Susceptibility

gd : granodiorite
por: porphyry
py : pyrite
moly: molybdenum
cc : chalcocite
ntwk: network
epi: epidotization
arg: argillization
and: andesite
bio: biotite
cp : chalcopyrite
bo : bornite
chl: chlorite
vlet: veinlet
chl: chloritization
Kf : Kali-feldspar
dp :diorite porphyry
hb : hornblende
limo: limonite
mala: malachite
qtz: quartz
diss: dissemination
sil: silicification

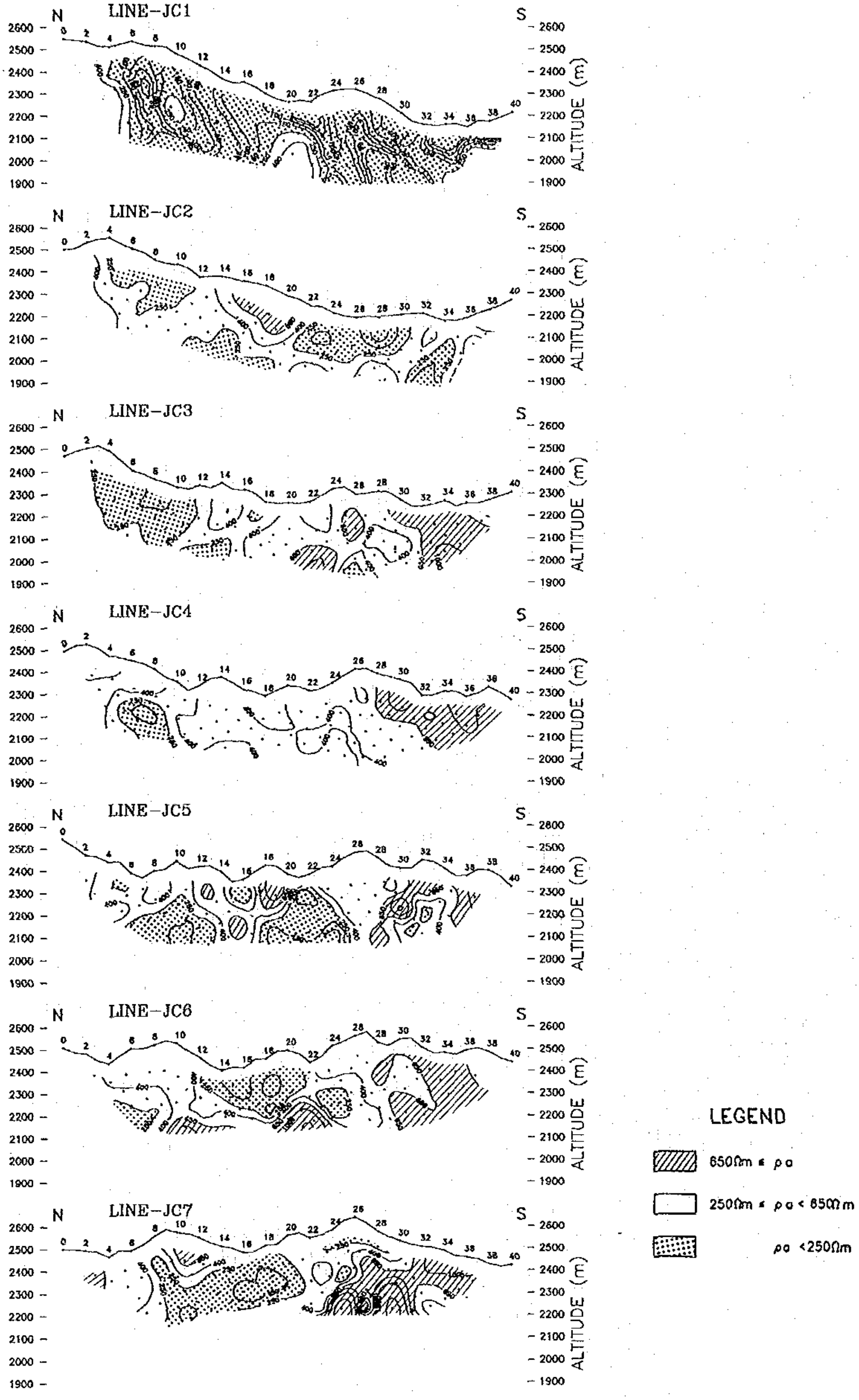


Fig.II-3-10 Pseudo-sections of Apparent Resistivity

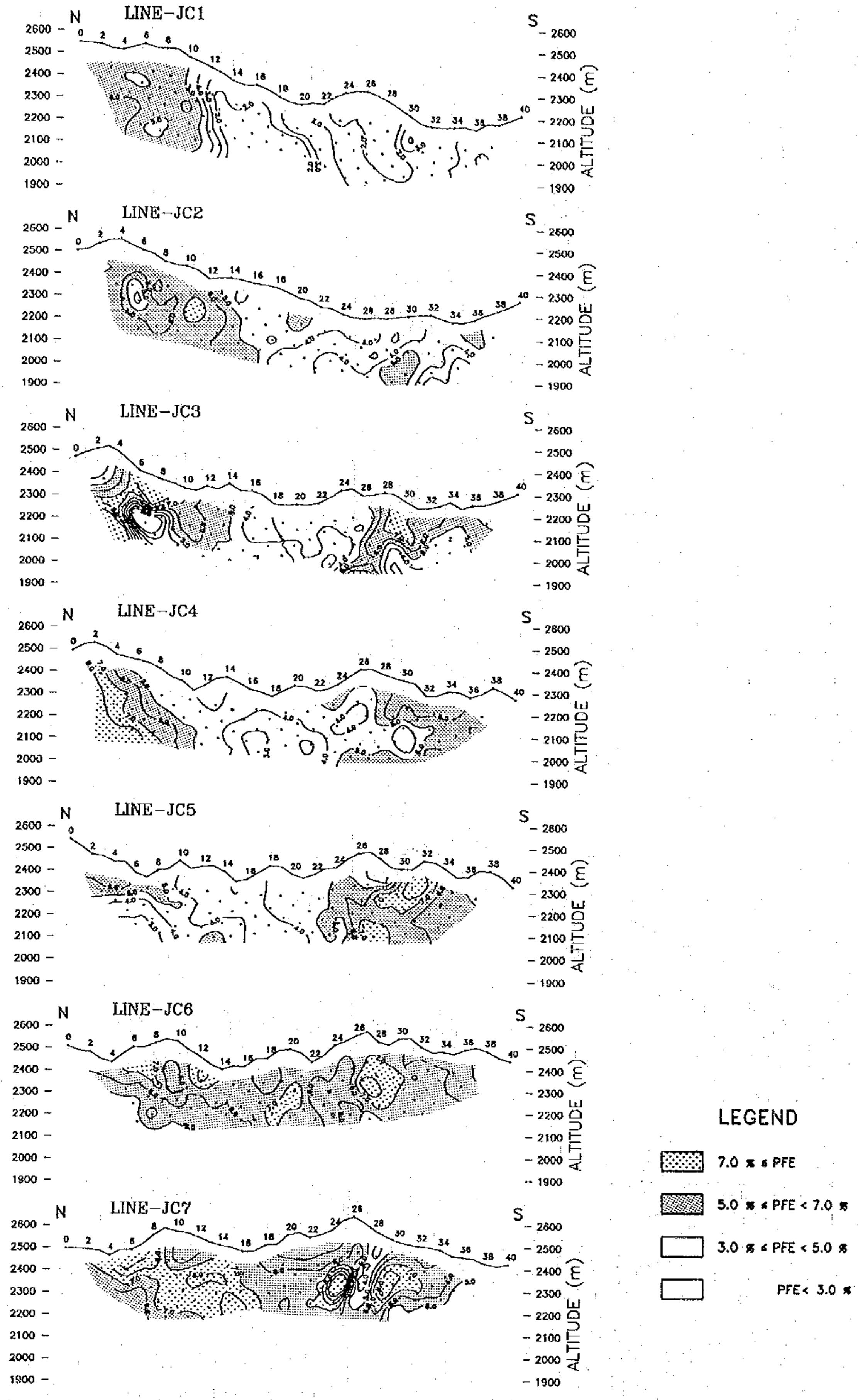
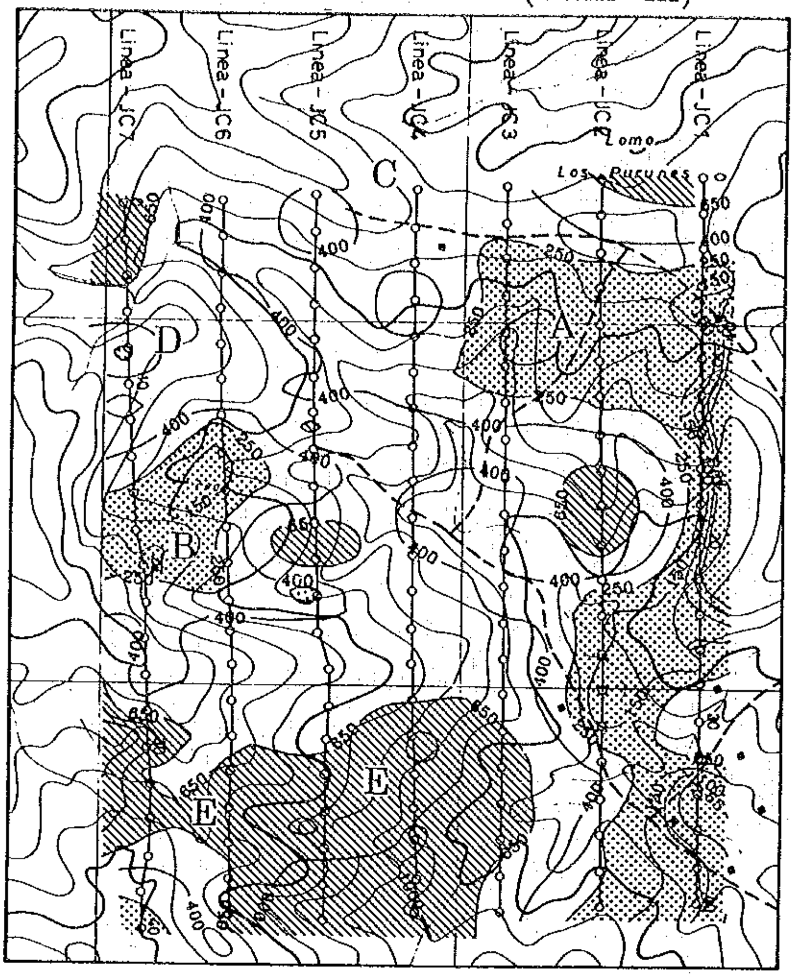


Fig.II-3-11 Pseudo-sections of Percent Frequency Effect

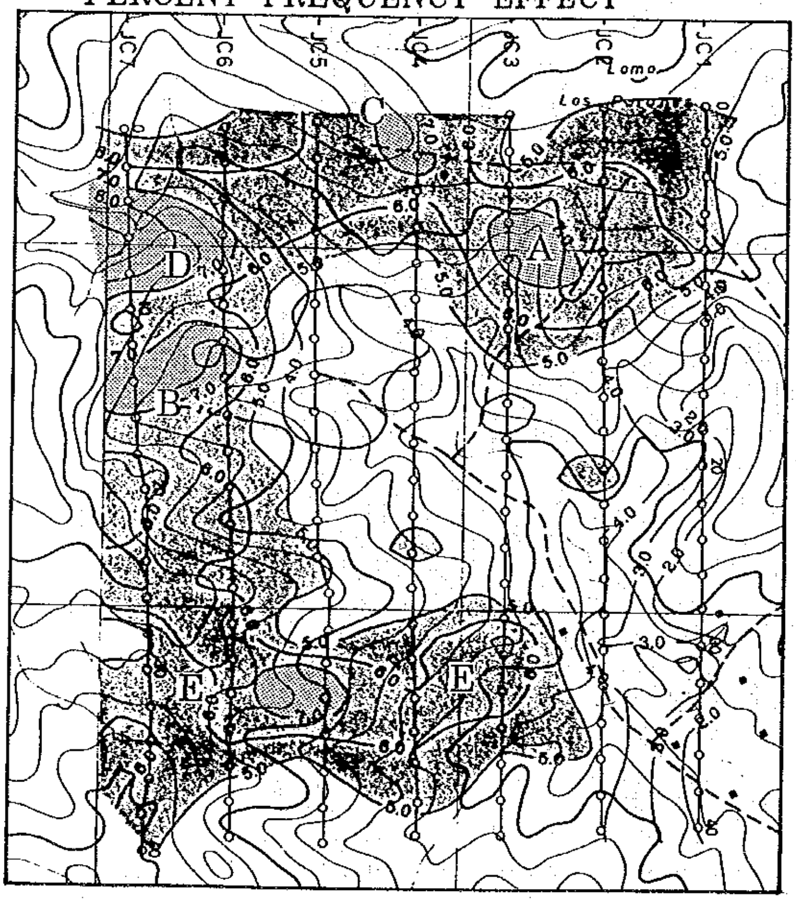
APPARENT RESISTIVITY (ohm-m)



LEGEND

- 650Ωm ≤ ρa
- 250Ωm ≤ ρa < 650Ωm
- ρa <250Ωm

PERCENT FREQUENCY EFFECT



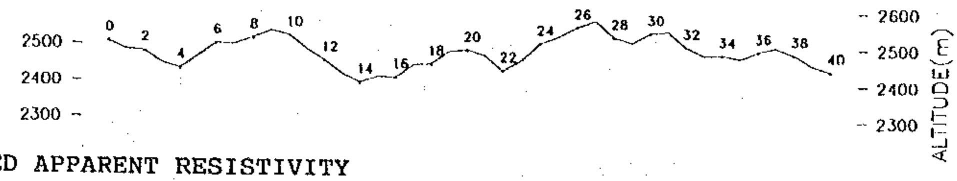
LEGEND

- 7.0 % ≤ PFE
- 5.0 % ≤ PFE < 7.0 %
- 3.0 % ≤ PFE < 5.0 %
- PFE< 3.0 %

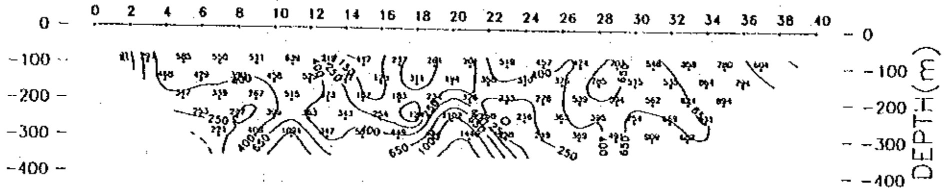
0 100 200 300m

Fig.II-3-12 Plane Map of Apparent Resistivity and Percent Frequency Effect (n=1)

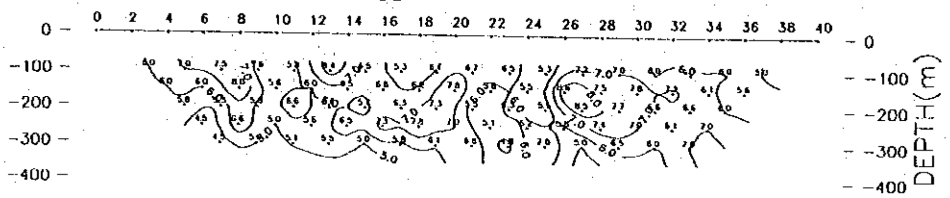
TOPOGRAPHY



OBSERVED APPARENT RESISTIVITY

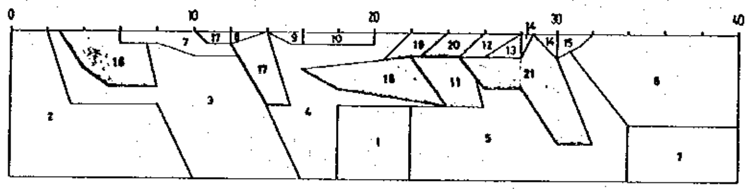


OBSERVED PERCENT FREQUENCY EFFECT

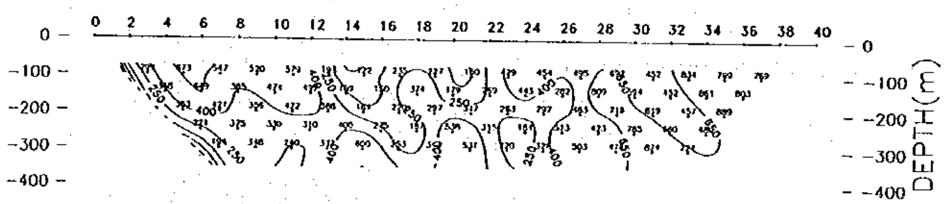


ASSUMED MODEL

CODE NUMBER :	1	2	3	4	5	6	7	8	9	10
RESIS(ohm-m):	4000.	250.0	500.0	300.0	500.0	800.0	950.0	250.0	250.0	120.0
P.F.E. (%) :	4.00	5.50	5.50	5.50	4.50	6.00	5.50	3.50	5.50	4.50
CODE NUMBER :	11	12	13	14	15	16	17	18	19	20
RESIS(ohm-m):	400.0	800.0	500.0	400.0	1000.	650.0	150.0	200.0	2500.	800.0
P.F.E. (%) :	4.50	4.00	5.00	4.50	6.00	7.50	7.50	9.00	7.50	7.00
CODE NUMBER :	21									
RESIS(ohm-m):	500.0									
P.F.E. (%) :	10.0									



CALCULATED APPARENT RESISTIVITY



CALCULATED PERCENT FREQUENCY EFFECT

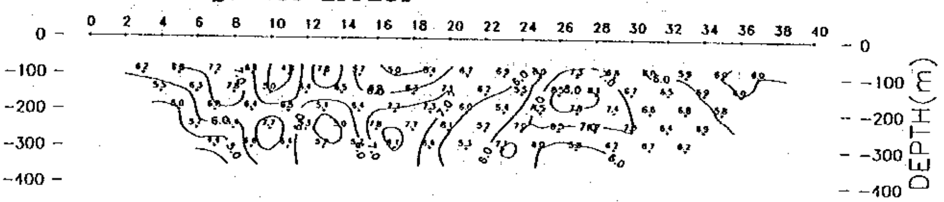
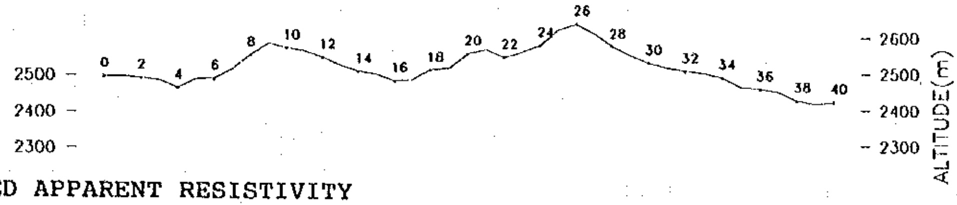
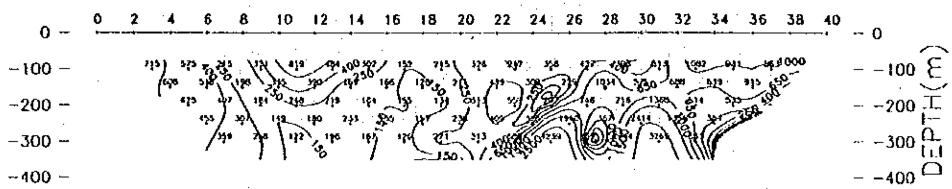


Fig.II-3-13 Results of Model Simulation (Line-JC6)

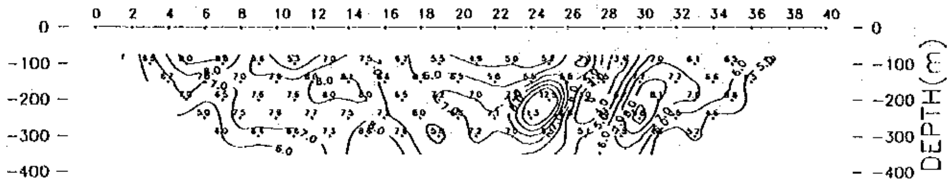
TOPOGRAPHY



OBSERVED APPARENT RESISTIVITY

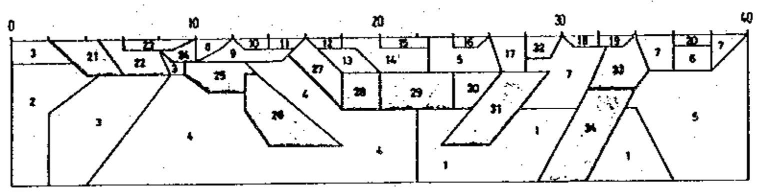


OBSERVED PERCENT FREQUENCY EFFECT

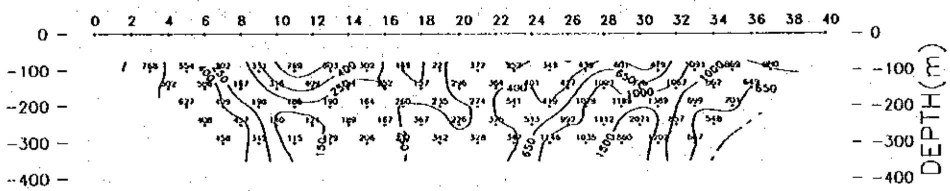


ASSUMED MODEL

CODE NUMBER :	1	2	3	4	5	6	7	8	9	10
RESIS(ohm-m):	6000.	2000.	750.0	150.0	350.0	950.0	1400.	450.0	900.0	950.0
P.F.E. (%) :	5.00	4.00	5.50	6.00	5.00	4.50	6.00	5.50	6.00	4.00
CODE NUMBER :	11	12	13	14	15	16	17	18	19	20
RESIS(ohm-m):	850.0	800.0	150.0	400.0	200.0	250.0	350.0	300.0	3000.	1000.
P.F.E. (%) :	5.00	6.00	6.00	5.00	4.50	6.00	6.50	5.00	5.00	5.50
CODE NUMBER :	21	22	23	24	25	26	27	28	29	30
RESIS(ohm-m):	850.0	180.0	850.0	900.0	250.0	250.0	150.0	250.0	1000.	350.0
P.F.E. (%) :	9.50	8.50	9.00	7.00	8.50	12.0	8.00	9.00	10.0	7.50
CODE NUMBER :	31	32	33	34						
RESIS(ohm-m):	2000.	300.0	1500.	4000.						
P.F.E. (%) :	15.0	7.50	7.00	15.0						



CALCULATED APPARENT RESISTIVITY



CALCULATED PERCENT FREQUENCY EFFECT

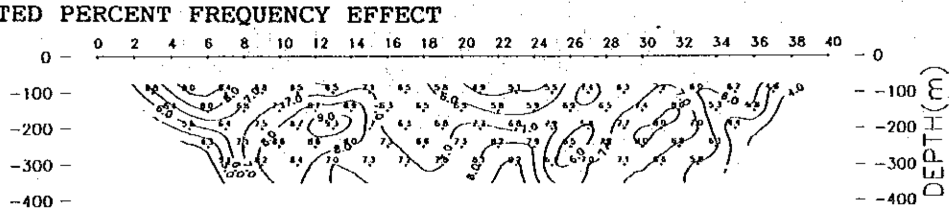


Fig.II-3-14 Results of Model Simulation (Line-JC7)

3-4 Consideration

In the Rio Magdalena Zone, the following mineralized zones are developed: mineralized zones A,B,C and E belonging to Type I; two south mineralized zones belonging type II; and mineralized zone D belonging to type III. A part of the mineralized zone C is overlapped by the mineralized zone D.

The mineralized zone A is the biggest one among them and is observed on area of 500 m x 400 m. Stockwork to dissemination deposits distribute in the center, film deposits around them. The mineral assemblage of alteration minerals shows zonal distribution which is in harmony with the mineralization types: quartz-sericite-chlorite-pyrite zone and chlorite-calcite zone in outward order. These zonal assemblages coincide with phyllic alteration zone and propylitic alteration zone of general porphyry copper deposit. The zoning of mineralization is also coincide markedly with that of general porphyry copper deposit. Average ore assay result is 0.6 % of Cu. The scale of the mineralization and Cu grade in this area ranks next to those of the Q.Limonita-Q.Verde mineralized zone of Central Zone of Junin area and the Q.Fortuna mineralized zone of Surrounding Zone of Junin area.

On the basis of correlation between geochemical anomaly and mineralization, high factor score distribution zones of Cu-Mo-Au-Ag were delineated on the mineralization A and E, south mineralized zone and northeastern part, high factor score distribution zones of Au-Ag on the mineralized zone D (Fig.II-3-6).

Owing to correlation between geophysical anomaly and mineralization, middle to low apparent resistivities and high to middle percent frequency effects were detected inside and/or beside the mineralized zones A and E, middle apparent resistivity and middle to low percent frequency effect inside and/or beside the mineralized zone D, and high apparent resistivity and high to middle percent frequency effect inside and/or south mineralized zone.

As to evaluation of IP anomaly by contents of normative chalcopyrite-pyrite, IP anomaly is proportion to total amounts of sulfide minerals. It seems that IP anomalies on the mineralized zone A and E are caused by same amount of chalcopyrite and pyrite, IP anomaly on the south mineralized zone pyrite > chalcopyrite, and IP anomaly on the northeastern part pyrite.

PART III CONCLUSIONS AND RECOMMENDATIONS

Chapter 1 Conclusions

(1) Geology of Junin area (Figs.II-1-1 and II-2-1)

Geology of Junin area consists of Apuela-Nanegal batholith of granodiorite and stocks or dikes of quartz porphyry and diorite porphyry, which intrude into batholith of granodiorite. Distributional density of stocks tends to be dominate in the Central Zone of Junin area. Lineaments were also analyzed to radiate outlying section of the drainage system from the Junction of Q. Limonita and Q. Crysocola.

(2) Mineralization and alteration in the Central Zone of Junin area

Mineralized and alteration zones in this Zone were classified in three types based on their occurrences: Type I, Type II and Type III (Tables II-4-1 and II-1-2, and Fig.II-1-2). Type I and Type II are of the porphyry copper mineralization.

Type I was characterized by dissemination and film of Cu-Mo minerals accompanied with phyllic alteration zone, which occurred mainly in the granodiorite around quartz porphyry stocks or dikes.

Type II occurred as Cu-Mo-Ag veins in granodiorite, and was subdivided into Type IIA and Type IIB on their occurrences.

1) Type IIA : abundant in sulfide ore minerals which was scattered in clay as principal gangue mineral.
2) Type IIB : quartz veins with sulfide ore minerals.

Both phyllic and potassic alteration zones were identified along the vein contacts mentioned above.

This type mineralized zones were sketched geologically and mineralogically in this Phase.

Type III was observed to be as acidic alteration zone being accompanied with network quartz veins in granodiorite and diorite porphyry. Geochemical Au-Ag anomalies were delineated in a part of this alteration zone.

The Q.Limonita-Upper reach mineralized zone, which belongs to Type IIA, has a vein of 2 m wide and 140 m long. Ore assay result averages 10 % Cu and 15 g/t Ag.

The Q.Crisocola mineralized zone belongs to Type IIA mainly, and has 1.1 m in vein width and 50 m in length. Average ore assay result is 30 % of Cu.

The Rio Junin mineralized zone is observed in an area of 200 m in width and 500 m in length, where Type I, IIA and IIB coexists as mineralization in sequence. Ore assay result is 1 % Cu.

The Q.Controversia mineralized zone is overlapped by Type I, Type IIA and Type IIB on an area of 150 m in width and 200 m in length. The mineralization, however, is not intense.

The Q.Rica mineralized zone is also overlapped by Type I and Type IIB, but the area is limited.

(3) Drilling survey in the Central Zone of Junin area

Drilling survey was carried out in the Q.Limonita and Rio Junin mineralized zones, which predominated dissemination and film of bornite-chalcopyrite-pyrite-molybdenite.

The drilling results are as follows:

In the Q.Limonita mineralized zone, intense mineralization is recognized to increase and predominate to the northeasternward and to the depth over 150 m. As the assay result of 37 samples obtained from drill cores (between 8.00 m and 148.80 m of drill hole MJJ-4; direction to the northeast), the content was 3.84 % Cu in maximum and 1.30 % Cu in average.

In the Rio Junin mineralized zone, strong mineralization is also observed. According to the assay result of 112 samples obtained from drill cores (between 6.00 m and 233.45 m of drill hole MJJ-8; direction to the east), the content was 2.10 % Cu in maximum and 0.46 % Cu in average.

Since a large amount of bornite was observed in fractures of drill cores, predominant mineralized part was thought to exist in the lower parts of the northeastern ridge of and the eastern ridge of the Q.Limonita and the Rio Junin mineralized zone, respectively.

(4) Mineralization and geochemical exploration in the Surrounding Zone of Junin area

The Surrounding Zone of Junin area comprises three mineralized zones; Q.Cristal-Branch, Q.Esperanza and Q.Fortuna (Fig.II-2-3).

The Q.Cristal-Branch is divided into east mineralized zone and west. The former consists of Type I generally, and the latter Type II mainly.

Q.Esperanza mineralizes zone, which contains vein deposit of 1 m wide, 1 km long and 120 m high, is classified in Type II. Ore assay result averages 10 % Cu and 20 g/t Ag.

Q.Fortuna mineralized zone, which consists of Type I mainly and Type II additionally, is distributed on an area of 600 m in length, 200 m in width and 200 m in vertical difference. Ore assay result was 1 % Cu on average.

The distributional pattern of geochemical anomalous zones indicates a good coincidence with those of mineralization and/or alteration (Figs.II-2-7 and II-2-8). For instance, Cu-Mo geochemical anomalous zones includes the mineralized zones observed, while Pb-Zn anomalous zone are scattered around the mineralized zone. Stream sediment anomalies (Phase I) and rock geochemical anomalies (Phase II) are both interpreted to be from mineralized outcrops.

(5) Rio Magdalena Zone of Cuellaje area

Geology of Cuellaje area consists mainly of the Apuela-Nanegal batholith of granodiorite, and stocks or dikes of andesitic porphyry, dioritic porphyry and/or quartz porphyry, which intrude into the batholith (Fig.II-3-1).

In the Rio Magdalena Zone, the following mineralized zones are developed: mineralized zones A,B,C and E, all of which belong to Type I; two other mineralized zones in south belongs Type II; and mineralized zone D belongs to Type III. A part of the mineralized zone C is overlapped by the mineralized zone D.

The mineralized zone A is the biggest one observed in an area of 500 m x 400 m. Stockwork and dissemination deposits distribute in the center, film deposits around them. The mineral assemblage of alteration minerals shows zonal distribution which is in harmony with the mineralization types: quartz-sericite-chlorite-pyrite zone and chlorite-calcite zone in outward order. These zonal assemblages coincident with phyllic alteration zone and propylitic alteration zone of general porphyry copper deposit. The zoning of mineralization is also coincide markedly with that of general porphyry copper deposit. Average ore assay result is 0.6 % of Cu. The scale of the mineralization and Cu grade in this area ranks next to those of the Q.Limonita-Q.Verde mineralized zone of Central Zone of Junin area and the Q.Fortuna mineralized zone of Surrounding Zone of Junin area.

On the basis of correlation between geochemical anomaly and mineralization, high factor score distribution zones of Cu-Mo-Au-Ag were delineated on the mineralization A and E, south mineralized zone and northeastern part, high factor score distribution zones of Au-Ag on the mineralized zone D (Fig.II-3-6).

Owing to correlation between geophysical anomaly and mineralization, middle to low apparent resistivities and high to middle percent frequency effects were detected inside and/or beside the mineralized zones A and E, middle apparent resistivity and middle to low percent frequency effect inside and/or beside the mineralized zone D, and high apparent resistivity and high to middle percent frequency effect inside and/or beside south mineralized zone. IP anomaly zones detected inside and/or beside the mineralization A and the south mineralized zone continue toward western and lower parts from both mineralized zones.

As to evaluation of IP anomaly by contents of normative chalcopyrite-pyrite, IP anomaly is proportional to total amounts of sulfide minerals. It seems that IP anomalies on the mineralized zone A and E are caused by same amount of chalcopyrite and pyrite, IP anomaly on the south mineralized zone pyrite > chalcopyrite, and IP anomaly on the northeastern part pyrite.

Chapter 2 Recommendations for Phase III Survey

Junin and Cuellaje areas were proved to have high potential of Cu-Mo-Ag dissemination and vein deposits. Followings are, therefore, recommended for Phase III survey including ore forming model (Fig.2).

(1) Central Zone of Junin area (Fig.3-1)

According to the steep topography, it is difficult to adopt the geophysical exploration. Drilling survey is, consequently, recommended to be continued although a transportation problem needs to be solved.

Taking the mobilization of diamond drilling machine into consideration, the recommended order of drilling survey is as follows:

1) The Q.Limonita mineralized zone, and intermediate area between the Q.Limonita and the Q.Verde mineralized zones (Type I, 250 m x 1 hole)

2) The Q.Verde mineralized zone (Type I, 100 m x 2 holes)

3) The Rio Junin mineralized zone (Types I and II, 100 m x 1 hole, 250 m x 1 hole)

4) The Q.Limonita-Upper reach mineralized zone (Type II, 100 m x 2 holes)

5) The Q.Crisocola mineralized zone (Type II, 100 m x 2 holes)

(2) Surrounding Zone of Junin area (Fig.3-1)

1) The Q.Fortuna mineralized zone (Type I):

Detailed geological sketch on mineralized zone, drilling of 100 m x 3 holes, and detailed geological survey in the southeast and east of quartz porphyry stock.

2) The Q.Esperanza mineralized zone (Type II):

Drilling of 100 m x 2 holes, underground exploration including Q.Limonita-Upper reach and Q.Verde mineralized zones.

(3) Rio Magdalena Zone of Cuellaje area (Fig.3-2)

1) The Rio Magdalena-Branch mineralized zone (mineralized zone A) and its western extension:

Drilling of 100 m x 2 holes and of 300 m x 2 holes, and geophysical survey.

2) The south mineralized zone and its western extension:

geophysical survey.

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LIST OF FIGURES AND TABLES

FIGURES

TABLES

APPENDICES

PLATES

APPENDIX

Appendix 1 Mineral assemblages of the rocks under thin section

Ser. No.	Sample No.	Area	Rock Names	Texture	Alteration (Pl : plagioclase, Bi : biotite)	Primary Minerals: Quartz (Q)	Postash feldspar	Plagioclase (Pl)	Biotite (Bi)	Hornblende	Pyroxene	Apatite	Sphane	Zircon	Alteration Minerals etc.: Quartz (Secondary)	Albite	Biotite (Secondary)	Sericite (Fine grained white mica)	Actinolite	Epidote	Chlorite	Calcite	Smectite	Leucoxene	Limonite	Opaque minerals
1	B 2024	Cuellaje	Biotite-granodiorite	holocrystalline	・Pl→partly albitized and epidotized ・Bi→partly chloritized and epidotized	○	•	◎	○			•	•			•		•		•	•					•
2	B 2026	Cuellaje	Altered dacite (Chloritezation, Carbonatization, Sericitization)	Original porphyritic texture : preserved	・Phenocryst:Q(•), Pl(∘), mafic mineral→altered ・Pl:Carbonatized and sericitized ・mafic mineral(biotite)→chloritized and carbonatized	•		○				•			∘	•		○			◎	○		•		•
3	B 2028	Cuellaje	Biotite-granodiorite	holocrystalline	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○	•	◎	○			•	•	•		•	•	•	•	•	•			•		•
4	B 2035	Cuellaje	Altered granodiorite (Strong biotization)	Original holocrystalline texture : preserved	・Strong biotirization ・Pl→partly sericitized and albitized ・Bi→chloritized and epidotized	○	•	○	altered						∘	•	◎	○			○			•		•
5	B 2036	Cuellaje	Biotite-granodiorite	holocrystalline	・Pl→partly sericitized and albitized ・Bi→partly chloritized and epidotized	○	•	◎	○			•				•		•		•	•			•		•
6	B 2043	Cuellaje	Biotite-granodiorite (biotization)	holocrystalline	・Pl→partly sericitized and albitized ・Bi→partly chloritized and epidotized	○	•	◎	○			•				•	∘	∘		•	•			•	•	•
7	B 2048	Cuellaje	Biotite-granodiorite (biotization)	holocrystalline	・Pl→partly sericitized, and albitized and carbonatized ・Bi→partly chloritized	○	•	◎	○			•				•	∘	•		•	∘	•				•
8	JC3-10A	Cuellaje	Biotite-granodiorite (biotization)	holocrystalline	・biotization ・Pl→partly albitized and sericitized ・Bi→partly chloritized	○	•	◎	○			•	•		○	•	○	•			•			∘	•	•
9	JC3-10B	Cuellaje	Sheared biotite-granodiorite	Sheared	・Pl→partly albitized and sericitized ・Bi→deformed	○		◎	○			•			∘	•	•	•		•	∘				•	•
10	JC3-19	Cuellaje	Hornblend-biotite granodiorite	holocrystalline	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	∘		•			•	•		•		•	∘				•	•
11	JC3-30	Cuellaje	Altered granodiorite (strong sericitization)	Original holocrystalline texture→partly preserved	・Strong sericitization ・Pl→sericitized ・Bi→Sericitized and chloritized	○		∘	altered						∘			◎			•			•	•	•
12	JC3-31	Cuellaje	Hornblende-biotite-granodiorite	holocrystalline	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	○		•		•		•		•		•	•			•		•

◎ : abundant, ○ : common, ∘ : a little, • : rare.

Ser. No.	Sample No.	Area	Rock Names	Texture	Alteration (Pl : plagioclase, Bi : biotite)	Primary Minerals									Alteration Minerals etc.											Opaque minerals
						Quartz (Q)	Postash feldspar	Plagioclase (Pl)	Biotite (Bi)	Hornblende	Pyroxene	Apatite	Sphane	Zircon	Quartz (Secondary)	Albite	Biotite (Secondary)	Sericite (Fine grained white mica)	Actinolite	Epidote	Chlorite	Calcite	Smectite	Leucoxene	Limonite	
13	JC4-11	Cuellaje	Sheared granodiorite	Sheared	・Pl→Sericitized and chloritized ・Bi→chloritized	○		○	altered				•		○			○			∘			•		•
14	JC4-32		Sheared hornblends-biotite granodiorite	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	○		•	•	•	∘	•		•		•	∘			•		•
15	JC4-36		Sheared hornblende-biotite granodiorite	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	○		•		•	∘	•		•		•	•					•
16	JC5-07		Biotite-granodiorite	Holocrystalline	・Pl→partly albitized and sericitized ・Bi→strongly chloritized and epidotized	○		◎	∘			•				•		•		•	∘				•	•
17	JC6-05		Sheared hornblende-biotite granodiorite (biotization)	Sheared	・Pl→partly sericitized ・Bi→transected by secondary biotite ・Hornblends→transected secondary biotite	○		◎	○	○		•			○		∘	•		•	•			•		•
18	JC6-32		Sheared hornblende-biotite granodiorite	Sheared	・Pl→partly albitized and epidotized ・Bi→partly chloritized and epidotized	○		◎	∘	∘		•			○		•	•		•	∘			•		•
19	JC7-04		Sheared hornblende-biotite granodiorite (biotization)	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	∘		•			○	•	∘	•		•	•					•
20	C 2006		Altered hornblende-(biotite)-quartz clorite porphyry (chloritization, epidotization)	Original porphyritic texture : preserved	・Pl→partly albitized and epidotized ・Bi→completely chloritized and epidotized ・Phenocryst : Q(•), Pl(∘), Hb(∘)	•		◎	altered	∘					∘	•	•	∘	•	○	○					•
21	C 2024		Sheared biotite grandiorite (biotization)	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chlocitized and epidotized	○		◎	○			•	•		∘	•	∘	•		•	•			•	∘	•
22	C 2027		Sheared hornblende-biotite granodiorite	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○	○		•	•	•	•	•	•	•		•	•			•		•
23	C 2053		Sheared biotite-granodiorite (biotization)	Sheared	・Pl→partly albitized and sericitized ・Bi→partly chloritized and epidotized	○		◎	○			•		•	∘	•	○	•		•	•			•		•
24	C 2068		Hornblende-biotite-granodiorite	Holocrystalline	・Pl→partly albitized and epidotized ・Bi→partly chloritized and epidotized	○		◎	○	∘		•	•	•		•	•			•	•			•		•

◎ : abundant, ○ : common, ∘ : a little, • : rare.

Mineral assemblages of rocks in thin section

No	Sample No.	Rock Name	Texture	Alteration	Primary Minerals: Quartz(Q)	K-feldspar(K-feld)	Plagioclase(Pl)	Biotite(Bi)	Hornblende	Pyroxene	Apatite	Sphane	Zircon		Alteration Minerals etc.: Quartz	Albite	Biotite [Bi(s)]	Sericite (Ser)	Actinolite	Epidote(Ep)	Chlorite(Chl)	Calcite(Cal)	Smectite	K-feldspar	Leucoxene	Hematite		Limonite	Opaque minerals
1	MJJ-2 150.5	Bi-Grano-diorite	Holocrystalline	Pl:Carb & Ser Bi:Chl	○	●	◎	⬤			●					●		⬤			⬤	⬤			●	●			● Mt
2	MJJ-3 150.0	Quartz-Porphyry	Porphyritic	Pl:Ser ptly Bi:Chl	○	●	○	●			●				○			○			○								●
3	MJJ-6 90.0	Bi-Grano-diorite	Holocrystalline	Pl:Ser ptly Bi:Chl ptly	○	●	○	⬤			●				⬤		◎	○			⬤								⬤ Mt
4	MJJ-6 120.0	Quartz-Porphyry	Porphyrytic	Pl:Ser Bi:Ser mnly	○	●	⬤	●			●				○		●	◎			●								● Cp*
5	MJJ-6 150.0	Quartz-Porphyry	Porphyrytic	Pl:Ser stly Bi:Ser ctly	○		⬤								○		⬤	◎					●	●	●				● Py
6	MJJ-7 137.4	Quzrtz-Porphyry	Porphyritic	Pl:Ser ctly Bi:Ser ctly	⬤										○			◎									●		● Py
7	MJJ-7 205.5	Quartz-Porphyry	Porphyritic	Pl:Epi & Ser Bi:Chl, Epi&Ser	⬤		○								○			○		○	○				●				● Py
8	MJJ-7 300.0	Quartz-Porphyry	Porphyritic	Pl:Epi, Alb&Ser bi:Chl	○		○				●				○	⬤		●		○	○								●
9	MJJ-9 42.0	Bi-Grano-diorite	Holocrystalline	Pl:Ser Bi:Ser ctly	○		⬤					●			○		●	◎											⬤ Py
10	MJJ-9 114.0	Bi-Grano-diorite	Holocrystalline	Pl:Ser Bi:Ser ctly	⬤		⬤				●				○		●	◎							●				● Py

◎:abandant ○:common ○:a little ●:rare

Bi:Biotite Pl:Plagioclase Alb:Albitization Ser:Sericitization Chl:Chloritization Epi:Epidotization
Mt:Magnetite Py:pyrite Cp*:Chalcopyrite with pyrite ctly:completely stly:strongly ptly:partly

Appendix 2 Mineral assemblages of the ores under polished section

Ser. No.	Sample No.	Area		Occurrence	Chalcopyrite (c.p)	Bornite (bn)	Chalcocite (cc)	Covellite (cv)	Cuprite (Cup)	Malachite (Mal)	Native Copper (Cu)	Molybdenite (mo)	Tetrahedrite (td)	Sphalerite (sp)	Galena (gn)	Pyrite (py)	Magnetite (Mt)	Hematite (Hm)	Limonite (mostly goethite (Goe))	Gangue minerals (G) Q:Quartz	Remarks
1	B2010	Cuellaje		(Mt) dissemination													·	·		◎	
2	B2013	Cuellaje		(py)-Q veinlet												·			●	◎Q	partly weathered
3	B2020	Cuellaje		(cp)-(Mt) dissemination	·											·	·	·		◎	
4	B2029	Cuellaje		(cp)-(Mt) dissemination	·												·	·		◎	
5	B2032	Cuellaje		cp dissemination	●		·													◎	
6	B2046	Cuellaje		cp dissemination	●		·													◎	
7	C2004	Cuellaje		mo-cp-Q veinlet and mo-cp dissemination	●		·					·	·	·		·				◎Q	
8	C2037	Cuellaje		(cp) dissemination	·									·		·			·	◎	partly weathered
9	C2038	Cuellaje		(cp) dissemination	·		·									·				◎	
10	D2009A	Cuellaje		(cp)-py dissemination	·	·	·							·		●				◎	
11	D2009B	Cuellaje		(cp)-Q veinlet and (Mt) dissemination	·	·	·									·	·			◎Q	
12	D2015	Cuellaje		(cp)-Q veinlet and (cp) dissemination	·		·	·								·				◎Q	
13	D2035	Cuellaje		(Mt) dissemination												·	·			◎	
14	D2038	Cuellaje		cp-Q veinlet and (Mt) dissemination	●												·	·		◎	
15	E2028	Cuellaje		(cp) dissemination	·	·								·		·				◎	
16	B2099	Surrounding Zone. Junin	Q. Cristal	td-py dissemination	·		·						●	·		●				◎	
17	C2075	Surrounding Zone. Junin	Q. Cristal	(cp) dissemination	·		·									·				◎	
18	C2094	Surrounding Zone. Junin	Q. Cristal	(cp) dissemination	·		·									·			●	◎	partly weathered
19	D2049	Surrounding Zone. Junin	Q. Cristal	(cp) dissemination	·		·	·								·				◎	
20	D2051	Surrounding Zone. Junin	Q. Cristal	(cp)-py dissemination	·		·	·								●				◎	
21	D2054	Surrounding Zone. Junin	Q. Cristal	(cp) dissemination	·		·	·								·			·	◎	partly weathered
22	D2063	Surrounding Zone. Junin	Q. Cristal	td-py dissemination	·	·	·	·					●			●				◎	
23	B2116	Surrounding Zone. Junin	Q. Esperanza	td-sp-(cp)-Q vein	·		·	·					●	●		·				◎Q	
24	B2117	Surrounding Zone. Junin	Q. Esperanza	cp-py ore	○	·	·	·					·			◎				●	
25	B2119	Surrounding Zone. Junin	Q. Esperanza	(cp)-py dissemination	·								·	·		○				◎	
26	B2121	Surrounding Zone. Junin	Q. Esperanza	cp-py ore	●	·							·	·		◎				○Q	
27	B2123	Surrounding Zone. Junin	Q. Esperanza	cp-cv-sp-py ore	●	·	·	●					·	●		◎				○	
28	B2126	Surrounding Zone. Junin	Q. Esperanza	sp-(cp)-py ore	·	·							·	●		◎				●Q	
29	B2128	Surrounding Zone. Junin	Q. Esperanza	td-(cp)-py ore	·								●	·		◎				·	massive py ore
30	B2130	Surrounding Zone. Junin	Q. Esperanza	(cp)-py-Q veinlet	·	·							·	·		○				○Q	
31	B2134	Surrounding Zone. Junin	Q. Esperanza	td-(cp)-py dissemination	·	·	·	·					●	·		○				◎	

◎>○>●>·

Ser. No.	Sample No.	Area		Occurrence	Chalcopyrite (cp)	Bornite (bn)	Chalcocite (cc)	Covellite (cv)	Cuprite (Cup)	Malachite (Mal)	Native Copper (Cu)	Molybdenite (mo)	Tetrahedrite (td)	Sphalerite (sp)	Galena (gn)	Pyrite (py)	Magnetite (Mt)	Hematite (Hm)	Limonite (mostly goethite (Goe))	Gangue minerals (G) Q:Quartz	Remarks
32	B2145	Surrounding zone, Junin	Q. Fortuna	td-(cp)-py-Q veinlet	·	·							●	·		○				◎Q	
33	C2118	Surrounding zone, Junin	Q. Fortuna	(cp)-(py)-(Mt)dissemination	·									·		·	·	·	·	◎	partly weathered
34	C2122	Surrounding zone, Junin	Q. Fortuna	(cp)-py dissemination	·		·	·						·		●			●	◎	partly weathered
35	D2101A	Surrounding zone, Junin	Q. Fortuna	(cp)-py dissemination	·									·		●		·		◎	
36	D2101B	Surrounding zone, Junin	Q. Fortuna	(cp)-py dissemination	·	·								·		●				◎	
37	D2104	Surrounding zone, Junin	Q. Fortuna	cp-Q veinlet	○		·	·								·				◎Q	
38	D2109	Surrounding zone, Junin	Q. Fortuna	cp-py veinlet and dissemination	●		·	·						·		○			●	◎	partly weathered
39	D2112	Surrounding zone, Junin	Q. Fortuna	(cp)-py dissemination	·	·	·	·					·	·		○			●	◎	partly weathered
40	D2119	Surrounding zone, Junin	Q. Fortuna	td-(cp)-py dissemination	·	·	·	·					●	·		○				◎	
41	C2129	Central zone, Junin	Q. Limonita	bn-cp-py ore	○	○	·	·		·						◎				○	Secondary enriched Cu ore
42	C2130	Central zone, Junin	Q. Limonita	(cp)-Hm-Q vein(?)	·													●		◎Q	
43	C2131	Central zone, Junin	Q. Limonita	(cp)-py dissemination	·		·	·								○			●	◎	
44	B2159	Central zone, Junin	Q. Crisocola	Cup in oxidized Cu ore	·				○											◎Q	
45	B2160	Central zone, Junin	Q. Crisocola	Cup and Mal in oxidized Cu ore					○	●	·					·				◎Q	Native copper in cuprite
46	B2163	Central zone, Junin	Q. Crisocola	Cup and Mal in oxidized Cu ore					○	○						·				○Q	
47	B2164	Central zone, Junin	Q. Crisocola	Cup and Mal in oxidized Cu ore			·	·	○	●	·					·				◎Q	Native copper in cuprite
48	B2171	Central zone, Junin	Rio Junin	(cp)-py dissemination	·		·	·								●				◎	
49	B2172	Central zone, Junin	Rio Junin	cp-py dissemination	●		·	·								●				◎	
50	B2173	Central zone, Junin	Rio Junin	mo-cp-Q veinlet	●		·	·				●	·			·				◎Q	
51	B2174	Central zone, Junin	Rio Junin	(cp)-py-Q veinlet and (cp)-py dissemination	·		·	·								○			●	◎Q	partly weathered
52	B2175	Central zone, Junin	Rio Junin	mo-(cp)-Q veinlet	·	·						○	·							◎Q	
53	C2133	Central zone, Junin	Rio Junin	(cp)-py dissemination	·		·	·								●			·	◎	
54	C2134	Central zone, Junin	Rio Junin	(cp) dissemination	·		·	·						·		·				◎	
55	C2135	Central zone, Junin	Rio Junin	cp-py dissemination	●		·	·								●				◎	
56	C2136	Central zone, Junin	Rio Junin	cp-td dissemination	○		·	·					●			·				◎	
57	C2137	Central zone, Junin	Rio Junin	cp-py dissemination	●		·	·						·		●				◎	
58	C2138	Central zone, Junin	Rio Junin	cp-py-Q veinlet and cp-py dissemination	●		·									●				◎Q	
59	C2139	Central zone, Junin	Rio Junin	(cp)-mo-py dissemination	·		·	·				·		·		●				◎	
60	C2140	Central zone, Junin	Rio Junin	bn-(cp) dissemination	·	●	·	·												◎	
61	E2078	Central zone, Junin	Rio Junin	mo-cp dissemination	●		·	·				·				·				◎	
62	B2165	Central zone, Junin	Q. Contro-versia	cp-py ore	◎		·	·								●				◎	
63	B2167	Central zone, Junin	Q. Contro-versia	(cp) dissemination	·											·	·	·		◎	
64	D2126	Central zone, Junin	Q. Rica	cp-py-Q veinlet and cp-py dissemination	●	·	·	·								○			·	◎Q	partly weathered

◎>○>●>·

Ser. No.	Sample No.	Occurrence	Chalcopyrite(Cp)	Bornite(Bo)	Chalcocite(Cc)	Covellite(Cv)	Cuprite(Cup)	Malachite(Mal)	Native Copper(Cu)	Molybdenite(Mo)	Tetrahedrite(Td)	Sphalerite(Sp)	Galena(Gn)	Pyrite(Py)	Magnetite(Mt)	Hematite(Hm)	Limonite(Goe)	Gangue minerals(G) Quartz(Q)	Remarks
1	MJJ-4 68.70	Bo-Q vlet & Bo diss	●	⬤	●													◎Q	
2	MJJ-5 9.50	Py-(Cp) diss	●											⬤				◎	
3	MJJ-6 58.81	Vlet & diss of Cp-Q	○	●	●									●	●	●		◎Q	Thin plty Wf(?): ●
4	MJJ-6 90.00	Cp-Bo-Q vlet & Mt diss	⬤	⬤	●										●			◎Q	Mt diss: ⬤
5	MJJ-6 137.40	Bo-Q diss & Mt diss	●	⬤								●		●	⬤			◎Q	
6	MJJ-6 139.60	Cp-Bo ore	◎	⬤	●													●Q	
7	MJJ-7 165.50	Cp-Py diss	○											⬤				◎	
8	MJJ-8 171.20	Bo-Q vlet & diss	●	⬤	●													◎Q	
9	MJJ-8 196.50	Bo diss		●	●													◎	
10	MJJ-8 198.80	Mo-Q vlet		●	●					⬤								◎Q	
11	MJJ-9 120.00	Cp-Py diss	⬤									●		⬤				◎	
12	MJJ-9 149.50	Cp diss	⬤									●		●				◎	

◎:abandant ○:common ∘:a little ●:rare

Appendix 3 Mineral assemblages of the rocks by X-ray diffraction analysis

Ser. No.	Sample No.	Rock Name	Montmorillonite	Ser./Mont.M.L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldsper	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
			Mineral Names																						
1	B2006	Dp						○		◎	○									•					
2	2007	Gd					∘		∘	◎	◎	∘	∘												
3	2008	Dp					∘	∘		◎	◎														
4	2009	Gd					∘	•	∘	◎	◎	∘	•							•		•			
5	2011	Gd						◎		◎		∘													
6	2012	Gd					∘	○	∘	◎	◎									•					
7	2014	Gd	•				○	∘	∘	◎	◎	•	•							•					
8	2016	Gd	•	•			∘	•		◎	◎				•										
9	2019	Gd					•	○		◎	∘	•								•					
10	2022	Gd	•	•	•		○	•		◎	◎	∘													
11	2024	Gd					∘	•	∘	◎	◎	∘													
12	2026	Ap		•	•	•	∘	•		◎	◎	∘													
13	2027	Gd	•				∘	∘		◎	◎														•
14	2028	Gd					∘	∘		◎	◎	∘										•	•		
15	2030	Gd	•				∘	∘	∘	◎	◎	∘													
16	2031	Gd			∘		•	∘		○	◎	∘		∘								•			∘
17	2033	Gd	•		•		∘	○	•	◎	◎	∘											•		
18	2034	Gd					○	∘		◎	◎	∘													•
19	2035	Gd					○	○	∘	◎	○	∘													
20	2036	Gd	•		•		∘		○	◎	◎	∘								•	•	•			
21	2038	Gd					∘	•	∘	◎	◎	∘								•	•		•		
22	2039	Gd	•	•	∘		∘	•	∘	◎	◎	∘	•			•									
23	2043	Gd					∘	•	∘	◎	◎	•													
24	2045	Gd		•	∘	•		○		◎	○	∘									•				
25	2047	Gd	•	•			∘	•	∘	◎	◎										•				
26	2048	Gd					∘	•	∘	◎	◎	∘		•						•		•	•		
27	2051	Gd					○	•	∘	◎	◎									•		•			
28	2053	Gd	•				∘		∘	◎	◎	∘	•							•	•				
29	2055	Dp	•	•			∘		∘	◎	◎	∘				•				•					•
30	2056	Gd		•			∘		∘	◎	◎	•	•							•					
31	2057	Gd					∘	∘	∘	◎	◎	∘								•			•		•
32	2060	Gd					∘	•	∘	◎	◎	∘									•				
33	2063	Gd			•			•	∘	◎	◎	∘								•		•			
34	2065	Gd			∘		∘	∘	•	◎	◎				•					•		•			
35	2068	Gd					∘	•	∘	◎	◎					•									
36	2069	Gd			•		∘	∘	∘	◎	◎	∘								•		•			
37	2071	Dp					∘	∘	∘	◎	◎	•									•				•
38	2072	Gd					∘	∘	∘	◎	◎	∘								•					
39	2074	Gd	•		•		∘		∘	◎	◎													•	
40	2076	Gd					∘		∘	◎	◎	∘													

◎ : abandant, ○ : common, ∘ : a little, • : rare.

Ser. No.	Sample No.	Rock Name	Mineral Names																						
			Montmorillonite	Ser./Mont.M.L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldsper	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
41	B2078	Gd					∘	●	●	◎	◎														
42	2081	Gd					∘	∘	∘	◎	◎	●	●							●					
43	C2001	Gd	●				●			◎	◎	●	∘												
44	2006	Ap					○			◎	◎	∘	○		●										●
45	2009	Gd					∘	∘	●	◎	◎	●	∘												
46	2011	Gd					∘	∘	∘	◎	◎	∘								●					
47	2013	Gd	●				∘	●	∘	◎	◎	∘				●									
48	2015	Gd	●				∘	∘	∘	◎	◎	∘													
49	2020	Gd		●			∘	●	∘	◎	◎	∘				●									
50	2021	Dp			●		∘	∘	●	◎	◎	∘				●					●				
51	2024	Gd					∘	●	∘	◎	◎	∘			●										
52	2025	Gd					∘	●	∘	◎	◎		●							●					
53	2026	Gd	●				∘		∘	◎	◎	∘	∘		●					●	●				
54	2027	Gd		●	●		∘		∘	◎	◎	∘	∘										●		
55	2028	Gd					●		∘	◎	◎	∘	∘												●
56	2029	Gd	●		●		●		∘	◎	◎	∘		∘						●					
57	2033	Gd					●	●	∘	◎	◎	∘	∘							●					
58	2036	Gd		●	●		●		∘	◎	◎	○	●							●		●			
59	2039	Gd	●		●		∘	●	∘	◎	◎	∘													
60	2042	Gd			●		●		∘	◎	◎	∘	∘							●	●				
61	2044	Qp			○					◎		∘													
62	2046	Gd					●	●	∘	◎	◎	∘	∘			●				●					
63	2053	Gd			●	●			∘	◎	◎	∘								●					●
64	2068	Gd		●			●	∘	∘	◎	◎	∘	●							●					
65	D2004	Gd	●		●		∘		●	◎	◎	∘	●												●
66	2005	Dp	∘		○			○		◎	○	∘													
67	2007	Gd					●		∘	◎	◎	∘	∘												
68	2009A	Gd					∘	●	∘	◎	◎	●								●					
69	2010	Gd			●		●	∘	●	◎	◎	∘	●							●					●
70	2012	Gd		●	●		∘	●	∘	◎	◎	∘	∘												
71	2014	Qp			∘			∘		◎	●	∘										●			
72	2018	Gd			●		●	●	∘	◎	◎	∘	∘			●									
73	2021	Gd			●		●	●	∘	◎	◎	∘	∘			●									●
74	2023	Gd	●				∘	●	∘	◎	◎	∘	∘												●
75	2025	Gd					∘	●		◎	◎	∘	∘												
76	2027	Gd		●			∘		∘	◎	◎	●	∘												
77	2029	Gd					∘	●	∘	◎	◎	●	●											●	
78	2031	Gd		●			∘			◎	◎	∘	∘								●				
79	2032	Gd			●		∘	●	○	◎	◎	∘								●			●		
80	2034	Gd	●		●		∘		○	◎	◎									●		●			●

◎ : abandant. ○ : common. ∘ : a little. ● : rare.

Ser. No.	Sample No.	Rock Name	Mineral Names																						
			Montmorillonite	Ser./Mont. M. L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldsper	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
81	D2037	Gd	•				∘	•	∘	◎	◎	∘								•		•			•
82	2039	Gd		•			○	∘	∘	◎	◎	∘								•		•			
83	2041	Gd					∘	•	∘	◎	◎	∘	•								•	•			
84	2044	Gd	•	•			∘		∘	◎	◎	∘	∘									•			
85	2047	Gd					•	•	∘	◎	◎	∘	•									•			•
86	E2001	Gd			•		∘			◎	◎	∘	∘		•										
87	2004	Gd	•		•		∘		•	◎	◎	∘									•				
88	2008	Gd					∘	•	∘	◎	◎	∘	•												
89	2011	Gd	•	•			•		∘	◎	◎	∘	∘			•									
90	2017	Gd					•	•	∘	◎	◎	∘	•			•									
91	2020	Gd	•				•		∘	◎	◎	∘	∘												
92	2022	Gd		•			∘	•	∘	◎	◎	∘	∘												
93	2025	Gd					∘		∘	◎	◎	∘	•												
94	2028	Gd			∘		•		∘	◎	◎	∘													
95	JC3-10A	Gd			∘				∘	◎	◎	•								•					•
96	JC3-19	Gd					∘	•	•	◎	◎	∘	∘												
97	JC3-30	Gd						∘		◎		○													
98	JC3-31	Gd		•	•		•		∘	◎	◎	∘	∘												
99	JC4-11	Dp		•			∘	∘		◎	◎	∘													
100	JC4-32	Gd					•	•	∘	◎	◎	∘	∘												•
101	JC4-36	Dp			•		∘	•	∘	◎	◎	∘	∘												
102	JC5-07	Gd					∘	∘		◎	◎	•													
103	JC6-05	Gd					∘	•	∘	◎	◎	∘				•									•
104	JC6-32	Gd	•		•		∘		∘	◎	◎	∘	∘												
105	JC7-04	Gd				•	•		∘	◎	◎	∘	∘												

◎ : abandant, ○ : common, ∘ : a little, • : rare.

Ser. No.	Zone	Sample No.	Rock Name	Mineral Names																						
				Montmorillonite	Ser./Mont.M.L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldspar	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
106	Cristal	B2087	Gd		●				○		◎								∘							
107		2090	Gd					●	∘		◎															
108		2093	Gd				●	●	∘		◎	◎	●	∘					●							
109		2095	Gd						○		◎															
110		2098	Gd						∘		◎										∘	●			○	
111		2102	Gd					●	∘		◎	◎	●	●							●					
112		2104	Gd					∘	●		◎	◎	●													
113		2107	Gd					●	●		◎	◎	●						●			●				
114		2110	Gd						○		◎															
115		2113	Qp						○		◎															
116		C2073	Gd					●	∘		◎	∘	●													
117		2076	Gd	●				∘			◎	◎	∘								●					
118		2078	Gd					∘	●		◎	◎	●													
119		2084	Gd				●	●	●		◎	◎	∘	∘												
120		2086	Gd		∘		●	∘			◎	○	●	∘					●							
121		2089	Gd					∘	●		◎	∘	●	●				○								
122		2099	Gd		●	●			○		◎		∘					●			●					
123		D2048	Gd					∘	○		◎															
124		2050	Gd						○		◎								●							
125		2053	Gd						●		◎										∘		●			
126		2057	Gd			∘			∘		◎								●	●						
127		2062	Gd			●					◎								●		○					
128		2064	Gd					∘	∘		◎	○	●													
129		2069	Gd						∘		◎								∘							
130		2071	Gd		●			●			◎	◎	●	∘												
131		2072	Gd					∘	∘		◎	∘	●	●								●				
132		2075	Qp						∘		◎															
133		2078	Gd						○		◎															
134		E2034	Gd			●			○		◎															
135		2046	Gd		●			∘	●		◎	○	●	●												
136	Esperanza	B2114	Gd					∘	●		◎	◎	●	●							●					
137		2115	Gd						○		◎										●					
138		2120	Gd						○		◎										●					
139		2124	Gd					∘	∘		◎	∘	●									●				
140		2127	Gd						∘		◎										●					
141		2129	Gd						○		◎										●					
142		2133	Gd						∘		◎										●					
143		C2100	Gd	∘		∘					◎								●							
144		2102	Gd					∘		●	◎	◎	●	●												
145		2104	Gd					●	●		◎	◎	∘	∘					●		●		●			

◎ : abandant, ○ : common, ∘ : a little, ● : rare.

Ser. No.	Zone	Sample No.	Rock Name	Montmorillonite	Ser./Mont.M.L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldsper	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
146	Esperanza	C2106	Gd		●						◎	◎	●	○							●		●			
147		D2080	Gd						○		◎															
148		2081	Gd		●			○			◎	◎	●	●				〇								
149		2082	Gd					○			◎	〇	○	●							●					
150		2084	Gd					○			◎	◎		●							●					
151		2086	Gd					●			◎	◎	●	○							●					
152		2087	Gd					●	●		◎	◎	○	○							●					
153		E2047	Gd					●		○	◎	◎	●	●							●					
154		2049	Gd					○		○	◎	◎	○	●							●					
155		2052	Gd						○		◎		●								●					
156		2054	Gd					●	●		◎	◎	○						●							
157		2057	Gd					●	○		◎	◎	○	●												
158	Fortuna	C2108	Qp					●	○		◎	◎	●													
159		2110	Qp					●	○		◎	〇	●													
160		2113	Qp					●	○		◎	◎	●						●							
161		2116	Qp						〇		◎								●							
162		2117	Gd					○	○		◎	◎	●								●					
163		2121	Gd						○		◎															
164		2124	Gd						○		◎		●													
165		2126	Gd						○		◎															
166		D2091	Qp					●	○		◎	◎	●						●	●						
167		2094	Qp					●	●		◎	◎	●						●	●						
168		2095	Gd					○	●		◎	◎	●								●					
169		2096	Gd					●	○		◎	◎	●								●					
170		2097	Gd					○	●		◎	◎	●						●	●						
171		2098	Gd					○	●		◎	◎	●								●					
172		2099	Gd					●	〇		◎										●					
173		2100	Gd						〇		◎								●				●			
174		2102	Gd					○	○		◎	○	●													
175		2103	Gd						●		◎										●		○			
176		2105	Gd						〇		◎							●	●							
177		2106	Gd						○		◎															
178		2107	Gd						○		◎							●	●							
179		2108	Gd						○		◎										○				●	
180		2110	Gd						〇		◎								●		●					
181		2111	Gd								◎										〇					
182		2113	Gd						●		◎										○		○			
183		2114	Gd						〇		◎										●					
184		2115	Gd						○		◎	○									●					
185		2116	Gd						○		◎	○	●													

◎ : abandant, 〇 : common, ○ : a little, ● : rare.

Ser. No.	Zone	Sample No.	Rock Name	Montmorillonite	Ser./Mont.M.L	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldsper	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite
				Mineral Names																						
186	Fortuna	D2117	Gd						∘		◎										∘					
187		2118	Gd						∘		◎															
188		2119	Gd						•		◎										○		•		∘	
189		2120	Qp					•	○		◎	○	•													
190		2121	Qp						○		◎	○														
191		2122	Qp						○		◎															
192		2123	Qp			•			∘		◎	∘	•					•								
193		E2069	Gd						○		◎															
194		2071	Gd			•			•		◎															
195		2073	Gd					•	•		◎	◎	•													
196		2075	Gd					•	∘		◎	○	•													
197		B2137	Qp						∘		◎	○	•						•		•					
198		2139	Qp					•	∘		◎	○	•													
199		2143	Gd						○		◎										•					
200		2146	Gd						○		◎										•					
201		2147	Gd					•	•		◎	○	•						•		•		•			
202		2149	Gd					•	∘		◎	∘	•													
203		2150	Gd					•	∘		◎	∘														
204		2153	Gd					•	∘		◎	∘	•													
205		2155	Gd			•			∘		◎															

◎ : abandant, ○ : common, ∘ : a little, • : rare.

Ser. No.	Sample No. Depth	Rock Name	Montmorillonite	Ser./Mont.M.L.	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldspar	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite	Remarks
1	MJJ-2 6	Gd					◎	ο		●	○	ο	○						ο							
2	MJJ-2 12	Gd					◎	●		ο	◎	○	○						ο							
3	MJJ-2 18	Gd					○	●		○	ο															
4	MJJ-2 24	Gd					○	●		◎	○															
5	MJJ-2 30	Gd						◎		◎										○						
6	MJJ-2 36	Gd						○		◎										●						
7	MJJ-2 42	Gd					ο	○		◎																
8	MJJ-2 48	Gd						○		◎										ο						
9	MJJ-2 54	Gd						◎		◎										ο						
10	MJJ-2 60	Gd					ο	○		◎		ο								●						
11	MJJ-2 66	Gd						◎		◎										ο						
12	MJJ-2 72	Gd						ο		◎										○						
13	MJJ-2 78	Gd						◎												◎						
14	MJJ-2 84	Gd						○		◎										ο						
15	MJJ-2 90	Gd						◎		◎										●						
16	MJJ-2 96	Gd					○	○		◎	ο									●						
17	MJJ-2 102	Gd					◎	●		◎	○									ο						
18	MJJ-2 108	Gd			○		◎	ο		◎	○									●						
19	MJJ-2 114	Gd			ο		◎	ο		◎	◎									ο						
20	MJJ-2 120	Gd					◎	ο		○	◎															
21	MJJ-2 126	Gd					◎	ο	ο	○	◎															
22	MJJ-2 132	Gd					◎		○	◎	◎		○							ο						
23	MJJ-2 138	Gd					◎	●		◎	◎	ο														
24	MJJ-2 144	Gd					◎	○		◎	○															
25	MJJ-2 150	Gd					●	○		◎	●									○		○				
26	MJJ-3 6	Gd					○	ο	ο	◎	◎	○	○							ο						
27	MJJ-3 12	Gd					○	●		◎	○		ο													
28	MJJ-3 18	Gd	ο				○			◎	◎	○	○													
29	MJJ-3 24	Gd	●				○	●		◎	◎															
30	MJJ-3 30	Gd						○		◎																
31	MJJ-3 36	Gd	●	ο			ο	●		◎	○															
32	MJJ-3 42	Gd					ο	●	ο	◎	◎	○	○													
33	MJJ-3 48	Gd					○	●	●	◎	◎	○														
34	MJJ-3 54	Gd					○	ο	●	○	◎	ο														
35	MJJ-3 60	Qp					◎	ο		◎	◎	○														
36	MJJ-3 66	Qp					◎	ο	●	◎	◎		ο							●						
37	MJJ-3 72	Gd	●				◎	ο		◎	◎	○														
38	MJJ-3 78	Gd					○	◎		◎	○									●						
39	MJJ-3 84	Gd					◎	○		◎	◎	○								ο						
40	MJJ-3 90	Gd					○	ο		◎	◎															
41	MJJ-3 96	Gd					ο		○	◎	◎		○							●						
42	MJJ-3 102	Gd					ο		ο	◎	◎		○							●						
43	MJJ-3 108	Gd					○			◎	◎	ο		●						●						
44	MJJ-3 114	Gd					◎	●		◎	◎	ο								●						
45	MJJ-3 120	Gd					◎	●		◎	◎	○														
46	MJJ-3 126	Gd					◎	○	ο	◎	◎	○														
47	MJJ-3 132	Gd					○	●		◎	◎															
48	MJJ-3 138	Gd					ο		ο	◎	○		ο													
49	MJJ-3 144	Qp					ο	●		◎	◎															
50	MJJ-3 150	Qp					ο	●		◎	◎															

◎abandant ○:common ο:a little ●:rare

Ser. No.	Sample No. Depth	Rock Name	Montmorillonite	Ser./Mont.M.L.	Kaolinite	Halloysite	Chlorite	Sericite	Biotite	Quartz	Plagioclase	K-Feldspar	Amphibole	Calcite	Epidote	Gypsum	Gibbsite	Goethite	Lepidocrocite	Pyrite	Hematite	Chalcopyrite	Bornite	Ten-Tetra	Molybdenite	Remarks
51	MJJ-6 6	Gd					o	o	○	◎	◎									●						
52	MJJ-6 12	Gd					o	o	o	◎	◎									●						
53	MJJ-6 18	Gd					o	○	o	◎	◎	o								●						
54	MJJ-6 24	Gd					o	o	○	◎	◎			●						●						
55	MJJ-6 30	Gd					o	●	○	◎	◎	o		●						●						
56	MJJ-6 36	Gd					o	○	o	◎	○			●						●						
57	MJJ-6 42	Gd					●			◎		o		●												
58	MJJ-6 48	Gd					○	o	o	◎	◎	o								●						
59	MJJ-6 54	Gd					o	o	○	◎	◎		●							o						
60	MJJ-6 60	Gd					o	○	○	◎	◎			●						●						
61	MJJ-6 66	Gd					●	○	○	◎	◎	○		o												
62	MJJ-6 72	Gd					○	o	○	◎	◎	o								o						
63	MJJ-6 78	Gd					●	○	○	◎	◎	o								●						
64	MJJ-6 84	Gd					o	o	○	◎	◎	o								o						
65	MJJ-6 90	Gd					o	o	○	◎	◎	○														
66	MJJ-6 96	Gd					●	○	o	◎	◎	○								●						
67	MJJ-6 102	Gd					●	○		◎	◎	o								●						
68	MJJ-6 108	Gd					o	○		◎	◎	●														
69	MJJ-6 114	Qp					●	○		◎	◎			●												
70	MJJ-6 120	Qp			●			○		◎	○															
71	MJJ-6 126	Qp					●	o		◎	◎			●												
72	MJJ-6 132	Qp					●	○		◎	◎															
73	MJJ-6 138	Gd					●	○		◎	○															
74	MJJ-6 144	Qp						○		◎	◎	o								o						
75	MJJ-6 150	Qp					●	○		◎	◎	o								●						
76	MJJ-9 6	Gd						◎		◎	o			●						o						
77	MJJ-9 12	Gd						◎		◎	o			o						●						
78	MJJ-9 18	Gd						◎		◎	o			●						o						
79	MJJ-9 24	Gd						◎		◎	o			o						●						
80	MJJ-9 30	Gd						◎		◎	◎		○	o						●						
81	MJJ-9 36	Gd						◎		◎	◎		○							o						
82	MJJ-9 42	Qp						◎		◎	o			o						o						
83	MJJ-9 48	Gd						◎		◎	o			o						o						
84	MJJ-9 54	Gd						○		◎	o			o						●						
85	MJJ-9 60	Gd						○		◎	◎									●						
86	MJJ-9 66	GD					o	○	o	◎	○			●												
87	MJJ-9 72	Gd						○	o	◎	○									o						
88	MJJ-9 78	GD					o	o	○	◎	◎									●						
89	MJJ-9 84	Gd					●	○	○	◎	○									●						
90	MJJ-9 90	Gd					o	o	o	◎	◎			●						●						
91	MJJ-9 96	Gd					●	◎		◎	◎			o						o						
92	MJJ-9 102	Gd					●	◎		◎	◎		o							●						
93	MJJ-9 108	Gd					●	○	o	◎	◎		o							o		o				
94	MJJ-9 114	QP					●	○	●	◎	◎		o							●						
95	MJJ-9 120	GD					o	○	●	◎	◎		o	●						○						
96	MJJ-9 126	Gd					o	○	●	◎	◎									o						
97	MJJ-9 132	Gd					●	o	○	◎	◎			●												
98	MJJ-9 138	Gd					●	o	○	◎	◎			●												
99	MJJ-9 144	Gd					●	o	o	◎	◎		o							●						
100	MJJ-9 150	Gd					●	o		◎	○		o	●												

◎:abandant ○:common o:a little ●:rare

Appendix 4 Assay data of ore samples

Ser. No.	Sample No.	Area	Description	Assay Results					
				Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Mo (%)
1	B 2002	Cuellaje area	Py-qz vein	Tr	Tr	0.01	<0.01	<0.01	<0.01
2	B 2005		Lim-qz ntwk	Tr	1.0	0.03	<0.01	<0.01	<0.01
3	B 2010		Py-Cp diss/film	Tr	1.0	0.08	<0.01	<0.01	<0.01
4	B 2013		Py film/diss	Tr	Tr	0.02	<0.01	<0.01	<0.01
5	B 2015		Py-qz vlet	Tr	Tr	0.01	<0.01	<0.01	<0.01
6	B 2020		Py diss	Tr	Tr	0.02	<0.01	<0.01	<0.01
7	B 2029		Cp-Bo-Chry diss (10.0m)	Tr	Tr	0.20	<0.01	<0.01	<0.01
8	B 2032		Cp-Bo-Chry-Mo diss/ntwk (20.0m)	Tr	1.4	1.40	0.01	<0.01	0.16
9	B 2037		Py-Chry-Cp film (5.0m)	Tr	Tr	0.21	<0.01	<0.01	<0.01
10	B 2046		Cp-Chry-Py diss (5.0m)	Tr	2.0	0.48	<0.01	<0.01	0.01
11	B 2049		Py-Cp-Cc-Bo diss/film (5.0m)	Tr	Tr	0.10	<0.01	<0.01	<0.01
12	B 2052		Cp-Py-qz vlet	0.2	7.3	0.31	<0.01	<0.01	<0.01
13	B 2058		Py-qz vein	Tr	Tr	0.13	<0.01	<0.01	<0.01
14	B 2066		Cp-Py-Chry film/diss	Tr	Tr	0.37	<0.01	<0.01	<0.01
15	B 2073		Chry film/stain	Tr	1.5	0.32	<0.01	<0.01	<0.01
16	C 2004		Py-Cp diss/film	Tr	2.4	0.49	0.01	<0.01	0.15
17	C 2019		qz vlet	Tr	Tr	0.03	<0.01	<0.01	<0.01
18	C 2022		qz vlet	Tr	Tr	0.02	<0.01	<0.01	<0.01
19	C 2030		Py-qz vein	0.1	4.3	0.06	<0.01	<0.01	<0.01
20	C 2037		Cp-py film	Tr	Tr	0.20	<0.01	<0.01	<0.01
21	C 2038		Cp-Py-Bo-Chry film (2.0m)	Tr	Tr	0.30	<0.01	<0.01	<0.01
22	C 2040		Py-Chry film (2.0m)	Tr	Tr	0.05	<0.01	<0.01	<0.01
23	C 2059		Py film	Tr	Tr	0.10	<0.01	<0.01	<0.01
24	C 2069		Py diss	Tr	Tr	0.04	<0.01	<0.01	<0.01
25	D 2009A		Py diss	Tr	Tr	0.26	<0.01	0.01	<0.01
26	D 2009B		Py diss in Ap	Tr	Tr	0.15	<0.01	<0.01	<0.01
27	D 2015		Py-Cp-qz vein along fault	Tr	4.0	0.34	<0.01	0.01	0.03
28	D 2035		Py-Cp-Chry diss/film	Tr	Tr	0.14	<0.01	<0.01	<0.01
29	D 2038		Py-Cp diss/film	Tr	Tr	0.32	<0.01	<0.01	<0.01
30	E 2022		Py film	Tr	Tr	0.01	<0.01	<0.01	<0.01
31	E 2028		Py film	Tr	Tr	0.03	<0.01	<0.01	<0.01

Ser. No.	Sample No.	Area	Description	Assay Results					
				Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Mo (%)
32	B2091	Q. Cristal-Branch mineralized zone	Lim-sil zone	Tr	Tr	0.02	0.03	<0.01	<0.01
33	B2092		Lim rock	Tr	Tr	0.10	<0.01	0.01	<0.01
34	B2096		Chry-arg zone (2.0m)	0.3	23.3	10.53	0.01	0.05	<0.01
35	B2099		Cp-Py-qz vein (0.2m)	0.3	114.5	4.14	0.06	0.56	<0.01
36	B2111		Spec stain	Tr	Tr	0.03	<0.01	<0.01	<0.01
37	C2075		Py-Cp-Bo diss	Tr	Tr	0.12	<0.01	0.02	<0.01
38	C2094		Lim-qz vein (0.25m)	2.4	59.7	0.06	0.03	<0.01	0.01
39	C2095		Lim film	Tr	Tr	0.05	<0.01	<0.01	<0.01
40	D2049		Py-Cp-Bo in fault zone	Tr	Tr	0.50	<0.01	<0.01	<0.01
41	D2051		ditto	Tr	1.5	0.11	<0.01	<0.01	<0.01
42	D2054		Cp-Lim in foult zone	Tr	Tr	0.10	<0.01	<0.01	<0.01
43	D2063		Py-Cp-Bo-qz vein	Tr	Tr	0.08	<0.01	<0.01	<0.01
44	D2066		Lim film/diss	Tr	3.5	0.78	<0.01	<0.01	<0.01
45	D2076		Py-Cp-Lim diss	Tr	1.9	0.03	<0.01	<0.01	<0.01
46	D2079		ditto	Tr	Tr	0.02	<0.01	<0.01	<0.01
47	B2116	Q. Esperanza mineralized zone	qz vein (0.3m)	Tr	Tr	0.35	<0.01	0.12	<0.01
48	B2117		Cp-Py-clay vein (1.3m)	4.2	36.5	11.99	<0.01	0.01	<0.01
49	B2119		ditto (0.6m)	0.1	4.9	0.23	<0.01	<0.01	<0.01
50	B2121		ditto (1.0m)	0.3	35.5	13.98	<0.01	0.01	0.01
51	B2123		ditto (1.0m)	0.2	43.7	10.74	<0.01	0.01	<0.01
52	B2126		ditto (1.0m)	0.1	13.2	3.25	<0.01	<0.01	<0.01
53	B2128		ditto (0.3m)	Tr	7.2	2.61	<0.01	<0.01	<0.01
54	B2130		ditto (0.3m)	Tr	Tr	1.99	<0.01	0.04	0.01
55	B2132		ditto (0.5m)	0.1	3.6	0.05	<0.01	<0.01	<0.01
56	B2134		ditto (0.6m)	0.1	18.4	1.16	0.04	0.29	0.01
57	B2144	Q. Fortuna mineralized zone	Lim-sil zone	Tr	Tr	0.70	<0.01	<0.01	0.01
58	B2145		Py-Cp-qz vein (0.1m)	Tr	Tr	2.26	<0.01	0.04	0.01
59	B2151		sil zone (10.0m)	0.1	4.9	0.05	<0.01	<0.01	<0.01
60	C2118		Cp-Py diss/film	Tr	Tr	0.08	<0.01	0.01	<0.01
61	C2122		Cp-Py diss	0.2	62.0	0.31	<0.01	<0.01	0.02
62	D2101A		Py-Cp-Cc diss	0.1	2.3	0.64	<0.01	<0.01	<0.01
63	D2101B		Mo-Bo-Cp-Cc-qz vein	Tr	2.1	0.09	<0.01	<0.01	0.01
64	D2104		Py-Mo-Cp diss/ntwk	Tr	3.4	0.50	<0.01	<0.01	0.03
65	D2109		ditto	Tr	Tr	0.06	<0.01	<0.01	<0.01
66	D2112		Cp-Cc-Py-qz vein (2.0m)	Tr	Tr	0.81	<0.01	<0.01	<0.01
67	D2119		Cp-Cc-Py diss/ntwk	Tr	2.9	1.99	<0.01	<0.01	<0.01

Ser. No.	Sample No.	Area	Description	Assay Results					
				Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Mo (%)
68	C 2127	Q. Limonita Upper reach mineralized zone	Cp-Bo-Cc-Py-clay vein (2.0m)	Tr	34.3	5.45	0.01	0.01	<0.01
69	C 2128		ditto (2.5m)	Tr	5.2	2.60	<0.01	<0.01	<0.01
70	C 2129		ditto (1.5m)	Tr	Tr	17.03	<0.01	0.01	<0.01
71	C 2130		Py-Cp-clay vein (0.8m)	Tr	Tr	0.07	<0.01	<0.01	<0.01
72	C 2131		Cp-Bo-Cc-clay vein (0.2m)	Tr	Tr	0.99	<0.01	<0.01	<0.01
73	D 2124		Py-Cp-Cc-Lim-qz vein	Tr	4.5	0.14	<0.01	<0.01	0.01
74	D 2125		ditto	Tr	Tr	0.34	<0.01	<0.01	<0.01
75	B 2156	Q. Crisocala mineralzed zone	qz ntwk (0.15m)	Tr	Tr	0.02	<0.01	<0.01	<0.01
76	B 2157		Chry-qz vein (0.1m)	Tr	Tr	4.94	<0.01	<0.01	0.01
77	B 2158		ditto (1.0m)	Tr	Tr	0.15	<0.01	<0.01	<0.01
78	B 2159		Cup-Cc-Chry-qz vein (1.0m)	Tr	Tr	43.00	<0.01	0.02	0.01
79	B 2160		ditto (1.0m)	Tr	Tr	23.49	<0.01	0.01	0.03
80	B 2161		Chry-Lim-qz vein (2.5m)	Tr	Tr	0.46	<0.01	<0.01	<0.01
81	B 2162		Chry-qz ntwk (3.0m)	Tr	Tr	0.14	<0.01	<0.01	<0.01
82	B 2163		Cup-Cc-Chry-qz vein (1.0m)	Tr	Tr	28.60	<0.01	0.02	0.14
83	B 2171	Rio Junin mineralized zone	Py-Cp-Cc-Lim-sil zone (1.2m)	Tr	Tr	0.08	<0.01	<0.01	<0.01
84	B 2172		Py-Cc-Lim-sil zone (1.0m)	Tr	Tr	0.61	<0.01	<0.01	<0.01
85	B 2173		Mo-Cp-qz vein (0.5m)	Tr	4.8	2.40	<0.01	<0.01	0.47
86	B 2176		Chry-qz vein (0.3m)	Tr	Tr	1.56	<0.01	<0.01	0.02
87	C 2133		Cp-Cc-Bo-Py-qz vein (2.3m)	Tr	Tr	0.14	<0.01	<0.01	<0.01
88	C 2134		ditto (1.0m)	Tr	Tr	0.07	<0.01	<0.01	<0.01
89	C 2135		Cp-Py-Cc-Mo-Bo-Chry film/diss (4.0m)	Tr	Tr	0.39	<0.01	<0.01	0.01
90	C 2136		ditto (3.0m)	Tr	Tr	1.63	<0.01	<0.01	0.01
91	C 2137		ditto (3.0m)	Tr	Tr	0.77	<0.01	<0.01	0.01
92	C 2138		ditto (3.5m)	Tr	Tr	0.34	<0.01	<0.01	<0.01
93	C 2139		Cp-Py-Cc-qz vein (0.5m)	Tr	Tr	0.57	<0.01	<0.01	<0.01
94	C 2140		Cp-Bo-Mo-Cc-Py-Chry diss/ntwk (1.5m)	0.1	6.9	1.10	<0.01	<0.01	0.01
95	E 2076		Py-Chry diss	Tr	Tr	3.53	<0.01	<0.01	<0.01
96	E 2077		Py diss	Tr	Tr	0.27	<0.01	<0.01	<0.01
97	E 2078		Cp-qz vein	Tr	Tr	1.21	<0.01	<0.01	0.03
98	B 2165	Q. Controversia mineralized zone	Cp-Py-Cc-Chry-clay vein (0.4m)	0.1	18.3	6.51	<0.01	<0.01	0.03
99	B 2166		Cc-Chry film	Tr	Tr	0.33	<0.01	<0.01	<0.01
100	B 2167		Cc-Mo-Chry ntwk/film (5.0m)	Tr	Tr	0.35	<0.01	<0.01	0.01
101	B 2169		Py-Cp-qz vein (0.2m)	Tr	Tr	0.07	<0.01	<0.01	<0.01
102	C 2132	Q. Rica min. zone	Chry-Cc diss (1.8m)	Tr	Tr	0.54	<0.01	<0.01	<0.01
103	D 2126		Py-Mo-Cp-Chry-qz vein (1.0m)	Tr	Tr	3.87	<0.01	0.01	0.04

February 10, 1993

ASSAY RESULTS OF DRILL HOLE CORE

TO:
Geologycal Survey Department
Bishimetal Exploration Co., Ltd
Re. Junin Project in Ecuador

FROM:
Geoscience Laboratory
Bishimetal Exploration Co., Ltd

The Result of chemical analysis is as follows:

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	MJJ-4- 1	8- 10	Tr	Tr	5915	13	28	7
2	2	10- 12	Tr	Tr	3738	8	1	<1
3	3	14- 16	Tr	Tr	2934	9	49	4
4	4	18- 20	Tr	Tr	951	14	107	10
5	5	22- 24	Tr	Tr	406	8	343	10
6	6	26- 28	Tr	Tr	1459	19	130	3
7	7	30- 32	0.1	1.9	10054	8	45	34
8	8	34- 36	0.2	4.7	15305	13	55	105
9	9	38- 40	Tr	Tr	2326	14	59	3
10	10	42- 44	Tr	Tr	9306	16	51	290
11	11	46- 48	Tr	5.0	14525	17	163	142
12	12	50- 52	Tr	7.8	23684	11	62	451
13	13	54- 56	0.2	12.7	37447	18	285	459
14	14	58- 60	0.2	11.3	24481	12	145	261
15	15	62- 64	Tr	Tr	20869	8	167	66
16	16	66- 68	0.1	10.1	38375	19	291	224
17	17	70- 72	0.3	12.2	23072	15	116	2177
18	18	74- 76	0.2	4.8	21794	14	156	4922
19	19	78- 80	0.2	8.9	27266	13	93	2941
20	20	82- 84	0.2	12.5	22750	16	331	9119
21	21	86- 88	0.1	5.5	13747	23	134	12386
22	22	90- 92	0.1	5.6	17986	20	227	2833
23	23	94- 96	Tr	Tr	11616	17	137	6867
24	24	98-100	0.1	3.9	13089	29	198	7502
25	25	102-104	0.2	9.7	28400	19	47	338

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
26	MJJ-4-26	106-108	0.1	5.3	14103	20	26	172
27	27	110-112	0.1	5.1	12161	15	103	122
28	28	114-116	Tr	Tr	1272	14	29	34
29	29	118-120	Tr	Tr	3426	7	30	25
30	30	122-124	Tr	1.2	6097	14	34	92
31	31	126-128	Tr	0.9	3376	12	18	113
32	32	130-132	Tr	Tr	9638	15	35	19
33	33	134-136	Tr	Tr	4355	10	17	34
34	34	138-140	Tr	Tr	2653	12	19	12
35	35	142-144	0.1	3.3	9266	14	229	79
36	36	146-148	Tr	5.9	9519	9	369	120
37	37	148-148.8	Tr	10.9	11994	14	1019	45
38	MJJ-5- 1	68 - 69	Tr	Tr	4319	24	226	22
39	2	138.5-140	Tr	Tr	9594	20	199	19
40	3	140.0-141.4	Tr	Tr	2427	15	16	<1
41	4	141.4-143.8	0.1	3.8	37477	27	82	4
42	5	143.8-145.8	Tr	Tr	1299	17	99	<1
43	MJJ-6- 1	4- 6	Tr	Tr	312	10	15	27
44	2	6- 8	Tr	Tr	873	11	56	22
45	3	8- 10	Tr	Tr	1150	12	40	102
46	4	10- 12	Tr	Tr	600	9	14	61
47	5	12- 14	Tr	Tr	477	8	32	29
48	6	14- 16	Tr	Tr	477	10	30	80
49	7	16- 18	Tr	2.6	1876	14	18	86
50	8	18- 20	Tr	Tr	4115	10	48	461
51	9	20- 22	Tr	Tr	2362	11	70	156
52	10	22- 24	Tr	Tr	4401	9	40	97
53	11	24- 26	Tr	Tr	2237	12	15	112
54	12	26- 28	Tr	Tr	2089	9	16	101
55	13	28- 30	Tr	Tr	1243	17	40	31
56	14	30- 32	Tr	Tr	1972	9	17	321
57	15	32- 34	Tr	Tr	661	15	29	7
58	16	34- 36	Tr	Tr	2847	14	30	15
59	17	36- 38	Tr	Tr	1242	13	15	5
60	18	38- 40	Tr	Tr	3476	13	60	52

No	Sample No.	Depth (m)	g/t Au	g/t Ag	ppm Cu	ppm Pb	ppm Zn	ppm Mo
61	MJJ-6-19	40- 42	Tr	Tr	6592	9	25	13
62	20	42- 44	Tr	Tr	2590	11	36	33
63	21	44- 46	Tr	Tr	1268	16	31	10
64	22	46- 48	Tr	Tr	635	13	49	<1
65	23	48- 50	Tr	Tr	714	13	36	16
66	24	50- 52	Tr	0.4	1390	13	16	30
67	25	52- 54	Tr	Tr	829	11	52	78
68	26	54- 56	Tr	Tr	219	10	39	<1
69	27	56- 58	Tr	Tr	1312	11	39	883
70	28	58- 60	Tr	1.0	4476	11	22	130
71	29	60- 62	Tr	Tr	2117	11	15	63
72	30	62- 64	Tr	Tr	2697	10	2	24
73	31	64- 66	Tr	0.7	2036	14	4	19
74	32	66- 68	Tr	Tr	854	15	4	23
75	33	68- 70	Tr	Tr	954	13	39	37
76	34	70- 72	Tr	Tr	628	10	47	25
77	35	72- 74	Tr	Tr	459	6	24	15
78	36	74- 76	Tr	Tr	409	11	30	66
79	37	76- 78	Tr	Tr	1491	13	24	63
80	38	78- 80	Tr	Tr	721	12	18	88
81	39	80- 82	Tr	Tr	1307	8	12	41
82	40	82- 84	Tr	1.4	1238	12	9	53
83	41	84- 86	Tr	Tr	1091	7	84	101
84	42	86- 88	Tr	Tr	1649	20	29	99
85	43	88- 90	Tr	Tr	817	14	13	17
86	44	90- 92	Tr	Tr	1549	13	14	32
87	45	92- 94	Tr	1.2	1122	15	11	88
88	46	94- 96	Tr	Tr	2306	7	8	93
89	47	96- 98	Tr	Tr	2270	7	15	32
90	48	98-100	Tr	Tr	2530	14	20	187
91	49	100-102	Tr	Tr	1287	8	12	49
92	50	102-104	Tr	Tr	1650	10	12	14
93	51	104-106	Tr	Tr	1884	7	7	58
94	52	106-108	Tr	0.7	915	7	10	12
95	53	108-110	Tr	1.5	2449	12	5	114

No	Sample No.	Depth (m)	g/t Au	g/t Ag	ppm Cu	ppm Pb	ppm Zn	ppm Mo
96	MJJ-6-54	110-112	Tr	1.2	2419	13	8	101
97	55	112-114	Tr	Tr	1571	12	22	89
98	56	114-116	Tr	Tr	1691	7	10	129
99	57	116-118	Tr	1.2	2363	5	11	137
100	58	118-120	Tr	0.9	2058	5	11	61
101	59	120-122	Tr	Tr	2172	7	5	25
102	60	122-124	Tr	Tr	1214	12	13	24
103	61	124-126	Tr	Tr	847	10	13	27
104	62	126-128	Tr	0.9	1780	10	25	42
105	63	128-130	Tr	Tr	1084	5	10	13
106	64	130-132	Tr	Tr	845	11	15	66
107	65	132-134	Tr	Tr	606	12	15	55
108	66	134-136	Tr	Tr	2666	18	15	65
109	67	136-138	Tr	Tr	1317	8	11	58
110	68	138-140	Tr	0.6	3444	10	12	46
111	69	140-142	Tr	Tr	2029	13	10	96
112	70	142-144	Tr	Tr	776	17	18	31
113	71	144-146	Tr	Tr	1096	9	12	38
114	72	146-148	Tr	Tr	1424	8	12	36
115	73	148-150	Tr	Tr	930	7	8	313
116	MJJ-7- 1	145-147	Tr	Tr	1086	11	7	4
117	2	151-153	Tr	Tr	678	11	26	1
118	3	153-155	Tr	Tr	658	12	39	<1
119	4	155-157	Tr	Tr	297	12	41	32
120	5	157-159	Tr	Tr	420	9	45	<1
121	6	159-161	Tr	Tr	738	5	<1	<1
122	7	161-163	Tr	Tr	2496	9	24	2
123	8	163-165	Tr	Tr	1324	9	<1	11
124	9	165-167	Tr	Tr	1516	9	9	6
125	10	167-169	Tr	Tr	382	8	25	<1
126	MJJ-8- 1	6- 8	Tr	Tr	2135	7	15	42
127	2	8- 10	Tr	0.3	5258	12	<1	169
128	3	10- 12	0.1	0.8	12851	9	11	249
129	4	12- 14	Tr	5.0	8460	9	7	266
130	5	14- 16	Tr	1.7	6174	17	5	20

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
131	MJJ-8- 6	16- 18	Tr	Tr	2268	14	7	8			
132	7	18- 20	Tr	Tr	774	8	7	8			
133	8	20- 22	Tr	Tr	2912	13	12	148			
134	9	22- 24	Tr	1.9	3995	8	<1	236			
135	10	24- 26	Tr	Tr	3087	11	13	156			
136	11	26- 28	Tr	Tr	2196	3	9	134			
137	12	28- 30	Tr	Tr	2054	9	13	111			
138	13	30- 32	Tr	Tr	2318	5	3	69			
139	14	32- 34	Tr	Tr	2075	12	6	131			
140	15	38- 40	Tr	1.8	4729	21	12	132			
141	16	40- 42	Tr	Tr	2790	9	11	147			
142	17	42- 44	Tr	Tr	2320	13	10	138			
143	18	44- 46	Tr	1.2	3855	17	18	76			
144	19	46- 48	Tr	2.1	4484	7	7	137			
145	20	48- 50	Tr	Tr	4160	10	2	111			
146	21	50- 52	Tr	1.1	2762	3	<1	140			
147	22	52- 54	Tr	2.5	6473	17	6	178			
148	23	54- 56	Tr	Tr	3197	6	<1	441			
149	24	56- 58	0.1	2.1	4634	6	<1	457			
150	25	58- 60	Tr	2.1	4055	6	<1	479			
151	26	60- 62	Tr	2.5	4547	15	<1	160			
152	27	62- 64	0.1	2.4	3737	9	9	323			
153	28	64- 66	Tr	Tr	1991	6	6	254			
154	29	66- 68	Tr	Tr	3210	11	7	75			
155	30	68- 70	Tr	1.8	2617	12	3	42			
156	31	70- 72	Tr	Tr	3279	8	<1	426			
157	32	72- 74	Tr	Tr	2264	8	8	79			
158	33	74- 76	Tr	Tr	2572	7	2	65			
159	34	76- 78	Tr	Tr	5920	8	3	90			
160	35	78- 80	Tr	1.3	4828	8	4	118			
16	36	80- 82	Tr	2.5	6279	10	7	225			
162	37	82- 84	0.2	16.5	21008	14	20	1314			
163	38	84- 86	0.2	14.5	13892	14	7	233			
164	39	86- 88	Tr	2.1	4879	4	4	96			
165	40	88- 90	Tr	1.2	3177	2	3	110			

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
166	MJJ-8-41	90- 92	Tr	1.6	4626	2	3	59			
167	42	92- 94	Tr	2.5	6238	11	6	40			
168	43	94- 96	Tr	0.9	1490	6	3	148			
169	44	96- 98	Tr	Tr	1330	3	<1	14			
170	45	98-100	Tr	1.3	3016	10	6	102			
171	46	100-102	Tr	Tr	2017	7	3	12			
172	47	102-104	Tr	Tr	3021	9	<1	133			
173	48	104-106	Tr	Tr	2099	23	<1	48			
174	49	106-108	Tr	Tr	2687	15	3	61			
175	50	108-110	Tr	Tr	2492	11	<1	91			
176	51	110-112	Tr	1.2	3780	<1	<1	223			
177	52	112-114	Tr	0.8	3742	11	<1	105			
178	53	114-116	Tr	Tr	3249	13	5	51			
179	54	116-118	Tr	Tr	1835	12	<1	96			
180	55	118-120	Tr	Tr	2435	9	11	92			
181	56	120-122	Tr	Tr	2274	8	<1	33			
182	57	122-124	Tr	Tr	1869	6	2	20			
183	58	124-126	0.1	3.6	8388	8	<1	84			
184	59	126-128	Tr	Tr	4364	10	<1	45			
185	60	128-130	Tr	Tr	2363	2	<1	22			
186	61	130-132	Tr	1.9	5192	12	3	110			
187	62	132-134	Tr	2.2	3748	3	<1	103			
188	63	134-136	Tr	1.6	3684	9	4	30			
189	64	136-138	Tr	Tr	1700	11	3	15			
190	65	138-140	Tr	1.2	2703	8	<1	86			
191	66	140-142	Tr	1.8	3016	6	<1	209			
192	67	142-144	Tr	Tr	6328	8	<1	142			
193	68	144-146	Tr	1.8	896	9	<1	24			
194	69	146-148	Tr	0.7	6297	9	<1	112			
195	70	148-150	Tr	Tr	2344	9	<1	82			
196	71	150-152	Tr	1.5	2895	9	<1	288			
197	72	152-154	Tr	Tr	3560	8	10	76			
198	73	154-156	Tr	Tr	2539	14	3	239			
199	74	156-158	Tr	1.7	1991	9	<1	417			
200	75	158-160	Tr	Tr	3850	14	<1	139			

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
201	MJJ-8-76	160-162	Tr	Tr	3721	5	2	128
202	77	162-164	0.1	1.7	4953	6	<1	339
203	78	164-166	Tr	2.1	5205	9	16	1746
204	79	166-168	Tr	2.3	5294	25	50	172
205	80	168-170	Tr	1.8	6655	14	16	278
206	81	170-172	Tr	Tr	5534	7	<1	437
207	82	172-174	Tr	2.7	8845	5	<1	79
208	83	174-176	Tr	Tr	7785	7	<1	100
209	84	176-178	Tr	1.2	1130	2	1	238
210	85	178-180	Tr	3.8	3164	7	<1	211
211	86	180-182	Tr	Tr	8433	<1	<1	182
212	87	182-184	Tr	Tr	9701	<1	1	684
213	88	184-186	Tr	1.0	4289	<1	<1	87
214	89	186-188	Tr	2.2	3477	7	<1	91
215	90	188-190	Tr	1.4	3754	8	<1	292
216	91	190-192	Tr	Tr	4692	1	<1	99
217	92	192-194	Tr	2.1	4430	9	<1	271
218	93	194-196	Tr	Tr	5555	1	<1	123
219	94	196-198	Tr	Tr	6282	7	<1	105
220	95	198-200	Tr	Tr	4719	7	<1	53
221	96	200-202	0.1	3.1	6190	2	<1	38
222	97	202-204	Tr	2.1	3643	10	<1	61
223	98	204-206	Tr	3.0	3393	<1	<1	441
224	99	206-208	Tr	2.5	6147	<1	<1	302
225	100	208-210	Tr	Tr	4116	2	<1	117
226	101	210-212	Tr	1.3	4104	2	<1	69
227	102	212-214	Tr	Tr	2965	9	<1	216
228	103	214-216	Tr	1.6	4103	2	<1	143
229	104	216-218	Tr	Tr	5954	<1	<1	147
230	105	218-220	0.1	3.8	8560	8	2	158
231	106	220-222	Tr	6.4	18042	7	15	71
232	107	222-224	0.1	3.2	9054	1	16	216
233	108	224-226	0.1	2.7	9345	4	12	224
234	109	226-228	Tr	1.0	2638	3	21	71
235	110	228-230	Tr	2.4	8218	8	<1	192

No	Sample No.	Depth (m)	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
236	MJJ-8-111	230-232	Tr	1.7	2549	3	<1	196
237	112	232-233.4	Tr	0.6	1267	1	<1	34
238	MJJ-9- 1	10- 12	Tr	Tr	1973	6	<1	5
239	2	12- 14	Tr	1.1	5314	6	<1	<1
240	3	14- 16	Tr	Tr	7568	6	<1	69
241	4	16- 18	Tr	Tr	4219	2	<1	2
242	5	18- 20	Tr	1.2	3842	3	<1	20
243	6	20- 22	Tr	0.9	2920	1	<1	37
244	7	22- 24	Tr	Tr	934	3	9	18
245	8	24- 26	Tr	Tr	567	6	3	<1
246	9	26- 28	Tr	Tr	508	6	8	<1
247	10	28- 30	Tr	Tr	1700	5	5	4
248	11	30- 32	Tr	Tr	938	9	<1	6
249	12	32- 34	Tr	Tr	1041	2	10	1
250	13	34- 36	Tr	Tr	449	3	7	5
251	14	36- 38	Tr	0.7	2985	6	5	<1
252	15	38- 40	Tr	Tr	3544	14	<1	40
253	16	40- 42	Tr	Tr	1245	3	<1	3
254	17	42- 44	Tr	0.3	1562	6	<1	1
255	18	44- 46	Tr	Tr	1406	9	<1	4
256	19	46- 48	Tr	Tr	4246	12	<1	11
257	20	48- 50	Tr	Tr	3469	5	<1	<1
258	21	50- 52	Tr	0.6	1315	6	8	<1
259	22	52- 54	Tr	Tr	2042	6	<1	<1
260	23	54- 56	Tr	Tr	2256	3	<1	38
261	24	56- 58	Tr	Tr	4748	11	4	5
262	25	58- 60	Tr	Tr	1920	6	<1	27
263	26	60- 62	Tr	Tr	1594	6	7	<1
264	27	62- 64	Tr	Tr	2119	9	8	<1
265	28	64- 66	Tr	Tr	1230	10	10	103
266	29	66- 68	Tr	Tr	1306	5	4	<1
267	30	68- 70	Tr	Tr	1055	12	3	1
268	31	70- 72	Tr	Tr	1225	8	2	<1
269	32	72- 74	Tr	Tr	1162	9	<1	5
270	33	74- 76	Tr	0.7	1217	12	<1	104

No	Sample No.	Depth (m)	g/t Au	g/t Ag	ppm Cu	ppm Pb	ppm Zn	ppm Mo			
271	MJJ-9-34	76- 78	Tr	Tr	1779	8	4	123			
272	35	78- 80	Tr	Tr	1992	10	2	25			
273	36	80- 82	Tr	Tr	3917	11	4	34			
274	37	82- 84	Tr	0.8	1401	8	8	22			
275	38	84- 86	Tr	1.2	2384	6	19	3			
276	39	86- 88	Tr	1.0	2501	14	9	7			
277	40	88- 90	Tr	0.9	1363	12	153	<1			
278	41	90- 92	Tr	Tr	1820	7	37	13			
279	42	92- 94	Tr	Tr	2156	11	56	19			
280	43	94- 96	Tr	Tr	894	8	87	9			
281	44	96- 98	Tr	Tr	2053	9	36	13			
282	45	98-100	Tr	Tr	2979	5	12	50			
283	46	100-102	Tr	Tr	2330	5	2	38			
284	47	102-104	Tr	Tr	1482	9	<1	15			
285	48	104-106	Tr	Tr	1741	13	6	2			
286	49	106-108	Tr	Tr	957	20	<1	432			
287	50	108-110	Tr	Tr	1112	7	3	7			
288	51	110-112	Tr	Tr	1275	11	<1	29			
289	52	112-114	Tr	Tr	3167	7	<1	124			
290	53	114-116	Tr	Tr	968	6	<1	<1			
291	54	116-118	Tr	Tr	1557	4	7	4			
292	55	118-120	Tr	0.5	3356	9	1	<1			
293	56	120-122	Tr	1.4	5264	6	4	42			
294	57	122-124	Tr	Tr	2238	9	<1	6			
295	58	124-126	Tr	0.4	1247	6	<1	7			
296	59	126-128	Tr	Tr	946	5	2	<1			
297	60	128-130	Tr	Tr	631	8	<1	8			
298	61	130-132	Tr	Tr	782	216	674	<1			
299	62	132-134	Tr	0.6	252	8	1	1			
300	63	134-136	Tr	1.0	2058	8	<1	63			
301	64	136-138	Tr	Tr	1345	8	<1	104			
302	65	138-140	Tr	Tr	809	6	<1	13			
303	66	140-142	Tr	Tr	1204	14	<1	26			
304	67	142-144	Tr	Tr	503	5	<1	7			
305	68	144-146	Tr	Tr	2510	8	4	<1			
306	69	146-148	Tr	Tr	2175	3	<1	9			
307	70	148-150	Tr	Tr	919	7	11	34			

Appendix 5 Analytical data of geochemical rock samples

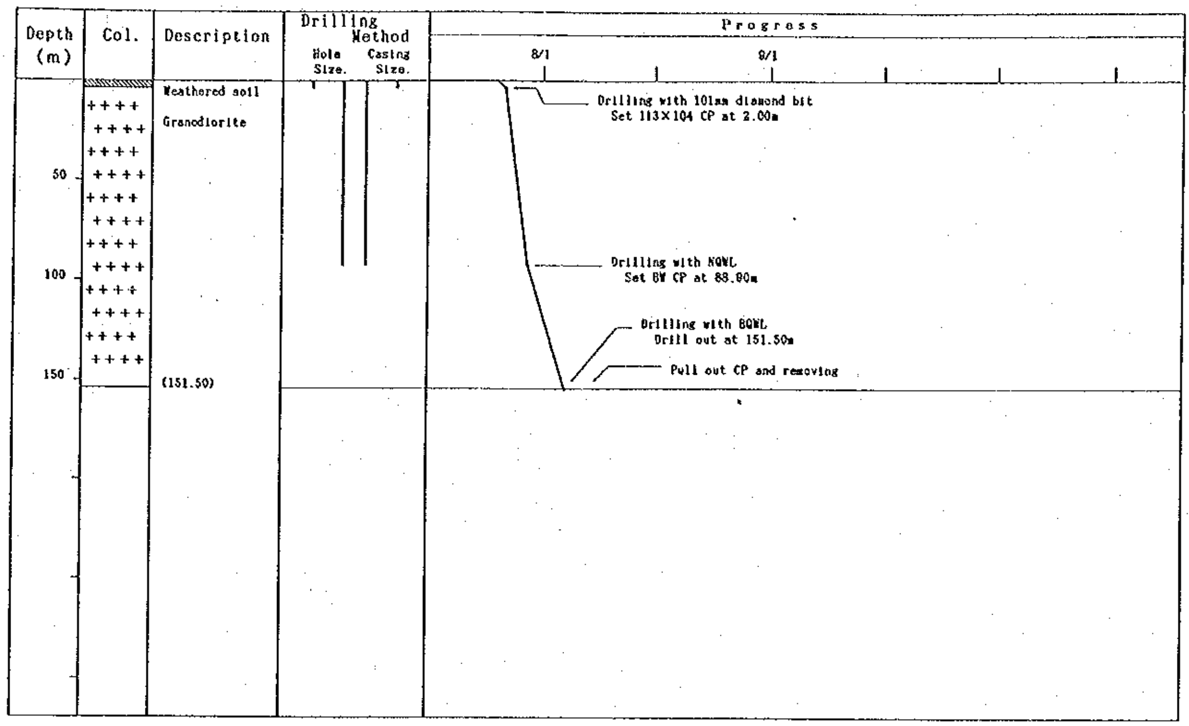
Ser. No.	Sample No.	Location (km) X-coord	Y-coord	Cu ppm	Pb ppm	Zn ppm	Au ppb	Ag ppm	Mo ppm	Fe %	S %
1	B2001	772.374	48.197	243	3	31	1>	.2>	1>	1.67	.018
2	B2003	772.372	48.736	315	3	32	3	.2>	1>	2.20	.019
3	B2004	772.385	48.786	809	3	39	1>	.2>	1>	2.41	.026
4	B2006	772.403	48.958	863	5	10	1	3.0	5	2.20	.923
5	B2007	772.260	48.611	332	1	28	1>	.2>	1>	2.55	.034
6	B2008	771.349	48.732	326	2	18	10	.3	8	1.45	.017
7	B2009	771.338	48.651	668	1	20	15	.8	1>	2.57	.026
8	B2011	771.343	48.576	274	10	2	6	1.0	70	1.91	.032
9	B2012	771.377	48.225	143	2	20	1>	.2	1	3.03	.045
10	B2014	771.380	48.169	202	2	23	1	.2>	4	2.27	.045
11	B2016	771.354	48.051	140	2	35	1>	.2>	1>	2.36	.028
12	B2017	771.381	47.908	580	1	71	1>	.2>	1>	1.93	.031
13	B2019	771.359	47.656	199	2	12	11	.2>	22	3.43	.022
14	B2021	771.374	47.420	28	2	39	1>	.2>	1>	2.59	.034
15	B2022	771.359	47.568	117	5	151	1>	.2>	1>	3.64	.015
16	B2023	771.803	48.491	3011	2	25	4	.2>	3	2.56	.023
17	B2024	771.744	48.540	433	2	16	6	.2>	1>	2.26	.025
18	B2025	771.695	48.585	738	2	27	4	.2>	1>	2.83	.025
19	B2026	771.658	48.586	536	3	47	1>	.2>	1	2.53	.019
20	B2027	771.518	48.586	655	2	41	1>	.2>	2	2.60	.014
21	B2028	771.488	48.579	1574	2	15	26	.6	103	1.32	.107
22	B2030	771.442	48.593	805	3	17	16	1.0	8	1.60	.024
23	B2031	771.398	48.583	18842	6	23	110	5.7	1688	1.89	1.557
24	B2033	771.381	48.608	669	4	17	20	2.1	92	1.12	.019
25	B2034	771.358	48.632	1404	2	27	25	.9	5	2.40	.023
26	B2035	771.310	48.670	1458	3	33	34	1.0	11	3.40	.026
27	B2036	771.291	48.568	1574	2	19	9	.3	1>	2.74	.115
28	B2038	771.823	48.450	488	1	32	1>	.2>	1>	1.79	.052
29	B2039	771.766	48.437	390	2	24	1>	.4	7	1.91	.026
30	B2040	771.736	48.408	481	1	20	1>	.3	1>	1.83	.023
31	B2041	771.707	48.396	657	2	22	4	.6	1>	1.60	.024
32	B2042	771.714	48.368	481	2	28	2	.2	1>	2.31	.031
33	B2043	771.688	48.349	510	4	41	3	.3	1	2.02	.025
34	B2044	771.662	48.321	561	5	9	18	3.4	1>	.89	.027
35	B2045	771.637	48.305	2131	2	8	15	1.2	1	1.63	.150
36	B2047	771.573	48.277	349	2	25	1	.2	1>	1.78	.025
37	B2048	771.538	48.271	816	2	33	3	.2	8	2.01	.142
38	B2050	771.511	48.243	381	1>	22	1>	.2	1>	1.92	.052
39	B2051	771.489	48.251	504	3	28	3	.3	1>	2.67	.108
40	B2053	771.460	48.244	148	1	24	1>	.2>	1>	2.04	.071
41	B2054	771.428	48.243	345	2	29	2	.2	1>	2.62	.032
42	B2055	771.400	48.236	340	2	53	1>	1.4	1>	2.03	.133
43	B2056	771.321	48.213	340	3	47	1>	.2	1>	2.13	.034
44	B2057	771.285	48.223	1708	1	19	7	.8	13	2.32	.628
45	B2059	771.261	48.241	119	1	29	1>	.2>	1>	2.53	.040
46	B2060	771.230	48.258	371	1	17	1>	.2>	1>	1.49	.024
47	B2061	771.987	48.489	193	1	13	1>	.2>	1>	1.11	.023
48	B2062	771.993	48.514	861	2	19	3	.3	1>	1.85	.033
49	B2063	772.008	48.571	1268	2	15	6	.3	2	1.32	.143
50	B2064	772.012	48.606	358	1	11	8	.3	1>	1.59	.040
51	B2065	772.018	48.647	805	1	17	4	.2	2	1.54	.131
52	B2067	771.986	48.700	422	3	7	21	.9	1>	.60	.016
53	B2068	771.966	48.732	970	2	10	14	.5	1>	1.50	.026
54	B2069	771.944	48.767	2041	1	10	37	1.1	1>	.98	.049
55	B2070	771.916	48.773	111	2	10	1>	.2>	1>	1.48	.012
56	B2071	771.886	48.783	728	2	12	38	1.0	1>	1.59	.025
57	B2072	771.827	48.771	819	2	12	71	.8	1>	1.00	.021
58	B2074	771.758	48.779	260	1	9	12	.5	1>	1.06	.023
59	B2075	771.724	48.792	104	1	10	7	.2>	1>	.95	.021
60	B2076	771.700	48.811	447	1	8	1	.3	1>	.99	.023
61	B2077	771.696	48.835	377	2	22	3	.7	1>	1.50	.020
62	B2078	771.691	48.874	592	2	10	7	.2	1>	.79	.021
63	B2079	771.662	48.901	953	2	17	19	.8	5	1.23	.024
64	B2080	771.636	48.923	634	2	15	15	.5	1	1.56	.024
65	B2081	771.617	48.948	353	2	14	2	.2	1>	1.65	.028
66	B2082	771.587	48.972	765	2	17	12	.7	2	1.44	.033
67	C2001	772.134	48.029	309	1	19	1	.2>	2	2.25	.027
68	C2002	772.148	47.800	46	1	18	1>	.2>	1>	2.32	.028
69	C2003	772.133	47.767	3728	108	106	13	5.3	1178	1.32	1.094
70	C2005	772.125	47.617	61	2	31	1>	.2>	4	2.31	.030
71	C2006	772.125	47.529	401	3	92	1>	.6	1>	4.27	.038
72	C2007	771.870	47.376	20	2	24	1>	.2>	1>	2.14	.026
73	C2008	771.882	47.618	69	1>	27	1>	.2>	1>	2.45	.031
74	C2009	771.879	47.711	128	12	31	1>	.2>	1>	1.98	.023
75	C2010	771.878	47.826	101	1	24	1>	.2>	1>	2.32	.031
76	C2011	771.877	48.172	357	2	17	1>	.2>	1>	1.30	.020
77	C2012	771.863	48.466	132	1	56	1>	.2>	1>	2.51	.029
78	C2013	771.600	49.238	140	2	20	1>	.2	1>	1.81	.023
79	C2014	771.600	49.139	268	2	19	1>	.2>	3	2.30	.025
80	C2015	771.598	49.097	180	2	22	1>	.2>	3	2.31	.022
81	C2016	771.597	49.058	438	2	16	14	.3	1>	1.86	.025
82	C2017	771.591	48.975	1198	2	14	13	.8	4	1.79	.023
83	C2018	771.585	48.896	997	2	19	15	.4	1>	1.51	.026
84	C2020	771.582	48.804	492	2	15	12	.7	1>	1.30	.021
85	C2021	771.579	48.637	325	2	13	109	.2	1>	1.66	.018
86	C2023	771.601	48.298	589	2	21	3	.3	1>	1.96	.025
87	C2024	771.616	48.248	341	2	35	1>	.2	1>	1.62	.020
88	C2025	771.613	48.160	363	2	25	1>	.2>	1>	2.29	.026
89	C2026	771.635	47.866	125	1	33	1>	.2>	1>	1.95	.029
90	C2027	771.632	47.809	221	1	23	1>	.2>	1>	2.20	.036
91	C2028	771.641	47.566	19	1	32	1>	.2>	1>	2.24	.031
92	C2029	772.413	48.085	5	1	22	1>	.2>	1>	2.23	.034
93	C2031	772.339	48.183	149	2	26	1>	.2>	1>	2.50	.025
94	C2032	772.323	48.190	250	2	25	1>	.2>	1>	2.09	.024
95	C2033	772.299	48.212	95	1>	40	2	.2>	1>	2.47	.030
96	C2034	772.298	48.271	123	2	33	6	.2>	1>	2.41	.031
97	C2035	772.303	48.313	633	1	27	6	.2>	1>	2.16	.028
98	C2036	772.292	48.345	100	1	8	18	.2>	1>	1.18	.022
99	C2039	772.269	48.379	142	1	19	5	.2>	1>	1.83	.035
100	C2041	772.225	48.409	196	1	29	21	.2>	1>	3.57	.025

Ser.	Sample	Location (km)		Cu	Pb	Zn	Au	Ag	Mo	Fe	S
No.	No.	X-coord	Y-coord	ppm	ppm	ppm	ppb	ppm	ppm	%	%
101	C2042	772.181	48.429	87	2	27	5	.2>	1>	2.43	.031
102	C2043	772.161	48.440	888	2	24	21	.2>	1>	1.89	.028
103	C2044	772.145	48.442	228	4	2	26	.6	6	.32	.022
104	C2045	772.069	48.442	254	1	15	15	.3	1>	1.57	.027
105	C2046	772.028	48.447	150	2	17	1>	.2>	1>	2.42	.032
106	C2047	771.995	48.431	185	3	25	4	.3	1>	2.19	.022
107	C2048	772.059	49.457	477	1	32	6	.4	2	2.07	.026
108	C2049	772.096	49.479	176	1	12	13	.4	1>	1.40	.026
109	C2050	772.133	49.503	216	2	19	41	.5	1	2.17	.035
110	C2051	772.165	49.526	116	2	11	6	.3	1>	1.20	.024
111	C2052	772.187	49.548	340	2	20	19	1.0	1>	2.34	.034
112	C2053	772.207	49.564	85	1>	18	6	.3	1>	2.49	.030
113	C2054	772.224	49.583	327	2	28	2	.5	5	2.01	.031
114	C2055	772.248	49.606	102	1	14	1>	.2	1>	2.19	.027
115	C2056	772.285	49.646	316	2	20	3	.5	1>	2.56	.029
116	C2057	772.166	49.643	243	2	33	1>	.5	2	2.54	.019
117	C2058	772.141	49.642	157	2	13	1>	.2	1>	2.05	.031
118	C2060	772.118	49.636	535	1	14	19	1.0	3	2.54	.041
119	C2061	772.091	49.630	81	2	11	1>	.2	1>	1.64	.032
120	C2062	772.053	49.619	617	2	21	4	.5	3	2.91	.030
121	C2063	771.962	49.578	233	1	16	6	.2>	1>	2.20	.031
122	C2064	771.939	49.568	943	2	19	7	.3	1>	2.66	.029
123	C2065	771.878	49.551	459	1	25	5	.2	2	2.65	.031
124	C2066	771.858	49.551	140	2	19	1	.2>	1>	1.97	.028
125	C2067	771.816	49.551	231	4	21	2	.2>	1>	2.57	.024
126	C2068	771.786	49.554	191	1	21	1	.2	1>	1.70	.025
127	D2001	772.107	48.492	1022	1	18	5	.3	2	2.07	.025
128	D2002	772.124	48.628	791	2	17	2	.2>	1	1.89	.027
129	D2003	772.120	48.824	125	45	13	1	2.0	11	1.06	.019
130	D2004	772.127	49.051	651	1	19	5	.2>	1	1.99	.025
131	D2005	771.844	48.869	414	2	3	54	1.6	13	.92	.018
132	D2007	771.042	49.285	55	2	14	1>	.2>	1>	1.69	.026
133	D2009A	771.075	49.004	861	2	19	3	.2	1>	2.17	.470
134	D2010	771.079	48.493	115	1	15	1>	.2>	1>	1.55	.110
135	D2011	772.387	47.745	269	3	20	1>	.2>	1	1.72	.026
136	D2012	772.322	47.748	573	4	27	1>	.2>	1>	2.45	.032
137	D2013	772.265	47.763	412	1	27	1>	.2>	1>	2.32	.032
138	D2014	772.235	47.777	4537	22	155	10	4.1	270	.77	.521
139	D2016	772.212	47.783	1272	7	43	2	1.1	7	1.60	.364
140	D2017	772.093	47.811	119	1	15	1>	.2>	1>	2.42	.029
141	D2018	772.063	47.814	222	1	22	1>	.2>	1>	2.35	.032
142	D2019	772.009	47.823	818	2	27	1>	.2>	1>	2.09	.030
143	D2020	771.966	47.812	327	1>	39	1>	.2>	1>	1.97	.031
144	D2021	771.924	47.797	46	1	24	1>	.2>	1>	2.53	.033
145	D2022	771.827	47.783	262	2	19	4	.2>	21	2.28	.045
146	D2023	771.787	47.798	217	1	21	4	.2>	1>	2.28	.032
147	D2024	771.726	47.816	548	2	29	1	.2	4	1.84	.026
148	D2025	771.679	47.815	169	2	25	1	.2>	1>	2.37	.029
149	D2026	771.585	47.834	99	1	24	1>	.2>	1>	2.38	.028
150	D2027	771.532	47.844	65	1	23	3	.2>	1>	2.42	.036
151	D2028	771.478	47.862	211	2	40	1>	.2	1>	2.48	.022
152	D2029	771.433	47.887	47	1>	30	1>	.2>	1>	1.81	.026
153	D2030	771.329	47.939	241	1	37	1>	.2>	1>	2.06	.026
154	D2031	771.271	47.966	210	2	33	1>	.5	1>	2.26	.026
155	D2032	771.554	49.018	1026	2	22	136	2.9	12	2.39	.044
156	D2033	771.533	49.045	551	1>	2	4	.4	14	.50	.055
157	D2034	771.498	49.089	1919	2	19	11	.6	1>	2.47	.216
158	D2036	771.442	49.102	1969	1	17	31	2.3	31	2.51	.157
159	D2037	771.409	49.110	2637	2	17	9	.9	10	2.12	.267
160	D2039	771.372	49.126	2423	5	27	5	1.1	166	1.54	.154
161	D2041	771.308	49.172	1002	2	20	2	.2	2	1.98	.119
162	D2042	771.283	49.193	323	1	17	4	.2>	1>	2.24	.025
163	D2043	771.249	49.210	63	1>	13	1>	.2	1>	.92	.016
164	D2044	771.202	49.214	240	1>	31	1>	.2>	1>	2.34	.053
165	D2045	771.145	49.174	112	2	20	4	.2	1>	2.49	.026
166	D2046	771.108	49.142	148	1	17	1>	.2>	1>	2.46	.026
167	D2047	770.984	49.103	87	1	20	1>	.2	1>	2.14	.028
168	E2001	772.399	47.713	310	3	27	1>	.2>	1>	2.95	.026
169	E2002	772.341	47.679	77	3	12	1>	.2>	1>	3.08	.030
170	E2003	772.308	47.683	372	2	15	1>	.2>	1>	2.38	.026
171	E2004	772.267	47.679	178	3	29	3	.3	2	1.75	.021
172	E2005	772.078	47.606	6	1	20	1>	.2>	1>	2.16	.027
173	E2006	772.043	47.601	50	1	25	1>	.2>	1>	2.31	.023
174	E2007	772.013	47.595	78	3	24	1>	.2>	1>	2.28	.023
175	E2008	771.961	47.584	569	2	35	1>	.6	1>	2.31	.024
176	E2009	771.854	47.568	183	1	27	1>	.2	1>	2.56	.055
177	E2010	771.799	47.566	10	1>	25	1>	.2>	1>	2.19	.026
178	E2011	771.776	47.567	15	1	20	1>	.2>	1>	2.08	.025
179	E2012	771.680	47.562	12	2	25	1>	.2>	1>	2.19	.029
180	E2013	771.610	47.569	23	2	20	1	.2>	1>	2.22	.027
181	E2014	772.435	48.229	128	3	37	1>	.2>	3	2.91	.014
182	E2015	772.476	48.278	12	1	18	1>	.2>	1>	1.36	.018
183	E2016	772.523	48.396	162	5	8	2	1.1	4	1.70	.016
184	E2017	772.518	48.421	96	1>	25	1>	.2>	1>	1.89	.024
185	E2018	772.510	48.447	109	2	10	1>	.2	2	1.68	.020
186	E2019	772.505	48.471	77	1	36	1>	.2>	1>	2.28	.029
187	E2020	772.510	48.522	92	1>	26	1>	.2>	1>	2.51	.029
188	E2021	772.509	48.545	134	1	27	1>	.2>	1>	2.06	.028
189	E2023	772.494	48.581	87	1	41	1>	.2>	1>	2.37	.029
190	E2024	772.491	48.601	50	1>	32	1>	.2>	1>	1.97	.026
191	E2025	772.480	48.624	15	1	48	1>	.2>	1>	2.18	.028
192	E2026	772.465	48.650	54	1>	30	1>	.2>	1>	2.13	.028
193	E2027	772.447	48.688	248	1	37	1>	.2>	1>	2.07	.025
194	E2029	772.436	48.748	8	2	34	1>	.2>	1>	1.44	.015
195	JC3-10A	772.137	48.878	494	2	47	2	.6	1>	1.76	.026
196	JC3-10B	772.120	48.850	182	1	21	3	.5	1>	1.76	.030
197	JC3-19	772.121	48.447	161	2	35	5	.4	1>	2.38	.024
198	JC3-30	772.142	47.887	226	16	7	15	3.2	93	.89	.015
199	JC3-31	772.125	47.828	47	2	16	1>	.2>	1	2.59	.026
200	JC4-11	771.864	48.804	711	2	5	73	1.8	3	.64	.017
201	JC4-32	771.877	47.779	87	1	25	1>	.2>	1>	2.51	.030
202	JC4-36	771.898	47.571	125	1	28	3	.3	1>	2.56	.033
203	JC5-07	771.588	49.001	726	1	13	14	.6	2	.94	.018
204	JC6-05	771.332	49.152	525	1	42	2	1.9	1>	2.54	.047
205	JC6-32	771.359	47.760	101	2	48	9	.2	1>	2.48	.028
206	JC7-04	771.049	49.135	36	3	24	1	.3	1>	2.17	.025

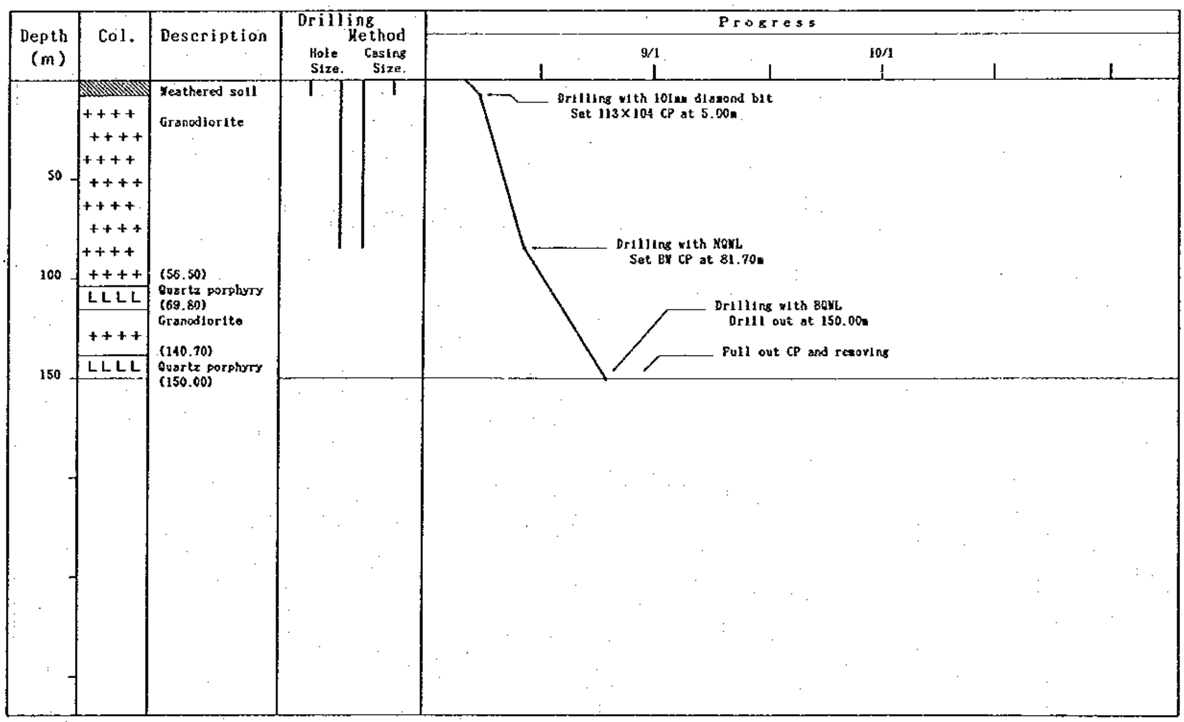
Ser. No.	Sample No.	Location (km) X-coord	Y-coord	Cu ppm	Pb ppm	Zn ppm	Au ppb	Ag ppm	Mo ppm
1	B2083	762.191	37.565	1321	3	58	1>	.2>	1>
2	B2084	762.143	37.595	439	13	73	2	.2	1>
3	B2085	762.130	37.656	78	4	71	1>	.2>	1>
4	B2086	762.134	37.736	216	5	49	1>	.2>	1>
5	B2087	762.067	37.644	379	5	6	10	1.1	1>
6	B2088	762.013	37.699	65	1	36	1>	.2>	1>
7	B2089	761.930	37.756	77	14	22	1>	.2>	1>
8	B2090	761.846	37.803	19	15	4	9	.4	1>
9	B2093	761.588	37.332	24	2	27	1	.2>	1>
10	B2094	761.581	37.388	460	3	54	1>	.2>	1>
11	B2095	761.536	37.446	1457	10	7	32	2.7	1>
12	B2097	761.484	37.525	7739	10	13	7	2.0	1>
13	B2098	761.443	37.606	18060	106	192	37	37.0	58
14	B2100	761.404	37.693	183	31	116	40	5.0	5
15	B2101	761.390	37.779	94	2	38	1>	.2>	1>
16	B2102	761.357	37.804	142	2	29	2	.4	1>
17	B2103	761.330	37.850	34	3	24	8	.2>	1>
18	B2104	762.571	36.858	140	18	280	1>	.2>	1>
19	B2105	762.488	36.922	245	2	94	1>	.4	1>
20	B2106	762.400	36.912	190	2	58	1	.2>	3
21	B2107	762.306	36.947	141	1	34	1>	.2>	1
22	B2108	762.221	37.007	6095	1>	7	1>	.7	1>
23	B2109	762.148	37.023	84	1	6	1>	.2>	1>
24	B2110	762.092	37.012	221	2	3	1>	.4	23
25	B2112	761.979	37.003	55	1>	3	1>	.4	2
26	B2113	761.940	37.014	124	1>	7	2	.2	3
27	C2070	762.451	36.977	233	2	61	1>	.2>	1>
28	C2071	762.385	37.026	122	1	25	1>	.2>	1>
29	C2072	762.409	37.101	124	9	73	1>	.2>	1>
30	C2073	762.382	37.181	374	3	76	11	.2	1>
31	C2074	762.329	37.251	124	28	160	1>	.2>	1>
32	C2076	762.248	37.334	99	10	138	1>	.2	1>
33	C2077	762.250	37.421	121	4	223	1>	.2>	1>
34	C2078	762.247	37.513	158	24	127	1>	.5	1>
35	C2079	762.264	37.593	109	8	91	1>	.2	1>
36	C2080	762.308	37.688	256	5	87	1>	.2	1>
37	C2081	762.289	37.775	34	6	21	1>	.2	1>
38	C2082	762.241	37.845	191	2	63	1>	.3	1>
39	C2083	762.350	37.768	243	41	16	27	.5	1>
40	C2084	762.305	37.834	33	3	42	1>	.2	1>
41	C2085	762.147	37.920	61	5	42	1>	.2>	1>
42	C2086	762.098	37.888	22	3	30	3	.2>	1>
43	C2087	762.006	37.864	36	4	46	3	.2>	1>
44	C2088	761.914	37.841	28	4	54	1>	.2>	1>
45	C2089	761.710	37.793	70	6	128	2	.2>	1>
46	C2090	761.695	37.718	316	3	67	1>	.2>	1>
47	C2091	761.683	37.634	64	3	41	1	.2>	1>
48	C2092	761.726	37.506	180	7	78	1>	.2>	1>
49	C2093	761.684	37.485	255	4	64	1>	.2>	1>
50	C2096	761.740	37.014	369	3	29	1>	.5	1>
51	C2097	761.708	36.941	759	2	13	5	.2>	1
52	C2098	761.652	36.903	704	2	7	4	.2	1>
53	C2099	761.649	36.867	926	2	12	4	.2	3
54	D2048	762.197	37.368	1326	2	81	2	1.4	1>
55	D2050	762.119	37.431	186	3	8	18	.7	5
56	D2052	762.066	37.424	187	17	106	1>	.2>	1>
57	D2053	762.035	37.423	5894	28	227	474	10.1	33
58	D2055	761.980	37.483	132	2	51	3	.3	1>
59	D2056	761.928	37.525	228	6	71	7	.3	21
60	D2057	761.880	37.565	679	41	6	359	13.4	5
61	D2058	761.829	37.606	320	3	40	1	.2	1>
62	D2059	761.960	37.407	278	4	56	1>	.2>	1>
63	D2060	761.883	37.419	375	5	43	1>	.2>	1>
64	D2061	761.789	37.409	254	4	46	2	.2>	1>
65	D2062	761.840	37.414	6818	19	25	81	19.2	4
66	D2064	761.509	37.225	548	3	71	8	.7	1>
67	D2065	761.451	37.274	163	14	4	9	.4	1>
68	D2067	761.409	37.294	71	4	7	1>	.3	1>
69	D2068	761.384	37.301	257	5	116	1>	.2>	1>
70	D2069	761.352	37.312	395	24	35	82	.4	1>
71	D2070	761.279	37.309	20	8	106	1>	.2>	1>
72	D2071	761.190	37.741	16	4	29	1>	.2>	1>
73	D2072	761.590	37.201	184	2	48	1	.2>	1>
74	D2073	761.646	37.159	180	3	31	1	.2>	1>
75	D2074	761.698	37.106	79	1	3	1>	.3	1>
76	D2075	761.767	37.075	65	7	3	12	1.3	1>
77	D2077	761.837	37.048	119	2	7	33	.3	2
78	D2078	761.903	37.036	188	1>	8	1>	.3	4
79	E2030	762.356	37.044	30	1>	4	1>	.2>	1>
80	E2031	762.327	37.066	36	2	11	16	.2>	1>
81	E2032	762.284	37.103	6	1>	2	1>	.2>	1>
82	E2033	762.227	37.155	33	2	68	1>	.2>	1>
83	E2034	762.203	37.182	14	1>	5	1>	.2>	1>
84	E2035	762.088	37.239	165	8	24	1>	.2>	1>
85	E2036	762.022	37.237	33	2	5	1>	.2>	1>
86	E2037	761.981	37.214	58	3	13	5	.3	1>
87	E2038	761.444	37.768	18	2	25	1>	.3	1>
88	E2040	761.520	37.832	22	1	22	1>	.2	1>
89	E2042	761.564	37.858	13	2	23	2	.2>	1>
90	E2043	761.638	37.081	667	2	27	1>	.2>	1>
91	E2044	761.559	37.086	67	2	3	1>	.3	2
92	E2045	761.471	37.087	543	3	4	125	3.7	1>
93	E2046	761.403	37.061	466	2	97	14	.3	1>
94	B2114	760.091	36.614	100	3	49	1>	.2	1>
95	B2115	760.114	36.692	5361	10	50	6	3.6	8
96	B2118	760.181	36.744	3549	6	13	1>	1.4	1>
97	B2120	760.217	36.773	6532	10	8	5	3.5	1>
98	B2122	760.294	36.830	263	5	2	2	1.8	1>
99	B2124	760.382	36.903	292	4	48	1>	.4	1>
100	B2125	760.484	36.951	992	19	5	13	9.0	2

Ser. No.	Sample No.	Location (km) X-coord	Location (km) Y-coord	Cu ppm	Pb ppm	Zn ppm	Au ppb	Ag ppm	Mo ppm
101	B2127	760.686	37.021	548	18	4	2	1.2	1
102	B2129	760.660	37.061	942	6	24	4	.7	1>
103	B2131	760.751	37.127	130	3	87	1>	.2>	1>
104	B2133	760.804	37.194	2150	58	26	3	2.4	2
105	C2100	760.875	37.372	28	6	39	1>	.2>	2
106	C2101	760.828	37.442	12	1	27	1>	.2>	1>
107	C2102	760.805	37.500	9	2	30	1>	.2>	1>
108	C2103	760.753	37.571	16	2	31	1>	.2>	1>
109	C2104	760.726	37.675	15	2	24	1>	.2>	1>
110	C2105	760.690	37.745	19	2	26	1>	.2>	1>
111	C2106	760.694	37.831	19	2	29	1>	.2>	1>
112	D2080	761.084	37.336	45	10	6	22	.2>	1>
113	D2081	760.972	37.310	38	2	30	1>	.2>	1>
114	D2082	760.857	37.263	13	6	35	1>	.2>	1>
115	D2083	760.979	37.410	6	1>	29	1>	.2>	1
116	D2084	761.042	37.499	16	2	30	1>	.2>	1>
117	D2085	761.061	37.602	22	2	29	1>	.2>	1>
118	D2086	761.033	37.724	14	2	30	1>	.2>	1>
119	D2087	760.982	37.873	42	2	29	1>	.2>	1>
120	E2047	760.338	36.936	14	1	33	1>	.2	1>
121	E2048	760.305	36.981	23	2	25	1>	.2	1>
122	E2049	760.268	37.032	6	2	37	1>	.2	1>
123	E2050	760.296	37.069	15	2	30	2	.2>	1>
124	E2051	760.364	37.157	18	2	24	1>	.2	1>
125	E2052	760.368	37.264	10	6	4	99	6.5	3
126	E2053	760.339	37.340	10	2	28	1>	.3	1>
127	E2054	760.390	37.379	9	1>	29	1>	.2	1>
128	E2056	760.458	37.443	14	1	26	1>	.2	1>
129	E2057	760.450	37.534	16	2	38	1>	.2>	1>
130	E2058	760.443	37.634	32	2	20	1>	.2>	1>
131	C2107	762.198	34.576	69	7	22	1>	1.2	1>
132	C2108	762.250	34.640	127	2	54	2	.7	1>
133	C2109	762.305	34.695	240	3	46	3	2.9	1>
134	C2110	762.349	34.748	551	12	542	1>	2.6	1>
135	C2111	762.385	34.811	293	3	127	1>	.9	1>
136	C2112	762.438	34.893	73	7	94	1>	.4	1>
137	C2113	762.491	34.956	102	8	101	1>	.3	1>
138	C2114	762.522	35.019	64	16	29	3	.4	1>
139	C2115	762.560	35.060	135	86	93	1>	.4	1>
140	C2116	762.602	35.113	227	2	17	3	.2>	1>
141	C2117	762.075	35.229	259	3	76	2	.2	1>
142	C2119	762.058	35.302	82	3	25	2	.6	2
143	C2120	762.093	35.379	62	1	2	1>	.2>	1>
144	C2121	762.111	35.413	33	2	3	1>	.4	1>
145	C2123	762.155	35.467	71	3	16	19	.9	9
146	C2124	762.116	35.605	117	2	5	7	4.1	8
147	C2125	762.133	35.689	103	2	21	1>	.2>	1>
148	C2126	762.173	35.756	33	1	3	1>	.2>	1>
149	D2088	761.672	34.057	149	8	93	13	.8	1>
150	D2089	761.757	34.103	36	4	99	1>	.2	1>
151	D2090	761.761	34.161	34	7	100	1>	.4	1>
152	D2091	761.775	34.215	221	11	383	1>	.6	1>
153	D2092	761.796	34.284	265	7	139	1>	.5	1>
154	D2093	761.704	34.315	300	10	301	1	.7	1>
155	D2094	761.641	34.374	18	3	68	1>	.3	1>
156	D2095	761.632	34.411	519	120	125	6	6.3	1>
157	D2096	761.624	34.455	397	18	112	10	4.4	1>
158	D2097	761.652	34.535	112	5	159	1	.6	1>
159	D2098	761.691	34.602	224	3	95	1>	.9	1>
160	D2099	761.740	34.676	810	4	17	12	1.8	12
161	D2100	761.775	34.698	4905	1	10	1>	1.7	60
162	D2102	761.806	34.729	132	3	76	3	1.8	2
163	D2103	761.813	34.750	12667	1	13	31	5.2	430
164	D2105	761.811	34.816	104	4	3	2	2.9	1>
165	D2106	761.837	34.833	32	5	2	10	1.0	5
166	D2107	761.849	34.864	73	2	2	3	1.9	4
167	D2108	761.875	34.887	807	5	9	11	1.8	9
168	D2110	761.919	34.910	1545	2	9	4	.7	1
169	D2111	761.935	34.927	2607	19	19	12	2.6	40
170	D2113	761.948	34.959	8052	5	11	10	1.4	143
171	D2114	761.952	34.997	529	4	18	4	.9	7
172	D2115	761.965	35.034	1247	4	7	3	.4	4
173	D2116	761.991	35.049	1742	1	6	4	2.1	20
174	D2117	762.021	35.082	1488	4	18	17	3.3	19
175	D2118	762.029	35.123	70	1	6	2	.4	13
176	D2119	762.063	35.143	17877	4	94	21	15.8	45
177	D2120	762.107	35.195	223	2	22	1>	.5	5
178	D2121	762.137	35.199	2501	9	173	4	3.2	1>
179	D2122	762.244	35.159	98	7	10	2	.2	1>
180	D2123	762.444	35.168	119	12	6	1>	.2>	1>
181	E2059	761.675	33.590	14	6	31	1>	.3	1>
182	E2060	761.690	33.665	34	2	43	1>	.2>	1>
183	E2061	761.664	33.736	25	3	50	2	.2	1>
184	E2062	761.631	33.838	21	37	574	3	.3	1>
185	E2063	761.635	33.912	565	12	817	1>	2.6	1>
186	E2064	761.581	33.934	9	2	37	1>	.2>	1>
187	E2065	761.570	34.014	5	3	87	1>	.2	1>
188	E2066	761.592	34.048	4	3	133	1>	.3	1>
189	E2067	761.538	34.142	11	7	77	1>	.2>	1>
190	E2068	761.494	34.201	21	5	76	1>	.2>	1>
191	E2069	761.433	34.797	39	1	3	8	.2>	1>
192	E2070	761.451	34.727	35	2	3	4	1.0	1>
193	E2071	761.502	34.645	235	31	19	37	15.1	27
194	E2072	761.505	34.556	2272	16	2627	1>	1.1	1>
195	E2073	761.559	34.503	27	3	56	1>	.2>	1>
196	E2074	761.422	34.575	86	27	69	1>	.4	1>
197	E2075	761.363	34.593	42	10	54	4	.3	1>
198	B2135	761.884	34.208	281	3	530	1>	.2>	1>
199	B2136	761.949	34.214	292	24	1545	1	1.3	1>
200	B2137	762.025	34.295	343	24	303	6	3.0	2
201	B2138	762.089	34.384	2014	3	15	1>	1.5	1>
202	B2139	762.134	34.438	604	4	93	1>	.2	1>
203	B2140	762.186	34.449	498	4	178	1>	1.1	1>
204	B2141	762.257	34.473	69	8	48	1>	.2>	1>
205	B2142	762.315	34.473	28	12	16	1	.2>	1>
206	B2143	761.708	34.718	2596	4	15	11	.8	100
207	B2146	761.713	34.790	186	1	7	1>	.5	1>
208	B2147	761.676	34.819	158	4	40	2	.4	5
209	B2148	761.603	34.877	85	2	5	1>	.2>	1>
210	B2149	761.575	34.901	55	1	12	2	.2>	1>
211	B2150	761.710	34.854	280	2	27	1>	1.2	1>
212	B2152	761.731	34.924	446	1	22	1>	.3	4
213	B2153	761.725	34.981	105	2	17	1>	.2>	6
214	B2154	761.765	35.039	53	4	32	6	.2>	1>
215	B2155	761.779	35.105	35	2	6	1>	.2>	10

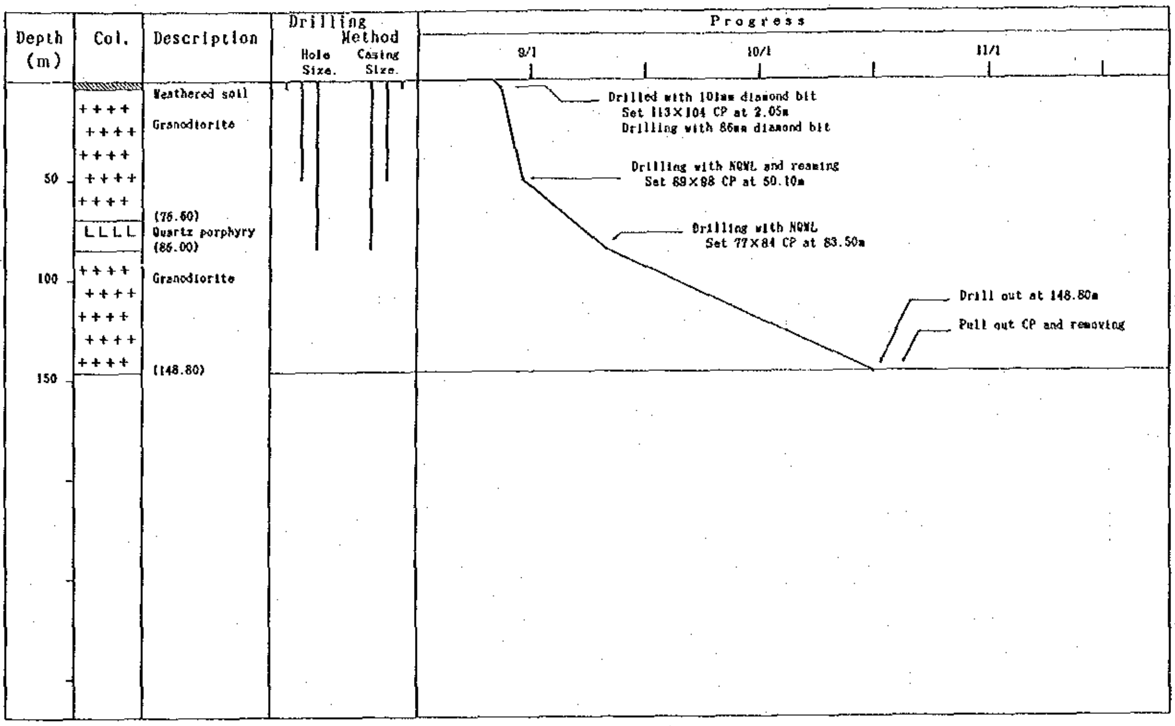
Appendix 6(1)–(8) Progress record of hole MJJ–2 to MJJ–9



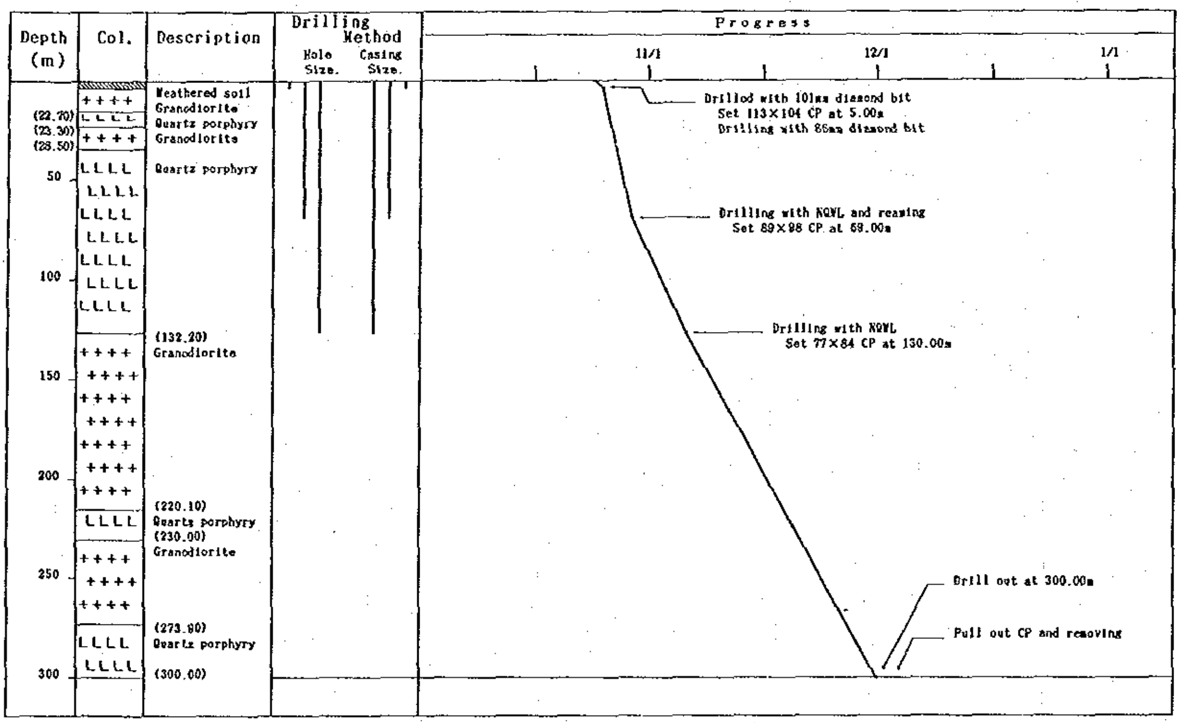
Progress record of hole MJJ－2



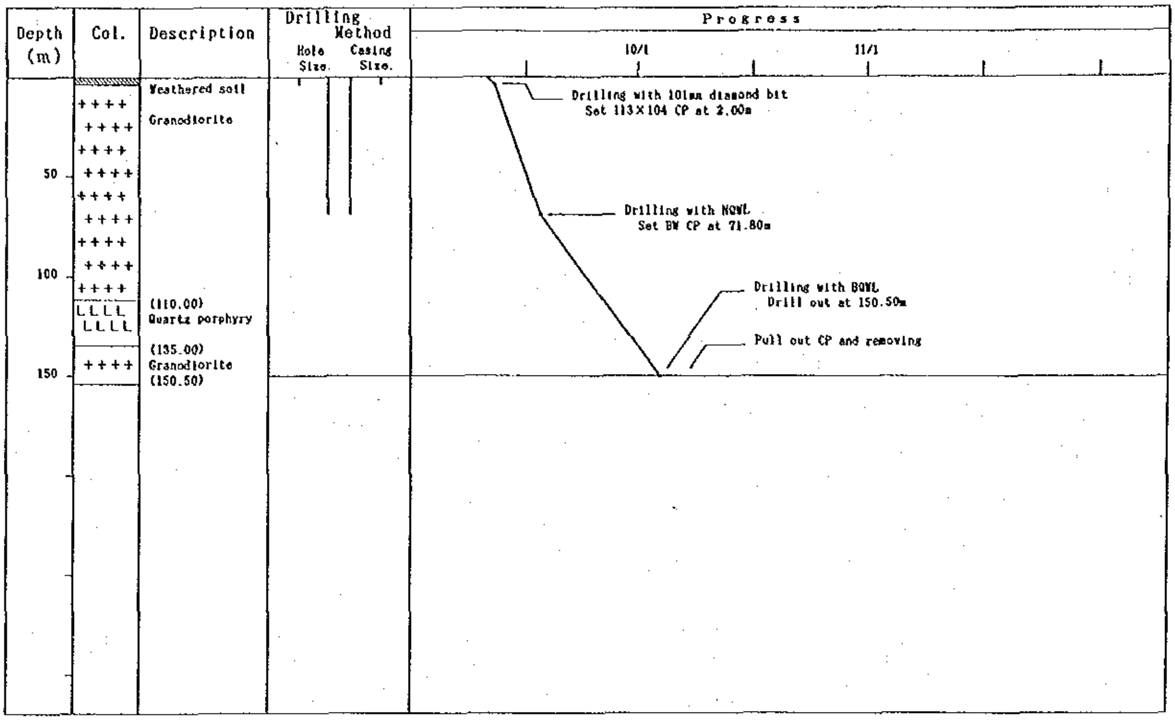
Progress record of hole MJJ－3



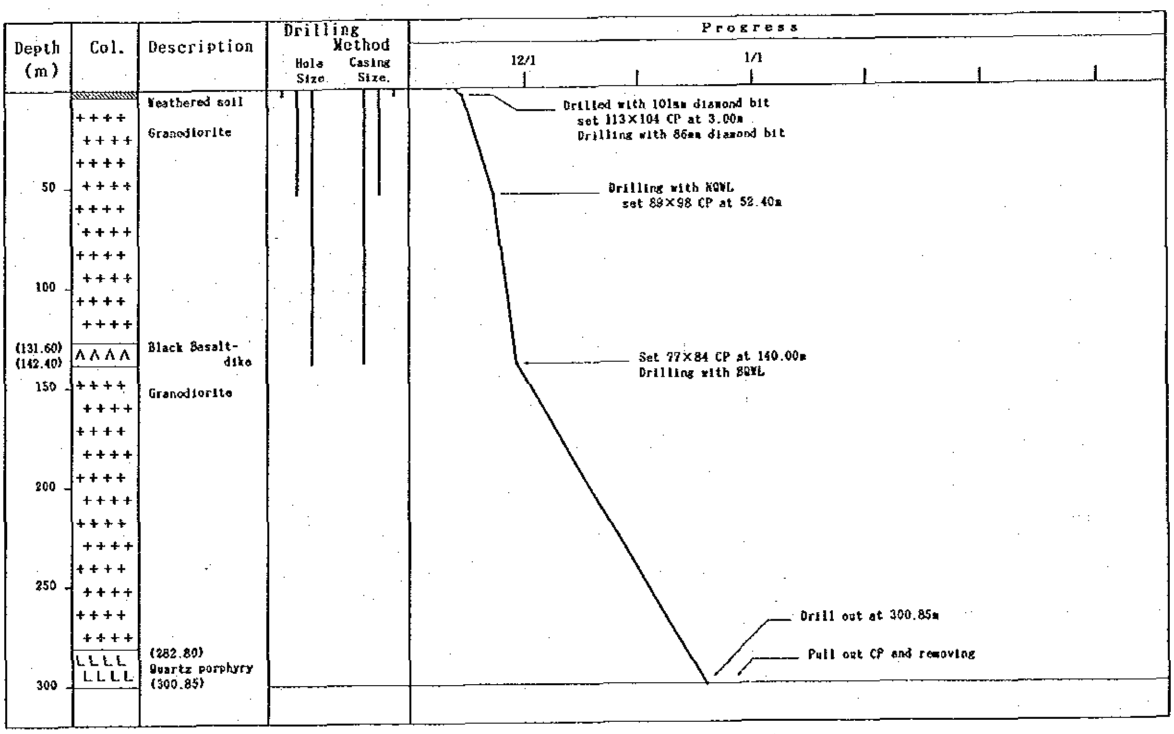
Progress record of hole MJJ－4



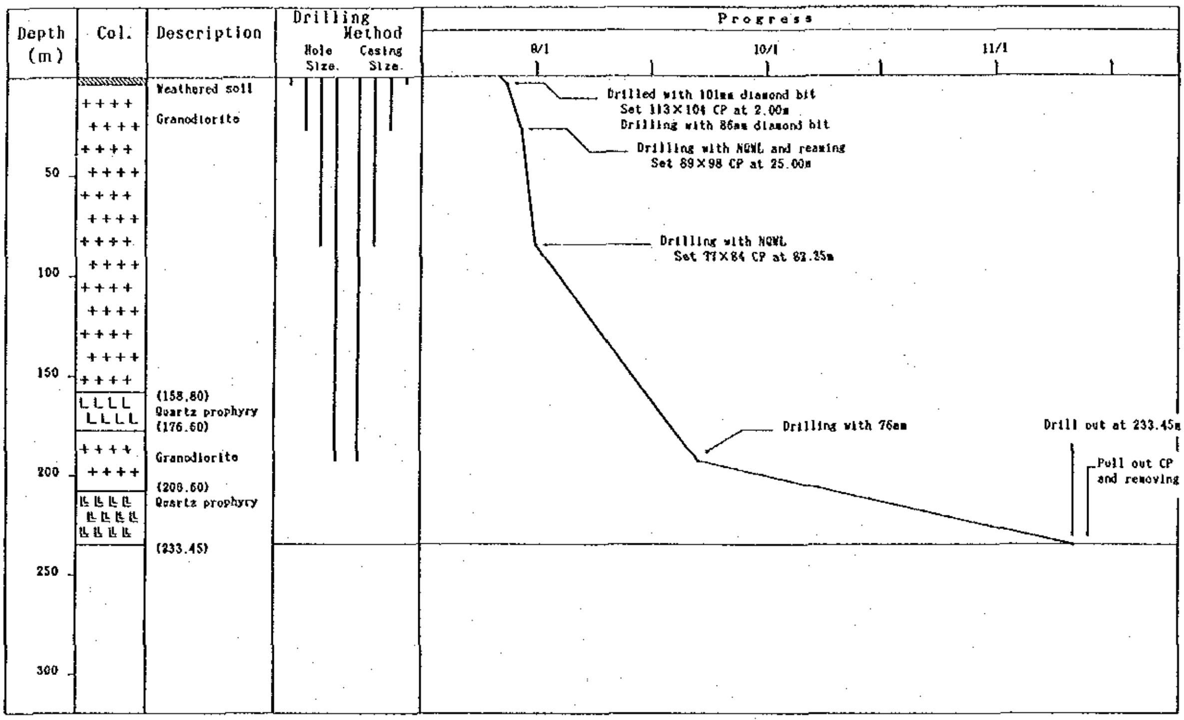
Progress record of hole MJJ－5



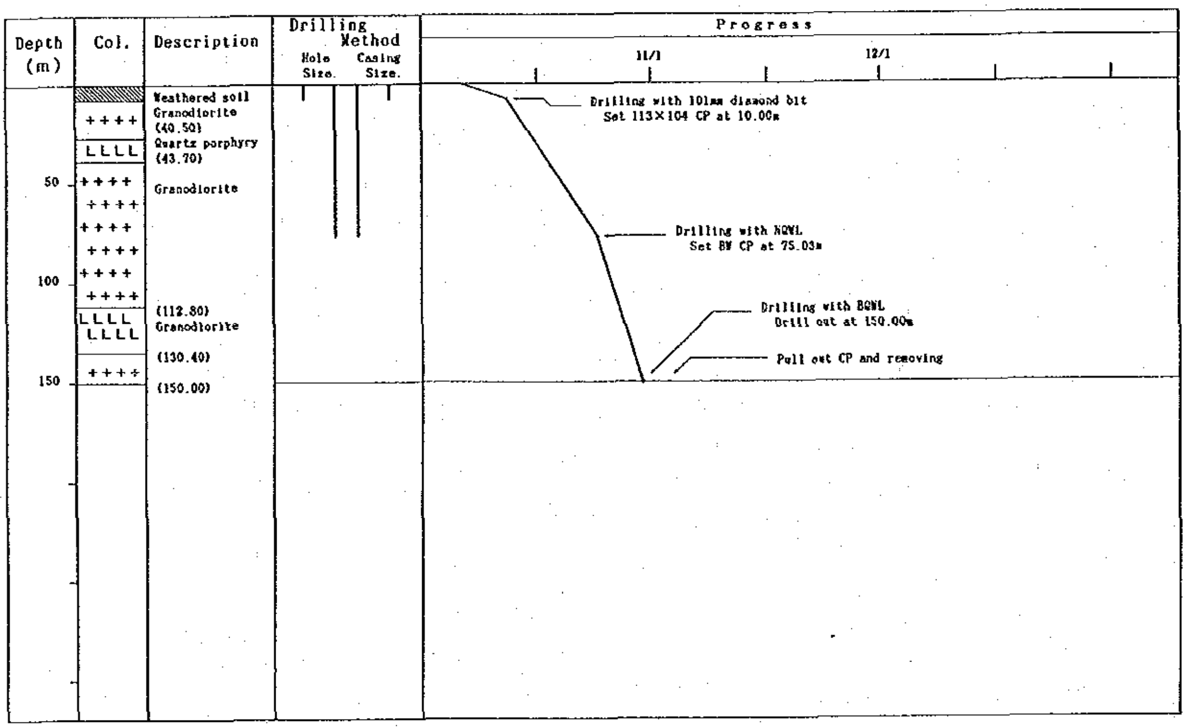
Progress record of hole MJJ－6



Progress record of hole MJJ－7



Progress record of hole MJJ-8



Progress record of hole MJJ-9

Appendix 7 Summary record of drilling activities(MJJ−2 to MJJ−9)

Summary of drilling activities (1992)

		MJJ－2	MJJ－3	MJJ－4	MJJ－5	MJJ－6	MJJ－7	MJJ－8	MJJ－9
Drilling Period	Preparation(A)	7/1 ～7/24	8/4	7/13～8/26	10/18 ～10/23	8/24 ～9/9	11/15 ～11/17	7/13 ～8/25	10/4～10/5
	Days, (Men)	24, (2220)	1, (12)	45, (168)	6, (144)	17, (567)	3, (36)	44, (156)	2, (108)
	Drilling(B)	7/25～8/2	8/5 ～8/23	8/27 ～10/15	10/24 ～11/30	9/10 ～10/2	11/18 ～12/20	8/26 ～11/11	10/6～10/29
	Days, (Men)	9, (108)	19, (108)	50, (444)	38, (360)	23, (220)	33, (384)	78, (720)	24, (144)
	Removing(C)	8/3	8/24～8/29	10/16～10/17	12/1 ～1/20	10/3	12/21～1/20	11/12～11/14	10/30 ～1/20
	Days, (Men)	1, (12)	6, (12)	2, (24)	51, (219)	1, (12)	31, (288)	3, (12)	83, (306)
	Total(D)	34, (2340)	26, (132)	97, (636)	95, (723)	41, (799)	67, (708)	125, (888)	109, (558)
Depth	Depth planned(E)	150.00	150.00	140.00	300.00	150.00	300.00	230.00	150.00
	Depth drilled(F)	151.50	150.00	148.80	300.00	150.50	300.85	233.45	150.00
Core Recovery	Overburden(G)	3.00	5.00	3.00	2.00	2.00	3.00	2.00	10.00
	Core Length(H)	144.50	134.40	145.09	297.00	148.50	297.85	231.45	143.00
	Recovery(H/F)	95.38	89.60	97.51	99.00	98.67	99.00	99.14	95.33
	Unit Recovery 0 － 50	85.80	71.70	95.48	94.00	96.00	94.00	96.00	86.00
	50 －100	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	100－150	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	150－200				100.00		100.00	100.00	
	200－250				100.00		100.00	100.00	
	250－300				100.00		100.00		
Casing	113 ×104 (mm)			2.05	5.00		3.00	2.00	
	89 × 98 (mm)	5.00	5.00	50.10	69.00	2.00	52.40	25.00	10.00
	77 ×84 (mm)	—	—	83.50	130.00	—	140.00	82.35	—
	BW Casing	88.90	81.70	—	—	71.80	—	190.00	75.03
Drilling Efficiency	F/B m/Day	16.83	7.89	2.98	7.89	6.54	9.12	2.99	6.25
	F/D m/Day	4.46	5.77	1.53	3.15	3.67	4.49	1.87	1.38
	(B)/F men/m	0.71	0.72	2.98	1.20	1.46	1.28	3.08	0.96
	(D)/F men/m	15.45	0.88	4.27	2.41	5.33	2.35	3.80	3.72

Appendix 8 Drilling equipments and consumed materials

A. Drilling Equipments

S O N D A   I S S A - N E P T U N O   1 . 2 0 0

Sonda rotativa hidraúlica, montada sobre chasis de patines, provista de retroceso hidráulico y acoplada con carrete hidraúlico para sistema "Wire-Line".

Capacidad de perforación: 400 m. con varillas HW y 1.200 m. con varillaje 33.5 mm.

Capacidad de empuje: 4.000 Kg. y de elevación 5.600 Kg.

Angulo de perforación: 360°

Acoplada con caja de cambios de cinco velocidades.

Accionada por motor DITTER-MWM-D-325-3, diesel, refrigerado por aire de 38.5 CV a 2.000 rpm.

B. Materials consumed

Article / Hale No.	Light Oil	Cement	Bentonite	TK-608
	ngine	50kg/SX	50kg/SX	20kg/SX
	ℓ	SX	SX	kg
MJJ-2	576	6	77	26
-3	648	8	53	27
-4	4,032	111	49	–
-5	4,032	109	60	–
-6	1,872	11	36	18
-7	4,032	101	101	–
-8	6,048	251	60	–
-9	1,872	42	24	53
Total	23,112	639	460	124

C. Bits consumed

Bit / Type / Hole No.	101			86			NQ			76			BQ		
	Drill Length	Bit	Reamer	Drill Length	Bit	Reamer	Drill Length	Bit	Reamer	Drill Length	Bit	Reamer	Drill Length	Bit	Reamer
MJJ-2	3.00	1					82.25	5	2				66.25	6	3
-3	5.00	1					82.85	3	2				67.15	3	2
-4	50.10	5	1	20.20	2	1	43.50	4	1	35.00	2	1			
-5	100.30	8	1				174.00	9	5						
-6	2.00	1					71.80	5	3				78.70	4	2
-7	52.40	4	1	74.60	7	1	173.85	9	4						
-8	25.00	4	1	56.65	8	1	118.25	8	1	14.90	2	2	19.15	9	1
-9	10.00	2					75.03	5	2				74.97	6	3
Total	277.80	26	4	151.45	17	3	821.53	48	20	49.90	4	3	306.22	28	11

Appendix 9(1)–(8) Drilling log of MJJ–2 to MJJ–9(1:200)

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
		5.00	Pinkish-white Granodiorite	1				3	2									
	+		Limonite dominant	1				3	2									
	+			1				3	2									
10	+		Dark green Granodiorite	1				3	2									
	+		Py film	1				3	2									
				1				3										
	+			1				3										
	+			1				3										
20	+		Pale green Granodiorite	1				3	2									
	+		Py film	1				3	2									
				1				3	2									
	+			1				3	2									
	+			1				3	2									
30	+		Whitish gray Granodiorite strong arg.	1			4	1										
	+		Py film & diss	1			4	1										
				1			4	1										
	+			1			4	1										
	+			1			4	1										
40	+		Whitish gray Granodiorite	2			3		2									
	+		Py film & diss	1			3		1									
				1			3		1									
	+			1			3		1									
	+			1			3		1									
50																		

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth (m)	Core (cm)	Au (g/t)	Ag (g/t)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)
	+		Whitish gray Granodiorite strong arg.	2			3											
	+		Py film & diss	2			3											
				2			3											
	+			2			3											
60	+			2			3											
	+		Whitish gray Granodiorite	2			3											
	+		Py film & diss	2			3											
				2			3											
	+			2			4											
70	+			2			4											
	+		Lt-gray Granodiorite strong arg.	2			4											
	+		Py>>Cp film & diss	2			4											
				2			3											
	+			2			3		1									
80	+			2			3		1									
	+		Gray Granodiorite	3			2		2									
	+		Py>>Cp diss & film	3			2		2									
				3			3		2									
	+			3			3		2									
90	+			3			3		3	3								
	+		Bluish green Granodiorite	3		1	3		3	3								
	+		Py>>Cp diss & film	3		1	3		3	3								
				3		1	3		3	3								
	+			3		1	3		3	3								
100	+			3		1	3		3	3								

Depth	Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	Bluish gray Granodiorite	3			3		3	3								
	Py>>Cp film & diss	3			3		3	3								
	He in cracks	3			3		4	3								
		3			3		4	3								
		3			3		4	3								
110																
	Yellowish white Granodiorite strong arg.	3			3		4	3								
	Py>>Cp diss & film	3			3		4	3								
		3			3		4	3								
		3			3		4	3								
		3			2		4	3								
120																
	Pale green Granodiorite	3			1		3	4								
	Py>>Cp diss & film	3			1		3	4								
		3			1		3	4								
		3			1		3	4								
		3			1		3	4								
130																
	Pale green Granodiorite	4			1		2	4								
	Py>Cp film	4			1		2	4								
		4			1		2	4								
		4			1		2	4								
		4			1		2	4								
140																
	Pale green Granodiorite	4			3		3	4								
	Py-Cp v-let Py>>Cp	4			3		3	4								
		4			3		3	4								
		4			3		3	4								
		4			3		3	4								
150		4			3		3	4								

151.50

Depth			Description	Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+	5.00	Pale green Granodiorite	1					1									
	+		Py diss	1				1	2	1								
10																		
	+		Pale green Granodiorite	1				1	2	1								
	+		Py diss	2				1	3	2								
				2					3	2								
	+			2					4	3								
	+			2					4	3								
20																		
	+		Pale green Granodiorite strong arg. Py diss															
	+																	
	+																	
	+																	
30																		
	+		Lt-brown Granodiorite															
	+		Py diss															
	+																	
	+								3	2								
40																		
	+		Lt-gray Granodiorite				1		3	2								
			Py diss				1		3	2								
	+						1		3	2								
	+								3	3								
	+								3	3								
50																		

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Lt-gray Granodiorite						3	3								
			Py diss						3	3								
	+								3	3								
	+	56.50	Yellowish-green Q-Porphyry						3	3								
	L						2		4	3								
60																		
	L		Pale green Q-Porphyry	1			2		4	3								
	L		Py diss	1			2		4	3								
				1			2		4	4								
	L			1			1		4	4								
	L			1			1		4	4								
70		69.80	Pale green Granodiorite															
	+		Py>>Cp diss	1			1		4	4								
	+			2			1		4	4								
				2			1		4	4								
	+			2					5	5								
	+			2					5	5								
80																		
	+		Pale green Granodiorite	2					5	5								
	+		Py>>Cp diss	2					5	5								
				2					5	5								
	+			2					5	4								
	+			3					5	4								
90																		
	+		Pale green Granodiorite	4					5	4								
	+		Py diss	5					5	4								
				5					5	4								
	+			5					5	4								
	+			5					5	4								
100																		

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Pale green Granodiorite	5					5	4								
			Py diss	5					5	4								
	+			5					5	4								
	+			5					5	4								
	+			5					5	4								
110																		
	+		Bluish green Granodiorite	5					5	4								
			Py diss	5					5	4								
	+			5					5	4								
	+			5					5	3								
	+			5					5	3								
120																		
	+		Bluish green Granodiorite	5					5	3								
			Py diss	5					5	3								
	+			4					5	3								
	+			4					5	3								
	+			4					4	1								
130																		
	+		Greenish gray Granodiorite	4					4	1								
			Py diss	4					4	1								
	+			4					4	1								
	+			4					4	1								
	+			4					4	1								
140																		
	L	140.70	Lt-green Q-Porphyry	3					4	1								
	L		Py diss	3					4	1								
				3					4	1								
	L			3					4	1								
				3					4	1								
150	L			3					4	1								

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+	2.05	Gray Granodiorite strong sil.	4			2		3	2								
	+			4			2		3	2								
	+		Bo-Mo in crack	4			2		3	2								
	+			4			2		3	2								
10	+			3			3	1	3	2	8.0	200	Tr	Tr	5915	13	28	7
	+		Gray Granodiorite Moderate sil.	3			3	1	3	2	10.0	200	Tr	Tr	3738	8	1	<1
	+		Bo-Mo in crack	3			4		3	2								
	+			3			4		3	2	14.0	200	Tr	Tr	2934	9	49	4
	+			3			4		3	2								
20	+			3			4		3	2	18.0	200	Tr	Tr	951	14	107	10
	+		Gray Granodiorite moderate sil.	2			4		3	2	20.0	200	Tr	Tr	406	8	343	10
	+		Bo-Mo in crack	2			4		3	2								
	+			2			4		3	1								
	+			2			4		3	1	26.0	200	Tr	Tr	1459	19	130	3
30	+			2			4		3	1								
	+		Gray Granodiorite strong sil.	2			4		3	1	30.0	200	0.1	1.9	10054	8	45	34
	+		Cp>Bo>Mo in cracks	2			4		3	1								
	+			2			4		3	1	34.0	200	0.2	4.7	15305	13	55	105
	+			2			4		3	1								
	+			2			4		3	1								
40											38.0	200	Tr	Tr	2326	14	59	3
	+		Gray granodiorite strong sil.	2			4		3	1								
	+		Bo-Cp-Mo diss & film	3			4		3	1	42.0	200	Tr	Tr	9306	14	51	290
	+			3			4		3	1								
	+			4			4		3	1	46.0	200	Tr	5.0	14525	17	163	142
50	+			4			4		3	1								

Depth			Description	Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Lt-gray granodiorite	4			3		3	1								
			Bo-Cp diss & film	4			3		3	1	50.0	200	Tr	7.8	23684	11	62	451
	+			4			3		3	1								
	+			4			3		3	1	54.0	200	0.2	12.7	37447	18	285	459
				4			3		3	1								
60	+			4			3		3	1	58.0	200	0.2	11.3	24481	12	145	261
	+		Gray Granodiorite strong sil.	3			4		3	1								
				3			4		3	1	62.0	200	Tr	Tr	20869	8	167	66
	+		Bo-Cp-Mo diss & film	3			4		3	1								
	+			3			4		3	1	66.0	200	0.1	10.1	38375	19	291	224
				3			4		3	1								
70	+																	
	+		Granodiorite strong sil.	4			3		3	1	70.0	200	0.3	12.2	23072	15	116	2177
	+		Bo-Cp-Mo diss & film	4			2		3	1								
				4			2		3	1	74.0	200	0.2	4.8	21794	14	156	4922
	+			4			2		3	1								
		76.60		5			1		1									
	L		Gray Q-Porphyry strong sil.								78.0	200	0.2	8.9	27266	13	93	2941
80				5			1		1									
	L		Gray Q-Porphyry. strong sil. Bo-Cp in crack	5			1		1									
				5			1				82.0	200	0.2	12.5	22750	16	331	9119
	L			5			1											
	L			5			1				86.0	200	0.1	5.5	13747	23	134	12386
	L		Lt-gray Q-Porphyry strong sil.	5			3											
90	L			5			3											
			Granodiorite strong sil.	5			4				90.0	200	0.1	5.6	17986	20	227	2833
	L			5			4											
			Bo-Cp in crack	5			1				94.0	200	Tr	Tr	11616	17	137	6867
	L			5			1											
	L			5			3				98.0	200	0.1	3.9	13089	29	198	7502
		98.00	Lr gray Granodiorite	5			3											
100	+																	

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Lt-gray	4	1		2	4	1									
			Granodiorite strong sil.	4	1		2		1		102.0	200	0.2	9.7	28400	19	47	338
	+			4	1		2		1									
	+		netwk of Bo-Cp & Mo	4	1		2		1									
				3	1		2		1		106.0	200	0.1	5.3	14103	20	26	172
110	+			3	1		2		2									
	+		Lt-gray	3	1		2		2	1	110.0	200	0.1	5.1	12161	15	103	122
			Granodiorite strong sil.	4			2		2									
	+			4			2		2		114.0	200	Tr	Tr	1272	14	29	34
	+			4			2		2									
				4			2		2		118.0	200	Tr	Tr	3426	7	30	25
120	+		Mo v-let	4			2		2									
	+		Lt-gray Granodiorite	3			3		2									
			strong sil.	3			3		2		122.0	200	Tr	Tr	6097	14	34	92
	+			3			3		2	1								
	+			3			3		2	1	126.0	200	Tr	0.9	3376	12	18	113
130	+		Cp film	3			3		2	1								
	+		Lt-gray Granodiorite	3			4		2	1	130.0	200	Tr	Tr	9638	15	35	19
			strong sil.	4			4		2	1								
	+			4			4		2	1	134.0	200	Tr	Tr	4355	10	17	34
	+			4			4		2	1								
			Cp>Py in crack	4			4		2	1	138.0	200	Tr	Tr	2653	12	19	12
140	+			4			4		2	1								
	+		Lt-gray	4			4		2	1								
			Granodiorite strong sil.	4			4		2	1	142.0	200	0.1	3.3	9266	14	229	79
	+			4			4		2	1								
	+		Py-Mo-Cp v-let	4			4		2	1								
			Cp-Py in crack								146.0	200	Tr	5.9	9519	9	369	120
150	+	148.80	(Bottom)															

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+	5.00	Greenish-gray Granodiorite	3			4		2	1								
				3			4		2	1								
	+			3			4		2	1								
10																		
	+		Greenish gray Granodiorite	3			4		2	1								
	+			3			4		2	1								
				3			4		2	1								
	+			3			4		2	1								
	+			3			4		2	1								
20																		
	+		Greenish gray Granodiorite	3			2		2	1								
	L L	22.70 23.30	Lt-bluish-green Q-Porphyry	3			2		2	1								
	+			3			2		2	1								
			Greenish gray granodiorite	3			2		2	1								
	+			3			2		2	1								
30	L	28.50	Lt-bluish-green Q-Porphyry															
	L			3			2		2	1								
			Pale green Q-Porphyry	3			2		2	1								
	L			3			2		2	1								
	L			3			2		2	1								
				3			2		2	1								
40	L																	
	L		Pale green Q-Porphyry	3			2		2	1								
				3			2		2	1								
	L			3			2		2	1								
	L			3			2		2	1								
				3			2		2	1								
50	L																	

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	L		Lt-bluish-green Q-Porphyry	3			2		2	1								
	L			3			2		2	1								
	L			3			2		2	1								
	L			3			2		2	1								
60	L			3			2		2	1								
	L		Lt-bluish-green Q-Porphyry	3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
70	L			3			3		2	1	68.0	100	Tr	Tr	4319	24	226	22
	L		Lt-bluish-green Q-Porphyry	3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
80	L			3			3		2	1								
	L		Lt-bluish-green Q-Porphyry	4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
90	L			4			3		2	1								
	L		Lt-bluish-green Q-Porphyry	4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
100	L			4			3		2	1								

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	L		Lt-bluish-green Q-Porphyry	4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
110	L			4			3		2	1								
	L		Lt-bluish-green Q-Porphyry	3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
	L			3			3		2	1								
120	L			3			3		2	1								
	L		Lt-bluish-green Q-Porphyry	4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
	L			4			3		2	1								
130	L			4			3		2	1								
	L		Lt-bluish-green Q-Porphyry	4			3		2	1								
	+	132.20	Greenish gray Granodiorite strong sil.	4			2		3	2								
	+			4			2		3	2								
	+			4			2		3	2								
140	+			4			2		3	2	138.5	150	Tr	Tr	9594	20	199	19
	+		Greenish gray Granodiorite strong sil.	4			2		3	2	140.0	140	Tr	Tr	2472	15	16	<1
	+			4			2		3	2	141.4	240	0.1	3.8	37477	27	82	4
	+			4			2		3	2	143.8	200	Tr	Tr	1299	17	99	<1
	+			4			1		3	2								
	+			4			1		3	2								
150	+			4			1		3	2								

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Lt-greenish-gray Granodiorite strong sil.	4			2		4	3								
	+			4			2		4	3								
				4			2		4	3								
	+			4			2		4	3								
				4			2		4	3								
160	+																	
	+		Greenish gray Granodiorite strong sil.	4			2		4	3								
	+			4			2		4	3								
				4			2		4	3								
	+			4			2		4	3								
				4			2		4	3								
170	+																	
	+		Greenish gray Granodiorite strong sil.	4			2		4	3								
	+			5			2		4	3								
				5			2		4	3								
	+			5			2		4	3								
				5			2		4	3								
180	+																	
	+		Greenish gray granodiorite strong sil.	5			2		4	4								
	+			5			2		4	4								
				5			2		4	4								
	+			5			2		4	4								
				5			2		4	4								
190	+																	
	+		Greenish gray Granodiorite strong sil.	5			2		4	4								
	+			5			2		4	4								
				5			2		4	4								
	+			5			2		4	4								
				5			2		4	4								
200	+																	

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Greenish gray Granodiorite strong sil.	5			2		4	4								
	+			5			2		4	4								
	+			5			2		4	4								
	+			5			2		4	4								
210	+			5			2		4	4								
	+		Greenish gray Granodiorite strong sil.	5			2		4	4								
	+			5			2		4	4								
	+			5		2	3		1									
	+			5		2	3		1									
220	+			5		2	3		1									
	L	220.10	Lt-greenish-blue Q-Porphyry	4			2		3	2								
	L			4			2		3	2								
	L			4			2		3	2								
	L			4			2		3	2								
230	L			4			2		3	2								
		230.00	Greenish gray granodiorite strong sil.	5			2		4	4								
				5			2		4	4								
				5			2		4	4								
				5			2		4	5								
240				5			2		4	5								
			Greenish gray Granodiorite strong sil.	5			2		4	5								
				5			2		4	5								
				5			2		4	5								
				5			2		4	5								
250				5			2		4	5								

Depth			Description	Alteration							Assay Results							
				Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
	+		Greenish gray Granodiorite strong sil.	5			2		4	5								
	+			5			2		4	5								
				5			2		4	5								
	+			5			2		4	4								
	+			5			2		4	4								
260																		
	+		Gray Granodiorite strong sil.	5			2		4	4								
	+			5			2		4	4								
				5			2		4	4								
	+			5			2		4	4								
	+			5			2		4	4								
270																		
	+		Gray Granodiorite strong sil.	5			2		4	4								
				5			2		4	4								
	L	273.90	Greenish blue Q-Porphyry	4			3		3	2								
	L			4			3		3	2								
				4			3		3	2								
280	L																	
	L		Grayish green Q-Porphyry	4			3		3	2								
				4			3		3	2								
	L			4			3		3	2								
	L			4			3		3	2								
				4			3		3	2								
290	L																	
	L		Grayish green Q-Porphyry	4			3		4	2								
				4			3		4	2								
	L			4			3		4	2								
	L			4			3		3	3								
				4			3		3	3								
300	L			4			3		3	3								

Depth			Description	Alteration: Quartz	Biotite	K-feldspar	Sericite	Kaoline	Chlorite	Epidote	Assay Results: Depth m	Core cm	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	Mo ppm
		2.00	Gray Granodiorite	3			1		2	1	4.0	200	Tr	Tr	312	10	15	27
	+		Py>Cp	4			1		2	1								
			Bo>>Cp film								6.0	200	Tr	Tr	873	11	56	22
	+			4			1		2	1								
	+			4			1		2	1	8.0	200	Tr	Tr	1150	12	40	102
10																		
	+		Gray Granodiorite	4			1		2	1	10.0	200	Tr	Tr	600	9	14	61
	+		Py>Cp Bo>>Cp film	4			1		2	1	12.0	200	Tr	Tr	477	8	32	29
				4			1		2	1	14.0	200	Tr	Tr	477	10	30	80
	+			4			1		2	1	16.0	200	Tr	2.6	1876	14	18	86
	+			4		1	1		2	1	18.0	200	Tr	Tr	4155	10	48	461
20																		
	+		Gray Granodiorite	4			1		2	1	20.0	200	Tr	Tr	2362	11	70	156
	+		Cp-Mo film	4			1		2	1	22.0	200	Tr	Tr	4401	9	40	97
				4			1		2	1	24.0	200	Tr	Tr	2237	12	15	112
	+		Cp film & diss	3			2		2	1	26.0	200	Tr	Tr	2089	9	16	101
	+			3			2		2	1	28.0	200	Tr	Tr	1243	17	40	31
30				3			2		2	1								
	+		Bluish gray granodiorite	3		1	2		2	1	30.0	200	Tr	Tr	1972	9	17	321
	+		Cp film & diss	3			2		2	1	32.0	200	Tr	Tr	661	15	29	7
				3			2		2	1	34.0	200	Tr	Tr	2847	14	30	15
	+			3			2		2	1	36.0	200	Tr	Tr	1242	13	15	5
	+			3			2		2	1	38.0	200	Tr	Tr	3476	13	60	52
40																		
	+		Bluish gray Granodiorite	3			2		2	1	40.0	200	Tr	Tr	6592	9	25	13
	+		Cp film & diss	3		1	2		2	1	42.0	200	Tr	Tr	2590	11	36	33
				3			2		2	1	44.0	200	Tr	Tr	1268	16	31	10
	+			3			2		2	1	46.0	200	Tr	Tr	635	13	49	<1
	+			3			2		2	1	48.0	200	Tr	Tr	714	13	36	16
50																		