第 III 部　結論及び将来への提言

第1章　結　　論

1－1　地質調査

1）地質

本地域の層序は，古生界基盤岩類と新生代の新第三系－第四系からなる。

(1)　基盤岩類

石炭系の堆積岩類（頁岩，砂岩，礫岩），火山砕屑岩類，溶岩類（安山岩，ヒン岩）からなる。

(2)　上部白亜紀風化殻

石炭系の堆積岩類，火山岩類，貫入岩類上に発達した粘土質風化残留物で新第三系及び第四系に被われる。厚さは一般に 10-20 m，断裂帯では 50-60 m に達する。著しいカオリン，モンモリロナイト，イライト化を被る。

(3)　新第三系アラル（Aral）層

基盤岩類あるいはその風化殻を不整合で被い，第四紀層に被覆される。本層は粘土，砂質粘土，粘土質砂からなり，希に礫層を挟む。本層下部の砂質粘土～粘土質砂にイルメナイト漂砂鉱床を胚胎する。

(4)　第四系

洪積世の砂礫，ローム，粘土，風成砂と現世の河床堆積物からなる。

(5)　火成岩類

プレオブラゼンスキイ（Preobrazhenskiy）貫入複合岩体，カラオトケルスキイ（Karaotkelskiy）貫入複合岩体が分布する。これらの貫入複合岩体は，下記の貫入時期，岩相に区分できる。

上部二畳紀－下部三畳紀；斑糲岩類，閃緑岩，モンゾニ岩

中部－上部三畳紀；閃長岩，閃緑岩，花崗閃長岩

下部－中部ジュラ紀；花崗岩，花崗閃長岩

TiO_2品位は斑糲岩，モンゾニ岩で高い。花崗岩，閃長岩ではTiO_2品位は低く，ZrO_2品位が高い。プレオブラゼンスキイ貫入岩体は，主として斑糲岩類が多くイルメナイト含有量が多い。

2）地質構造

鉱床地域はザイサン（Zaisan）盆地の北西部にあたり，東ザルミンスキイ（East Zharminskiy）複向斜帯に位置する。北側を WNW-ESE 方向のバラジャルスキイ（Baladzhalskiy）断層によって境され，西カルビンスキイ（West Kalbinskiy）複向斜帯に接する。

構造運動は後期石炭紀－二畳紀に始まり，おそらく古第三紀にも継続して，

WNW-ESE 方向のマイトイビンスカヤ（Maytuibinskaya）地溝状向斜，テレクテチィンスカヤ（Terektinskaya）地溝状向斜と中間のベクチミルスカヤ（Bektemirskaya）地塁状背斜を形成した。ベクチミルスカヤ地塁状背斜には貫入複合岩体を伴い，地溝状向斜部へ流入する削剥物とイルメナイトの源となった。

NE-SW 方向の断層は貫入複合岩体及び石炭系を切り，断層弱線に沿ってイルメナイト砂鉱体を胚胎する場となった谷が形成された。

3) 鉱床

鉱床はイルメナイト漂砂鉱床で，ベクチミール地区，カラオトケル地区及びベクチミール北地区に鉱体が分布する。

イルメナイト漂砂鉱床は新第三系アラル層下部層の砂質粘土，粘土質砂中に胚胎する。アラル層は，粘土質で玉石を含まぬ特徴から，旧ザイサン（Zaisan）湖の拡張に伴い浸水した旧渓谷に堆積した湖成層と考えられる。

ベクチミール鉱床のイルメナイトは，プレオブラゼンスキイ貫入岩体の深成岩類に由来すると考えられる。特に，斑糲岩類，モンゾニ岩中のイルメナイト高含有が，風化残留物中でのイルメナイト濃集とその後の砂鉱床生成の原因となったと考えられる。

1－2 ボーリング調査

1) 第 1 鉱体南

第 1 鉱体の確認済み C_2 鉱量鉱画の南側 1 km にわたって 500 x 200 m のグリッドで 3 測線（38，34，30 測線），12 孔，471 m のボーリングを実施した。

鉱体は旧渓谷の河床底に堆積し，ボーリングで捕捉された鉱体の厚さは 2.1～8.9 m，イルメナイト品位は 105.41～201.10 kg/m^3 であった。ジルコン品位は微量（0.5～3.4 kg/m^3）であった。

鉱体は南側に行くに従ってイルメナイトの品位が僅かに低下し，被覆土の厚さが増すものの，鉱体の幅は増大し，鉱体の容量が増大する傾向にある。

鉱量計算の結果，C_2 カテゴリーに相当する鉱量増分は下記のとおり。

カットオフ条件を鉱体の上盤 70 kg/m^3，下盤 100 kg/m^3 以上，または 2.0 m x 100 kg/m^3 以上とした場合，鉱量 5 百万 m^3，イルメナイト量 621 千 t，イルメナイト平均品位 124 kg/m^3，剥土比 5.38 m^3/m^3 であった。

カザフ側の基準によると上述のイルメナイト品位と剥土比は，本鉱体が露天掘りによって経済的に採掘可能な範囲であることが示されている。

2) 第 3 鉱体南

2G 測線において 200 m 間隔の 5 孔，184 m のボーリングを実施した。

5 孔のうち 2 孔（MJBK-12, 15）でカットオフ品位以上のイルメナイト鉱化作用を確認した。MJBK-12 は厚さ 1.9 m，イルメナイト平均品位 110.72 kg/m^3，MJBK-15 は厚さ 4.4 m，イルメナイト平均品位 121.11 kg/m^3 の鉱体を捕捉した。鉱体深度は，それぞれ 28.0 m，24.5 m である。

ボーリングで捕捉したイルメナイト鉱体の成因には 2 つの仮説が考えられる。第 1 の仮説は，断裂の弱線帯に規制された旧渓谷の河床底に堆積した漂砂鉱床とするものである。本仮説によると，捕捉された鉱化作用は，NE-SW 方向のベクチミルスキイ断層帯に規制された 2 つの渓谷に堆積したと考えられる。

第 2 の仮説は，湖底地形平坦部に堆積した漂砂鉱床とするものである。本仮説によると，着鉱したボーリングは第 3 鉱体西側から第 1 鉱体南側に連続する NW-SE 方向の鉱体の北東端を捕捉したと考えられる。

以上の様に，本地区の砂鉱床の方向性を確認することが今後の探鉱線を設定する上で重要となる。

第２章　第２年次調査への提言

本年度の調査の結果，以下のような鉱床探査の指針が得られた。

本地域のイルメナイト鉱床の成因には後背地に斑糲岩やモンゾニ岩等の TiO_2 含有量の高い貫入岩類の分布が推定され，鉱床の堆積環境として下記の２つの仮説が考えられる。

① 断裂の弱線帯に規制された旧渓谷の河床底に堆積した漂砂鉱床

② 湖底地形平坦部に堆積した漂砂鉱床

この考えに基づけば，既存鉱床の延長部にはボーリング調査が有効であるが，全く未探鉱の地域においては物理探査等で旧河川の抽出を目的とした地下構造を把握する手法が有効と考えられる。

各地区について，第２年次調査の調査方針をとりまとめた。

1）ベクチミール地区

(1) 第１鉱体南

第１鉱体の南限と鉱体幅を確認するために，さらに追加ボーリングを実施し，第１鉱体南の鉱量評価を行う必要がある。但し，鉱体は南に向かって被覆土が厚くなることから，経済的に採掘可能な深度を見極めながら調査を行う必要がある。

(2) 第３鉱体南

今年度確認した鉱体の方向を確認するボーリングが必要である。

今年度捕捉された鉱化作用は上述する仮説①，②のどちらによるものか判別されないため，例えば着鉱した MJBK-15, MJBK-12 を通り２G 測線に直角な NE-SW 方向の測線，あるいは２G 測線の北東及び南西に２G 測線と平行な２測線でボーリングを実施する必要がある。また，第３鉱体西部と第１鉱体南の間に鉱体の連続性が期待される場合には，これらの間でボーリングを行う必要がある。

2) カラオトケル地区

既存資料によるとカラオトケル鉱床はジルコン品位がやや高いもののイルメナイト品位が低いことから，既存資料による再評価を行うことにとどめ，ボーリング調査等の現地調査については他地区に較べて優先度が低い。

3) ベクチミール北地区

既存資料解析の結果，本地区にもプレオブラゼンスキイ貫入岩体から源を発した旧渓谷と湖底地形平坦部に堆積した漂砂鉱床の存在が予想される。旧渓谷と湖底地形を確認するための物理探査を実施し，イルメナイトが堆積していると推定される箇所においてボーリングを実施する必要がある。

なお，本漂砂鉱床の賦存の可能性は，イルメナイト，ジルコンの源岩となっているプレオブラゼンスキイ貫入複合岩類，カラオトケルスキイ貫入複合岩類の分布状況と地質構造に大きく左右されることから，ベクチミール北，ベクチミール，カラオトケル地区を含む地域で地質精査を実施し，これら貫入岩類の分布状況を明らかにすることでイルメナイトの探鉱有望地を絞り込むことが可能と考えられる。

また，イルメナイトが賦存する地質構造を把握する方法として，旧渓谷地形の抽出に効果的と考えられる物理探査を検討する必要があると考えられる。

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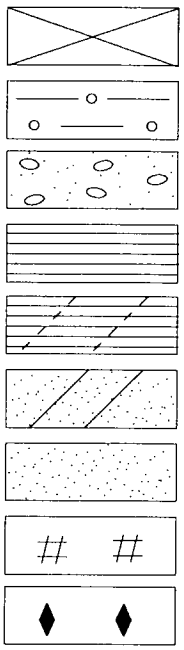
巻末資料

Appendix 1. Geologic Core Logs of the Drillings

Appendix 1.Geologic Core Logs of the Drillings

Legend

Q_I	Quarternary
$N_1^{1-2}ar$	Aral Formation
$C_{2-3}mt$	MIddle-Upper Carboniferous Maityub Formation



Soil
Loam
Pebble-gravel-boulder
Clay
Sandy clay
Clayey sand
Sand
Crust of weathering
Ilmenite

Abbreviation

il ----- ilmenite
qz ----- quartz
feld ----- feldspar
frags ----- fragments
crs ----- coarse

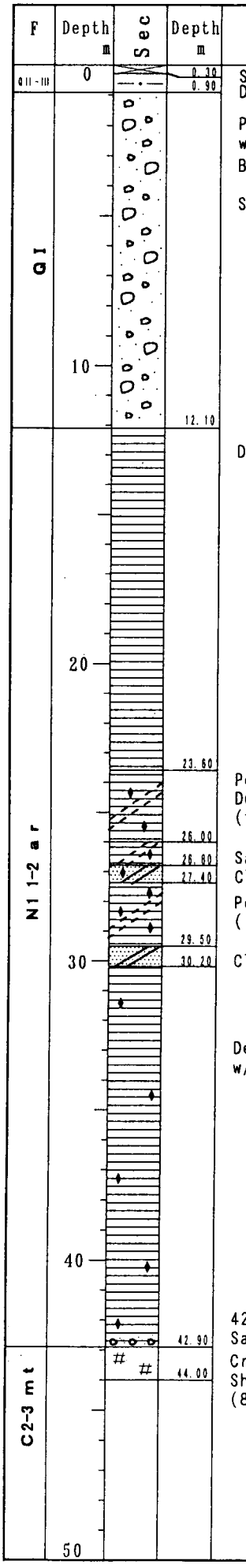
M J B K − 1　　(1:200)　　ELEVATION : 469.40 m
COORDINATE : N 14,636,598.8 E 5,402,404.4

F	Depth m	Sec	Depth m	Geology & Mineralization
Q II - III	0		0.30	Soil
			1.00	Loam
Q I				Pebble-gravel-boulder deposits w/Sand & Clay
				Boulder (MAX. 7 × 15cm)
	10			
			12.80	
N1 1-2 a r				Dense, plastic Clay
	20			
			26.80	
				Some dusty impregnation of ilmenite
			29.90	
C2-3 m t	30	# #		Crust of weathering on siltstone
			32.00	
	40			
	50			

Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leucoxene kg/m³	Anothe kg/m³
	28.00					
38/32-1	29.00	2.59	0.07	Tr	0.04	7.99
32-2	29.90	1.10	0.05	Tr	0.02	15.08
32-3	31.00	1.24	0.02	Tr	Tr	1.57
32-4	32.00	0.76	0.02	Tr	0.02	5.20

MJBK－2　　(1:200)　　ELEVATION　:　469.54 m
COORDINATE　:　N 14,636,452.6 E 5,402,441.6



Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leu-coxene kg/m³	Anothe kg/m³
	23.60					
38/28-1	25.00	3.96	00.11	0.02	0.02	1.06
28-2	26.00	2.90	0.07	Tr	Tr	0.22
28-3	26.80	99.16	2.88	0.36	0.22	8.64
28-4	27.40	117.34	2.48	0.16	0.18	6.41
28-5	28.30	56.38	1.33	0.05	0.02	0.50
28-6	29.50	24.59	0.45	0.04	0.04	0.72
28-7	30.20	47.93	0.43	0.04	0.05	2.92
28-8	31.50	1.33	0.04	Tr	Tr	2.77
28-9	33.00	1.24	0.04	Tr	Tr	2.30
28-10	34.00	0.29	0.02	Tr	Tr	0.77
28-11	35.00	0.52	0.04	Tr	0.02	2.16
28-12	36.00	0.70	0.02	Tr	0.02	2.90
28-13	37.00	0.70	0.02	Tr	Tr	1.89
28-14	38.00	2.65	0.11	Tr	0.02	0.43
28-15	39.00	1.35	0.09	Tr	0.02	2.83
28-16	40.00	1.21	0.07	Tr	Tr	1.12
28-17	41.00	0.50	0.02	Tr	0.02	0.70
28-18	42.00	4.86	0.31	0.02	0.16	3.55
28-19	42.90	14.96	0.41	0.02	0.18	6.05
28-20	44.00	0.20	0.02	Tr	Tr	0.07

MJBK－3　　(1:200)　　ELEVATION　：　469.75 m
COORDINATE　：　N14,636,257.6 E 5,402,491.2

F	Depth m	Sec	Depth m	Geology & Mineralization
Q II-III	0		1.40	Loam w/rare Pebble and gravel
QI				Gravel-Pebble-sand deposits w/rare boulder(max φ 15cm)
	10		10.30	
N1 1-2 ar				Olive grey～grey very plastic clay w/rare hematite and limonit
	20			
			26.00	
				26.00～28.50m Sandy clayey w/Poo sandy ilmenite
			28.50	
			29.30	il=2～3%
	30		30.00	il=2～5%
			30.50	
			31.30	il=1～5%
			32.00	il=2～3%
			33.50	
			33.70	il=2～3%
			34.60	
			35.20	
			37.60	il=2～3% 37.6m qz & feld frags(2～4cm)
			38.20	il=7～10cm
C2-3 mt		# # # #		38.2m qz & feld frags crust of weathering white clay
	40		41.00	Bottom of the holes
	50			

Assay

Sample	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leu-coxene kg/m³	Anothe kg/m³
	26.00					
38/24- 1	27.50	1.42	0.05	Tr	Tr	1.55
24- 2	28.50	9.70	0.36	0.02	Tr	6.48
24- 3	29.30	42.35	1.22	0.11	Tr	7.97
24- 4	30.00	89.73	1.82	0.13	0.23	8.87
24- 5	30.50	61.74	1.28	0.05	0.22	1.85
24- 6	31.30	61.74	1.30	0.09	0.04	6.23
24- 7	32.00	75.85	1.30	0.07	0.13	4.54
24- 8	33.00	134.46	2.25	0.07	0.02	12.94
24- 9	33.50	122.85	2.57	0.05	Tr	22.19
24-10	33.70	24.57	0.49	0.05	0.18	53.73
24-11	34.60	122.13	1.96	0.05	4.28	1.04
24-12	35.20	27.86	0.68	0.04	0.11	0.88
24-13	36.40	106.42	2.11	0.11	0.74	1.22
24-14	37.60	166.64	2.47	0.07	0.05	27.56
24-15	38.20	161.23	2.03	0.09	0.34	1.19
24-16	39.00	0.56	0.007	Tr	0.009	0.68
24-17	40.00	0.41	0.02	Tr	Tr	32.60

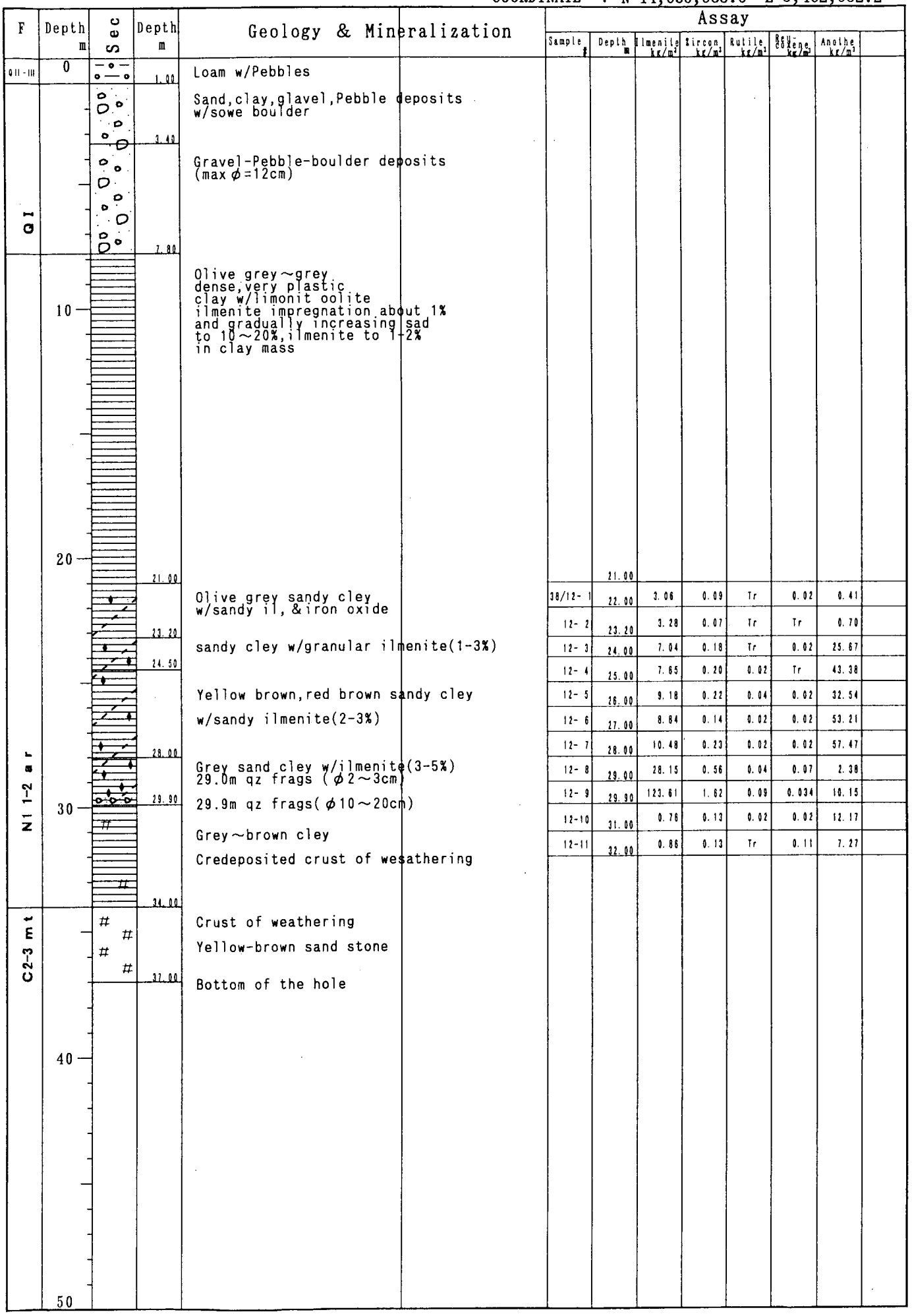
MJBK－4　　(1:200)　　ELEVATION　:　470.26 m
COORDINATE　:　N 14,635,877.8 E 5,402,584.6

F	Depth m	Sec	Depth m	Geology & Mineralization
0 II-III	0		1.00	Loam
QI				Gravel-Pebble-sand deposits w/boulder(max φ20cm)
			9.80	
N1 1-2 ar	10			Yellowish brow～Olive grey dense plastic clay
	20		24.00	
			26.00	24.00～26.00m Sandy clayey w/dust-like il
			27.00	il=1～3%
			28.00	il=1%
			29.20	il=1%
			29.60	
	30		31.40	il=1-2%～5-7%
			31.80	il=1-2%～3-5%
			32.40	
			33.20	il=2～3%
			33.90	il=7～10%
C2-3 mt				33.9m qz frags(5×3×2cm)
				33.9～34.9m crust of weathering(Kaolin)
				33.9～34.9m clay shale
			36.00	Bottom of the hole
	40			
	50			

Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Rem-Xene kg/m³	Anothe kg/m³
	24.00					
38/16- 1	25.00	0.74	0.04	Tr	Tr	0.23
16- 2	26.00	11.07	0.42	0.05	0.04	4.54
16- 3	27.00	12.37	0.45	0.05	0.04	2.02
16- 4	28.00	4.37	0.14	0.02	0.02	1.04
16- 5	29.20	41.04	1.24	0.16	0.09	9.05
16- 6	29.60	85.63	1.89	0.20	0.11	6.89
16- 7	30.60	113.17	2.57	0.18	Tr	9.67
16- 8	31.40	144.22	3.20	0.20	Tr	3.65
16- 9	31.80	173.03	2.97	0.16	0.23	1.62
16-10	32.40	59.42	1.40	0.16	0.05	1.46
16-11	33.20	78.34	2.11	0.23	0.27	2.03
16-12	33.90	184.28	2.68	0.07	1.30	2.95
16-13	34.90	7.13	0.14	Tr	Tr	0.50
16-14	36.00	1.44	0.04	Tr	Tr	1.75

MJBK－5　　(1:200)　　ELEVATION　：　470.40 m
COORDINATE　：　N 14,635,685.6　E 5,402,632.2



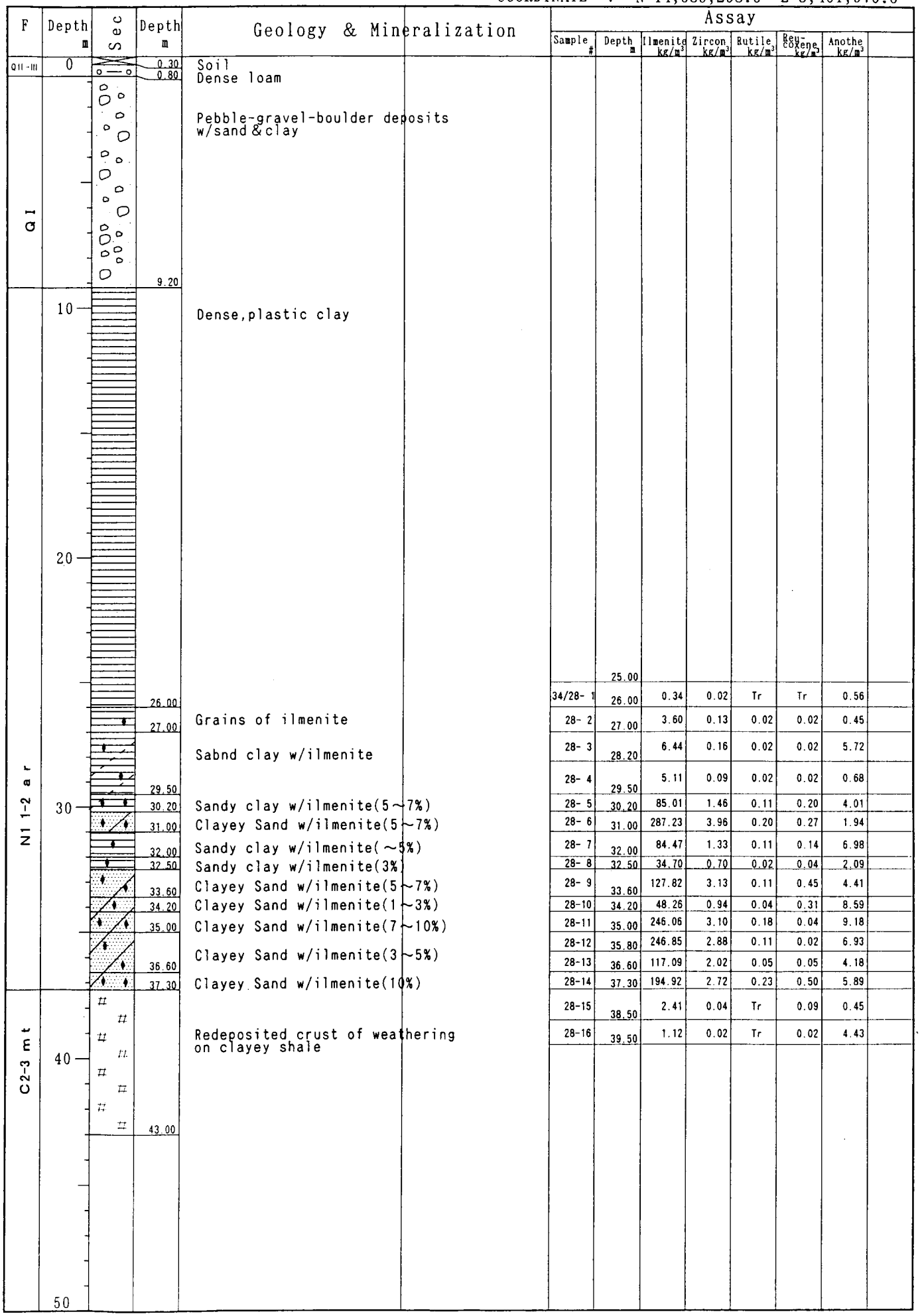
Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Sph-Leucoxene kg/m³	Anothe kg/m³
	21.00					
38/12- 1	22.00	3.06	0.09	Tr	0.02	0.41
12- 2	23.20	3.28	0.07	Tr	Tr	0.70
12- 3	24.00	7.04	0.18	Tr	0.02	25.67
12- 4	25.00	7.65	0.20	0.02	Tr	43.38
12- 5	26.00	9.18	0.22	0.04	0.02	32.54
12- 6	27.00	8.84	0.14	0.02	0.02	53.21
12- 7	28.00	10.48	0.23	0.02	0.02	57.47
12- 8	29.00	28.15	0.56	0.04	0.07	2.38
12- 9	29.90	123.61	1.62	0.09	0.034	10.15
12-10	31.00	0.76	0.13	0.02	0.02	12.17
12-11	32.00	0.86	0.13	Tr	0.11	7.27

M J B K − 6 (1:200) ELEVATION : 468.07 m
COORDINATE : N 14,636,493.1 E 5,401,923.4

F	Depth m	Sec	Depth m	Geology & Mineralization	Assay							
					Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Sphene kg/m³	Anothe kg/m³	
Qll-lll	0		1.60	Dense loam w/Pebbles								
Ql			8.80	Pebble-gravel deposits w/boulders(max.4×10cm)								
N1 1-2 a r	10		23.50	Dense clay		23.20						
			25.70	Poor dust like ilmenite(<1%)	34/32- 1	25.00	1.26	0.02	Tr	0.02	0.88	
	20		26.50	Sandy clay w/ilmenite(1~5%)	32- 2	26.00	2.70	0.05	0.02	0.02	0.99	
			27.70	Clayey Sand w/ilmenite(3~5%)	32- 3	27.00	44.32	0.70	0.09	0.11	5.49	
C2-3 m t		# # #	30.00	Redeposited crust of weathering	32- 4	28.00	57.83	1.01	0.11	0.65	3.31	
	30				32- 5	29.00	0.94	0.02	Tr	0.02	0.07	
					32- 6	29.90	1.26	0.04	Tr	0.02	0.23	
	40											
	50											

MJBK－7　　(1:200)　　ELEVATION　:　468.10 m
COORDINATE　:　N 14,636,298.6　E 5,401,970.6



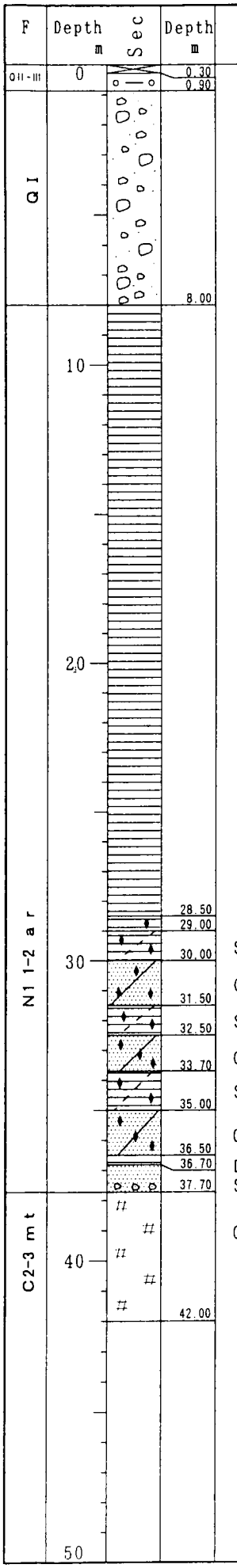
MJBK－8　　(1:200)　　ELEVATION　:　468.47 m
COORDINATE　:　N 14,636,107.5　E 5,402,017.7

F	Depth m	Sec	Depth m	Geology & Mineralization
Qll-lll	0		0.80	Dense loam
Q I				Sand-Pebble-gravel deposits w/rare boulder
			8.00	
	10			Dense,plastic clay w/hematite &ilmenite
	20			
			24.60	
N1 1-2 a r			25.30	Poorly Sabnd clay w/dusty ilmenite
			26.00	Sandy clay w/ilmenite(3～5%)
			27.20	Clayey Sand w/ilmenite(5%)
			28.50	Dense clay w/ilmenite(1%) Grains of ilmenite
			29.30	Sandy clay w/ilmenite(1%)
	30		30.60	Sandy clay w/ilmenite(3～10%)
			32.00	Dense clay w/ilmenite(<1%)
			33.00	Sandy clay w/ilmenite(3%)
			33.50	Sandy clay w/ilmenite(5%)
			34.90	Dense clay w/few ilmenite(<1%)
			35.70	Sandy clay w/fewilmenite
			36.50	Sandy clay w/ilmenite(3%)
			37.50	Clayey Sand w/ilmenite(5～10%)
				Dense clay w/ilmenite(<1%)
	40		40.40	
			41.00	Clayey Sand w/ilmenite(7～10%) & silicous rock fragments
C2-3 m t			43.00	Crust of weathering deposited shale
	50			

Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Reu-coxene kg/m³	Anothe kg/m³
	23.50					
34/24- 1	24.60	0.61	0.02	Tr	Tr	0.29
24- 2	25.30	2.29	0.05	0.02	Tr	0.43
24- 3	26.00	34.07	0.77	0.07	0.04	1.42
24- 4	27.20	113.44	3.10	0.31	0.14	1.30
24- 5	28.50	19.89	0.45	0.07	0.02	0.97
24- 6	29.30	73.15	1.85	0.22	0.23	0.81
24- 7	30.60	279.81	4.36	0.23	0.86	2.65
24- 8	32.00	35.32	6.14	0.52	0.14	2.56
24- 9	33.00	24.75	0.47	0.04	0.04	0.43
24-10	33.50	91.33	1.49	0.13	0.18	8.68
24-11	34.90	4.30	0.18	0.02	0.02	1.96
24-12	35.70	29.61	0.45	0.02	0.16	1.57
24-13	36.50	52.87	0.70	0.02	0.02	3.83
24-14	37.50	197.95	1.76	0.11	0.43	3.24
24-15	38.50	7.92	0.31	Tr	0.05	9.11
24-16	39.50	3.56	0.09	0.02	0.04	5.76
24-17	40.40	7.13	0.09	0.02	0.07	7.90
24-18	41.00	172.76	2.25	0.31	0.04	12.20
24-19	42.00	13.12	0.23	0.05	0.05	3.96
24-20	43.00	6.55	0.31	0.04	0.09	3.89

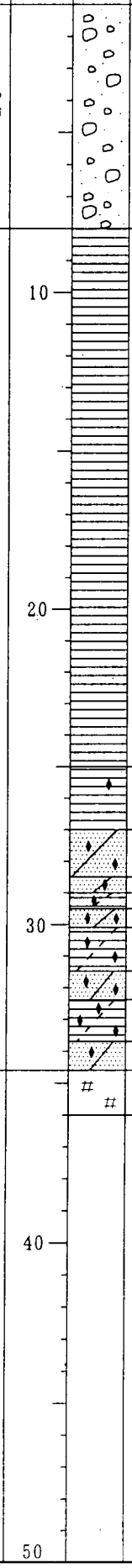
MJBK－9　　(1:200)　　ELEVATION　:　469.30 m
COORDINATE　:　N 14,635,912.7　E 5,402,064.7



Assay

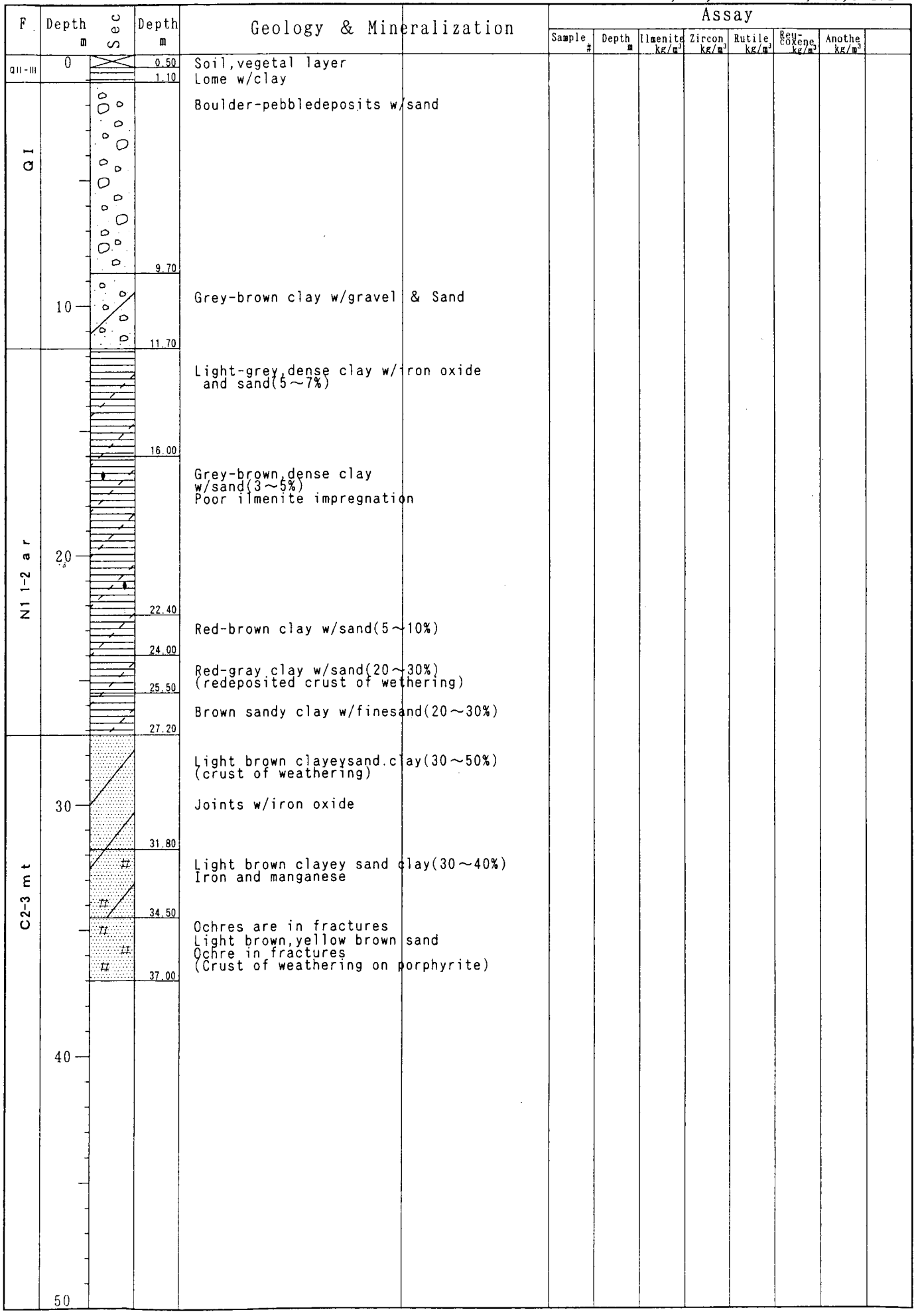
Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leucoxene kg/m³	Anothe kg/m³
	27.00					
34/20- 1	28.00	5.18	0.09	0.02	0.02	0.97
20- 2	29.00	4.12	0.07	0.02	Tr	6.62
20- 3	30.00	65.92	1.28	0.07	0.04	3.62
20- 4	31.00	101.18	1.71	0.20	0.72	1.51
20- 5	31.50	156.92	2.39	0.14	0.49	17.84
20- 6	32.50	39.13	0.68	0.05	0.16	2.41
20- 7	33.70	121.21	2.20	0.13	0.45	5.69
20- 8	35.00	78.44	1.82	0.13	3.74	9.97
20- 9	36.50	111.15	2.23	0.11	0.47	9.99
20-10	37.70	184.01	2.23	0.07	0.05	4.36
20-11	39.00	7.04	0.22	0.02	0.13	11.16
20-12	40.00	4.82	0.13	0.02	0.04	12.74

MJBK－10　　(1:200)　　ELEVATION　:　469.36 m
COORDINATE　:　N 14,635,719.6　E 5,402,111.4



Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Reu-cokene kg/m³	Anothe kg/m³
	25.00					
34/16- 1	26.00	0.32	0.02	Tr	Tr	0.72
16- 2	27.00	2.27	0.05	0.02	0.02	0.50
16- 3	28.50	23.15	0.49	0.05	0.04	2.30
16- 4	29.00	56.54	1.04	0.05	0.31	4.52
16- 5	29.50	202.45	6.08	0.90	0.86	52.29
16- 6	30.10	51.80	1.08	0.14	0.47	2.18
16- 7	31.50	41.22	1.01	0.22	0.32	2.75
16- 8	32.40	204.17	3.55	0.38	2.88	12.94
16- 9	33.70	151.65	0.34	0.72	0.67	5.58
16-10	34.60	108.34	1.76	0.07	0.72	4.59
16-11	36.00	19.91	0.23	0.02	0.07	1.17

MJBK－11　(1:200)　ELEVATION : 488.01 m
COORDINATE : N 14,632,772.4 E 5,406,624.1



MJBK－12　(1:200)　ELEVATION : 488.96 m
COORDINATE : N 14,632,661.7 E 5,406,728.8

F	Depth m	Sec	Depth m	Geology & Mineralization
QII-III	0		0.50	Soil
			1.10	Loam
			1.40	Grey sandy clay
QI				Boulder-pebble deposits w/sand
	10		10.00	
				Light gray dense clay w/sand & gravel
			13.00	
N1 1-2 ar				Brown grey dense clay w/nests of ironoxide and manganese ochre
			16.90	
			17.50	Light grey clay w/sand
			18.60	Red brown cley w/sand and impregnations of ilmenite
	20			Grey brown dense clay
			22.40	
				Light grey clay w/sand In base of bed,sand 10-15% and ilmenite impregnation
			25.30	
				Light grey sand w/clay ilmenite impregnation
			26.90	
			28.00	Light grey sand w/clay & ilmenite
			28.50	Sand w/ilmenite impregnation
				Sand w/clay & ilmenite impregnation
	30		29.90	
				Yellow brown clay w/Sand (redeposited crust of weathering)
			32.50	
				Yellow brown clay w/Sand
			35.00	
C2-3 mt				Green brown dense clay-sand deposits (crust of weathering)
			37.50	
			38.70	Grey brown sand
			39.20	Brown fine sand
	40		40.20	Clay (crust of weathering)
			41.40	Weathered siltsone Bottom of the hole
	50			

Assay

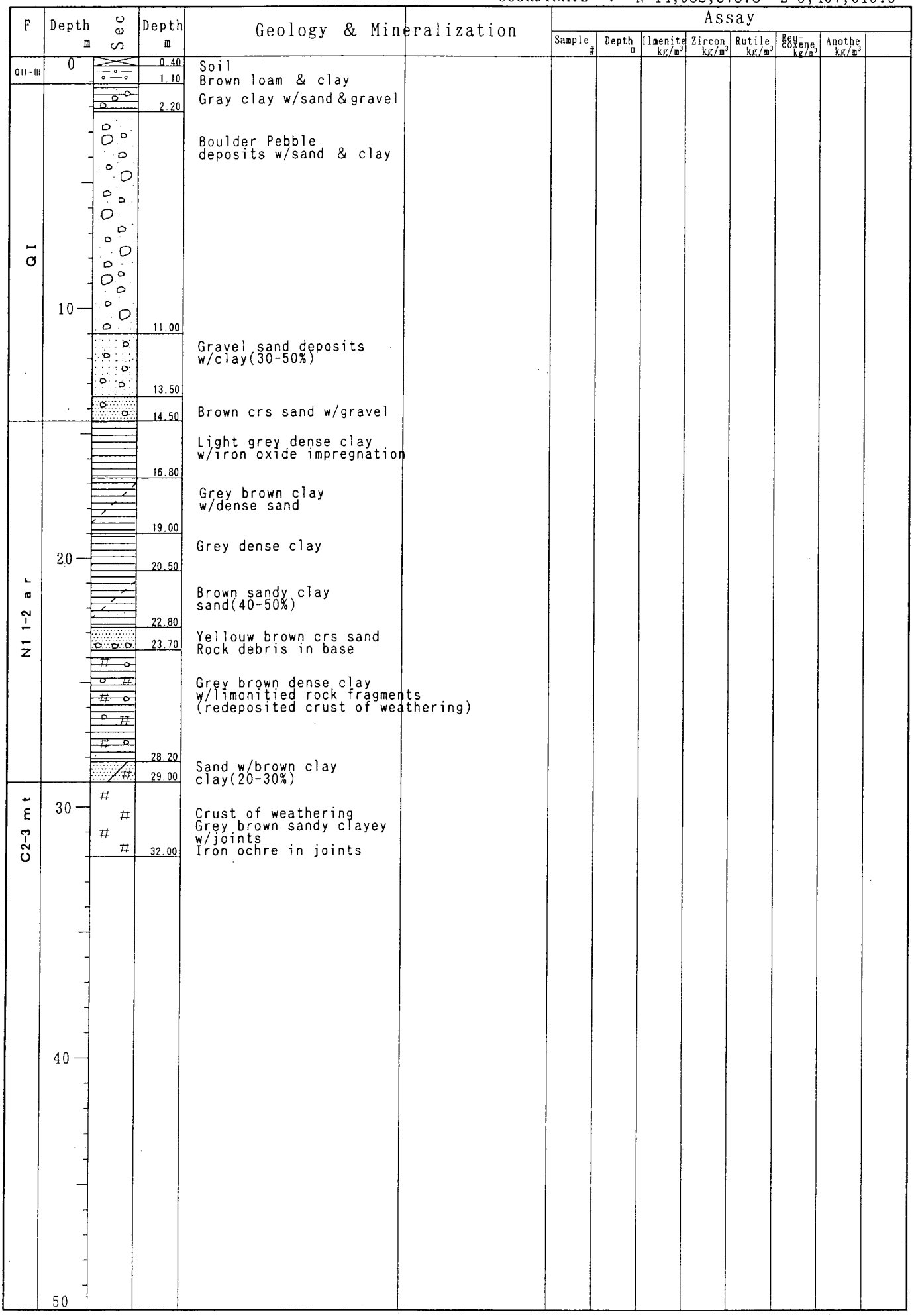
Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leucoxene kg/m³	Anothe kg/m³
	23.30					
2GL/12-1	24.30	8.93	0.23	Tr	0.11	0.77
12- 2	25.90	22.54	0.67	Tr	0.34	2.41
12- 3	26.90	6.70	0.23	Tr	0.07	5.15
12- 4	28.00	34.83	0.92	Tr	0.38	1.85
12- 5	28.50	119.05	4.95	0.29	0.92	0.49
12- 6	29.90	107.75	3.96	0.45	0.79	0.68
12- 7	30.90	2.54	10.49	Tr	0.04	17.51
12- 8	31.90	3.08	0.22	0.02	0.16	5.63

M J B K − 1 3 (1:200) ELEVATION : 489.80 m
COORDINATE : N 14,632,520.3 E 5,406,868.2

F	Depth m	Sec	Depth m	Geology & Mineralization
QII-III	0		0.50	Soilvegetalbad
			0.60	Loam
				Pebble boulder deposits w/gravel sand & clay
				Boulder(max ϕ=40cm)
				cley=5-10%
				Grey sandy clay
QI			8.40	
	10			Sand pebbles & clay
				cley=30-40%
			12.30	
				Brownish grey dense clay w/gypsun & limonite
			14.30	
			14.60	Light gray sandy clay
				Light grey dense clay w/limonite inclusion
			17.30	
			18.30	Light gray clay w/sand & il
N1 1-2 ar				Red grey dense cley w/iron hgdroxide nests
	20		20.80	
				Lght grey white dense clay w/iron hgdroxide nests
			23.00	
				Brown red cley w/lenticulers spots of white sandy clay (redeposited crust of weathering)
			28.20	
				Brown grey yellow brown dense spotted banded clay w/sand and iron oxide (red eposited crust of wethering)
	30		32.80	
			33.80	Brown clay (crust of wethering)
				Brown light brown sand clay w/rare qz frags
C2-3 mt			37.00	
				Dark green silt stone (crust of weathering)
			39.00	Bottom of the hole
	40			
	50			

Assay							
Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leu-coxene kg/m³	Anothe kg/m³	

MJBK－14　　(1:200)　　ELEVATION　：　490.60 m
COORDINATE　：　N 14,632,378.8　E 5,407,010.6



M J B K − 1 5　　(1:200)　　ELEVATION : 491.96 m
COORDINATE : N 14,632,237.4 E 5,407,152.0

F	Depth m	Sec	Depth m	Geology & Mineralization
QII-III	0		0.30	Soil
			1.20	Loam
QI				Pebble boulde deposits w/sand
	10		11.00	
				Clay w/sand & gravel
			12.50	
N1 1-2 a r				Light-gray dense clay
			16.00	
				Brown dense clay w/sand(5-10%)
			17.00	
				Brown dense clay w/sand(5-7%)
	20			
			21.50	
				Red brown grey dense clay w/sand (5-10%)
			23.40	
			24.10	Red brown clay w/sand
			24.50	Yellow brown crs sand
				Red brown grey dense clay w/sand(10-20%)
			27.20	
				Light grey sand w/ilmenite(1-3%)
			28.90	
			29.50	Light grey brown clay w/sand
			29.80	Brown fine sand w/clay
C2-3 m t	30			Brown sand w/clay(30-40%)
			31.80	Bande and jointy sand
				Grey brown fine sand w/clay(20-30%) Ochre of Fe&Mn are in joints crust of wethering
			34.50	
	40			
	50			

Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leu-coxene kg/m³	Anothe kg/m³
	23.40					
2GL/24-1	24.10	1.19	0.04	Tr	Tr	4.03
24- 2	24.50	3.71	0.34	Tr	0.14	53.01
24- 3	26.00	225.50	6.37	0.02	1.73	10.17
24- 4	27.20	24.57	1.04	0.02	0.34	5.00
24- 5	28.20	46.42	1.51	0.04	0.49	98.19
24- 6	28.90	169.63	2.99	0.02	1.06	9.18
24- 7	29.90	0.72	0.04	Tr	0.04	4.25
24- 8	30.90	0.52	0.09	Tr	0.02	1.62

MJBK－16　　(1:200)　　ELEVATION　:　465.98 m
COORDINATE　:　N 14,636,202.4　E 5,401,485.0

F	Depth m	Sec	Depth m	Geology & Mineralization
Qll-lll	0		0.30	Soil
			1.10	Dense loam
Q I				Clay sand pebble gravel deposits w/boulder(max.7×15cm)
			9.10	
	10			Dense plastic clay
	20			
			24.00	
			25.00	
N1 1-2 a r				Rare impregnation of ilmenite(1%)
			28.20	
				Sand clay w/ilmenite(1-5%)
	30		30.50	
			31.20	Clayey sand w/ilmenite(5-7%)
			32.70	Weak sand clay w/ilmenite(ab.1%)
			34.00	Clayey sand w/ilmenite(1-5%)
			35.50	Clayey sand w/ilmenite(5-10%)
			36.00	Sand clay w/ilmenite(ab.3%)
			37.00	Clayey sand w/ilmenite(5-10%)
			38.00	Ferrous clayey sand w/ilmenite(1-7%)
			39.00	Sand clay w/ilmenite(1-10%)
C2-3 m t	40		41.00	Crust of weathering
	50			

Assay							
Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leu-coxene kg/m³	Anothe kg/m³	
30/28- 1	25.00	0.49	0.02	Tr	Tr	0.63	
28- 2	26.00	6.34	0.18	0.02	0.04	0.70	
28- 3	27.50	3.62	0.11	Tr	0.02	1.04	
28- 4	28.20	1.58	0.04	Tr	0.02	0.65	
28- 5	29.00	61.06	1.31	0.16	0.13	2.79	
28- 6	30.50	45.02	0.77	0.07	0.16	3.38	
28- 7	31.20	272.95	4.55	0.27	1.17	28.49	
28- 8	32.70	15.01	0.31	0.02	0.02	5.35	
28- 9	34.00	28.17	0.68	0.04	0.14	2.12	
28-10	34.50	132.68	1.69	0.18	0.18	8.91	
28-11	35.50	70.83	1.08	0.13	0.40	18.22	
28-12	36.00	58.10	1.10	0.09	0.20	9.32	
28-13	36.50	129.11	2.30	0.09	0.50	12.15	
28-14	37.00	85.99	1.17	0.05	0.40	15.32	
28-15	38.00	133.09	2.07	0.25	0.76	7.11	
28-16	39.00	165.44	2.25	0.16	0.34	17.84	
28-17	40.00	5.36	0.07	Tr	0.02	1.04	
28-18	41.00	16.94	0.20	0.02	0.02	0.54	

MJBK－17　　(1:200)　　ELEVATION　:　466.55 m
COORDINATE　:　N 14,635,821.6　E 5,401,578.9

F	Depth m	Sec	Depth m	Geology & Mineralization
QII-III	0		0.60	Dense loam w/Pebble
QI			9.00	Clay sand Pebble gravel deposits w/boulder(max.7×15cm)
N1 1-2 ar	10			Dense plastic clay w/ flakes of hematite
	20			
	30			
			32.50	
			34.00	Rare dusty impregnation of ilmenite
			36.00	Sand clay w/ilmenite(2-3%)
			37.00	Sand clay w/ilmenite(5-7%)
			38.00	Clayey sand w/ilmenite(5-7%)
			38.20	Clayey sand w/iron oxide
			39.50	Clayey sand w/ilmenite(3-5%)
	40		40.00	Clayey sand w/ilmenite(5-7%)
			41.00	Sand clay w/ilmenite(about3%)
			41.50	Clayey sand w/ilmenite(3-5%)
			43.00	Clayey sand w/ilmenite(5-7%)&qz
			43.50	Sand clay w/ilmenite(5-7%)
			44.00	Clay w/ilmenite(1%)
C2-3 mt			46.00	Crwst of weathering
	50			

Assay

Sample #	Depth m	Ilmenite kg/m³	Zircon kg/m³	Rutile kg/m³	Leucoxene kg/m³	Anothe kg/m³
	31.00					
30/20- 1	32.00	0.68	0.02	Tr	Tr	0.90
20- 2	33.00	0.97	0.05	Tr	0.02	0.22
20- 3	34.00	2.03	0.04	Tr	0.02	0.54
20- 4	35.00	18.81	0.61	0.02	0.05	0.52
20- 5	36.00	59.09	1.13	0.14	0.23	0.52
20- 6	37.00	103.09	1.67	0.11	0.43	2.12
20- 7	38.00	65.86	0.83	0.04	0.07	16.45
20- 8	38.50	77.40	1.51	0.16	0.09	4.59
20- 9	39.50	70.65	1.62	0.09	0.34	3.92
20-10	40.00	121.72	1.15	0.02	0.25	0.49
20-11	41.00	88.78	1.35	0.07	0.72	2.84
20-12	41.50	29.65	0.36	0.27	Tr	1.71
20-13	43.00	196.74	2.65	0.13	1.37	0.85
20-14	43.50	60.84	1.22	0.05	0.72	24.52
20-15	44.00	7.07	0.31	0.02	0.36	26.64
20-16	45.00	2.18	0.07	0.02	0.16	31.37
20-17	46.00	2.66	0.09	Tr	0.56	15.61

Appendix 2. Results of Laboratory Works

Appendix 2-1 List of Laboratory Works

Appendix 2-1 List of Laboratory Works

No.	Type of work	Whole Area	Bektemir No.1 South	Bektemir No.3 South	Total
1	Microscopic observation of the thin sections	12	0	0	12
2	X-Ray diffraction analysis	6	14	2	22
3	Preparation for analysis	0	249	22	271
4	Quantity mineralogical analysis for ilmenite, rutile and zircon of usual and check samples	0	198	16	214
5	Inside (same laboratory) geological check of mineralogical analysis (Ⅲ classes of content - select 30 samples each)	0	90	0	90
6	Outside (another laboratory) geological check of mineralogical analysis (Ⅲ classes of content - select 30 samples each)	0	90	0	90
7	Chemical analysis of check samples for TiO_2 and ZrO_2	0	25	6	31
8	Separation of monomineral ilmenite and zircon fractions from group samples	0	22	0	22
8.1	Grainmetric analysis of monomineral fraction	0	22	0	22
8.2	Chemical and spectral quantity analysis of monomineral fraction Ilmenite; TiO_2, Sc_2O_3, Nb_2O_5, Ta_2O_5, TR, V_2O_5, Cr_2O_3, Al_2O_3, SiO_2, FeO, Fe_2O_3	0	11	0	11
	Zircon; ZrO_2, Sc_2O_3, Hf, TR, Y, Th	0	11	0	11
8.3	Determination of zircon radioactivity	0	11	0	11
9	Chemical analysis of water sample	0	4	0	4
10	Chemical analysis of water sample according to the State Standard (GOST) "Drinking water"	0	2	0	2
11	Physical - mechanical test of rock;				
	* short complex	0	11	0	11
	* complete complex	0	10	0	10
	Total of laboratory works	18	770	46	834

Appendix 2-2 Microscopic Observations of the Thin Sections

Appendix 2-2 Microscopic Observations of the Thin Sections

No.	Sample No.	Locality	Rock name	Igneous rock															Pyroclastic rocks										Secondary minerals																Remarks
																			Rock fragment	Crystal fragment																											
				Qz	Kf	Pl	Bt	Hb	Cpx	Opx	Mt	Ilm	Sph	Ap	Zr	Mz	Al	Fl		Qz	Kf	Pl	Bt	Hb	Cpx	Opx	Mt	Ap	Qz	Pl	Ch	Ser	Bt	Act	Prh	Ep	Cal	Cord	Sph	Mt	Ilm	Hm	Gt	Ap	Lc	
1	9-16-8	Beloe	Bt hornfels from andesite tuff																○ And, Tuff			◎	○		△	△		·			△	△													
2	9-16-9	Beloe	Cpx-Aug-Hb alkali feldspar granite	○	◎	△		△		△	·				·	·																										·			Cpx : aegirine-augite
3	9-17-2	Marinogorka	Volcanic sandstone																◎ And, Bas, Rhy, Mst	△		○	·	△	·					△	·			·		·									
4	9-20-2	Beloe	Bt-Cord hornfels																	△	△			○									◎					·	·			·		Cord : poikiloblastic
5	9-20-4	Beloe	Meta-Hb andesite tuff																◎ And			△		○								△	·						·	·				
6	9-28-2	Beloe	Hb-Bt alkali feldspar granite	○	◎	△	○	○				·		·	·	·																												
7	9-28-3	Beloe	Hb-Bt granite	○	◎	○	○	○			·			·	·	·	·																										·		
8	9-28-4	Preobrajenka	Aug-Hb-Bt Qz monzodiorite	○	○	◎						△	·	·	·	·															·				·				·					
9	9-28-10	Preobrajenka	Schistose Bt granite	◎	◎	○	○					·		·	·		·	·														·												Qz : mortar structure
10	9-30-5	Preobrajenka	Altered andesite tuff																◎ And			○		·	○						△					△								·	
11	9-30-7	Preobrajenka	Altered trachyte		◎	△																										△									·	·		
12	9-30-8	Preobrajenka	Altered andesite			◎			△																							△										△		·	

[Abbreviations]
Act : actinolite, Al : allanite, And : andesite, Ap : apatite, Aug : augite, Bas : basalt, Bt : biotite, Cal : calcite, Ch : chlorite, Cord : cordierite, Cpx : clinopyroxene, Ep : epidote, Fl : fluorite, Gt : goethite, Hb : hornblende, Hm : hematite, Ilm : ilmenite, Kf : K-feldspar, Mst : mudstone, Mt : magnetite, Mz : monazite, Lc : leucoxene, Opx : orthopyroxene, Pl : plagioclase, Prh : prehnite, Qz : quartz, Ser : sericite, Sph : sphene, Zr : zircon

[Abundance]
◎ : Abundant, ○ : Common, △ : Poor, · : Rare

Appendix 2-3 Photomicrographs of the Thin Sections

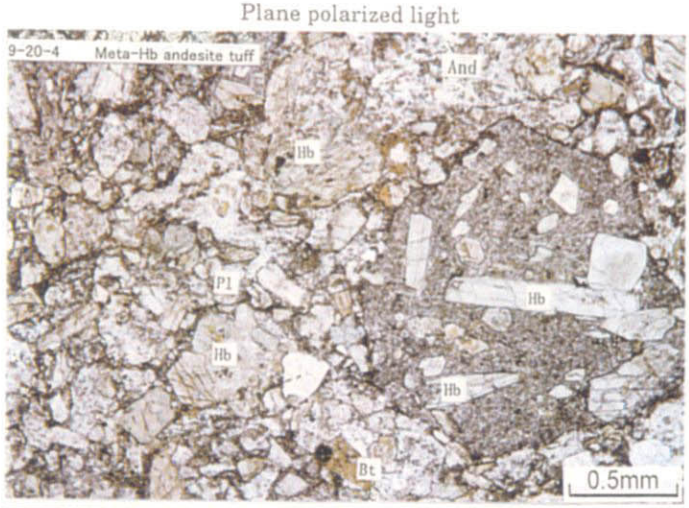
Abbreviations

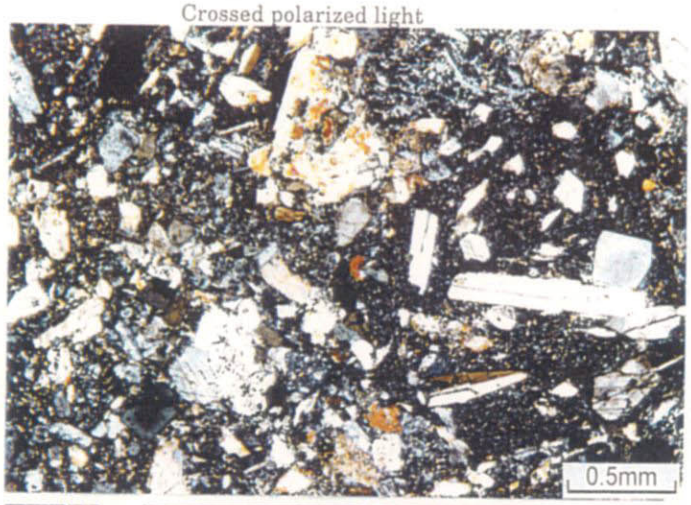
Act	:	actinolite
Al	:	allanite
And	:	andesite
Ap	:	apatite
Aug	:	augite
Bas	:	basalt
Bt	:	biotite
Cal	:	calcite
Ch	:	chlorite
Cord	:	Cordierite
Cpx	:	clinopyroxene
Ep	:	epidote
Fl	:	fluorite
Gt	:	goethite
Hb	:	hornblende
Hm	:	hematite
Ilm	:	ilmenite
Kf	:	K-feldspar
Mst	:	mudstone
Mt	:	magnetite
Mz	:	monazite
Lc	:	leucoxene
Opx	:	orthopyroxene
Pl	:	plagioclase
Prh	:	prehnite
Qz	:	quartz
Ser	:	sericite
Sph	:	sphene
Zr	:	zircon

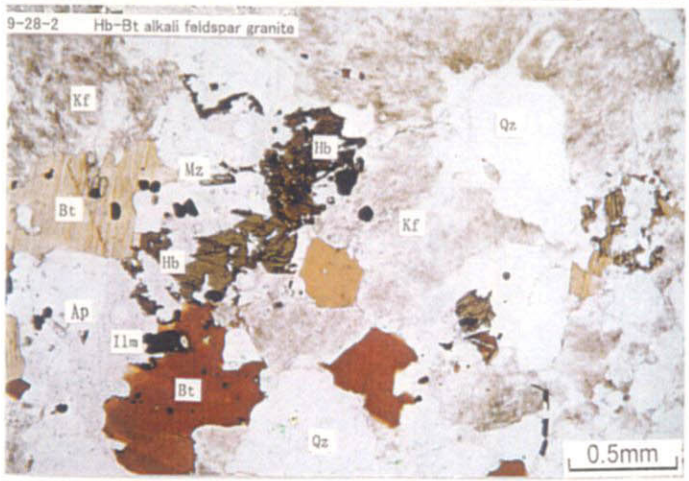
Appendix 2-3 Photomicrographs of the Thin Sections

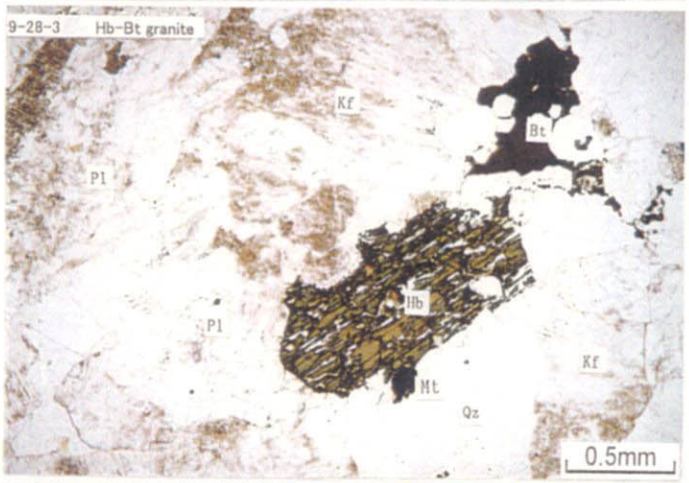
Plane polarized light

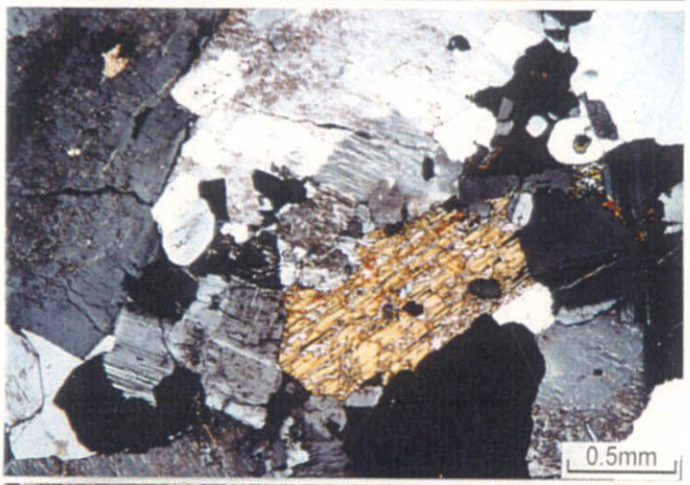
Crossed polarized light

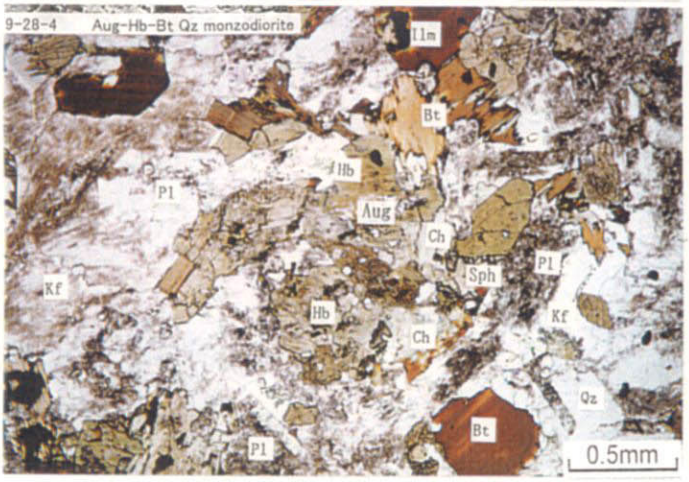


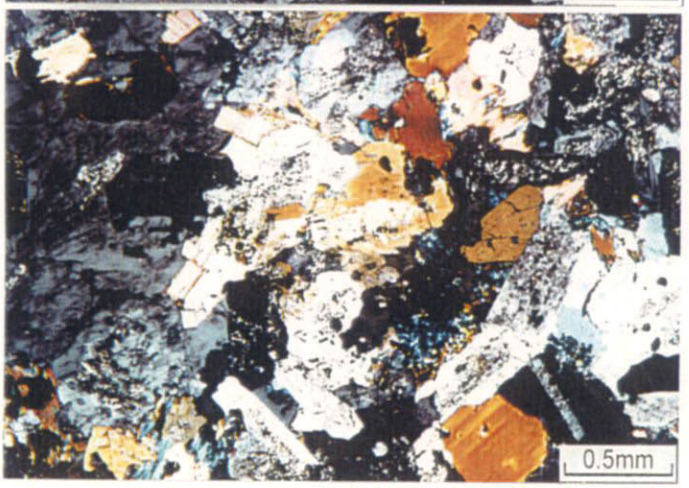








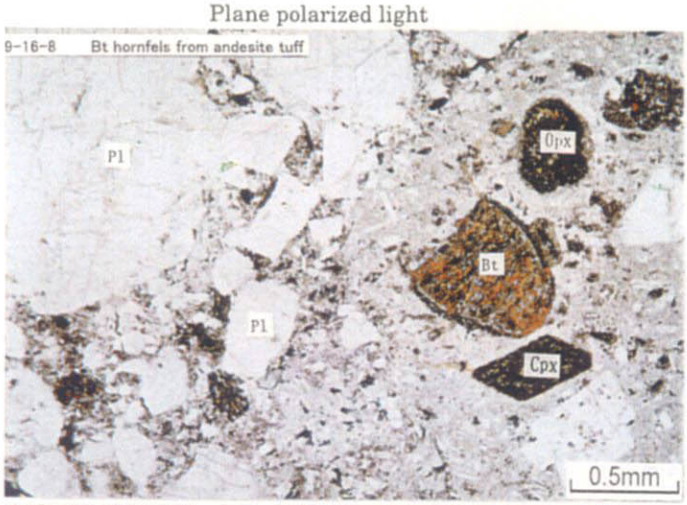


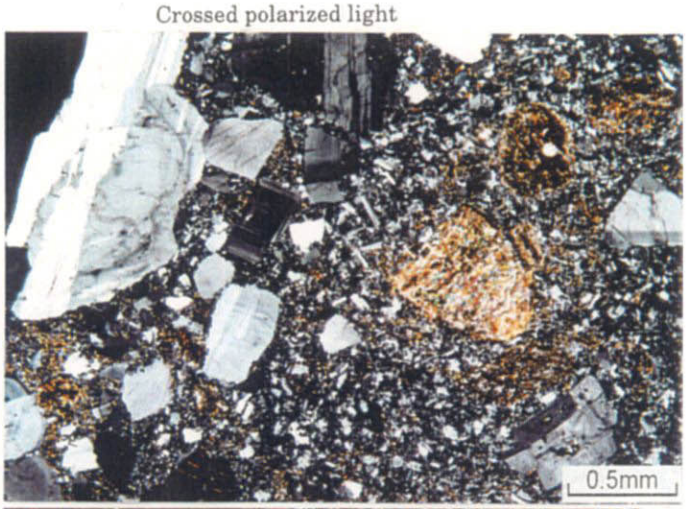


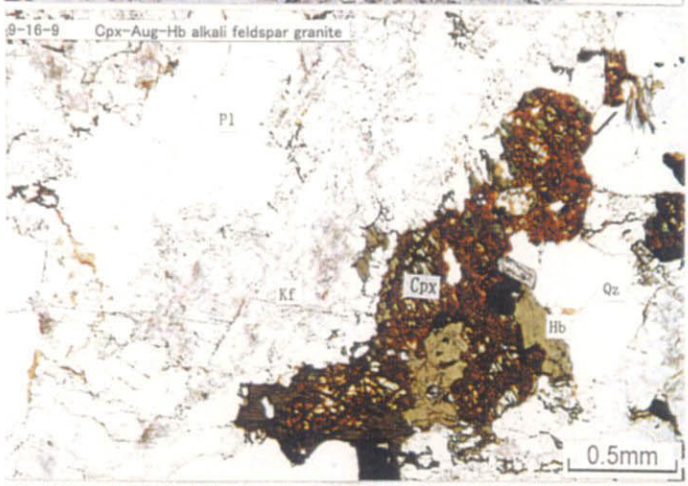
Appendix 2-3 Photomicrographs of the Thin Sections

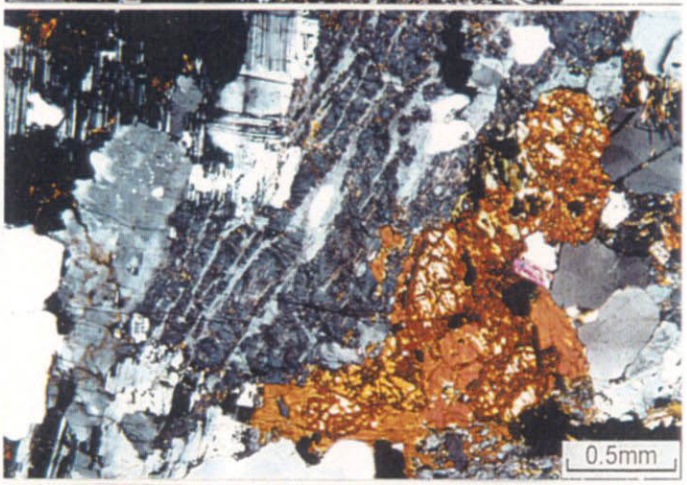
Plane polarized light

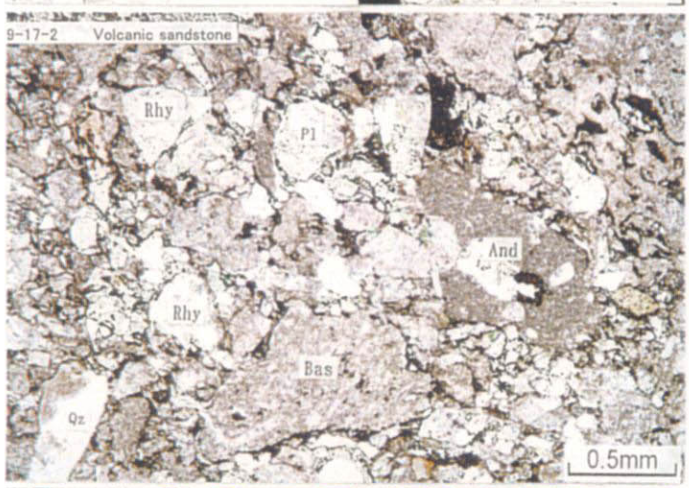
Crossed polarized light

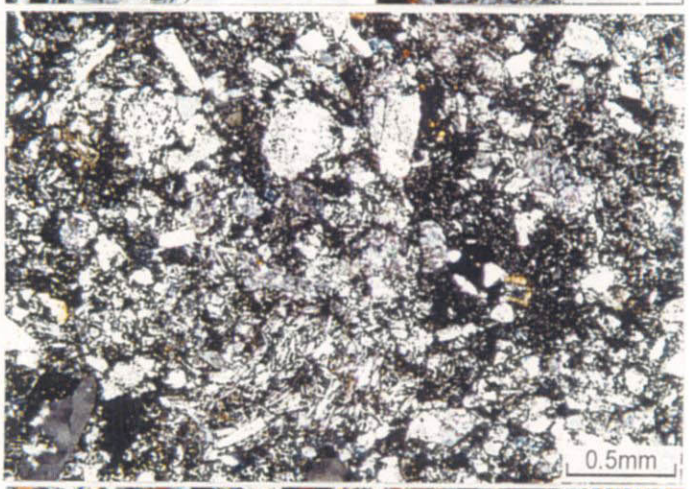


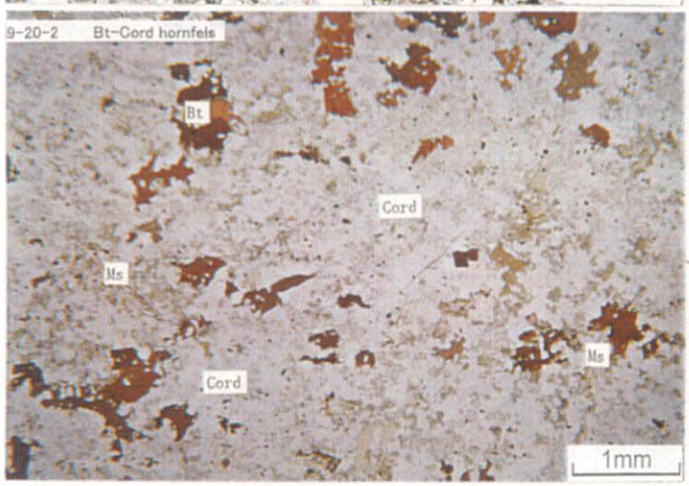


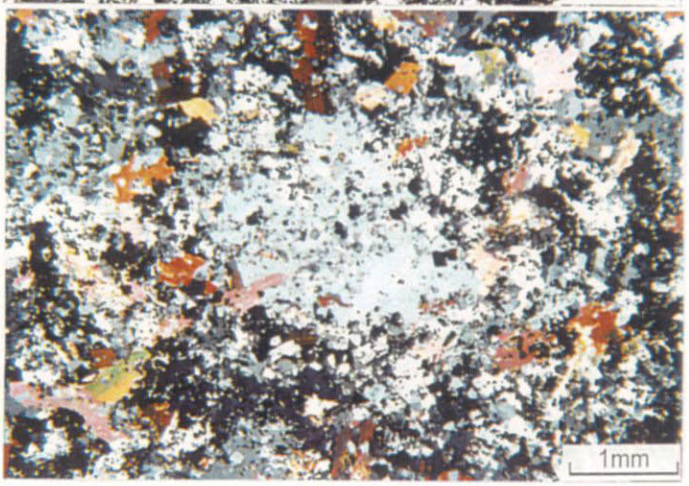








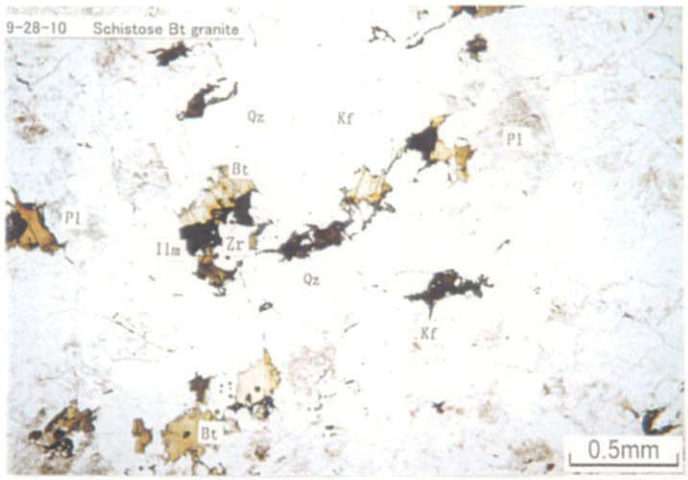


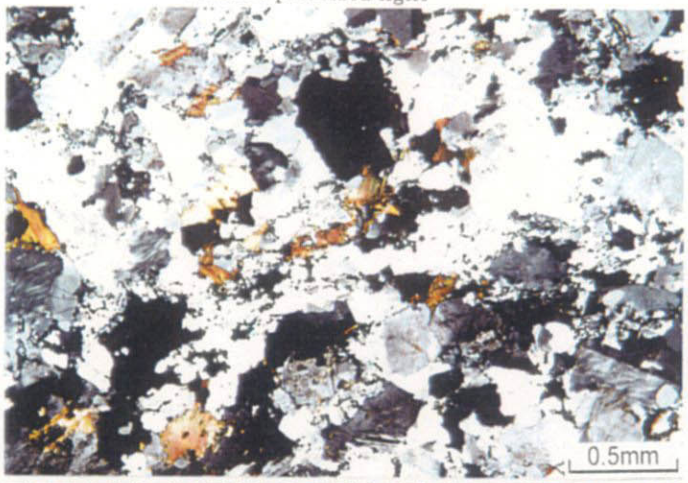


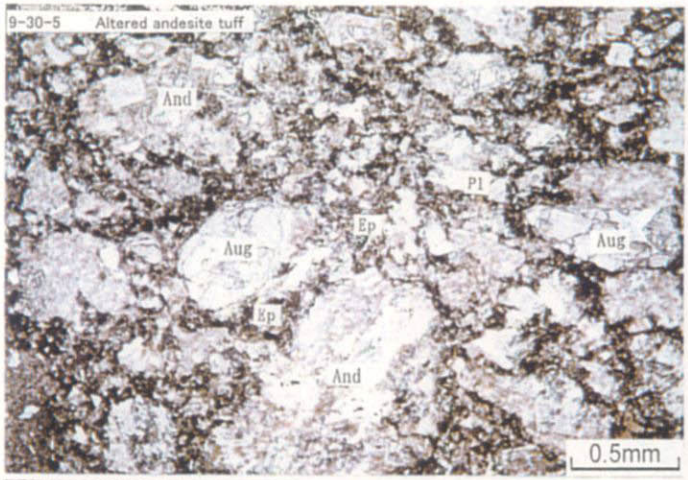
Appendix 2-3 Photomicrographs of the Thin Sections

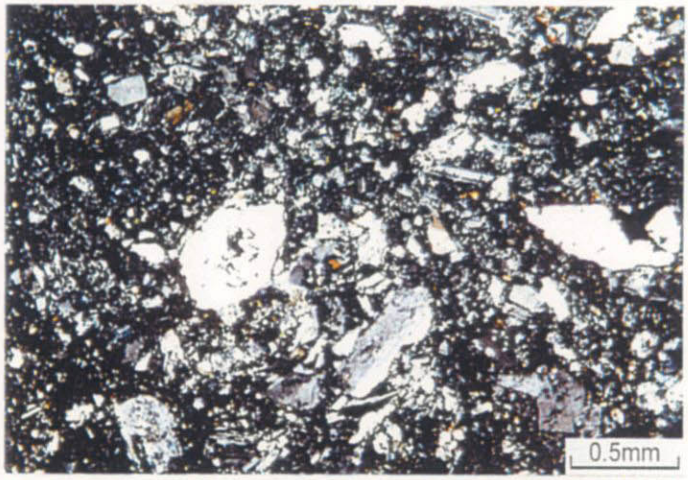
Plane polarized light

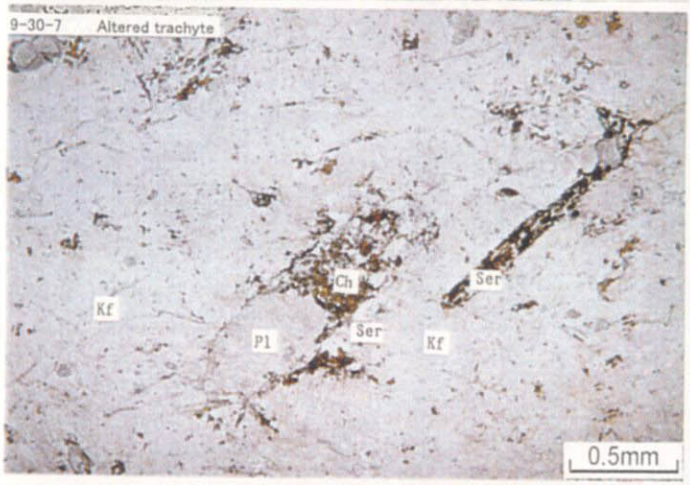
Crossed polarized light

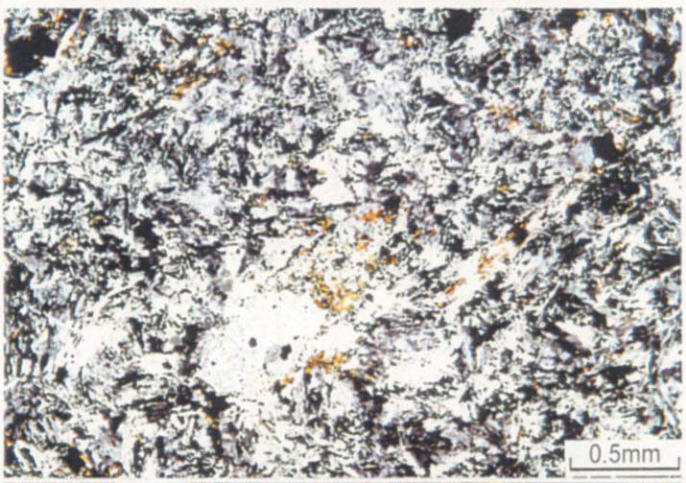


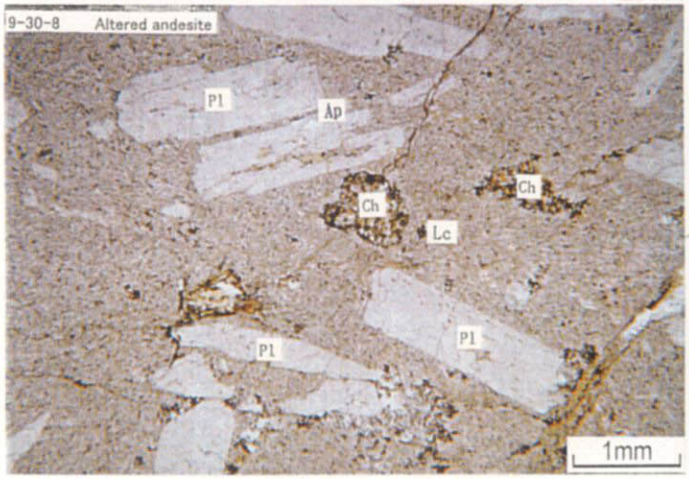












Appendix 2-4 Results of X-Ray Diffraction Analysis

Appendix 2-4 Results of X-Ray Diffraction Analysis

	Sample no.	Locality	Rock description	Q	K	S	C	S-Sm	Mont	Ilm	Bt	Zir	Pl	K-f	Illite	Ae	Hb	Remarks
1	9-16-9	Beloe	aegirine-hb alkali-f.granite	◎									◎	◎		○		TiO_2: 0.18 %, ZrO_2: 0.11 %
2	9-20-4	Beloe	meta-hb andesite tuff								○		◎				◎	TiO_2: 0.64 %, ZrO_2: 0.02 %
3	9-28-2	Beloe	hb-bt granite	◎							○		◎	◎			△	TiO_2: 0.37 %, ZrO_2: 0.03 %
4	9-28-3	Beloe	hb-bt granite	◎							○		◎	◎			△	TiO_2: 0.09 %, ZrO_2: 0.03 %
5	9-28-4	Preobrazhenskiy	bt-hb quartz diorite	◎			○				○		◎	△			◎	TiO_2: 1.10 %, ZrO_2: 0.02 %
6	9-28-10	Preobrazhenskiy	schistose hb-bt granite	◎							△		◎	◎				TiO_2: 0.18 %, ZrO_2: 0.02 %
7	MJBK-1	31.0m	Clay	◎	·													
8	MJBK-3	40.0m	Clay	◎	○										○			
9	MJBK-8	42.0m	Clay	◎	·				·				·	·				
10	MJBK-11	36.0m	Clay	◎	○				△						·			
11	MJBK-13	38.0m	Clay	◎	○				○						·			
12	MJBK-16	40.0m	Clay	◎	△				○						△			
13	MJBK-3	26.3m	Ilmenite sand	◎					○	△			△	△				
14	MJBK-4	30.5m	Ilmenite sand	◎						△			△	△				
15	MJBK-7	32.6m	Ilmenite sand (concentrate)	◎						◎			◎					TiO_2: 38.71 %, ZrO_2: 0.04 %
16	MJBK-7	34.5m	Ilmenite sand	◎						○			○	○				
17	MJBK-7	35.5m	Ilmenite sand	◎						○			○	○				
18	MJBK-8	30.0m	Ilmenite sand	◎	△					△			○	○				
19	MJBK-8	37.5m	Ilmenite sand	◎						○			○	○				
20	MJBK-8	40.9m	Ilmenite sand (concentrate)	◎						△			△	△				TiO_2: 27.87 %, ZrO_2: 0.54 %
21	MJBK-9	31.5m	Ilmenite sand	◎						△			△	△				
22	MJBK-9	36.0m	Ilmenite sand (concentrate)	◎					△	△			◎	◎				

[Abundance]

◎ : Abundant, ○ : Common, △ : Poor, · : Rare

[Abbreviations]

Q= Quartz K= Kaolinite S= Sericite C= Chlorite

S-Sm= Sericite-Smectite mixed Mont= Montmorillonite Ilm= Ilmenite

Bt= Biotite Zir= Zircon K-f= K-Feldspar Ae=Aegirine

Hb=Hornblende

Appendix 2-5 Quantity Mineralogical Analysis of Usual and Check Samples

Appendix 2-5 Quantity Mineralgical Analysis of Usual and Check Samples (1)

No.	No. of drillholes	Sample No.	Depth (m)	Weight of dried sample (kg)	Weight of sand after sieving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (%)	Heavy fractions					Content of heavy fraction (kg/t)	Content of heavy fractions				
										Ilmenite (%)	Zircon (%)	Rutile (%)	Leucoxene (%)	the others (%)		Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
1	MJBK-1	38/32-1	28.0 m – 29.0 m	10.3	138.9	34.7	34.7	14.52	41.84	20.26	0.67	0.01	0.33	78.73	5.54	1.14	0.04	tr	0.02	4.44
2	MJBK-1	38/32-2	29.0 m – 29.9 m	9.2	151.4	37.8	38.2	20.97	54.89	6.74	0.35	0.02	0.09	92.8	9.03	0.61	0.03	tr	0.01	8.38
3	MJBK-1	38/32-3	29.9 m – 31.0 m	9.1	82.3	41.1	40.9	7.09	17.33	43.82	0.85	0.05	0.16	55.12	1.57	0.69	0.01	tr	tr	0.87
4	MJBK-1	38/32-4	31.0 m – 32.0 m	10.9	81.7	40.8	41.4	18.37	44.37	12.73	0.34	0.02	0.03	86.88	3.33	0.42	0.01	tr	0.01	2.89
5	MJBK-2	38/28-1	23.6 m – 25.0 m	11.9	200	37.5	37.42	6.38	17.05	76.92	2.01	0.26	0.3	20.51	2.87	2.2	0.06	0.01	0.01	0.59
6	MJBK-2	38/28-2	25.0 m – 26.0 m	8.2	93	34.6	34.41	5.36	15.58	90.73	2.16	0.26	0.28	6.57	1.77	1.61	0.04	tr	tr	0.12
7	MJBK-2	38/28-3	26.0 m – 26.8 m	8.5	2790	43.5	43.5	8.19	18.83	89.12	2.59	0.32	0.2	7.77	61.81	55.09	1.6	0.2	0.12	4.8
8	MJBK-2	38/28-4	26.8 m – 27.4 m	7.6	3355	39.2	39.1	6.23	15.93	92.7	1.96	0.13	0.14	5.07	70.32	65.19	1.38	0.09	0.1	3.56
9	MJBK-2	38/28-5	27.4 m – 28.3 m	6.1	1164	36.3	36.3	6.16	16.97	96.73	2.3	0.1	0.02	0.85	32.38	31.32	0.74	0.03	0.01	0.28
10	MJBK-2	38/28-6	28.3 m – 29.5 m	10.1	780	36.5	36.5	6.78	18.57	95.21	1.72	0.11	0.16	2.8	14.35	13.66	0.25	0.02	0.02	0.4
11	MJBK-2	38/28-7	29.5 m – 30.2 m	5.9	945	29.5	29.52	5.26	17.82	93.32	0.84	0.06	0.11	5.67	28.54	26.63	0.24	0.02	0.03	1.62
12	MJBK-2	38/28-8	30.2 m – 31.5 m	12.1	203	37.6	37.32	5.11	13.69	32.14	0.66	tr	0.07	67.13	2.3	0.74	0.02	tr	tr	1.54
13	MJBK-2	38/28-9	31.5 m – 33.0 m	13.2	150	37.5	38.2	6.69	17.51	34.49	1.03	0.06	0.06	64.36	1.99	0.69	0.02	tr	tr	1.28
14	MJBK-2	38/28-10	33.0 m – 34.0 m	10.6	49	36.2	36.2	4.7	12.98	27.5	1.16	0.08	tr	71.26	0.6	0.16	0.01	tr	tr	0.43
15	MJBK-2	38/28-11	34.0 m – 35.0 m	11.1	160	40	40	4.22	10.55	19.24	1.23	tr	0.38	79.15	1.52	0.29	0.02	tr	0.01	1.2
16	MJBK-2	38/28-12	35.0 m – 36.0 m	10.6	230	42.3	42.5	3.96	9.32	19.46	0.59	0.05	0.21	79.69	2.02	0.39	0.01	tr	0.01	1.61
17	MJBK-2	38/28-13	36.0 m – 37.0 m	9.1	145	36.2	36.4	3.31	9.09	26.89	0.3	0.01	0.17	72.63	1.45	0.39	0.01	tr	tr	1.05
18	MJBK-2	38/28-14	37.0 m – 38.0 m	10.3	168	42	41.8	4.56	10.91	82.53	3.39	0.23	0.44	13.41	1.78	1.47	0.06	tr	0.01	0.24
19	MJBK-2	38/28-15	38.0 m – 39.0 m	11.7	145	36.2	36	6.91	19.19	31.42	1.93	0.05	0.47	66.13	2.38	0.75	0.05	tr	0.01	1.57
20	MJBK-2	38/28-16	39.0 m – 40.0 m	11.4	105	39.1	38.3	5.54	14.47	50.31	2.76	0.14	0.28	46.51	1.33	0.67	0.04	tr	tr	0.62
21	MJBK-2	38/28-17	40.0 m – 41.0 m	10.2	44	44	44.3	7.13	16.09	41.7	1.06	0.06	0.99	56.19	0.69	0.28	0.01	tr	0.01	0.39
22	MJBK-2	38/28-18	41.0 m – 42.0 m	10.1	470	29.3	29.7	3.15	10.61	54.57	3.49	0.19	1.79	39.96	4.94	2.7	0.17	0.01	0.09	1.97
23	MJBK-2	38/28-19	42.0 m – 42.9 m	8.6	875	40.6	40	4.72	11.8	69.15	1.95	0.08	0.85	27.97	12.01	8.31	0.23	0.01	0.1	3.36
24	MJBK-2	38/28-20	42.9 m – 44.0 m	7.1	350	43.7	44.4	0.14	0.32	71.88	3.12	tr	tr	25	0.16	0.11	0.01	tr	tr	0.04
25	MJBK-3	38/24-1	26.0 m – 27.5 m	12.7	125	31.2	31.35	5.34	17.03	47.22	1.61	0.02	0.21	50.94	1.68	0.79	0.03	tr	tr	0.86
26	MJBK-3	38/24-2	27.5 m – 28.5 m	9.9	505	31.5	31.37	5.66	18.04	58.57	2.21	0.06	0.03	39.13	9.2	5.39	0.2	0.01	tr	3.6
27	MJBK-3	38/24-3	28.5 m – 29.3 m	8.3	1855	28.9	28.73	3.69	12.84	81.99	2.37	0.21	0	15.43	28.7	23.53	0.68	0.06	tr	4.43
28	MJBK-3	38/24-4	29.3 m – 30.0 m	7.7	3775	30	33.54	3.83	11.42	89.03	1.81	0.12	0.24	8.8	55.99	49.85	1.01	0.07	0.13	4.93
29	MJBK-3	38/24-5	30.0 m – 30.5 m	5.9	1250	32	33.6	5.74	17.08	94.79	1.96	0.09	0.32	2.84	36.19	34.3	0.71	0.03	0.12	1.03
30	MJBK-3	38/24-6	30.5 m – 31.3 m	5.1	1180	40	42.08	7.01	16.66	88.98	1.87	0.13	0.05	8.97	38.55	34.3	0.72	0.05	0.02	3.46
31	MJBK-3	38/24-7	31.3 m – 32.0 m	11.5	3165	36.3	35.97	5.83	16.53	92.63	1.59	0.08	0.16	5.54	45.49	42.14	0.72	0.04	0.07	2.52
32	MJBK-3	38/24-8	32.0 m – 33.0 m	14.2	6175	36.1	35.97	6.88	19.13	89.79	1.5	0.05	0.02	8.64	83.19	74.7	1.25	0.04	0.01	7.19
33	MJBK-3	38/24-9	33.0 m – 33.5 m	5	2150	40.2	40.2	7.67	19.08	83.19	1.74	0.04	tr	15.03	82.04	68.25	1.43	0.03	tr	12.33
34	MJBK-3	38/24-10	33.5 m – 33.7 m	1.5	235	44	43.86	12.29	28.02	31.09	0.61	0.07	0.23	68	43.9	13.65	0.27	0.03	0.1	29.85
35	MJBK-3	38/24/11	33.7 m – 34.6 m	16.9	5780	33.7	33.43	7.03	21.03	94.34	1.51	0.04	3.31	0.8	71.92	67.85	1.09	0.03	2.38	0.58
36	MJBK-3	38/24-12	34.6 m – 35.2 m	8.2	1190	37.2	37	4.19	11.32	94.24	2.28	0.14	0.35	2.99	16.43	15.48	0.38	0.02	0.06	0.49
37	MJBK-3	38/24-13	35.2 m – 36.4 m	14.4	4960	38.7	38.57	6.88	17.84	96.23	1.9	0.1	0.67	1.1	61.44	59.12	1.17	0.06	0.41	0.68
38	MJBK-3	38/24-14	36.4 m – 37.6 m	16.6	5860	34.2	34	10.53	30.97	84.68	1.25	0.04	0.03	14	109.33	92.58	1.37	0.04	0.03	15.31
39	MJBK-3	38/24-15	37.6 m – 38.2 m	6.5	2360	36.9	36.7	9.26	25.23	97.79	1.23	0.05	0.21	0.72	91.6	89.57	1.13	0.05	0.19	0.66
40	MJBK-3	38/24-16	38.2 m – 39.0 m	6.1	185	34.6	34.47	0.8	2.32	44.56	0.59	0.04	0.75	54.73	0.7	0.31	0.004	tr	0.005	0.38
41	MJBK-3	38/24-17	39.0 m – 40.0 m	7.9	330	41.2	41.08	18.05	43.94	1.22	0.06	0	0.01	98.71	18.35	0.23	0.01	tr	tr	18.11
42	MJBK-4	38/16-1	24.0 m – 25.0 m	9.1	25	25	24.02	4.93	20.52	73.87	3.29	0.09	0.16	22.59	0.56	0.41	0.02	tr	tr	0.13
43	MJBK-4	38/16-2	25.0 m – 26.0 m	10.9	540	33.7	33.66	6.33	18.81	69.8	2.55	0.37	0.2	27.08	9.32	6.51	0.24	0.03	0.02	2.52
44	MJBK-4	38/16-3	26.0 m – 27.0 m	12.5	640	40	40	6.48	16.2	82.82	3	0.38	0.28	13.52	8.29	6.87	0.25	0.03	0.02	1.12
45	MJBK-4	38/16-4	27.0 m – 28.0 m	10.8	185	34.5	34.4	6.24	18.14	78.15	2.73	0.17	0.4	18.55	3.11	2.43	0.08	0.01	0.01	0.58
46	MJBK-4	38/16-5	28.0 m – 29.2 m	12.3	2160	33.7	33.77	5.51	16.32	79.57	2.42	0.3	0.16	17.55	28.66	22.8	0.69	0.09	0.05	5.03
47	MJBK-4	38/16-6	29.2 m – 29.6 m	6.1	1295	40.4	40.4	9.95	24.63	90.34	2	0.22	0.11	7.33	52.29	47.24	1.05	0.11	0.06	3.83
48	MJBK-4	38/16-7	29.6 m – 30.6 m	11	3550	40.8	40.7	8.8	21.62	90.11	2.05	0.15	tr	7.69	69.77	62.87	1.43	0.1	tr	5.37
49	MJBK-4	38/16-8	30.6 m – 31.4 m	8.9	2980	34.6	34.5	8.66	25.1	95.34	2.12	0.13	tr	2.41	84.04	80.12	1.78	0.11	tr	2.03

Appendix 2-5 Quantity Mineralgical Analysis of Usual and Check Samples (2)

No.	No. of drillholes	Sample No.	Depth (m)	Weight of dried sample (kg)	Weight of sand after sieving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (%)	Heavy fractions					Content of heavy fraction (kg/t)	Content of heavy fractions				
										Ilmenite (%)	Zircon (%)	Rutile (%)	Leucoxene (%)	the others (%)		Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
50	MJBK-4	38/16-9	31.4 m – 31.8 m	5.4	2320	36.2	36.1	8.31	23.02	97.2	1.67	0.09	0.13	0.91	98.9	96.13	1.65	0.09	0.13	0.9
51	MJBK-4	38/16-10	31.8 m – 32.4 m	6.7	2565	40	39.8	3.61	9.07	95.08	2.24	0.25	0.09	2.34	34.72	33.01	0.78	0.09	0.03	0.81
52	MJBK-4	13/16-11	32.4 m – 33.2 m	8.1	2460	38.4	38.26	5.79	15.18	94.41	2.53	0.28	0.32	2.46	46.1	43.52	1.17	0.13	0.15	1.13
53	MJBK-4	38/16-12	33.2 m – 33.9 m	5.6	2450	38.2	38.13	9.26	24.29	96.34	1.4	0.04	0.68	1.54	106.27	102.38	1.49	0.04	0.72	1.64
54	MJBK-4	38/16-13	33.9 m – 34.9 m	8.6	280	35	35.3	4.68	13.26	91.5	1.88	0.05	0.03	6.54	4.32	3.96	0.08	tr	tr	0.28
55	MJBK-4	38/16-14	34.9 m – 36.0 m	6.6	90	45	45.38	5.97	13.16	44.92	0.97	0.06	0.07	53.98	1.79	0.8	0.02	tr	tr	0.97
56	MJBK-5	38/12-1	21.0 m – 22.0 m	8.9	155	38.7	38.4	4.38	11.41	85.63	2.45	0.09	0.35	11.48	1.99	1.7	0.05	tr	0.01	0.23
57	MJBK-5	38/12-2	22.0 m – 23.2 m	13.4	300	37.5	37.74	3.8	10.07	80.63	1.89	0.1	0.1	17.28	2.25	1.82	0.04	tr	tr	0.39
58	MJBK-5	38/12-3	23.2 m – 24.0 m	6.7	290	36.2	36.06	15.23	42.23	21.36	0.54	0.02	0.05	77.98	18.28	3.91	0.1	tr	0.01	14.26
59	MJBK-5	38/12-4	24.0 m – 25.0 m	8.2	520	32.5	32.42	14.51	44.76	14.99	0.38	0.05	з н.	84.58	28.38	4.25	0.11	0.01	tr	24.1
60	MJBK-5	38/12-5	25.0 m – 26.0 m	4.3	360	45	45.58	12.7	27.86	21.89	0.5	0.07	0.05	77.49	23.33	5.1	0.12	0.02	0.01	18.08
61	MJBK-5	38/12-6	26.0 m – 27.0 m	8	480	30	30.08	17.33	57.63	14.22	0.24	0.01	0.02	85.51	34.57	4.91	0.08	0.01	0.01	29.56
62	MJBK-5	38/12-7	27.0 m – 28.0 m	8.2	575	35.9	35.76	19.33	54.05	15.36	0.35	0.02	0.01	84.26	37.9	5.82	0.13	0.01	0.01	31.93
63	MJBK-5	38/12-8	28.0 m – 29.0 m	9.1	500	31.2	31.58	9.96	31.54	90.26	1.78	0.09	0.24	7.63	17.33	15.64	0.31	0.02	0.04	1.32
64	MJBK-5	38/12-9	29.0 m – 29.9 m	6.6	1305	40.7	40.96	15.63	38.16	91.02	1.19	0.07	0.25	7.47	75.45	68.67	0.9	0.05	0.019	5.64
65	MJBK-5	38/12-10	29.9 m – 31.0 m	7.5	830	37.9	37.92	2.49	6.57	5.77	0.91	0.2	0.17	92.95	7.27	0.42	0.07	0.01	0.01	6.76
66	MJBK-5	38/12-11	31.0 m – 32.0 m	7.6	1290	40.3	40.55	1.11	2.74	10.28	1.46	0.03	1.35	86.88	4.65	0.48	0.07	tr	0.06	4.04
67	MJBK-6	34/32-1	23.5 m – 24.5 m	10.6	150	37.5	37.76	3.22	8.53	57.77	1.05	0.14	0.66	40.38	1.21	0.7	0.01	tr	0.01	0.49
68	MJBK-6	34/32-2	24.5 m – 25.7 m	13.9	265	33.1	33	3.64	11.3	71.68	1.5	0.18	0.47	26.2	2.1	1.5	0.03	0.01	0.01	0.55
69	MJBK-6	34/32-3	25.7 m – 26.5 m	8.2	4931.7	38.5	38.43	1.8	4.68	87.41	1.37	0.18	0.22	10.82	28.17	24.62	0.39	0.05	0.06	3.05
70	MJBK-6	34/32-4	26.5 m – 27.7 m	8.3	3765	36.7	36.6	2.82	7.7	91.93	1.6	0.18	1.03	5.26	34.95	32.13	0.56	0.06	0.36	1.84
71	MJBK-6	34/32-5	27.7 m – 28.8 m	7.9	28.2	28.2	28	4.53	16.18	89.93	1.53	0.17	0.51	7.86	0.58	0.52	0.01	tr	0.01	0.04
72	MJBK-6	34/32-6	28.8 m – 30.0 m	8	60.4	30.2	29.87	3.39	11.35	81.5	2.91	0.14	0.47	14.98	0.86	0.7	0.02	tr	0.01	0.13
73	MJBK-7	34/28-1	25.0 m – 26.0 m	9.7	75	37.5	37.9	2.5	6.6	36.68	1.74	0.26	0.26	61.06	0.51	0.19	0.01	tr	tr	0.31
74	MJBK-7	34/28-2	26.0 m – 27.0 m	8.3	182	45.5	45.8	4.88	10.66	85.28	3.16	0.4	0.32	10.84	2.34	2	0.07	0.01	0.01	0.25
75	MJBK-7	34/28-3	27.0 m – 28.2 m	11.2	420	39.3	38.9	7.13	18.33	52.14	1.28	0.12	0.17	46.29	6.87	3.58	0.09	0.01	0.01	3.18
76	MJBK-7	34/28-4	28.2 m – 29.5 m	10.6	300	37.5	37.3	4.34	11.64	86.22	1.6	0.25	0.22	11.71	3.29	2.84	0.05	0.01	0.01	0.38
77	MJBK-7	34/28-5	29.5 m – 30.2 m	9.7	2153	33.6	33.4	7.59	22.72	93.63	1.61	0.12	0.22	4.42	50.44	47.23	0.81	0.06	0.11	2.23
78	MJBK-7	34/28-6	30.2 m – 31.0 m	6.6	3120	36.5	35.3	12.18	34.5	97.83	1.35	0.07	0.09	0.66	163.11	159.57	2.2	0.11	0.15	1.08
79	MJBK-7	34/28-7	31.0 m – 32.0 m	10.2	2915	34.1	34	6.15	18.09	90.79	1.44	0.11	0.15	7.51	51.69	46.93	0.74	0.06	0.08	3.88
80	MJBK-7	34/28-8	32.0 m – 32.5 m	8.7	1120	35	35	5.67	16.2	92.42	1.85	0.06	0.09	5.58	20.86	19.28	0.39	0.01	0.02	1.16
81	MJBK-7	34/28-9	32.5 m – 33.6 m	8.6	4265	33.3	33.3	5.07	15.22	94.04	2.3	0.08	0.33	3.25	75.51	71.01	1.74	0.06	0.25	2.45
82	MJBK-7	34/28-10	33.6 m – 34.2 m	5.4	1340	41.8	41.8	5.44	13.01	83.03	1.61	0.07	0.53	14.76	32.29	26.81	0.52	0.02	0.17	4.77
83	MJBK-7	34/28-11	34.2 m – 35.0 m	6.6	3540	41.4	41.3	11.06	26.78	95.17	1.2	0.07	0.01	3.55	143.64	136.7	1.72	0.1	0.02	5.1
84	MJBK-7	34/28-12	35.0 m – 35.8 m	6.3	3030	35.4	35.4	10.5	29.66	96.13	1.12	0.04	0.01	2.7	142.66	137.14	1.6	0.06	0.01	3.85
85	MJBK-7	34/28-13	35.8 m – 36.6 m	11.3	4750	37.1	37.1	6.05	16.31	94.89	1.63	0.05	0.04	3.39	68.55	65.05	1.12	0.03	0.03	2.32
86	MJBK-7	34/28-14	36.6 m – 37.3 m	8.1	3525	41.2	41.8	10.9	26.08	95.43	1.33	0.11	0.25	2.88	113.48	108.29	1.51	0.13	0.28	3.27
87	MJBK-7	34/28-15	37.3 m – 38.5 m	5	275	34.3	34.2	1.04	3.04	80.51	1.05	0.06	3.1	15.28	1.67	1.34	0.02	tr	0.05	0.26
88	MJBK-7	34/28-16	38.5 m – 39.5 m	8.2	330	41.2	41.9	3.23	7.71	20.07	0.3	0.05	0.36	79.22	3.1	0.62	0.01	tr	0.01	2.46
89	MJBK-8	34/24-1	23.5 m – 24.6 m	7.5	25.6	25.6	25.4	3.79	14.92	66.56	2.56	0.32	0.4	30.16	0.51	0.34	0.01	tr	tr	0.16
90	MJBK-8	34/24-2	24.6 m – 25.3 m	5.5	176.5	33	32.6	1.57	4.82	81.86	1.73	0.42	0.16	15.83	1.55	1.27	0.03	0.01	tr	0.24
91	MJBK-8	34/24-3	25.3 m – 26.0 m	7.1	1274.6	39.8	39.6	4.46	11.26	93.65	2.12	0.21	0.12	3.9	20.21	18.93	0.43	0.04	0.02	0.79
92	MJBK-8	34/24-4	26.0 m – 27.2 m	13.4	6640	37.7	37.7	5	13.26	95.91	2.61	0.26	0.12	1.1	65.71	63.02	1.72	0.17	0.08	0.72
93	MJBK-8	34/24-5	27.2 m – 28.5 m	13.8	1445	35.8	35.5	4.03	11.35	92.93	2.09	0.32	0.12	4.54	11.89	11.05	0.25	0.04	0.01	0.54
94	MJBK-8	34/24-6	28.5 m – 29.3 m	7.3	2390	37.3	37.1	4.8	12.94	95.91	2.44	0.27	0.31	1.07	42.37	40.64	1.03	0.12	0.13	0.45
95	MJBK-8	34/24-7	29.3 m – 30.6 m	12.3	6945	40.6	40.6	11.5	28.33	97.19	1.51	0.08	0.3	0.92	159.96	155.46	2.42	0.13	0.48	1.47
96	MJBK-8	34/24-8	30.6 m – 32.0 m	11.1	1925	30	29.5	4.22	14.31	79.06	13.73	1.17	31	5.73	24.82	19.62	3.41	0.29	0.08	1.42
97	MJBK-8	34/24-9	32.0 m – 33.0 m	10	1135	35.4	38.2	4.81	12.59	96.2	1.86	0.13	0.15	1.66	14.29	13.75	0.26	0.02	0.02	0.24
98	MJBK-8	34/24-10	33.0 m – 33.5 m	4.5	1160	36.2	36.1	7.92	21.94	89.72	1.46	0.12	0.17	8.53	56.56	50.74	0.83	0.07	0.1	4.82
99	MJBK-8	34/24-11	33.5 m – 34.9 m	9.8	203.4	38.1	38	6.6	17.37	66.33	3.16	0.07	0.06	30.38	3.6	2.39	0.1	0.01	0.01	1.09

Appendix 2-5 Quantity Mineralgical Analysis of Usual and Check Samples (3)

No.	No. of drillholes	Sample No.	Depth (m)	Weight of dried sample (kg)	Weight of sand after sieving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (%)	Heavy fractions					Content of heavy fraction (kg/t)	Content of heavy fractions				
										Ilmenite (%)	Zircon (%)	Rutile (%)	Leucoxene (%)	the others (%)		Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
100	MJBK-8	34/24-12	34.9 m – 35.7 m	5.3	435	40.6	40.5	8.72	21.53	93.1	1.43	0.07	0.49	4.91	17.67	16.45	0.25	0.01	0.09	0.87
101	MJBK-8	34/24-13	35.7 m – 36.5 m	4.9	815	38.1	38	7.29	19.18	92.03	1.23	0.02	0.04	6.68	31.91	29.37	0.39	0.01	0.01	2.13
102	MJBK-8	34/24-14	36.5 m – 37.5 m	11.8	6020	35.2	35.2	7.8	22.16	97.29	0.87	0.05	0.2	1.59	113.05	109.97	0.98	0.06	0.24	1.8
103	MJBK-8	34/24-15	37.5 m – 38.5 m	9.1	470	29.3	29.3	5.48	18.7	45.52	1.73	0.02	0.34	52.39	9.66	4.4	0.17	tr	0.03	5.06
104	MJBK-8	34/24-16	38.5 m – 39.5 m	7.8	160	40	40	10.26	25.6	37.66	1.06	0.09	0.41	60.78	5.26	1.98	0.05	0.01	0.02	3.2
105	MJBK-8	34/24-17	39.5 m – 40.4 m	11.4	435	40.6	40.6	8.99	22.1	46.95	0.6	0.06	0.46	51.93	8.45	3.96	0.05	0.01	0.04	4.39
106	MJBK-8	34/24-18	40.4 m – 41.0 m	5.6	2085	32.5	32.3	9.04	27.9	92.11	1.2	0.16	0.02	6.51	104.2	95.98	1.25	0.17	0.02	6.78
107	MJBK-8	34/24-19	41.0 m – 42.0 m	7.7	445	41.7	41.8	7	16.7	75.29	1.32	0.29	0.38	22.72	9.68	7.29	0.13	0.03	0.03	2.2
108	MJBK-8	34/24-20	42.0 m – 43.0 m	13.1	650	40.6	30.3	3.69	12.18	60.23	2.82	0.25	0.89	35.81	6.04	3.64	0.17	0.02	0.05	2.16
109	MJBK-9	34/20-1	27.0 m – 28.0 m	7.9	154.3	38.5	38.38	6.85	17.85	82.67	1.51	0.14	0.31	15.37	3.49	2.88	0.05	0.01	0.01	0.54
110	MJBK-9	34/20-2	28.0 m – 29.0 m	9.8	264.1	33	32.91	7.35	22.33	38.03	0.7	0.04	0.02	61.21	6.02	2.29	0.04	0.01	tr	3.68
111	MJBK-9	34/20-3	29.0 m – 30.0 m	8.2	1995	31.1	30.81	4.99	16.2	92.95	1.81	0.09	0.05	5.1	39.4	36.62	0.71	0.04	0.02	2.01
112	MJBK-9	34/20-4	30.0 m – 31.0 m	9.6	3130	36.6	36.5	6.55	17.95	96.07	1.62	0.18	0.69	1.44	38.51	56.21	0.95	0.11	0.4	0.84
113	MJBK-9	34/20-5	31.0 m – 31.5 m	5.9	2460	38.4	38.33	9.08	23.69	88.27	1.35	0.08	0.27	10.03	98.77	87.18	1.33	0.08	0.27	9.91
114	MJBK-9	34/20-6	31.5 m – 32.5 m	9	1195	37.3	37.27	6.62	17.76	92.21	1.62	0.12	0.37	5.68	23.58	21.74	0.38	0.03	0.09	1.34
115	MJBK-9	34/20-7	32.5 m – 33.7 m	11.4	4570	35.7	35.5	6.38	17.97	93.47	1.7	0.1	0.34	4.39	72.04	67.34	1.22	0.07	0.25	3.16
116	MJBK-9	34/20-8	33.7 m – 35.0 m	12.9	4425	34.5	34.38	5.24	15.24	83.37	1.93	0.13	3.98	10.59	52.28	43.58	1.01	0.07	2.08	5.54
117	MJBK-9	34/20-9	35.0 m – 36.5 m	14.9	7170	42	41.86	7.73	18.47	92	1.4	0.07	0.29	6.24	88.86	61.75	1.24	0.06	0.26	5.55
118	MJBK-9	34/20-10	36.5 m – 37.7 m	12.2	4245	33.1	33.1	10.08	30.45	96.48	1.17	0.04	0.03	2.28	105.96	102.23	1.24	0.04	0.03	2.42
119	MJBK-9	34/20-11	37.7 m – 39.0 m	10.4	640	40	39.22	5.57	16.75	37.96	1.18	0.06	0.63	60.17	10.31	3.91	0.12	0.01	0.07	6.2
120	MJBK-9	34/20-12	39.0 m – 40.0 m	10.1	310	38.7	38.7	12.43	32.12	27.21	0.74	0.04	0.24	71.77	9.86	2.68	0.07	0.01	0.02	7.08
121	MJBK-10	34/16-1	25.0 m – 26.0 m	8.3	195	36.4	34.7	0.86	2.53	30.95	1.48	0.1	0.18	67.29	0.59	0.18	0.01	tr	tr	0.4
122	MJBK-10	34/16-2	26.0 m – 27.0 m	8.9	360	33.7	32.58	1.28	3.93	79.16	2.21	0.2	0.74	17.69	1.59	1.26	0.03	0.01	0.01	0.28
123	MJBK-10	34/16-3	27.0 m – 28.5 m	15.2	1795	42	41.9	5.13	12.24	88.97	1.86	0.2	0.15	8.82	14.46	12.86	0.27	0.03	0.02	1.28
124	MJBK-10	34/16-4	28.5 m – 29.0 m	6.3	1520	35.6	35.6	5.12	14.38	90.52	1.68	0.09	0.48	7.23	34.17	31.41	0.58	0.03	0.17	2.51
125	MJBK-10	34/16-5	29.0 m – 29.5 m	4.5	7856	36.7	36.62	3.06	8.36	77.1	2.32	0.34	0.33	19.91	145.88	112.47	3.38	0.5	0.48	29.05
126	MJBK-10	34/16-6	29.5 m – 30.1 m	7.2	1710	40	39.77	5.18	13.02	93.06	1.94	0.26	0.82	3.92	30.93	28.78	0.6	0.08	0.26	1.21
127	MJBK-10	34/16-7	30.1 m – 31.5 m	11.1	2650	41.4	41.34	4.38	10.6	90.54	2.23	0.47	0.71	6.05	25.29	22.9	0.56	0.12	0.18	1.53
128	MJBK-10	34/16-8	31.5 m – 32.4 m	8.1	3680	35.9	35.9	9.83	27.38	91.18	1.58	0.17	1.29	5.78	124.4	113.43	1.97	0.21	1.6	7.19
129	MJBK-10	34/16-9	32.4 m – 33.7 m	14.1	5935	34.6	34.46	7.23	20.98	95.4	0.21	0.46	0.42	3.51	88.31	84.25	0.19	0.4	0.37	3.1
130	MJBK-10	34/16-10	33.7 m – 34.6 m	6.8	2655	41.4	41.32	6.79	16.43	93.81	1.53	0.06	0.62	3.98	64.16	60.19	0.98	0.04	0.4	2.55
131	MJBK-10	34/16-11	34.6 m – 36.0 m	7.6	285	35.6	35.53	11.27	31.72	93.08	1.08	0.07	0.31	5.46	11.89	11.06	0.13	0.01	0.04	0.65
132	MJBK-12	2GL/12-1	23.3 m – 24.3 m	3.7	143.5	35.8	35.6	4.69	13.17	87.85	2.47	0.07	1.09	8.52	5.11	4.49	0.13	tr	0.06	0.43
133	MJBK-12	2GL/12-2	24.3 m – 25.9 m	4.6	531.5	33.2	33.1	4.13	12.48	86.87	2.47	0.03	1.35	9.28	14.42	12.52	0.37	tr	0.19	1.34
134	MJBK-12	2GL/12-3	25.9 m – 26.9 m	6.8	260	32.5	32.4	5.72	17.65	55.18	1.86	0.02	0.54	42.4	6.75	3.72	0.13	tr	0.04	2.86
135	MJBK-12	2GL/12-4	26.9 m – 28.0 m	5.1	790	37	37	5.04	13.62	91.72	2.4	0.02	1	4.86	21.1	19.35	0.51	tr	0.21	1.03
136	MJBK-12	2GL/12-5	28.0 m – 28.5 m	2.1	1055	32.9	32.8	4.56	13.9	94.72	3.94	0.22	0.73	0.39	69.83	66.14	2.75	0.16	0.51	0.27
137	MJBK-12	2GL/12-6	28.5 m – 29.9 m	5.7	2205	34.4	34.5	5.63	16.32	94.82	3.49	0.4	0.69	0.6	63.13	59.86	2.2	0.25	0.44	0.38
138	MJBK-12	2GL/12-7	29.9 m – 30.9 m	4.1	380	35.5	35.5	4.3	12.11	12.57	0.52	-	0.18	86.73	11.22	1.41	5.83	-	0.02	9.73
139	MJBK-12	2GL/12-8	30.9 m – 31.9 m	3.6	490	30.6	30.4	1.13	3.72	33.79	2.35	0.1	1.83	61.93	5.06	1.71	0.12	0.01	0.09	3.13
140	MJBK-15	2GL/24-1	23.4 m – 24.1 m	2.3	45	45	45.7	11.38	24.9	22.91	0.79	0.03	0.45	76.81	2.92	0.66	0.02	tr	tr	2.24
141	MJBK-15	2GL/24-2	24.1 m – 24.5 m	1.8	130	32.5	32.5	14.3	44	6.49	0.6	0.01	0.24	92.66	31.78	2.06	0.19	tr	0.08	29.45
142	MJBK-15	2GL/24-3	24.5 m – 26.0 m	5.2	2915	34.1	34.1	8.24	24.16	92.5	2.61	0.01	0.71	4.17	135.44	125.28	3.54	0.01	0.96	5.65
143	MJBK-15	2GL/24-4	26.0 m – 27.2 m	4.3	495	30.9	30.9	4.62	14.95	79.34	3.36	0.05	1.09	16.16	17.21	13.65	0.58	0.01	0.19	2.78
144	MJBK-15	2GL/24-5	27.2 m – 28.2 m	5	1410	33	30.6	8.84	28.89	31.66	1.03	0.02	0.33	66.96	81.47	25.79	0.84	0.02	0.27	54.55
145	MJBK-15	2GL/24-6	28.2 m – 28.9 m	3.2	1290	40.3	39.4	9.93	25.2	92.76	1.63	0.01	0.58	5.02	101.6	94.24	1.66	0.01	0.59	5.1
146	MJBK-15	2GL/24-7	28.9 m – 29.9 m	4	130	32.5	32.4	2.79	8.61	14.12	0.73	0.03	0.66	84.46	2.8	0.4	0.02	tr	0.02	2.36
147	MJBK-15	2GL/24-8	29.9 m – 30.9 m	1.8	420	39.3	39.3	0.21	0.53	23.44	3.94	0.01	0.43	72.18	1.25	0.29	0.05	tr	0.01	0.9
148	MJBK-16	30/28-1	24.0 m – 25.0 m	13.1	56.5	28.2	28.2	4.1	14.54	42.75	1.1	0.16	0.14	55.85	0.63	0.27	0.01	tr	tr	0.35
149	MJBK-16	30/28-2	25.0 m – 26.0 m	12.4	735	34.4	34.3	2.34	6.82	87.21	2.36	0.3	0.47	9.66	4.04	3.52	0.1	0.01	0.02	0.39

Appendix 2-5 Quantity Mineralgical Analysis of Usual and Check Samples (4)

No.	No. of drillholes	Sample No.	Depth (m)	Weight of dried sample (kg)	Weight of sand after sieving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (%)	Heavy fractions					Content of heavy fraction (kg/t)	Content of heavy fractions				
										Ilmenite (%)	Zircon (%)	Rutile (%)	Leucoxene (%)	the others (%)		Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
150	MJBK-16	30/28-3	26.0 m – 27.5 m	11.4	180	33.7	33.5	5.64	16.87	75.5	2.39	0.1	0.21	21.8	2.66	2.01	0.06	tr	0.01	0.58
151	MJBK-16	30/28-4	27.5 m – 28.2 m	8.3	125	31.2	31	2.62	8.45	69.1	1.89	0.16	0.52	28.33	1.27	0.88	0.02	tr	0.01	0.36
152	MJBK-16	30/28-5	28.2 m – 29.0 m	9.5	2125	33.2	33.1	5.38	16.25	93.28	2.02	0.24	0.2	4.26	36.36	33.92	0.73	0.09	0.07	1.55
153	MJBK-16	30/28-6	29.0 m – 30.5 m	17.8	3120	36.1	36.4	5.7	15.66	91.12	1.56	0.13	0.34	6.85	27.45	25.01	0.43	0.04	0.09	1.88
154	MJBK-16	30/28-7	30.5 m – 31.2 m	8.4	4105	32	31.7	11.08	34.95	88.78	1.48	0.09	0.38	9.27	170.8	151.64	2.53	0.15	0.65	15.83
155	MJBK-16	30/28-8	31.2 m – 32.7 m	8.5	790	36.9	36.7	4.54	12.37	72.48	1.48	0.09	0.1	25.85	11.5	8.34	0.17	0.01	0.01	2.97
156	MJBK-16	30/28-9	32.7 m – 34.0 m	11.3	1100	34.3	34.3	6.1	17.78	90.4	2.19	0.15	0.46	6.8	17.31	15.65	0.38	0.02	0.08	1.18
157	MJBK-16	30/28-10	34.0 m – 34.5 m	5.7	2355	36.7	36.5	7.05	19.32	92.37	1.18	0.12	0.12	6.21	79.8	73.71	0.94	0.1	0.1	4.95
158	MJBK-16	30/28-11	34.5 m – 35.5 m	10.6	4530	35.3	35.3	4.16	11.38	78.14	1.19	0.13	0.45	20.09	50.36	39.35	0.6	0.07	0.22	10.12
159	MJBK-16	30/28-12	35.5 m – 36.0 m	4.5	1605	37.5	37.5	4.02	10.72	84.43	1.6	0.13	0.3	13.54	38.23	32.28	0.61	0.05	0.11	5.18
160	MJBK-16	30/28-13	36.0 m – 36.5 m	5.7	2135	33.3	33.3	7.12	21.38	89.56	1.6	0.06	0.35	8.44	80.09	71.73	1.28	0.05	0.28	6.75
161	MJBK-16	30/28-14	36.5 m – 37.0 m	6.1	1895	29.6	29.5	5.43	18.41	83.54	1.13	0.06	0.39	14.88	57.18	47.77	0.65	0.03	0.22	8.51
162	MJBK-16	30/28-15	37.0 m – 38.0 m	8.6	3260	38.1	38	7.98	21	92.89	1.44	0.18	0.53	4.96	79.6	73.94	1.15	0.14	0.42	3.95
163	MJBK-16	30/28-16	38.0 m – 39.0 m	9.6	3910	30.5	30.7	7.79	25.37	88.93	1.21	0.09	0.18	9.59	103.35	91.91	1.25	0.09	0.19	9.91
164	MJBK-16	30/28-17	39.0 m – 40.0 m	6	245	30.6	30.5	2.7	8.85	82.58	1.21	0.07	0.22	15.92	3.61	2.98	0.04	tr	0.01	0.58
165	MJBK-16	30/28-18	40.0 m – 41.0 m	5.6	330	41.2	41.4	6.91	16.69	95.64	1.12	0.06	0.13	3.05	9.84	9.41	0.11	0.01	0.01	0.3
166	MJBK-17	30/20-1	31.0 m – 32.0 m	10.1	255	31.8	32.5	1.15	3.54	42.68	1.25	0.1	0.03	55.94	0.89	0.38	0.01	tr	tr	0.5
167	MJBK-17	30/20-2	32.0 m – 33.0 m	10.4	360	34.2	35.2	0.71	2.02	76.71	4.17	0.45	0.99	17.68	0.7	0.54	0.03	tr	0.01	0.12
168	MJBK-17	30/20-3	33.0 m – 34.0 m	11.1	300	37.5	37.7	2.04	5.41	77.57	1.71	0.22	0.25	20.25	1.46	1.13	0.02	tr	0.01	0.3
169	MJBK-17	30/20-4	34.0 m – 35.0 m	11	945	29.5	29.5	3.82	12.95	93.95	3.1	0.11	0.27	2.57	11.12	10.45	0.34	0.01	0.03	0.29
170	MJBK-17	30/20-5	35.0 m – 36.0 m	10.2	1780	41.7	41.7	8.7	20.86	90.17	1.72	0.22	0.37	7.52	36.41	32.83	0.63	0.08	0.13	2.74
171	MJBK-17	30/20-6	36.0 m – 37.0 m	13.5	4760	37.1	37.1	6.28	16.93	95.96	1.55	0.1	0.41	1.98	59.68	57.27	0.93	0.06	0.24	1.18
172	MJBK-17	30/20-7	37.0 m – 38.0 m	11.5	4245	33.1	33.2	4.16	12.53	79.1	1	0.05	0.09	19.76	46.25	36.59	0.46	0.02	0.04	9.14
173	MJBK-17	30/20-8	38.0 m – 38.5 m	5.4	1450	33.9	33.7	5.84	17.33	92.42	1.8	0.2	0.11	5.47	46.53	43	0.84	0.09	0.05	2.55
174	MJBK-17	30/20-9	38.5 m – 39.5 m	8.1	3440	40.3	40.2	4.03	10.02	92.25	2.06	0.11	0.46	5.12	42.57	39.25	0.9	0.05	0.19	2.18
175	MJBK-17	30/20-10	39.5 m – 40.0 m	3.6	1310	40.9	40.8	7.7	18.87	98.45	0.94	0.02	0.2	0.39	68.68	67.62	0.64	0.01	0.14	0.27
176	MJBK-17	30/20-11	40.0 m – 41.0 m	8.1	3755	29.3	29.1	3.27	11.24	94.68	1.44	0.07	0.77	3.04	52.09	49.32	0.75	0.04	0.4	1.58
177	MJBK-17	30/20-12	41.0 m – 41.5 m	7.7	3420	40	40	1.6	4	92.69	1.11	0.83	0.02	5.35	17.77	16.47	0.2	0.15	tr	0.95
178	MJBK-17	30/20-13	41.5 m – 43.0 m	16	5535	43.2	43	13.93	32.4	97.53	1.31	0.06	0.68	0.42	112.07	109.3	1.47	0.07	0.76	0.47
179	MJBK-17	30/20-14	43.0 m – 43.5 m	4.3	710	33.1	32.8	9.64	29.39	69.44	1.41	0.06	0.82	28.07	48.53	33.8	0.68	0.03	0.4	13.62
180	MJBK-17	30/20-15	43.5 m – 44.0 m	3.7	410	38.4	38.2	6.59	17.25	20.57	0.9	0.05	1.04	77.44	19.11	3.93	0.17	0.01	0.2	14.8
181	MJBK-17	30/20-16	44.0 m – 45.0 m	7	635	39.6	39.6	8.2	19.9	6.45	0.23	0.03	0.5	92.79	18.78	1.21	0.04	0.01	0.09	17.43
182	MJBK-17	30/20-17	45.0 m – 46.0 m	9	1600	37.5	37.4	2.21	5.91	14.08	0.5	0.04	2.9	82.48	10.51	1.48	0.05	tr	0.31	8.67

Appendix 2-5 Quantity Mineralgical Analysis of Usual and Check Samples (5)

No.	No. of drillholes	Sample No.	Depth (m)	Weight of dried sample (kg)	Weight of sand after sieving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (%)	Heavy fractions					Content of heavy fraction (kg/t)	Content of heavy fractions					Remarks
										Ilmenite (%)	Zircon (%)	Rutile (%)	Leucoxene (%)	the others (%)		Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)	
1	MJBK-3	38/24-3 K	28.5 m – 29.3 m	39,8	4820	37,6	37,6	4,17	11,09	81,61	1,81	0,22	0,71	15,65	13,43	10,96	0,24	0,03	0,10	2,10	Check for usual sample
2	MJBK-3	38/24-4 K	29.3 m – 30.0 m	23,5	11000	42,9	42,5	4,67	10,99	90,82	1,58	0,23	0,34	7,03	51,43	46,71	0,81	0,12	0,17	3,62	Check for usual sample
3	MJBK-3	38/24-5 K	30.0 m – 30.5 m	13,9	4015	31,3	31,3	3,61	11,53	88,71	1,60	0,15	0,44	9,1	33,31	29,55	0,53	0,05	0,15	3,03	Check for usual sample
4	MJBK-3	38/24-6 K	30.5 m – 31.3 m	30,9	7380	42,4	42,4	7,35	17,33	95,43	1,77	0,13	0,38	2,29	41,39	39,50	0,73	0,05	0,16	0,95	Check for usual sample
5	MJBK-3	38/24-7 K	31.3 m – 32.0 m	34,2	10050	39,2	39,2	7,55	19,26	92,99	1,49	0,11	0,26	5,15	56,60	52,63	0,84	0,06	0,15	2,92	Check for usual sample
6	MJBK-3	38/24-8 K	32.0 m – 33.0 m	34,6	15770	30,8	30,8	4,91	15,94	83,29	1,19	0,11	0,16	15,25	72,66	60,52	0,86	0,08	0,12	11,08	Check for usual sample
7	MJBK-3	38/24-9 K	33.0 m – 33.5 m	14,6	5440	42,5	42,5	8,6	20,24	82,74	1,09	0,07	0,09	16,01	75,4	62,39	0,82	0,05	0,07	12,07	Check for usual sample
8	MJBK-3	38/24-11 K	33.7 m – 34.6 m	38,9	14480	42,1	42,1	10,36	24,61	95,27	1,47	0,21	0,47	2,58	91,6	87,27	1,35	0,19	0,43	2,36	Check for usual sample
9	MJBK-3	38/24-13 K	35.2 m – 36.4 m	41,6	13595	39,3	39,3	6,68	17,00	94,16	1,97	0,19	0,38	3,3	55,55	52,31	1,09	0,11	0,21	1,83	Check for usual sample
10	MJBK-3	38/24-14 K	36.4 m – 37.6 m	27,9	10830	42,3	42,3	12,96	12,64	75,94	1,03	0,03	0,02	22,98	118,93	90,32	1,22	0,04	0,02	27,33	Check for usual sample
11	MJBK-3	38/24-15 K	37.6 m – 38.2 m	37,9	11285	33,0	33,0	9,11	27,61	94,0	0,94	0,06	0,24	4,76	82,2	77,27	0,77	0,05	0,2	3,91	Check for usual sample
12	MJBK-4	38/16(7-12)	29.6 m – 33.9 m	45,7	400	37,5	37,5	5,26	14,03	87,62	1,57	0,14	1,0	9,67	1,23	1,08	0,02	tr	0,01	0,12	Check for fine component (-1mm)
13	MJBK-2	38/28(3-7)	26.0 m – 30.2 m	38,2	269	33,6	33,6	5,61	16,7	88,45	1,64	0,13	0,27	9,51	1,18	1,04	0,02	tr	0,01	0,11	Check for fine component (-1mm)
14	MJBK-10	34/16-4 K	28.5 m – 29.0 m	12,3	3840	30,0	29,9	4,05	13,55	90,34	2,23	0,31	0,50	6,62	42,29	38,21	0,94	0,13	0,21	2,80	Check for usual sample
15	MJBK-10	34/16-5 K	29.0 m – 29.5 m	17,9	2865	33,5	33,6	4,82	14,35	69,33	1,69	0,32	0,63	28,03	22,96	15,92	0,39	0,07	0,14	6,44	Check for usual sample
16	MJBK-10	34/16-6 K	29.5 m – 30.1 m	17,0	6950	40,6	40,6	5,40	13,30	92,08	1,37	0,06	0,04	6,45	54,38	50,07	0,75	0,03	0,02	3,51	Check for usual sample
17	MJBK-10	34/16-7 K	30.1 m – 31.5 m	32,1	9570	37,3	37,3	6,34	17,00	91,54	1,72	0,19	0,35	6,20	50,67	46,38	0,87	0,10	0,18	3,14	Check for usual sample
18	MJBK-6	34/32-3 K	25.7 m – 26.5 m	21.1	10560	39,7	39,6	2,59	6,54	89,5	1,30	0,13	0,39	8,68	32.73	29.29	0.43	0.04	0.13	2.84	Check for usual sample
19	MJBK-6	34/32-4 K	26.5 m – 27.7 m	33.0	16710	30,4	29,2	3,07	10,51	92,55	1,43	0,09	0,26	5,67	53.24	49.27	0.76	0.05	0.14	3.02	Check for usual sample
20	MJBK-10	34/16-8 K	31.5 m – 32.4 m	23,1	9560	37,3	37,24	6,56	17,62	92,72	1,51	0,13	1,91	3,73	72,92	67,61	1,10	0,09	1,40	2,72	Check for usual sample
21	MJBK-10	34/16-9 K	32.4 m – 33.7 m	24,7	10280	40,1	39,96	6,86	17,17	97,91	0,65	0,08	0,73	0,63	73,41	71,88	0,48	0,06	0,53	0,46	Check for usual sample
22	MJBK-10	34/16-10 K	33.7 m – 34.6 m	21,8	8375	32,7	32,65	6,87	21,04	95,92	1,46	0,11	0,52	1,99	80,83	77,53	1,18	0,09	0,42	1,61	Check for usual sample
23	MJBK-17	30/20-12	41.0 m – 41.5 m	7,7	520	32,5	32,7	0,02	0,06	25,69	0,12	0,11	-	74,08	0,04	0,01	tr	tr	-	0,03	Check for coarse component (-1mm)
24	MJBK-16	30/28-11	34.5 m – 35.5 m	10,6	160	40,0	40,2	0,05	0,12	47,57	0,09	-	0,04	52,30	0,02	0,01	tr	-	tr	0,01	Check for coarse component (-1mm)
25	MJBK-10	34/16-6 K	29.5 m – 30.1 m	17,0	520	32,5	32,40	0,08	0,25	12,59	1,12	-	0,04	86,25	0,08	0,01	tr	-	tr	0,07	Check for coarse component (-1mm)
26	MJBK-10	34/16-10	33.7 m – 34.6 m	6,8	485	30,3	29,96	0,12	0,4	16,85	0,75	-	-	82,40	0,29	0,05	tr	-	-	0,24	Check for coarse component (-1mm)
27	MJBK-9	34/20-3	29.0 m – 30.0 m	8,2	80	40,0	39,54	3,86	9,76	0,81	0,15	0,01	tr	99,03	0,95	0,01	tr	tr	tr	0,94	Check for coarse component (-1mm)
28	MJBK-9	34/20-7	32.5 m – 33.7 m	11,4	245	30,6	30,34	0,29	0,96	13,58	0,76	0,16	0,33	85,17	0,21	0,03	tr	tr	tr	0,18	Check for coarse component (-1mm)
29	MJBK-8	34/24-14	36.5 m – 37.5 m	11,8	590	36,8	36,50	0,04	0,11	23,25	0,22	-	0,88	75,65	0,05	0,01	tr	-	tr	0,04	Check for coarse component (-1mm)
30	MJBK-7	34/28-10	33.6 m – 34.2 m	5,4	250	31,2	30,53	1,75	5,73	1,00	0,02	-	0,05	98,93	2,65	0,03	tr	-	tr	2,62	Check for coarse component (-1mm)
31	MJBK-6	34/32-3 K	25.7 m – 26.5 m	21,1	385	36,0	36,14	0,04	0,11	28,3	3,18	0,32	0,18	68,02	0,02	0,005	tr	tr	tr	0,015	Check for coarse component (-1mm)
32	MJBK-3	38/24-6	30.5 m – 31.3 m	5,1	95	35,5	35,42	1,19	3,36	6,25	0,44	0,01	0,01	93,29	0,63	0,04	tr	tr	tr	0,59	Check for coarse component (-1mm)

Appendix 2-6 Inside Geological Check of Mineralogical Analysis

Appendix 2-6 Inside Geological Check of Mineralogical Analysis (1)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
									Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
									Basic	Checking	Checking	Basic	Checking	Checking
1	MJBK-2	38/28-3	8.5	2790	42.6	42.93	7.71	58.95	II	II	55.12	I	I	I.18
2	MJBK-2	38/28-4	7.6	3355	39.2	39.37	7.29	81.74	III	III	76.17	I	I	1.32
3	MJBK-2	38/28-5	6.1	1164	36.1	36.3	6.72	35.33	I	I	33.28	I	I	0.59
4	MJBK-2	38/28-6	10.1	780	35.4	35.34	6.8	14.86	I	I	14.26	I	< I	0.22
5	MJBK-2	38/28-6	10.1	780	35.4	35.34	6.8	14.86	I	I	14.31	I	< I	0.24
6	MJBK-2	38/28-7	5.9	945	36.8	36.2	6.45	28.54	I	I	27.04	I	I	0.49
7	MJBK-3	38/24-3	8.3	1855	39	39.27	4.35	24.76	I	I	21.34	I	I	0.44
8	MJBK-3	38/24-4	7.7	3775	37.5	37.5	4.44	58.05	II	II	54	I	I	1.07
9	MJBK-3	38/24-5	5.9	1250	40.2	40.5	7.54	39.44	I	I	36.02	I	I	0.71
10	MJBK-3	38/24-6	5.1	1180	37.1	37.28	8.23	51.08	I	II	48.38	I	I	0.71
11	MJBK-3	38/24-6	5.1	1180	37.1	37.28	8.23	51.08	I	II	47.29	I	I	1.07
12	MJBK-3	38/24-7	11.5	3165	37.4	38.43	8.06	57.72	II	II	54.85	I	I	0.96
13	MJBK-3	38/24-8	14.2	6175	35.5	35.2	7.91	97.72	III	III	88.34	I	I	1.22
14	MJBK-3	38/24-9	5	2150	32.1	32.2	6.27	83.72	III	III	73.73	I	I	0.95
15	MJBK-3	38/24-10	1.5	235	47.2	37.2	8.68	36.56	I	I	15.34	I	I	0.35
16	MJBK-3	38/24-11	16.9	5780	33.5	35.15	7.77	75.6	III	III	70.86	I	I	1.26
17	MJBK-3	38/24-12	8.2	1190	32.9	32.9	3.95	17.42	I	I	15.87	I	I	0.34
18	MJBK-3	38/24-13	14.4	4960	38.9	39.05	6.64	58.57	III	II	53.61	I	I	0.98
19	MJBK-3	38/24-13	14.4	4960	38.9	39.05	6.64	58.57	III	II	53.87	I	I	0.93
20	MJBK-3	38/24-14	16.6	5860	34.1	33.54	10.07	105.99	III	III	91.3	I	I	1.47
21	MJBK-3	38/24-15	6.5	2360	36.6	36.6	10.38	102.97	III	III	100.97	I	I	1.22
22	MJBK-4	38/16-5	12.3	2160	31.1	31.7	4.59	25.43	I	I	23.4	I	I	0.55
23	MJBK-4	38/16-6	6.1	1295	40.4	39.71	9.56	51.11	II	II	43.67	I	I	0.85
24	MJBK-4	38/16-7	11	3550	30.5	29.88	6.44	69.56	III	III	62.57	I	I	1.31
25	MJBK-4	38/16-8	8.9	2980	29.2	29.26	6.78	77.59	III	III	73.92	I	I	2.54
26	MJBK-4	38/16-9	5.4	2320	32.1	32.55	7.86	103.74	III	III	100.34	I	I	1.76

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-6 Inside Geological Check of Mineralogical Analysis (2)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
									Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
									Basic	Checking	Checking	Basic	Checking	Checking
27	MJBK-4	38/16-10	6.7	2565	37.9	37.41	3.4	34.79	I	I	32.36	I	I	0.84
28	MJBK-4	38/16-11	8.1	2460	38.1	30.22	4.9	49.24	III	II	45.88	I	I	1.02
29	MJBK-4	38/16-11	8.1	2460	38.1	30.22	4.9	49.24	III	II	46.7	I	I	1.04
30	MJBK-4	38/16-12	5.6	2450	39	37.8	11.07	128.13	III	III	123.64	I	I	0.42
31	MJBK-5	38/12-8	9.1	500	31.4	30.18	8.15	14.84	I	I	12.68	I	< I	0.25
32	MJBK-5	38/12-8	9.1	500	31.4	30.18	8.15	14.84	I	I	12.62	I	< I	0.27
33	MJBK-5	38/12-9	6.6	1305	38.1	38.55	16.72	85.76	III	III	79.86	I	I	1.12
34	MJBK-7	34/28-5	9.7	2153	33.4	33.2	8.34	55.76	II	II	52.6	I	I	0.99
35	MJBK-7	34/28-6	6.6	3120	36.1	36.3	13.82	179.97	III	III	174.47	I	I	2.18
36	MJBK-7	34/28-6	6.6	3120	36.1	36.3	13.82	179.97	III	III	174.52	I	I	2.18
37	MJBK-7	34/28-7	10.2	2915	34.9	35.05	5.84	47.62	II	II	45.02	I	I	0.67
38	MJBK-7	34/28-8	8.7	1120	34.9	34.8	6.18	22.86	I	I	22.09	I	I	0.43
39	MJBK-7	34/28-9	8.6	4265	33	32.95	5.6	84.29	III	III	82.3	I	I	1.28
40	MJBK-7	34/28-10	5.4	1340	41.2	41.82	5.33	31.63	I	I	27.51	I	I	0.6
41	MJBK-7	34/28-11	6.6	3540	40.8	41.13	11.72	152.84	III	III	145.26	I	I	2.2
42	MJBK-7	34/28-12	6.3	3030	35.1	35.52	11.24	152.19	III	III	148.98	I	I	1.77
43	MJBK-7	34/28-13	11.3	4750	37.1	37.36	6.25	70.32	III	III	65.4	I	I	1.25
44	MJBK-7	34/28-14	8.1	3525	41.5	41.72	11	114.74	III	III	108.57	I	I	1.68
45	MJBK-8	34/24-3	7.1	1274.6	39.1	39	5.24	24.12	I	I	21.63	I	I	0.53
46	MJBK-8	34/24-4	13.4	6640	37.1	37.5	5.16	68.18	III	III	63.3	I	I	1.21
47	MJBK-8	34/24-5	13.8	1445	37.8	36.6	4.92	14.08	I	I	12.24	I	< I	0.26
48	MJBK-8	34/24-5	13.8	1445	37.8	36.6	4.92	14.08	I	I	12.14	I	< I	0.27
49	MJBK-8	34/24-6	7.3	2390	37.4	37.1	5	44.12	II	II	39.27	I	I	0.76
50	MJBK-8	34/24-7	12.3	6945	41.1	41.33	11.88	162.3	III	III	155.81	I	I	1.59
51	MJBK-8	34/24-8	11.1	1925	36.6	36.4	4.98	23.73	I	I	19.86	II	I	0.34
52	MJBK-8	34/24-8	11.1	1925	36.6	36.4	4.98	23.73	I	I	19.48	II	I	0.35
53	MJBK-8	34/24-9	10	1135	34	33.86	4.87	16.32	I	I	14.62	I	I	0.26
54	MJBK-8	34/24-9	10	1135	34	33.86	4.87	16.32	I	I	14.61	I	I	0.29

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-6 Inside Geological Check of Mineralogical Analysis (3)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
									Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
									Basic	Checking	Checking	Basic	Checking	Checking
55	MJBK-8	34/24-10	4.5	1160	35.9	36.28	8.84	62.81	II	III	59.12	I	I	0.93
56	MJBK-8	34/24-10	4.5	1160	35.9	36.28	8.84	62.81	II	III	58.7	I	I	1.01
57	MJBK-8	34/24-12	5.3	435	46.7	46.37	10.79	19.1	I	I	17.93	I	I	0.37
58	MJBK-8	34/24-13	4.9	815	37.9	37.73	7.99	35.22	I	I	31.5	I	I	0.71
59	MJBK-8	34/24-14	11.8	6020	35.1	34.8	9.12	133.7	III	III	126.29	I	I	1.52
60	MJBK-8	34/24-18	5.6	2085	33.5	33.62	11.4	126.25	III	III	115.28	I	I	1.78
61	MJBK-12	2GL/12-2	4.6	531.5	31.5	31.39	3.86	14.21	I	I	13.27	I	I	0.38
62	MJBK-12	2GL/12-4	5.1	790	37.1	36.58	5.02	21.26	I	I	19.97	I	I	0.57
63	MJBK-12	2GL/12-5	2.1	1055	32.2	33.35	4.64	69.9	III	III	65.63	I	I	1.61
64	MJBK-12	2GL/12-6	5.7	2205	34.8	34.57	6.24	69.83	III	III	67.09	I	I	1.68
65	MJBK-15	2GL/24-3	5.2	2915	34	34.25	3.53	57.78	III	II	55.01	II	I	1.38
66	MJBK-15	2GL/24-3	5.2	2915	34	34.25	3.53	57.78	III	II	54.34	II	I	1.42
67	MJBK-15	2GL/24-4	4.3	495	29.4	9.33	1.76	21.72	I	I	17.98	I	I	0.87
68	MJBK-15	2GL/24-5	5	1410	33.9	33.85	8.24	68.65	I	III	59.63	I	I	1.73
69	MJBK-15	2GL/24-5	5	1410	33.9	33.85	8.24	68.65	I	III	59.58	I	I	1.61
70	MJBK-15	2GL/24-6	3.2	1290	41	40.91	12.43	122.48	III	III	114.93	I	I	2.36
71	MJBK-16	30/28-13	6.2	2180	33	32.42	7.29	79.06	III	III	71.51	I	I	1.07
72	MJBK-16	30/28-16	9.1	4395	35.9	35.7	8.82	119.32	III	III	113.46	I	I	1.91
73	MJBK-17	30/20-4	11	945	36.8	36.5	3.44	8.1	I	I	7.45	I	< I	0.22
74	MJBK-17	30/20-4	11	945	36.8	36.5	3.44	8.1	I	I	7.26	I	< I	0.2
75	MJBK-17	30/20-5	10.2	1780	42.3	42.34	9.43	38.87	I	I	35.02	I	I	0.76
76	MJBK-17	30/20-6	13.5	4760	36.4	36.17	6.97	67.94	III	III	57.98	I	I	1.04
77	MJBK-17	30/20-7	11.5	4245	33.8	33.63	7.07	77.6	I	III	67.68	I	I	0.9
78	MJBK-17	30/20-7	11.5	4245	33.8	33.63	7.07	77.6	I	III	67.48	I	I	1.01
79	MJBK-17	30/20-8	5.4	1450	34.1	34.2	4.98	39.1	II	I	34.94	I	I	0.63
80	MJBK-17	30/20-8	5.4	1450	34.1	34.2	4.98	39.1	II	I	34.97	I	I	0.77
81	MJBK-17	30/20-9	8.1	3440	40.2	37.18	3.84	43.86	II	II	41.92	I	I	0.79
82	MJBK-17	30/20-10	3.6	1310	40.9	40.65	8.7	77.88	III	III	68.8	I	I	0.76

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-6 Inside Geological Check of Mineralogical Analysis (4)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
									Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
									Basic	Checking	Checking	Basic	Checking	Checking
83	MJBK-17	30/20-11	8.1	3755	31.8	31.8	3.54	51.61	II	II	46.13	I	I	0.75
84	MJBK-17	30/20-12	7.7	3420	39.5	39.4	3.04	34.27	I	I	31.62	I	I	0.51
85	MJBK-17	30/20-13	16	5535	42.9	43.02	13.95	112.18	III	III	104.93	I	I	1.25
86	MJBK-17	30/20-14	4.3	710	33.4	33.41	10.06	49.72	I	I	37.8	I	I	0.46
87	MJBK-3	38/24-4k	23.5	11000	40.1	40.33	5.62	65.23	II	III	58.74	I	I	1.27
88	MJBK-3	38/24-4k	23.5	11000	40.1	40.33	5.62	65.23	II	III	58.91	I	I	1.29
89	MJBK-3	38/24-6k	30.9	7380	40.1	40.71	7.54	44.24	II	II	41.86	I	I	0.89
90	MJBK-3	38/24-7k	34.2	10050	40.8	40.65	8.66	62.6	II	II	55.33	I	I	1.13
91	MJBK-3	38/24-13k	41.6	13595	35.1	35.54	6.34	58.3	II	II	55.53	I	I	0.94
92	MJBK-6	34/32-4k	33	16710	37.5	37.4	4.76	64.45	II	III	61.06	I	I	0.97
93	MJBK-6	34/32-4k	33	16710	37.5	37.4	4.76	64.45	II	III	61.03	I	I	0.9
94	MJBK-9	34/20-8	12.9	4425	13.4	13.36	1.89	48.53	II	II	46.94	I	I	0.72
95	MJBK-10	34/16-6	7.2	1710	41.6	41.54	5.25	30.02	I	I	28.8	I	I	0.65
96	MJBK-10	34/16-6k	17	6950	41.8	41.58	7.61	74.82	II	III	70.69	I	I	1.32
97	MJBK-10	34/16-6k	17	6950	41.8	41.58	7.61	74.82	II	III	70.65	I	I	1.38
98	MJBK-10	34/16-7k	32.1	9570	37.9	37.86	7.4	58.27	II	II	54.89	I	I	1.12
99	MJBK-16	30/28-11	10.6	4530	33.9	34	4.45	55.93	II	II	47.85	I	I	0.96
100	MJBK-16	30/28-14	6.1	1895	40.9	26.5	5.36	62.83	II	III	59.38	I	I	1.14
101	MJBK-16	30/28-14	6.1	1895	40.9	26.5	5.36	62.83	II	III	59.76	I	I	1.04

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-7 Outside Geological Check of Mineralogical Analysis

Appendix 2-7 Outside Geological Check of Mineralogical Analysis (1)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
									Classes of content(basic)	Content (kg/t)	Classes of content(basic)	Content (kg/t)
1	MJBK-12	2GL/12-2	4.6	531.5	31	31	3.91	14.57	I	13.72	I	0.34
2	MJBK-12	2GL/12-4	5.1	790	37.8	36.5	4.75	20.16	I	19.1	I	0.55
3	MJBK-12	2GL/12-5	2.1	1055	31.9	31.7	4	63.39	III	60.54	I	1.11
4	MJBK-12	2GL/12-6	5.7	2205	33.4	33.2	5.85	68.16	III	63.27	I	1.51
5	MJBK-15	2GL/24-3	5.2	2915	33.9	33.8	3.48	55.53	III	54.74	II	1.49
6	MJBK-15	2GL/24-4	4.3	495	27.9	27.8	4.29	17.76	I	16.15	I	0.58
7	MJBK-15	2GL/24-5	5	1410	34.4	34.2	7.89	65.06	I	60.61	I	1.32
8	MJBK-15	2GL/24-6	3.2	1290	40	40.3	11.34	113.44	III	105.53	I	1.9
9	MJBK-16	30/28-13	6.2	2180	33.4	33.4	7.11	74.85	III	72.32	I	1.05
10	MJBK-16	30/28-16	9.1	4395	35.8	35.2	8.15	111.82	III	107.84	I	1.51
11	MJBK-17	30/20-4	11	945	37.1	37.3	4.17	96	I	8.96	I	0.27
12	MJBK-17	30/20-5	10.2	1780	40.8	38.4	8.3	37.72	I	34.54	I	0.73
13	MJBK-17	30/20-6	13.5	4760	37.2	37.9	7.35	68.38	III	66.05	I	0.93
14	MJBK-17	30/20-7	11.5	4245	34.1	34.1	6.67	72.8	I	67.66	I	0.87
15	MJBK-17	30/20-8	5.4	1450	33.9	33.9	5.12	40.56	II	38.18	I	0.63
16	MJBK-17	30/20-9	8.1	3440	41.1	40.4	4.24	44.57	II	43.31	I	0.63
17	MJBK-17	30/20-10	3.6	1310	41.1	39.3	8.17	75.65	III	72.96	I	0.65
18	MJBK-17	30/20-11	8.1	3755	31.2	31.3	3.39	50.21	II	48.43	I	0.89
19	MJBK-17	30/20-12	7.7	3420	40	38.4	2.76	31.92	I	31.11	I	0.35
20	MJBK-17	30/20-13	16	5535	42.3	42.6	13.07	106.14	III	101.51	I	1.22
21	MJBK-17	30/20-14	4.3	710	33.2	31.6	8.57	44.78	I	38.98	I	0.42
22	MJBK-2	38/28-3	8.5	2790	43.1	42.9	6.36	48.66	II	46.21	I	0.99
23	MJBK-2	38/28-4	7.6	3355	40.1	39.9	7.18	79.44	III	77.11	I	1

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-7 Outside Geological Check of Mineralogical Analysis (2)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
									Classes of content(basic)	Content (kg/t)	Classes of content(basic)	Content (kg/t)
24	MJBK-2	38/28-5	6.1	1164	35.8	35.9	6.1	32.42	I	31.31	I	0.43
25	MJBK-2	38/28-6	10.1	780	36.4	36.3	6.69	14.23	I	13.68	I	0.21
26	MJBK-2	38/28-	5.9	945	37.1	37.2	6.53	28.12	I	26.91	I	0.47
27	MJBK-3	38/24-3	8.3	1855	38.1	37.9	4	23.59	I	22.41	I	0.35
28	MJBK-3	38/24-4	7.7	3775	38	37.9	4.4	56.92	II	54.85	I	0.9
29	MJBK-3	38/24-5	5.9	1250	41.9	41.6	7.51	38.25	I	36.31	I	0.61
30	MJBK-3	38/24-6	5.1	1180	38.5	38.5	8.46	50.84	I	47.9	I	1.08
31	MJBK-3	38/24-7	11.5	3165	36.6	37.1	7.52	55.79	II	53.56	I	0.82
32	MJBK-3	38/24-8	14.2	6175	35.3	35.3	7.65	94.24	III	88.94	I	1.23
33	MJBK-3	38/24-9	5	2150	31.5	31.2	5.67	78.14	III	73.04	I	0.96
34	MJBK-3	38/24-10	1.5	235	46.5	46.3	5.63	19.05	I	13.2	I	0.3
35	MJBK-3	38/24-11	16.9	5780	33.3	34.6	7.38	72.95	III	69.89	I	0.79
36	MJBK-3	38/24-12	8.2	1190	32.4	32.2	3.65	16.45	I	15.68	I	0.36
37	MJBK-3	38/24-13	14.4	4960	38.2	38	6.34	57.47	III	54.39	I	0.73
38	MJBK-3	38/24-14	16.6	5860	34.2	34.1	9.72	100.62	III	92.65	I	1.04
39	MJBK-3	38/24-15	6.5	2360	37.1	36.9	9.73	95.74	III	92.2	I	1.08
40	MJBK-4	38/16-5	12.3	2160	32.9	33.1	3.49	18.52	I	17.51	I	0.27
41	MJBK-4	38/16-6	6.1	1295	38.3	38.5	8.51	46.93	II	44.39	I	0.55
42	MJBK-4	38/16-7	11	3550	32.2	32.1	8.26	83.04	III	79.92	I	0.8
43	MJBK-4	38/16-8	8.9	2980	30.6	31	7.41	80.04	III	76.9	I	0.97
44	MJBK-4	38/16-9	5.4	2320	37.1	37.1	9.23	106.89	III	103.41	I	1.39
45	MJBK-4	38/16-10	6.7	2565	40.5	40.6	2.18	20.56	I	19.52	I	0.38
46	MJBK-4	38/16-11	8.1	2460	36.8	36.4	5.29	44.14	III	41.72	I	0.83

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-7 Outside Geological Check of Mineralogical Analysis (3)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
									Classes of content(basic)	Content (kg/t)	Classes of content(basic)	Content (kg/t)
47	MJBK-4	38/16-12	5.6	2450	37.2	37.5	9.75	113.75	III	108.03	I	1.4
48	MJBK-5	38/12-8	9.1	500	29.9	29.9	9.08	16.69	I	15.71	I	0.2
49	MJBK-5	38/12-9	6.6	1305	39.3	39.2	16.4	82.72	III	78.43	I	1.01
50	MJBK-7	34/28-5	9.7	2153	33.1	33.3	8.11	54.06	II	50.32	I	0.8
51	MJBK-7	34/28-6	6.6	3120	36.7	37.6	13.31	167.34	III	156.78	I	2.39
52	MJBK-7	34/28-7	10.2	2915	34.5	34.8	5.49	45.08	II	43.36	I	0.57
53	MJBK-7	34/28-8	8.7	1120	34.5	34.1	5.34	20.16	I	19.37	I	0.34
54	MJBK-7	34/28-9	8.6	4265	33.1	33.4	5.14	76.32	III	74.24	I	1.04
55	MJBK-7	34/28-10	5.4	1340	40.1	41.6	4.09	24.4	I	23.26	I	0.36
56	MJBK-7	34/28-11	6.6	3540	41.3	41.7	11.6	149.2	III	142.39	I	1.8
57	MJBK-7	34/28-12	6.3	3030	34.5	34.7	10.24	141.93	III	135.42	I	1.39
58	MJBK-7	34/28-13	11.3	4750	36.8	36.9	5.16	58.78	III	55.71	I	0.91
59	MJBK-7	34/28-14	8.1	3525	40.7	40.8	9.43	100.58	III	94.4	I	1.18
60	MJBK-8	34/24-3	7.1	1274.6	39.4	39.3	4.52	20.65	I	19.87	I	0.27
61	MJBK-8	34/24-4	13.4	6640	34.5	34.4	4.49	64.68	III	62.52	I	1.01
62	MJBK-8	34/24-5	13.8	1445	38.1	38.1	3.94	10.83	I	10.25	I	0.16
63	MJBK-8	34/24-6	7.3	2390	36.9	36.7	3.95	35.24	II	33.36	I	0.71
64	MJBK-8	34/24-7	12.3	6945	40.7	41	11.18	153.97	III	148.32	I	1.65
65	MJBK-8	34/24-8	11.1	1925	35.4	35.2	3.95	19.49	I	17	II	0.22
66	MJBK-8	34/24-9	10	1135	34.7	34.5	4.35	14.31	I	13.92	I	0.16
67	MJBK-8	34/24-10	4.5	1160	35.5	36.5	8.87	62.64	II	61.23	I	0.64
68	MJBK-8	34/24-12	5.3	435	49.4	49.3	10.28	17.11	I	16.36	I	0.27
69	MJBK-8	34/24-13	4.9	815	38	37.8	7.52	33.13	I	31.51	I	0.4

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-7 Outside Geological Check of Mineralogical Analysis (4)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
									Classes of content(basic)	Content (kg/t)	Classes of content(basic)	Content (kg/t)
70	MJBK-8	34/24-14	11.8	6020	34.2	31.2	7.8	127.54	III	120.67	I	1.96
71	MJBK-8	34/24-18	5.6	2085	34.4	34.1	10.33	112.79	III	107	I	1.2
72	MJBK-12	2GL/12-2	4.6	531.5	31	31	3.91	14.57	I	13.72	I	0.34
73	MJBK-12	2GL/12-4	5.1	790	37.8	36.5	4.75	20.16	I	19.1	I	0.55
74	MJBK-12	2GL/12-5	2.1	1055	31.9	31.7	4	63.39	III	60.54	I	1.11
75	MJBK-12	2GL/12-6	5.7	2205	33.4	33.2	5.85	68.16	III	63.27	I	1.51
76	MJBK-15	2GL/24-3	5.2	2915	33.9	33.8	3.48	55.53	III	54.74	II	1.49
77	MJBK-15	2GL/24-4	4.3	495	27.9	27.8	4.29	17.76	I	16.15	I	0.58
78	MJBK-15	2GL/24-5	5	1410	34.4	34.2	7.89	65.06	I	60.61	I	1.32
79	MJBK-15	2GL/24-6	3.2	1290	40	40.3	11.34	113.44	III	105.53	I	1.9
80	MJBK-16	30/28-13	6.2	2180	33.4	33.4	7.11	74.85	III	72.32	I	1.05
81	MJBK-16	30/28-16	9.1	4395	35.8	35.2	8.15	111.82	III	107.84	I	1.51
82	MJBK-17	30/20-4	11	945	37.1	37.3	4.17	96	I	8.96	I	0.27
83	MJBK-17	30/20-5	10.2	1780	40.8	38.4	8.3	37.72	I	34.54	I	0.73
84	MJBK-17	30/20-6	13.5	4760	37.2	37.9	7.35	68.38	III	66.05	I	0.93
85	MJBK-17	30/20-7	11.5	4245	34.1	34.1	6.67	72.8	I	67.66	I	0.87
86	MJBK-17	30/20-8	5.4	1450	33.9	33.9	5.12	40.56	II	38.18	I	0.63
87	MJBK-17	30/20-9	8.1	3440	41.1	40.4	4.24	44.57	II	43.31	I	0.63
88	MJBK-17	30/20-10	3.6	1310	41.1	39.3	8.17	75.65	III	72.96	I	0.65
89	MJBK-17	30/20-11	8.1	3755	31.2	31.3	3.39	50.21	II	48.43	I	0.89
90	MJBK-17	30/20-12	7.7	3420	40	38.4	2.76	31.92	I	31.11	I	0.35
91	MJBK-17	30/20-13	16	5535	42.3	42.6	13.07	106.14	III	101.51	I	1.22
92	MJBK-17	30/20-14	4.3	710	33.2	31.6	8.57	44.78	I	38.98	I	0.42

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-7 Outside Geological Check of Mineralogical Analysis (5)

No.	No. of drillholes	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
									Classes of content(basic)	Content (kg/t)	Classes of content(basic)	Content (kg/t)
93	MJBK-3	38/24-4k	23.5	11000	41.2	41.8	5.15	57.67	II	55.77	I	0.67
94	MJBK-3	38/24-6k	30.9	7380	42.6	42.5	6.7	37.65	II	36.42	I	0.48
95	MJBK-3	38/24-7k	34.2	10050	38.6	39.1	7.65	57.49	II	53.89	I	0.9
96	MJBK-3	38/24-13k	41.6	13595	39.2	39.9	5.64	46.19	II	40.07	I	0.66
97	MJBK-6	34/32-4k	33	16710	35.5	35.6	4.22	60.02	II	56.89	I	0.71
98	MJBK-9	34/20-8	12.9	4425	13.8	13.6	1.66	41.87	II	39.09	I	0.63
99	MJBK-10	34/16-6	7.2	1710	41.5	41.2	4.97	28.65	I	27.09	I	0.46
100	MJBK-10	34/16-6k	17	6950	41.5	41.2	6.75	66.98	II	63.9	I	0.99
101	MJBK-10	34/16-7k	32.1	9570	37.8	36.8	6.63	53.71	II	50.71	I	1.05
102	MJBK-16	30/28-11	10.6	4530	32	31.9	3.46	46.35	II	42.34	I	0.8
103	MJBK-16	30/28-14	6.1	1895	40.8	40.4	6.8	52.29	II	48.67	I	0.62

Classes of content:

Ilmenite: I 8.33-38.89 kg/t (15-70kg/m^3) II 38.90-55.56 kg/t (70-100kg/m^3) III > 55.56 kg/t (>100kg/m^3)

Zircon: I 0.30-2.85 kg/t II 2.86-5.69 kg/t III >5.69 kg/t

Appendix 2-8 Chemical Analysis of Check Samples for TiO_2 and ZrO_2

Appendix 2-8 Chemical Analysis of Check Samples for TiO_2 and ZrO_2

No.	No. of drillholes	Sample No.	Sampling position (m)		Assay results (%)		
					X-Ray spectral		Chemical analysis
			from	to	ZrO_2	TiO_2	TiO_2
1	MJBK-9	34/20-3K	29.0	30.0	0.035	2.49	2.64
2	MJBK-9	34/20-4K	30.0	31.0	0.037	4.65	4.59
3	MJBK-9	34/20-5K	31.0	31.5	0.034	3.91	4.12
4	MJBK-9	34/20-6K	31.5	32.5	0.027	2.27	2.37
					0.030	2.32	2.56
5	MJBK-9	34/20-7K	32.5	33.7	0.020	5.39	5.60
6	MJBK-9	34/20-8K	33.7	35.0	0.037	4.38	4.63
7	MJBK-9	34/20-9K	35.0	36.5	0.032	5.95	6.14
8	MJBK-9	34/20-10K	36.5	37.7	0.038	7.65	7.54
9	MJBK-8	34/24-3K	25.3	26.0	0.044	3.17	3.02
10	MJBK-8	34/24-4K	26.0	27.2	0.071	5.34	5.13
					0.070	5.29	5.05
11	MJBK-8	34/24-5K	27.2	28.5	0.048	2.29	2.44
12	MJBK-8	34/24-6K	28.5	29.3	0.059	3.18	3.06
13	MJBK-8	34/24-7K	29.3	30.6	0.041	9.43	9.63
14	MJBK-8	34/24-8K	30.6	32.0	0.030	1.85	1.93
15	MJBK-8	34/24-9K	32.0	33.0	0.036	2.25	2.43
16	MJBK-8	34/24-10K	33.0	33.5	0.052	4.91	4.82
17	MJBK-8	34/24-11K	33.5	34.9	0.022	1.47	1.42
18	MJBK-8	34/24-12K	34.9	35.7	0.026	2.22	2.47
19	MJBK-8	34/24-13K	35.7	36.5	0.051	3.29	3.50
20	MJBK-8	34/24-14K	36.5	37.5	0.039	7.28	7.31
21	MJBK-2	38/28-3K	26.0	26.8	0.063	4.09	4.04
					0.058	4.12	4.12
22	MJBK-2	38/28-4K	26.8	27.4	0.043	5.70	5.70
23	MJBK-2	38/28-5K	27.4	28.3	0.039	2.93	3.23
24	MJBK-2	38/28-6K	28.3	29.5	0.027	2.33	2.46
25	MJBK-2	38/28-7K	29.5	30.2	0.041	4.07	4.00
26	MJBK-12	2GL/12-3	25.3	26.9	0.075	3.68	3.79
27	MJBK-12	2GL/12-4	26.9	28.0	0.060	3.57	3.46
28	MJBK-12	2GL/12-5	28.0	28.5	0.094	4.28	4.12
29	MJBK-12	2GL/12-6	28.5	29.9	0.088	4.98	5.21
					0.088	5.06	5.17
30	MJBK-15	2GL/27-5	27.2	28.2	0.066	6.31	6.49
31	MJBK-15	2GL/24-6	28.2	28.9	0.055	8.45	9.15

Appendix 2-9 Grainmetric Analysis of Monomineral Fraction of Ilmenite

Appendix 2-9 Grainmetric Analysis of Monomineral Fraction of Ilmenite

Class of granulation (mm)	Sample No. Depth (m) Grain distribution (%)										
	MJBK-2	MJBK-3	MJBK-4	MJBK-5	MJBK-7	MJBK-8	MJBK-8	MJBK-9	MJBK-10	MJBK-16	MJBK-17
	26.0-27.4	29.3-38.2	29.2-33.9	28.0-29.9	30.2-37.3	26.0-30.6	40.4-41.0	30.0-37.7	29.0-34.6	34.0-39.0	36.0-43.0
+ 0.44	0.11	0.84	0.82	0.62	0.96	0.58	4.62	1.38	0.63	1.16	0.83
- 0.44+ 0.315	0.31	4.42	4.28	2.60	4.77	2.70	13.50	5.69	3.51	5.93	5.05
- 0.315 + 0.2	8.37	33.16	25.54	29.02	36.12	23.19	49.22	37.33	26.18	33.95	37.42
- 0.2 + 0.1	58.66	47.73	51.12	48.46	43.05	43.34	27.23	43.31	45.64	45.02	44.78
- 0.1 + 0.071	20.85	9.97	10.75	13.36	10.46	16.93	4.18	9.08	12.13	8.58	8.05
- 0.071 + 0.04	10.26	3.40	6.23	4.76	3.88	10.68	1.09	2.72	8.52	4.32	3.22
- 0.04 + 0	1.44	0.48	1.26	1.18	0.76	2.58	0.16	0.49	3.39	1.04	0.65
Total	100	100	100	100	100	100	100	100	100	100	100

Appendix 2-10 Grainmetric Analysis of Monomineral Fraction of Zircon

Appendix 2-10 Grainmetric Analysis of Monomineral Fraction of Zircon

Class of granulation (mm)	Sample No. Depth (m) Grain distribution (%)										
	MJBK-2	MJBK-3	MJBK-4	MJBK-5	MJBK-7	MJBK-8	MJBK-8	MJBK-9	MJBK-10	MJBK-16	MJBK-17
	26.0-27.4	29.3-38.2	29.2-33.9	28.0-29.9	30.2-37.3	26.0-30.6	40.4-41.0	30.0-37.7	29.0-34.6	34.0-39.0	36.0-43.0
+0.4	0.28	1.12	0.84	0.68	1.17	0.95	5.77	0.39	0.48	0.82	0.72
- 0.4 + 0.315	0.56	1.37	0.96	0.31	0.95	0.60	4.54	2.55	1.03	1.00	0.73
- 0.315 + 0.25	0.86	14.11	9.32	10.01	19.28	14.99	33.20	9.32	7.29	12.96	29.25
- 0.25 + 0.14	24.19	53.31	36.96	41.06	45.42	43.06	41.59	35.64	37.33	38.12	42.10
- 0.14 + 0.071	67.26	25.49	48.30	41.29	26.94	35.13	14.16	47.83	46.64	41.14	23.77
- 0.071 + 0	6.85	4.60	3.62	6.65	6.24	5.27	0.74	4.27	7.23	5.96	3.43
Total	100	100	100	100	100	100	100	100	100	100	100

Appendix 2-11 Chemical and Spectral Quantity Analysis of Ilmenite

Appendix 2-11 Chemical and Spectral Quantity Analysis of Ilmenite

No.	Drillhole	Depth of sampling	Content (%)													
	No.	from - to (m)	Al_2O_3	SiO_2	P_2O_5	TiO_2 (X-Ray spectral)	Fe (primary)	Sc_2O_3	Cr_2O_3	V_2O_5	Ta_2O_5	Nb_2O_3	FeO	Fe_2O_3	ΣTR_2O_3 + Y	TiO_2 (chemical)
1	MJBK-2	26.0-27.4	1.45	3.53	0.03	57.52	34.68	0.0015	0.0175	0.17	< 0.005	< 0.004	19.1	13.67	0.02	54.5
2	MJBK-3	29.3-38.2	1.03	2.28	0.02	57.46	36.01	0.0017	0.019	0.172	< 0.005	< 0.004	24.34	9.24	0.08	51.6
3	MJBK-4	29.2-33.9	0.88	1.84	0.02	57.83	36.54	0.0017	0.0219	0.172	< 0.005	< 0.004	15.1	19.93	0.02	54.29
4	MJBK-5	28.0-29.9	1.01	1.96	0.01	58.55	36.37	0.0017	0.02	0.196	< 0.005	< 0.004	18.27	16.09	0.17	54.5
5	MJBK-7	30.2-37.3	0.94	1.95	0.01	58.72	36.41	0.0012	0.0175	0.172	< 0.005	< 0.004	22.51	11.65	0.03	54.87
6	MJBK-8	26.0-30.6	1.09	2.11	0.02	56.7	37.11	0.001	0.0219	0.178	< 0.005	< 0.004	22.07	12.83	0.05	52.32
7	MJBK-8	40.4-41.0	0.8	1.77	0.02	58.56	34.34	0.0012	0.0146	0.185	< 0.005	< 0.004	17.14	15.32	0.15	51.96
8	MJBK-9	30.0-37.7	1	2.06	0.02	58.51	35.88	0.0018	0.0204	0.171	< 0.005	< 0.004	15.81	18.33	0.05	55.23
9	MJBK-10	29.0-34.6	1.05	2.16	0.03	58.24	35.91	0.0017	0.026	0.208	< 0.005	< 0.004	16.61	17.47	0.06	53.05
10	MJBK-16	34.0-39.0	0.8	1.66	0.02	53.37	36.67	0.0011	0.0161	0.144	< 0.005	< 0.004	26.74	6.99	0.05	52.47
11	MJBK-17	36.0-43.0	1.05	2.35	0.01	58.23	35.52	0.0015	0.026	0.196	< 0.005	< 0.004	16.5	17.37	0.06	54.5

Appendix 2-12 Chemical and Spectral Quantity Analysis of Zircon

Appendix 2-12 Chemical and Spectral Quantity Analysis of Zircon

No.	Drillhole	Depth of sampling	Content (%)					
	No.	from - to (m)	Y	Sc_2O_3	Hf	Th	ZrO_2	ΣTR_2O_3+Y
1	MJBK-2	26.0-27.4	0.029	0.0096	0.55	< 0.01	64.71	0.23
2	MJBK-3	29.3-38.2	0.038	0.0109	0.59	< 0.01	64.53	0.21
3	MJBK-4	29.2-33.9	0.038	0.0107	0.52	< 0.01	59.28	0.17
4	MJBK-5	28.0-29.9	0.03	0.0139	0.54	< 0.01	66.26	0.18
5	MJBK-7	30.2-37.3	0.032	0.0116	0.48	< 0.01	63.37	0.17
6	MJBK-8	26.0-30.6	0.034	0.0113	0.41	< 0.01	61.88	0.1
7	MJBK-8	40.4-41.0	0.025	0.0107	0.66	< 0.01	56.56	0.08
8	MJBK-9	30.0-37.7	0.042	0.0133	0.46	< 0.01	64.28	0.18
9	MJBK-10	29.0-34.6	0.04	0.0136	0.54	< 0.01	66.37	0.17
10	MJBK-16	34.0-39.0	0.041	0.0121	0.44	< 0.01	64.47	0.21
11	MJBK-17	36.0-43.0	0.03	0.011	0.55	< 0.01	64.68	0.21

Appendix 2-13 Determination of Zircon Radioactivity

Appendix 2-13 Determination of Zircon Radioactivity

No.	Drillhole	Depth of sampling	Alpha integral		Beta integral	
	No.	from - to (m)	Becquerel/kg	±	Becquerel/kg	±
1	MJBK-2	26.0-27.4	<880		610	150
2	MJBK-3	29.3-38.2	<880		440	140
3	MJBK-4	29.2-33.9	<710		830	150
4	MJBK-5	28.0-29.9	<850		700	150
5	MJBK-7	30.2-37.3	<670		480	170
6	MJBK-8	26.0-30.6	<720		370	140
7	MJBK-8	40.4-41.0	760	690	870	150
8	MJBK-9	30.0-37.7	<900		710	170
9	MJBK-10	29.0-34.6	<660		680	170
10	MJBK-16	34.0-39.0	870	700	700	190
11	MJBK-17	36.0-43.0	<770		420	170

Appendix 2-14 Chemical Analysis of Water Sample

Appendix 2-14 Chemical Analysis 0f Water Samples

Sample No.	Spot of sampling (borehole No.)	Cation content												Sum of Mg-equivalent of cation	Hardness	
		Ca^{+2}		Mg^{+2}		Na^{+}		K^{+}		NH^{4+}	Fe total	SiO_2	Aggressivity CO_2		Carbonate	Total
		Mg-l	Mg-equivalent	Mg-l	Mg-equivalent	Mg-l	Mg-equivalent	Mg-l	Mg-equivalent	Mg-l	Mg-l	Mg-l	Mg-l		Mg-equivalent	Mg-equivalent
1	13G		8.90		5.20		7.00		6.00					21.16	3.20	14.10
	38-42	178.36		63.19		160.87		2.28		6.00	1.00	14.00	17.60			
2	13G		8.90		5.10		6.89		6.00					20.90	3.10	14.00
	29-37.7	178.36		61.98		157.25		2.42		7.00	1.00	13.00	4.40			
3	13G		8.90		4.80		6.43		6.00					20.19	3.00	13.70
	6.44-8.0	178.36		58.33		148.00		2.48		5.00	1.00	10.00	4.40			
4	12G		8.35		4.45		8.04		7.00					20.91	3.20	12.80
	28.5-38	167.33		54.08		185.00		2.61		6.00	1.00	13.00	2.20			
6	12G		4.20		2.50		1.48		4.00					8.22	4.10	6.70
	6.6-10.3	84.07		30.38		34.00		1.63		2.00	1.00	16.00	N/D			
6K	12G		4.20		2.55		1.43		4.00					8.22	4.10	6.75
	6.6-10.3	84.07		30.99		33.00		1.62		2.00	1.00	15.00	N/D			

Note: N/D – not detected

Appendix 2-15 Chemical Analysis of Water Sample According to the State Standard (GOST) "Drinking Water"

Appendix 2-15 Chemical Analysis of Water Sample According to the State Standard (GOST) "Drinking Water"

No.	Component to be defined (dm^3)	Sample No.2		Sample No.6	
1	Copper	0.0148		0.0075	0.0070
2	Lead	<0.025		<0.025	<0.025
3	Zinc	0.0158		0.0188	0.0188
4	Cadmium	0.0025		0.001	0.001
5	Lithium			0.02	
6	Arsenic	<0.1	<0.1	0.1	0.1
7	Fluorine	0.30	0.32	0.43	0.43
8	Molybdenum	0.0080	0.010	<0.0025	<0.0025
9	Selenium	<0.0005	<0.0005	0.0009	0.0008
10	Strontium	1.0	0.98	0.5	
11	Thallium	0.0001		<0.0001	<0.0001
12	Beryllium	<0.00005	<0.00005	<0.00005	<0.00005
13	Vanadium	<0.02	<0.02	<0.02	<0.02
14	Manganese	<0.05		<0.05	
15	Cobalt	0.0125		<0.0125	<0.0125
16	Mercury	<0.0003	<0.0003	<0.0003	
17	Titanium	0.013	0.010	0.012	0.012
18	Boron	0.06	0.07	0.1	0.1

Appendix 2-16 Physical-Mechanical Test of Rock

Appendix 2-16 Physical - Mechanical Test of Rock (1)

Definition of ground density, moisture content and density of dry ground

Complex No.1 Table No.1

No	No. of samples	Place of selection	Interval (m)	Ground density (g/cm^3)	Moisture content (%)		Density of dry ground (g/cm^3)
1	5	Hole 18i	8.5-9.0	1.92 1.92 1.92	29.7 29.4 29.4	29.5	1.48
2	7	Hole 18i	223-226	2.09 2.10 2.12	18.7 19.2 19.0	19.0	1.76
3	10	Hole 18i	35.8-36	2.0 2.03 2.06	21.7 20.1 22.5	21.4	1.67
4	14	Hole 19i	13.7-14.0	1.86 1.84 1.82	31.3 31.0 31.2	31.2	1.4
5	16	Hole 19i	25.7-26.0	1.81 1.82 1.82	34.1 34.1 34.2	34.1	1.36
6	17	Hole 19i	29.2-29.5	2.02 2.03 2.05	18.5 19.0 18.5	18.7	1.71
7	19	Hole 19i	35.0-35.3	2.10 2.12 2.13	16.7 14.8 15.9	15.8	1.83

Appendix 2-16 Physical - Mechanical Test of Rock (2)

Degree of maceration, moisture content

Complex No.1

Table No.2

No.	No. of samples	Place of selection	Selection interval (m)	Moisture content (%)	Degree of maceration depending on the time in %								
					1 min.	5 min.	10 min.	30 min.	1 hour	3 hours	24 hours	48 hours	72 hours
1	5	Hole 18	8.5-9.0	30.2	-	0.1	0.1	10	12	12	12	15	15
2	7	Hole 18	22.3-22.6	18.7	There is no failure, sample is dense					0.1	0.1	0.1	0.1
3	10	ditto	35.8-36	20.7	5	20	35	80	Fully macerated in 40 minutes				
4	14	Hole 19	13.7-14.0	30.2	There is no failure, sample is dense					5	5	5	5
5	16	ditto	25.7-26	34	0.1	3	7	12	25	30	40	40	40
6	17	ditto	29.2-29.5	18.5	10	15	60	85	90	90	95	95	95
7	19	ditto	35-35.3		2	10	20	30	40	45	52	52	52

Complex No.2

Table No.3

No.	No. of samples	Place of selection	Selection interval (m)	Moisture content (%)	Degree of maceration depending on the time in %								
					1 min.	5 min.	10 min.	30 min.	1 hour	3 hours	24 hours	48 hours	72 hours
1	4	Hole 18 ch	11.7-12	29.1	Failure is not seen, sample is dense				0.1	0.1	2	2	2
2	6	ditto	19.5-20.0	28.5	There is no failure, sample is dense				1	2	10	10	13
3	8	ditto	25.3-25.8	21.3	-	0.9	2	10	15	22	25	32	32
4	9	ditto	30.3-30.5	22.4	0.9	5	30	Fully macerated in 20 minutes					
5	15	Hole 19 ch	19.5-20	37.5	-	-	-	3	3	5	8	10	10
6	18	ditto	29.5-29.75	17.6	10	2.5	50	70	85	87	87	87	87
7	20	ditto	37.7-38	18.4	-	0.5	1	2	3	7	7	7	7
8	21	ditto	41.2-41.5	24.5	1	10	15	35	47	55	60	70	75

Appendix 2-16 Physical - Mechanical Test of Rock (3)

Results of definition of grainmetric composition of grounds - 1

Complex No.2

Table No.4

No.	No. of samples	Place of selection	Selection interval (m)	Grainmetric composition (mm) content of fractions (%)													
				40	40-20	20-10	10-5	5-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1	5	Hole 18i	8.9-9	-	-	-	0.3	0.3	0.2	0.2	0.2	0.2	0.4	8.7	7.5	17.5	64.5
2	7	18 i	22.3- 22.6	-	-	-	-	-	<0.1	0.1	1.8	4.8	13.4	16	10.4	10.1	43.4
3	10	18 i	35.8- 36.7	-	-	1.9	1.3	1.2	1	1	7.1	9.4	20.3	10.8	9.6	21.6	14.8
4	14	Hole 19i	3.7-14	-	-	-	<0.1	<0.1	0.1	0.1	0.2	0.2	4.1	6.7	5.5	9.7	73.4
5	16	19i	25.7-26	-	-	-	-	-	<0.1	<0.1	0.1	0.1	1.4	3.2	1.6	1.2	92.4
6	17	19i	29.2-29.5	-	-	-	-	0.1	0.2	0.8	5.4	23.1	31.6	5.6	2.1	5.2	25.9
7	19	19i	35-35.3	-	-	-	-	0.1	0.5	4.1	12	17.6	30	5.4	6.2	8.7	15.4
Check:																	
1	10	Hole 18i	35.8-36.7	-	-	1.9	1.3	1.2	1	1	7.1	9.4	20.2	10.6	10.3	20.7	15.3
2	19	19i	35-35.3	-	-	-	-	0.1	0.5	4.1	12	17.6	31.2	6.2	4.6	7.7	16
7	20	19i	37.7-38.0	2.03	20.1	20.1	0.48										
				2	20.9	0.52											
8	21	19i	1.2-41.5	1.97 1.92 1.93	26.0 19.5 26.5	0.18 0.26 0.22	0.22	1.9	19.3	0.19	1.16						

Comments: Samples No. 4,6,8,15 have the broken structure, sleeve making is impossible.
When the samples were tested for compression, slip area was not clearly identified.

Appendix 2-16 Physical - Mechanical Test of Rock (3)

Results of definition of grainmetric composition of grounds - 2

Complex No.2

Table No.5

No.	No. of samples	Place of selection	Selection interval (m)	Grainmetric composition (mm) content of fractions (%)													
				40	40-20	20-10	10-5	5-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1	4	Hole 18i	11.7-12.0				<0.1	0.5	0.3	0.1	0.1	0.1	0.2	4.9	6.5	11.3	76
2	6	18i	19.5-20					<0.1	<0.1	<0.1	0.2	0.3	0.4	6	4.8	12.7	75.6
3	8	18i	25.3-25.8			1.7	3.5	2.7	1.3	1.4	3.7	7.4	19.7	16.7	4.5	10	27.4
4	9	18i	30.3-31.2			3.8	5.2	4	1.9	1.3	3.8	8.4	17.1	10.9	9.3	18.6	15.7
5	15	Hole 19i	19.5-20				0.1	0.1	0.1	0.2	0.3	0.5	4.1	1.6	8.5	8.9	75.6
6	18	19i	30.25-30.95				<0.1	0.3	3.1	11.1	17	26.8	18.2	9.6	0.6	3.7	9.6
7	20	19i	37.7-38.3			0.1	0.2	0.6	0.6	0.7	0.8	1.8	12	10.1	11.2	24.2	37.7
8	21	19i	41.2-42			0.5	2.9	2.6	1.7	1.2	1.3	0.9	17.6	17.4	11.6	26.3	16
Control:																	
1	21	194	41.1-42			0.5	2.9	2.6	1.7	1.2	1.3	0.9	18	18.1	11.4	25.4	16
2	4	Hole 184	11.7-12.0				<0.1	0.5	0.3	0.1	0.1	0.1	0.1	4.9	6.6	11.3	76

Comments: Samples No. 4,6,8,15 have the broken structure, sleeve making is impossible.
When the samples were tested for compression, slip area was not clearly identified.

Appendix 2-16 Physical - Mechanical Test of Rock (4)

Results of ground tests - 1

Complex No.2

Table No. 6

No.	No. of samples	Place of selection	Interval (m)	Ground humidity (%)		Ground density (g/cm^3)		Particles density (g/cm^3)		Dry ground density (g/cm^3)	Porosity (%)	Porosity ratio	Maceration	
				Def.	Aver.	Def.	Aver.	Def.	Aver.				Maceration humidity	Relative maceration ratio
1	4	18i	11.7-12	29.3 32.2 33.7 33.1 28.6 32.2 27.7 29.1 28.3	30.5	1.86 1.88 1.86 1.89 1.86 1.84 1.86 1.86 1.90	1.87	2.66 2.69	2.655 1.43	1.43	46.1	0.857	45.4	0.1949
2	6	18i	19.5-20	29.2 29.9 28.5 27.9 33.0 33.4 27.8 29.5 30.2	29.9	1.87 1.89 1.85 1.84 1.87 1.87 1.86 1.86 1.86	1.86	2.65 2.64	2.64	1.43	45.8	0.846	44.1	0.0979
3	8	18i	25.3-25.8	18.2 22.1 18.6 18.9 18.6 18.8 16.7 16.2 15.4	18.2	2.05 2.01 2.06 2.03 2.04 2.04 2.05 2.04 2.03	2.04	2.71 2.73	2.72	1.73	36.4	0.572	27.6	0.1138

Appendix 2-16 Physical - Mechanical Test of Rock (4)

Results of ground tests - 2

Complex No.2

Table No.7

No.	No. of samples	Place of selection	Interval (m)	Ground humidity (%)		Ground density (g/cm^3)		Particles density (g/cm^3)		Dry ground density (g/cm^3)	Porosity (%)	Porosity ratio	Maceration	
				Def.	Aver.	Def.	Aver.	Def.	Aver.				Maceration humidity	Relative maceration ratio
4	9	18i	30.3-30.5	21.2 21.4 20.9 21.1 21.1 23.0 12.2 15.5 20.5	19.7	2.01 2.00 1.96 1.99 2.00 2.00 1.97 1.98 1.99	1.99	2.79 2.79	2.79	1.66	40.5	0.681	38.8	0.2011
5	15	19i	19.5-20	29.4 30.6 30.6 34.7 36.3 36.7 31.3 30.9 31.1	32.4	1.89 1.90 1.86 1.83 1.86 1.79 1.80 1.85 1.83	1.85	2.74 2.76	2.75	1.4	49.1	0.964	53.2	0.1168
6	18	19i	29.5-29.75	17.9 18.4 11.4 16.4 10.1 17.2 13.0 12.3 16.5	14.8	2.04 2.11 2.50 2.24 2.23 2.16 2.08 2.31 2.10	2.19	3.05 3.07	3.06	1.91	37.6	0.602	22.1	0.021

Appendix 2-16 Physical - Mechanical Test of Rock (4)

Results of ground tests - 3

Complex No.2

Table No. 8

No.	No. of samples	Place of selection	Interval (m)	Ground humidity (%)		Ground density (g/cm^3)		Particles density (g/cm^3)		Dry ground density (g/cm^3)	Porosity (%)	Porosity ratio	Maceration	
				Def.	Aver.	Def.	Aver.	Def.	Aver.				Maceration humidity	Relative maceration ratio
7	20	19i	37.7-38.0	17.3 24.4 19.0 18.3 19.4 18.8 18.0 20.0 20.9	19.5	2.12 2.11 2.11 2.02 2.06 2.07 2.03 2.03 2.00	2.06	2.64 2.64	2.64	1.72	34.8	0.535	35.1	0.102
8	21	19i	41.2-41.5	24.6 23.6 25.3 24.1 24.9 24.8 26.0 19.5 26.5	24.4	1.93 1.94 1.89 1.94 1.96 1.81 1.97 1.92 1.93	1.92	2.69 2.69	2.69	1.54	42.7	0.747	39.7	0.1821

Appendix 2-16 Physical - Mechanical Test of Rock (5)

Filtration ratio (method of cutting ring)

Complex No.2 **Table No.9**

No.	No. of samples	Place of selection	Selection Interval (m)	Filtration ratio K10 (m/24 hours)	Humidity after the test, (%)
1	4	Hole 18i	11.7-12	$9.96\text{-}10^{-6}$	34.6
2	6	18i	19.5-20	$1.73\text{-}10^{-5}$	29.4
3	8	18i	25.3-25.8	$6.4\text{-}10^{-5}$	20.7
4	9	18i	30.3-31.2	$1.24\text{-}10^{-4}$	28.0
5	15	Hole 19i	19.5-20	$2.17\text{-}10^{-6}$	33.3
6	18	19i	30.25-30.95	$7.12\text{-}10^{-6}$	17.9
7	20	19i	37.7-38.3	$2.62\text{-}10^{-6}$	20.0
8	21	19i	41.2-42	$1.72\text{-}10^{-5}$	27.0

Appendix 2-16 Physical - Mechanical Test of Rock (6)

Result of plasticity definition - 1

Complex No.2 **Table No.10**

No.	No. of samples	Place of selection	Selection Interval (m)	Flow limit (%)	Plasticity limit (%)	Number of plasticity	Plasticity ratio (%)
1	4	Hole 18i	11.7-12	83.1	32.4	50.7	-0.037
2	6	18i	19.5-20.0	72.5	33.4	39.1	-0.089
3	8	18i	25.3-25.8	39.6	16.9	22.7	0.057
4	9	18i	30.3-30.5	48.3	31.2	17.1	-0.672
5	15	19i	19.5-20.0	74.4	32.7	41.7	-0.007
6	18	19i	29.5-29.75	32.0	14.9	17.1	-0.006
7	20	19i	37.7-38.0	48.0	27.3	20.7	-0.377
8	21	19i	41.2-41.5	49.7	33.3	16.4	-0.543

Result of plasticity definition - 2

Complex No.1 **Table No.11**

No.	No. of samples	Place of selection	Selection Interval (m)	Flow limit (%)	Plasticity limit (%)	Number of plasticity	Plasticity ratio (%)
1	5	Hole 18i	8.5-9.0	69.8	29.4	40.4	0.002
2	7	18i	22.3-22.6	47.4	21.0	26.4	-0.076
3	10	18i	35.8-36.0	44.7	28.6	16.1	-0.447
4	14	19i	13.7-14.0	77.0	31.8	45.2	-0.013
5	16	19i	25.7-26.0	71.6	35.8	35.8	-0.047
6	17	19i	29.2-29.5	36.8	17.8	19.0	0.047
7	19	19i	35.0-35.3	35.1	16.9	18.2	0.692

Appendix 2-16 Physical - Mechanical Test of Rock (7)

Results of definition of grainmetric composition of ground

Complex No.3

Table No.12

No	No. of samples	Place of selection	Selection Interval (m)	Grainmetric composition (mm) Content of fractions (%)											
				100	100-60	60-40	40-20	20-10	10-5	5-2	2-1	1-0.5	0.5-0.25	0.25-0.1	< 0.1
1	2	Hole 18i	0.3-3.4	18.2	6.9	10.8	16.6	13.2	12.9	3.3	2.7	2.0	2.2	2.3	8.9
2	12	19 i	0.4-4.5	-	-	-	2.9	1.8	1.7	3.7	6.6	5.5	4.9	4.7	68.2
3	18	19 i	30.95-31.0	-	-	-	-	-	-	0.3	2.0	10.4	26.0	22.8	38.5
4	1	18i	0.0-0.3	-	-	1.2	2.9	7.3	7.9	2.8	2.4	2.6	2.7	3.5	66.7
5	11	19i	0.0-0.4	-	3.1	8.2	15.3	17.0	21.3	5.3	6.2	4.6	4.0	3.5	11.5

Appendix 2-16 Physical - Mechanical Test of Rock (8)

Results of definition of natural repose angle, density of dry ground

Complex No.3 Table No.13

NN.	No. of samples	Place of selection	Selection interval (m)	Angle of natural repose (degree)		Volume-filling mass (g/cm^3)	
				In air-dry conditions	Under the water	Loose structure	Dense structure
1	2	Hole 18i	0.3-3.4	35°	44°		
2	12	19i	0.4-4.5	38°	45°		
3	18	19i	30.95-31.0	35°	45°		
4	1	18i	0.0-0.3	38°	44°	1.15	1.25
5	11	19i	0.0-0.4	36°	40.5°	1.36	1.41

Appendix 2-16 Physical - Mechanical Test of Rock (9)

Definition of full moisture capacity, maximum molecular moisture capacity, yield of water, filtration ratio and angle of natural repose

Complex No.4 **Table No.14**

No.	No. of samples	Place of Selection	Selection Interval (m)	Full moisture capacity (%)	Maximum molecular moisture capacity (%)	Yield of water (%)	Filtration Ratio (m/24 hours) K10	Angle of natural repose, degree	
								In dry condition	Under water
1	3	18i	3.4-7.8	18.9	13.3	5.6	189.2	35°	30°
2	13	19i	4.5-9.2	24.1	16.4	7.7	1.70	38°	45°

Appendix 3. Miscellaneous Data for the Drilling Survey

Appendix 3-1 List of the Used Equipment for Drilling

Appendix 3-1 List of the Used Equipment for Drilling (1) No.1 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-3UK,	1	percussion
Motor for Drilling machine	22kw	1	
Generator	60KVA	1	
Tank for water	$3m^3$	1	
Tank for fuel	$1m^3$	1	
Tanker for water	$3m^3$	1	
Trailer house	6 passengers	1	
Casing pipes	12″ L= 6.70m	5	
	10″ L= 6.70m	10	
	8″ L= 2.00m	20	
Bailer	φ300mm L= 3.80m	1	
	φ240mm L= 3.50m	1	
	φ240mm L= 2.20m	1	ball valve
Sampler	φ190mm L= 5.00m	1	
Hanmer with chain	W=1,000kg	1	used for driving casing pipes
Tripod derrik	H= 9.0m	1	used for recoverying casing pipes
Implements		1	

Appendix 3-1 List of the Used Equipment for Drilling (2) No.2 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-3UK,	1	percussion
Motor for Drilling machine	22kw	1	
Generator	40KVA, 400V, 52A	1	
Tank for water	$3m^3$	1	
Tank for fuel	$1.5m^3$	1	
Tanker for water	$3m^3$	1	
Trailer house	6 passengers	1	
Casing pipes	12″ L= 6.70m	5	
	10″ L= 6.70m	10	
	8″ L= 2.00m	30	
Bailer	φ300mm L= 3.80m	1	
	φ240mm L= 3.50m	1	
	φ240mm L= 2.20m	1	ball valve
Sampler	φ190mm L= 5.00m	1	
Hanmer with chain	W=1,000kg	1	used for driving casing pipes
Tripod derrik	H= 9.0m	1	used for recoverying casing pipes
Implements		1	

Appendix 3-1 List of the Used Equipment for Drilling (3) No.3 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-2A-2	1	rotary
Motor for Drilling machine	MJBOK-13, 131HP	1	
Drilling Pump	MB-50, 50m3/h	1	
Pump for water	100L/min	1	
Generator	3KVA	1	
Tank for water	$2m^3$	1	
Tank for fuel	$1m^3$	1	
Tanker for water	$3m^3$	1	
Tractor		1	
Truck	4t, 10t	2	
Bus		1	
Rods	ϕ 50mm L= 6.70m	20	
Casing pipes	ϕ 127mm L= 3.00m	5	
	ϕ 144mm L= 4.50m	20	
	ϕ 98mm L= 1.50m	5	
Core tube assembly	ϕ 127mm L= 1.50m	3	
	ϕ 89mm L= 3.00m	3	
Implements		1	

Appendix 3-2 Miscellaneous Results of Drilling Works on Individual Drillhole

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-1)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	21 Sept., '00 ~ 21 Sept., '00	1.0	1.0	—	3	8
Drilling	22 Sept., '00 ~ 26 Sept., '00	5.0	Drilling : 5.0	—	27	46
			Accident: 0.0	—	—	—
Dismount	27 Sept., '00 ~ 27 Sept., '00	1.0	1.0	—	3	6
Total	21 Sept., '00 ~ 27 Sept., '00	7.0	7.0	—	33	60

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	12.80 m
Prolongation	-3.00 m	Core length	19.20 m
Effective length	32.00 m	Core recovery	100.0 %

Working hours			
Drilling	16.0 hrs	23.50%	17.4%
Supplemental drilling work	52.0 hrs	76.50%	56.5%
Recovery from accident	—	—	—
Subtotal	68.0 hrs	100%	73.9%
Preparation/setting up	8.0 hrs	—	8.7%
Dismount/mobilization	4.0 hrs	—	4.4%
Transportation of water	12.0 hrs	—	13.0%
Others			
Total	92.0 hrs	—	100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 12.8	None core	None core
12.8 - 20.0	100.0	100.0
20.0 - 32.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 32.00m/3 days =10.67 m/d
Effective length / Total drilling shifts =
= 32.00m/6 shifts = 5.33 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	12.80m	19.20m			32.00m
Core length	None core	19.20m			19.20m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	13.00m	40.60%	53.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-2)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	18 Sept., '00 ~ 18 Sept., '00	1.0	1.0	—	3	8
Drilling	19 Sept., '00 ~ 20 Sept., '00	2.0	Drilling : 2.0	—	9	22
			Accident: 0.0	—	—	—
Dismount	21 Sept., '00 ~ 21 Sept., '00	1.0	1.0	—	3	5
Total	18 Sept., '00 ~ 21 Sept., '00	4.0	4.0	—	15	35

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	12.00 m
Prolongation	9.00 m	Core length	32.00 m
Effective length	44.00 m	Core recovery	100.0 %

Working hours			
Drilling	18.0 hrs	50.00%	28.1%
Supplemental drilling work	18.0 hrs	50.00%	28.1%
Recovery from accident	—	—	—
Subtotal	36.0 hrs	100%	56.2%
Preparation/setting up	16.0 hrs	—	25.0%
Dismount/mobilization	4.0 hrs	—	6.3%
Transportation of water	8.0 hrs	—	12.5%
Others	—		0.0%
Total			100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 12.0	None core	None core
12.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 44.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 44.00m/2 days = 22.00 m/d
Effective length / Total drilling shifts
= 44.00m/4 shifts = 11.00 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	12.00m	32.00m			44.00m
Core length	None core	32.00m			32.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	13.00m	29.50%	53.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-3)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	30 Aug., '00 ~ 31 Aug., '00	2.0	2.0	—	6	10
Drilling	01 Sept., '00 ~ 04 Sept., '00	3.6	Drilling : 3.6	—	22	35
			Accident: 0.0	—	—	—
Dismount	04 Sept., '00 ~ 04 Sept., '00	0.4	0.4	—	2	5
Total	21 Sept., '00 ~ 27 Sept., '00	6.0	6.0	—	30	50

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	13.40 m
Prolongation	6.00 m	Core length	41.00 m
Effective length	41.00 m	Core recovery	100.0 %

Working hours			
Drilling	26.0 hrs	44.80%	27.1%
Supplemental drilling work	32.0 hrs	55.20%	33.3%
Recovery from accident	—	—	—
Subtotal	58.0 hrs	100%	60.4%
Preparation/setting up	16.0 hrs	—	16.6%
Dismount/mobilization	6.0 hrs	—	6.4%
Transportation of water	16.0 hrs	—	16.6%
Others			
Total	96.0 hrs	—	100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 13.4	None core	None core
13.4 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 41.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 41.00m/4 days =10.25 m/d
Effective length / Total drilling shifts =
= 41.00m/8 shifts = 5.12 m/shift

Drilling length by diameter					
Bit diameter	190mmϕ				Total
Drilling length	41.00m				41.00m
Core length	41.00m				41.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
400mmϕ	13.00m	31.70%	69.20%
270mmϕ	13.00m	31.70%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-4)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	05 Sept., '00 ~ 05 Sept., '00	1.0	1.0	—	3	10
Drilling	06 Sept., '00 ~ 12 Sept., '00	7.0	Drilling : 7.0	—	39	70
			Accident: 0.0	—	—	—
Dismount	13 Sept., '00 ~ 14 Sept., '00	2.0	2.0	—	3	15
Total	05 Sept., '00 ~ 14 Sept., '00	10.0	10.0	—	45	95

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	9.00 m
Prolongation	1.00 m	Core length	27.00 m
Effective length	36.00 m	Core recovery	100.0 %

Working hours			
Drilling	18.0 hrs	14.70%	10.7%
Supplemental drilling work	100.0 hrs	82.00%	59.5%
Recovery from accident	4.0 hrs	3.30%	2.4%
Subtotal	122.0 hrs	100%	72.6%
Preparation/setting up	16.0 hrs	—	9.5%
Dismount/mobilization	6.0 hrs	—	3.6%
Transportation of water	24.0 hrs	—	14.3%
Others	—		0.0%
Total	168.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 9.0	None core	None core
9.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 36.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 36.00m/7 days = 5.40 m/d
Effective length / Total drilling shifts
= 36.00m/13 shifts = 2.77 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	9.00m	27.00m			36.00m
Core length	None core	27.00m			27.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	9.20m	25.50%	100.00%
220mmϕ	33.00m	91.60%	84.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-5)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	14 Sept., '00 ~ 15 Sept., '00	1.5	1.5	—	3	10
Drilling	15 Sept., '00 ~ 17 Sept., '00	2.0	Drilling : 2.0	—	6	20
			Accident: 0.0	—	—	—
Dismount	17 Sept., '00 ~ 17 Sept., '00	0.5	0.5	—	3	5
Total	14 Sept., '00 ~ 17 Sept., '00	4.0	4.0	—	12	35

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	7.80 m
Prolongation	2.00 m	Core length	29.20 m
Effective length	37.00 m	Core recovery	100.0 %

Working hours			
Drilling	16.0 hrs	44.40%	24.6%
Supplemental drilling work	20.0 hrs	55.60%	30.8%
Recovery from accident	—	—	—
Subtotal	36.0 hrs	100%	55.4%
Preparation/setting up	16.0 hrs	—	24.6%
Dismount/mobilization	4.0 hrs	—	6.2%
Transportation of water	9.0 hrs	—	13.8%
Others			
Total	65.0 hrs	—	100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 7.8	None core	None core
7.8 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 37.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 37.00m/2 days =18.50 m/d
Effective length / Total drilling shifts =
= 37.00m/4 shifts = 9.25 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	7.80m	29.20m			37.00m
Core length	None core	29.20m			29.20m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	6.70m	18.10%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-6)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	27 Sept., '00 ~ 27 Sept., '00	0.5	0.5	—	1	5
Drilling	27 Sept., '00 ~ 29 Sept., '00	2.0	Drilling : 2.0	—	7	20
			Accident: 0.0	—	—	—
Dismount	29 Sept., '00 ~ 29 Sept., '00	0.5	0.5	—	1	5
Total	27 Sept., '00 ~ 29 Sept., '00	3.0	3.0	—	9	30

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	8.80 m
Prolongation	-5.00 m	Core length	21.20 m
Effective length	30.00 m	Core recovery	100.0 %

Working hours			
Drilling	18.0 hrs	50.00%	32.7%
Supplemental drilling work	18.0 hrs	50.00%	32.7%
Recovery from accident	—	—	—
Subtotal	36.0 hrs	100%	65.4%
Preparation/setting up	4.0 hrs	—	7.3%
Dismount/mobilization	8.0 hrs	—	14.6%
Transportation of water	7.0 hrs	—	12.7%
Others	—		0.0%
Total			100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 8.8	None core	None core
8.8 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 30.00m/2 days = 15.00 m/d
Effective length / Total drilling shifts
= 30.00m/4 shifts = 7.50 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	8.80m	21.20m			30.00m
Core length	None core	21.20m			21.20m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	9.10m	30.30%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-7)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	23 Sept., '00 ~ 23 Sept., '00	0.5	0.5	—	1	5
Drilling	23 Sept., '00 ~ 26 Sept., '00	3.0	Drilling : 2.92	—	9.5	27
			Accident: 0.08	—	0.5	3
Dismount	26 Sept., '00 ~ 26 Sept., '00	0.5	0.5	—	1	5
Total	23 Sept., '00 ~ 26 Sept., '00	4.0	4.0	—	12	40

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	8.50 m
Prolongation	8.00 m	Core length	34.50 m
Effective length	43.00 m	Core recovery	100.0 %

Working hours			
Drilling	25.0 hrs	48.10%	33.8%
Supplemental drilling work	25.0 hrs	48.10%	33.3%
Recovery from accident	2.0 hrs	3.80%	2.7%
Subtotal	52.0 hrs	100%	70.3%
Preparation/setting up	5.0 hrs	—	6.7%
Dismount/mobilization	7.0 hrs	—	9.5%
Transportation of water	10.0 hrs	—	13.5%
Others			
Total	74.0 hrs	—	100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 13.4	None core	None core
13.4 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 41.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 43.00m/3 days =14.33 m/d
Effective length / Total drilling shifts =
= 43.00m/6 shifts = 7.16 m/shift

Drilling length by diameter					
Bit diameter	240mm ϕ	190mm ϕ			Total
Drilling length	8.50m	34.50m			43.00m
Core length	None core	34.50m			34.50m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mm ϕ	8.50m	19.80%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-8)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	14 Sept., '00 ~ 15 Sept., '00	2.0	2.0	—	3	12
Drilling	16 Sept., '00 ~ 22 Sept., '00	6.5	Drilling : 4.8	—	21.5	53
			Accident: 1.7	—	1.5	10
Dismount	22 Sept., '00 ~ 22 Sept., '00	0.5	0.5	—	1	5
Total	14 Sept., '00 ~ 22 Sept., '00	9.0	9.0	—	27	80

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	8.00 m
Prolongation	8.00 m	Core length	35.00 m
Effective length	43.00 m	Core recovery	100.0 %

Working hours			
Drilling	23.0 hrs	27.40%	19.8%
Supplemental drilling work	21.0 hrs	25.00%	18.1%
Recovery from accident	40.0 hrs	47.60%	34.5%
Subtotal	84.0 hrs	100%	72.4%
Preparation/setting up	16.0 hrs	—	13.8%
Dismount/mobilization	4.0 hrs	—	3.5%
Transportation of water	12.0 hrs	—	10.3%
Others	—		0.0%
Total	116.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 8.0	None core	None core
8.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 40.0	100.0	100.0
40.0 - 43.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 43.00m/6.5 days = 6.61 m/d
Effective length / Total drilling shifts
= 43.00m/10 shifts = 4.30 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	8.00m	35.00m			43.00m
Core length	None core	35.00m			35.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	13.00m	30.20%	53.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-9)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	27 Sept., '00 ~ 29 Sept., '00	2.5	2.5	—	3	15
Drilling	29 Sept., '00 ~ 1 Oct., '00	2.5	Drilling : 2.5	—	11	29
			Accident: -	—	—	—
Dismount	2 Oct., '00 ~ 2 Oct., '00	1.0	1.0	—	2	6
Total	14 Sept., '00 ~ 22 Sept., '00	6.0	6.0	—	16	50

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	8.00 m
Prolongation	7.00 m	Core length	34.00 m
Effective length	42.00 m	Core recovery	100.0 %

Working hours			
Drilling	20.0 hrs	41.70%	23.3%
Supplemental drilling work	16.0 hrs	33.30%	18.6%
Recovery from accident	12.0 hrs	25.00%	13.9%
Subtotal	48.0 hrs	100%	55.8%
Preparation/setting up	8.0 hrs	—	9.3%
Dismount/mobilization	16.0 hrs	—	18.6%
Transportation of water	14.0 hrs	—	16.3%
Others	—		0.0%
Total	116.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 8.0	None core	None core
8.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 40.0	100.0	100.0
40.0 - 42.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 42.00m/2.5 days = 16.8 m/d
Effective length / Total drilling shifts
= 42.00m/5 shifts = 8.40 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	8.00m	34.00m			42.00m
Core length	None core	34.00m			34.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	13.00m	30.90%	53.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-10)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	2 Oct., '00 ~ 2 Oct., '00	0.5	2.5	—	1	8
Drilling	3 Oct., '00 ~ 6 Oct., '00	4.0	Drilling : 2.5	—	8	24
			Accident: —	—	3	10
Dismount	7 Oct., '00 ~ 7 Oct., '00	1.0	1.0	—	2	8
Total	2 Oct., '00 ~ 7 Oct., '00	5.5	6.0	—	14	50

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	8.00 m
Prolongation	1.00 m	Core length	28.00 m
Effective length	36.00 m	Core recovery	100.0 %

Working hours			
Drilling	27.0 hrs	45.00%	27.6%
Supplemental drilling work	17.0 hrs	28.30%	17.3%
Recovery from accident	12.0 hrs	26.70%	16.3%
Subtotal	60.0 hrs	100%	61.2%
Preparation/setting up	8.0 hrs	—	8.2%
Dismount/mobilization	12.0 hrs	—	12.2%
Transportation of water	18.0 hrs	—	18.4%
Others	—		0.0%
Total	116.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 8.0	None core	None core
8.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 32.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 36.00m/4.0 days = 9.00 m/d
Effective length / Total drilling shifts
= 36.00m/7 shifts = 5.14 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	8.00m	28.00m			36.00m
Core length	None core	28.00m			28.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	9.00m	25.00%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-11)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	20 Sept., '00 ~ 17 Sept., '00	0.2	0.2	—	0.5	3
Drilling	20 Sept., '00 ~ 20 Sept., '00	0.6	Drilling : 0.6	—	3	4
			Accident: —	—	—	—
Dismount	20 Sept., '00 ~ 20 Sept., '00	0.2	0.2	—	0.5	3
Total	20 Sept., '00 ~ 20 Sept., '00	1.0	1.0	—	4	10

Drilling Length			
Programmed length	50.00 m	Overburden, sand & gravel, Quarternary	13.00 m
Prolongation	-13.00 m	Core length	24.00 m
Effective length	37.00 m	Core recovery	100.0 %

Working hours			
Drilling	14.0 hrs	77.80%	50.0%
Supplemental drilling work	4.0 hrs	22.20%	14.3%
Recovery from accident	—	—	—
Subtotal	18.0 hrs	100%	64.3%
Preparation/setting up	3.0 hrs	—	10.7%
Dismount/mobilization	3.0 hrs	—	10.7%
Transportation of water	4.0 hrs	—	14.3%
Others	—		0.0%
Total	28.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 8.0	None core	None core
8.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 37.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 37.00m/0.6 days = 61.66 m/d
Effective length / Total drilling shifts
= 37.00m/2 shifts = 18.50 m/shift

Drilling length by diameter					
Bit diameter	4"T.B.	92mmϕ			Total
Drilling length	13.00m	24.00m			24.00m
Core length	None core	24.00m			24.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
127mmϕ	13.00m	35.10%	100.00%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-12)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	17 Sept., '00 ~ 17 Sept., '00	0.5	0.5	—	1	6
Drilling	17 Sept., '00 ~ 19 Sept., '00	2.0	Drilling : 2.0	—	10	18
			Accident: —	—	—	—
Dismount	19 Sept., '00 ~ 19 Sept., '00	0.5	0.5	—	1	6
Total	17 Sept., '00 ~ 19 Sept., '00	3.0	3.0	—	12	30

Drilling Length			
Programmed length	50.00 m	Overburden, sand & gravel, Quarternary	14.00 m
Prolongation	-8.50 m	Core length	27.50 m
Effective length	41.50 m	Core recovery	100.0 %

Working hours			
Drilling	32.0 hrs	78.00%	47.8%
Supplemental drilling work	9.0 hrs	22.20%	13.4%
Recovery from accident	—	—	—
Subtotal	41.0 hrs	100%	61.2%
Preparation/setting up	8.0 hrs		11.9%
Dismount/mobilization	7.0 hrs		10.5%
Transportation of water	11.0 hrs		16.4%
Others	—		0.0%
Total	67.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 14.0	None core	None core
14.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 41.5	100.0	100.0

Efficiency
Effective length / Working drilling days
= 41.50m/2.0 days = 20.75 m/d
Effective length / Total drilling shifts
= 41.50m/3 shifts = 13.83 m/shift

Drilling length by diameter					
Bit diameter	4"T.B.	92mmϕ			Total
Drilling length	14.00m	27.50m			41.50m
Core length	None core	27.50m			27.50m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
127mmϕ	13.50m	32.50%	77.80%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-13)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	11 Sept., '00 ~ 13 Sept., '00	3.0	3.0	—	2	10
Drilling	14 Sept., '00 ~ 16 Sept., '00	2.6	Drilling : 2.6	—	21	45
			Accident: —	—	—	—
Dismount	16 Sept., '00 ~ 16 Sept., '00	0.4	0.4	—	1	5
Total	11 Sept., '00 ~ 16 Sept., '00	6.0	6.0	—	24	60

Drilling Length			
Programmed length	50.00 m	Overburden, sand & gravel, Quarternary	9.00 m
Prolongation	-11.00 m	Core length	30.00 m
Effective length	39.00 m	Core recovery	100.0 %

Working hours			
Drilling	42.0 hrs	70.00%	47.7%
Supplemental drilling work	18.0 hrs	30.00%	20.5%
Recovery from accident	—	—	—
Subtotal	60.0 hrs	100%	68.2%
Preparation/setting up	16.0 hrs	—	18.2%
Dismount/mobilization	4.0 hrs	—	4.5%
Transportation of water	8.0 hrs	—	9.1%
Others	—		0.0%
Total	88.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 9.0	None core	None core
9.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 39.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 39.00m/2.6 days = 15.00 m/d
Effective length / Total drilling shifts
= 39.00m/4.5 shifts = 8.66 m/shift

Drilling length by diameter					
Bit diameter	4"T.B.	92mmϕ			Total
Drilling length	9.00m	30.00m			43.00m
Core length	None core	30.00m			35.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
127mmϕ	11.00m	28.20%	54.50%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-14)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	21 Sept., '00 ~ 21 Sept., '00	0.5	0.5	—	1	5
Drilling	21 Sept., '00 ~ 22 Sept., '00	1.5	Drilling : 1.5	—	9	15
			Accident: —	—	—	—
Dismount	23 Sept., '00 ~ 23 Sept., '00	1.0	1.0	—	1	5
Total	21 Sept., '00 ~ 23 Sept., '00	3.0	3.0	—	11	25

Drilling Length			
Programmed length	50.00 m	Overburden, sand & gravel, Quarternary	13.00 m
Prolongation	-18.00 m	Core length	14.50 m
Effective length	32.00 m	Core recovery	76.3 %

Working hours			
Drilling	27.0 hrs	58.70%	38.5%
Supplemental drilling work	13.0 hrs	28.30%	18.6%
Recovery from accident	6.0 hrs	13.00%	8.6%
Subtotal	46.0 hrs	100%	65.7%
Preparation/setting up	7.0 hrs	—	9.7%
Dismount/mobilization	7.0 hrs	—	9.7%
Transportation of water	10.0 hrs	—	13.9%
Others	—		0.0%
Total	88.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 13.0	None core	None core
13.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 32.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 32.00m/1.5 days = 21.33 m/d
Effective length / Total drilling shifts
= 32.00m/3 shifts = 10.66 m/shift

Drilling length by diameter					
Bit diameter	4"T.B.	92mmϕ			Total
Drilling length	13.00m	19.00m			32.00m
Core length	None core	14.50m			14.50m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
127mmϕ	16.00m	50.00%	62.50%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-15)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	24 Sept., '00 ~ 24 Sept., '00	0.5	0.5	—	2	5
Drilling	24 Sept., '00 ~ 26 Sept., '00	2.0	Drilling : 2.0	—	10	25
			Accident: —	—	—	—
Dismount	26 Sept., '00 ~ 27 Sept., '00	1.5	1.5	—	4	10
Total	24 Sept., '00 ~ 27 Sept., '00	4.0	4.0	—	16	40

Drilling Length			
Programmed length	50.00 m	Overburden, sand & gravel, Quarternary	12.00 m
Prolongation	-15.50 m	Core length	21.10 m
Effective length	34.50 m	Core recovery	93.7 %

Working hours			
Drilling	18.0 hrs	45.00%	20.9%
Supplemental drilling work	22.0 hrs	55.00%	25.6%
Recovery from accident	—	—	—
Subtotal	40.0 hrs	100%	46.5%
Preparation/setting up	8.0 hrs	—	9.3%
Dismount/mobilization	24.0 hrs	—	27.9%
Transportation of water	14.0 hrs	—	16.3%
Others	—		0.0%
Total	86.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 13.0	None core	None core
13.0 - 20.0	100.0	100.0
20.0 - 30.0	86.0	92.2
30.0 - 34.5	100.0	93.7

Efficiency
Effective length / Working drilling days
= 34.50m/2.0 days = 17.25 m/d
Effective length / Total drilling shifts
= 34.50m/4 shifts = 8.62 m/shift

Drilling length by diameter					
Bit diameter	4"T.B.	92mmϕ			Total
Drilling length	12.00m	22.50m			34.50m
Core length	None core	21.10m			21.10m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
127mmϕ	12.00m	34.80%	58.30%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-16)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	30 Sept., '00 ~ 30 Sept., '00	0.5	0.5	—	0.5	5
Drilling	30 Sept., '00 ~ 1 Oct., '00	1.5	Drilling : 1.5	—	6.5	20
			Accident: —	—	—	—
Dismount	2 Oct., '00 ~ 2 Oct., '00	1.0	1.0	—	1	5
Total	30 Sept., '00 ~ 2 Oct., '00	3.0	3.0	—	8	30

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	9.50 m
Prolongation	6.00 m	Core length	31.50 m
Effective length	41.00 m	Core recovery	100.0 %

Working hours			
Drilling	17.0 hrs	60.70%	34.0%
Supplemental drilling work	11.0 hrs	39.30%	22.0%
Recovery from accident	—	—	—
Subtotal	28.0 hrs	100%	56.0%
Preparation/setting up	4.0 hrs	—	8.0%
Dismount/mobilization	8.0 hrs	—	16.0%
Transportation of water	10.0 hrs	—	20.0%
Others	—		0.0%
Total	50.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 9.5	None core	None core
9.5 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 40.0	100.0	100.0
40.0 - 41.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 34.50m/1.5 days = 23.00 m/d
Effective length / Total drilling shifts
= 34.50m/3 shifts =11.50 m/shift

Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	9.50m	31.50m			41.00m
Core length	None core	31.50m			31.50m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	10.50m	25.60%	47.60%

Appendix 3-2 Miscellaneous Results of Individual Drillhole (MJBK-17)

	Survey period		Breakdown of period		Total workers	
	Period	Total days	Working days	No working days	Engineers	Workers
Preparation	2 Oct., '00 ~ 2 Oct., '00	0.5	0.5	—	0.5	6
Drilling	3 Oct., '00 ~ 4 Oct., '00	2.0	Drilling : 1.5	—	4.5	21
			Accident: —	—	—	—
Dismount	5 Oct., '00 ~ 6 Oct., '00	2.0	1.0	—	2	13
Total	2 Oct., '00 ~ 6 Oct., '00	4.5	3.0	—	7	40

Drilling Length			
Programmed length	35.00 m	Overburden, sand & gravel, Quarternary	9.00 m
Prolongation	11.00 m	Core length	37.00 m
Effective length	46.00 m	Core recovery	100.0 %

Working hours			
Drilling	23.0 hrs	63.90%	32.8%
Supplemental drilling work	13.0 hrs	36.10%	18.6%
Recovery from accident	—	—	—
Subtotal	36.0 hrs	100%	51.0%
Preparation/setting up	6.0 hrs	—	8.6%
Dismount/mobilization	16.0 hrs	—	22.9%
Transportation of water	12.0 hrs	—	17.1%
Others	—		0.0%
Total	88.0 hrs		100%

Core recovery by each 10 meters		
Length (m)	Each (%)	Cumula. (%)
0 - 9.0	None core	None core
9.0 - 20.0	100.0	100.0
20.0 - 30.0	100.0	100.0
30.0 - 40.0	100.0	100.0
40.0 - 46.0	100.0	100.0

Efficiency
Effective length / Working drilling days
= 46.00m/2 days = 23.00 m/d
Effective length / Total drilling shifts
= 46.00m/4 shifts =11.50 m/shift

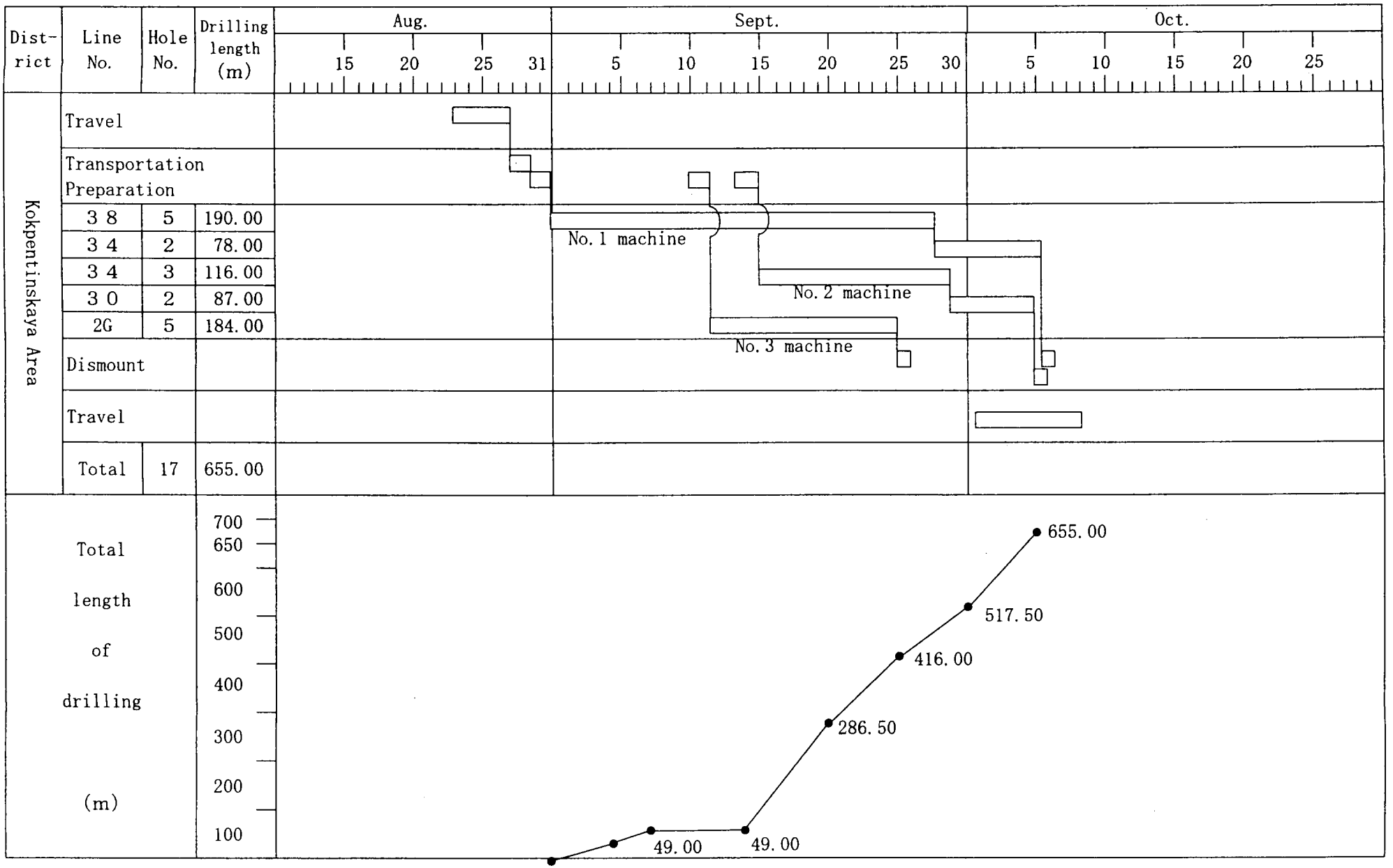
Drilling length by diameter					
Bit diameter	240mmϕ	190mmϕ			Total
Drilling length	9.00m	37.00m			46.00m
Core length	None core	37.00m			37.00m

Inserted casing pipes			
Inserted length by diameter		Inserted length / Drilling length	Casing recovery
270mmϕ	10.50m	21.70%	60.00%

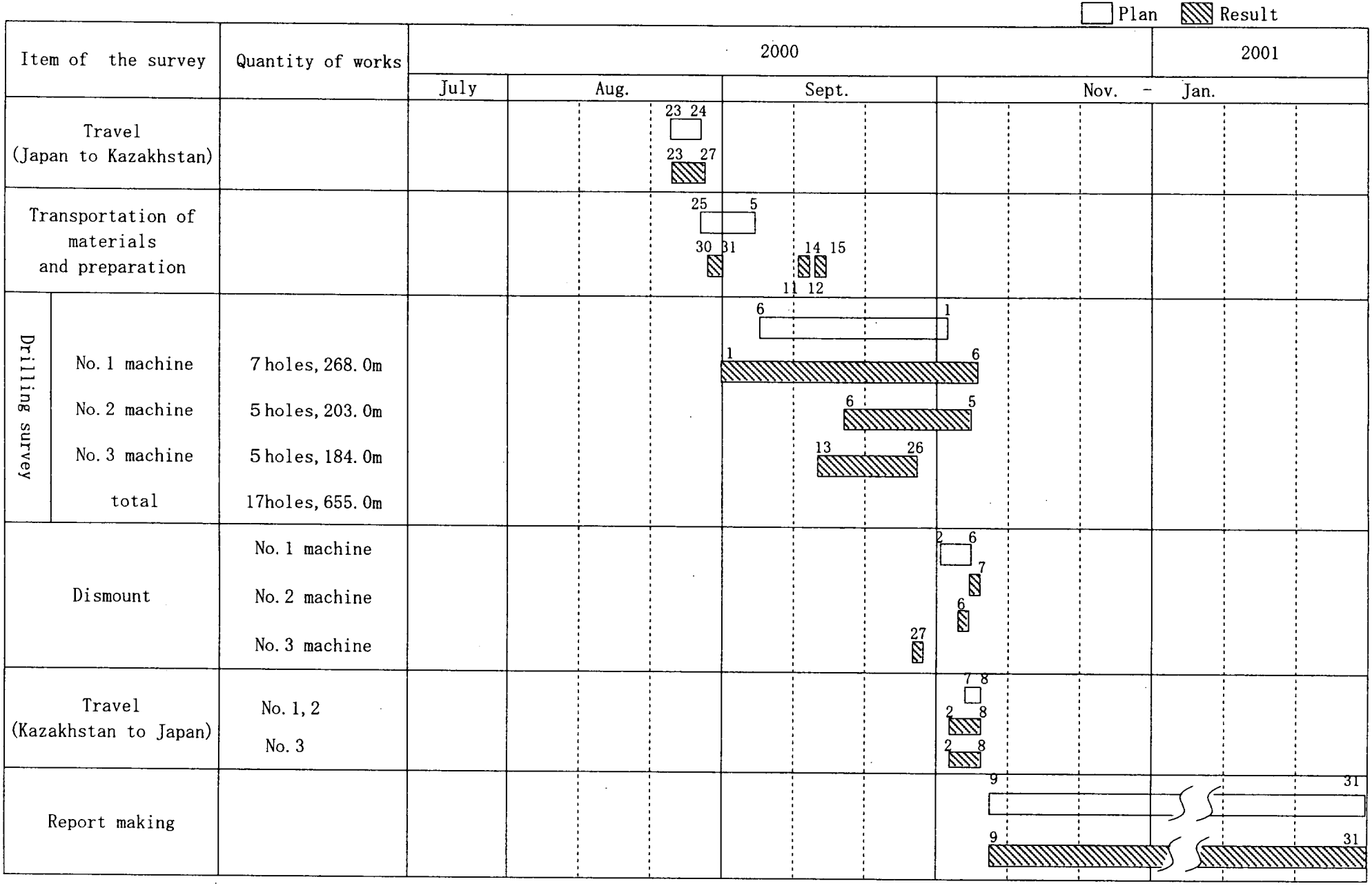
Appendix 3-3 Progress Record of Drilling

Appendix 3-3 Progress Record of Drilling (1)

District	Line No.	Hole No.	Drilling length (m)
Kokpentinskaya Area	Travel		
	Transportation Preparation		
	38	5	190.00
	34	2	78.00
	34	3	116.00
	30	2	87.00
	2G	5	184.00
	Dismount		
	Travel		
	Total	17	655.00

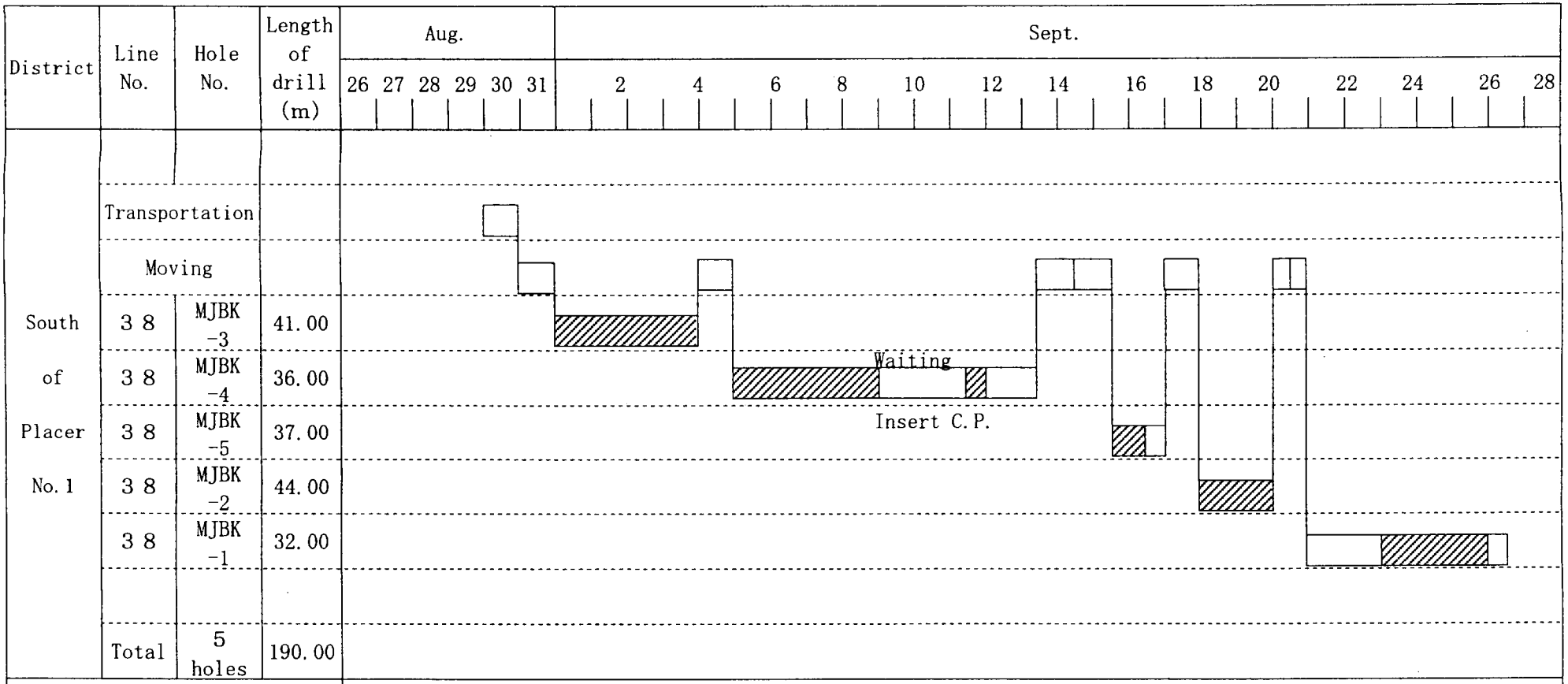


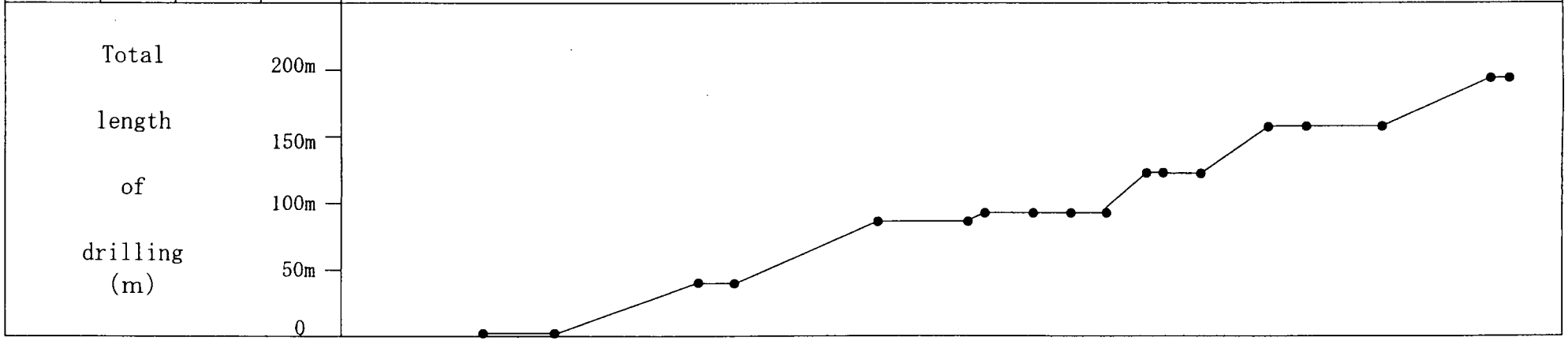
Appendix 3-3 Progress Record of Drilling (2)



Appendix 3-3 Progress Record of Drilling (3) [Drilling Machine No. 1(1)]

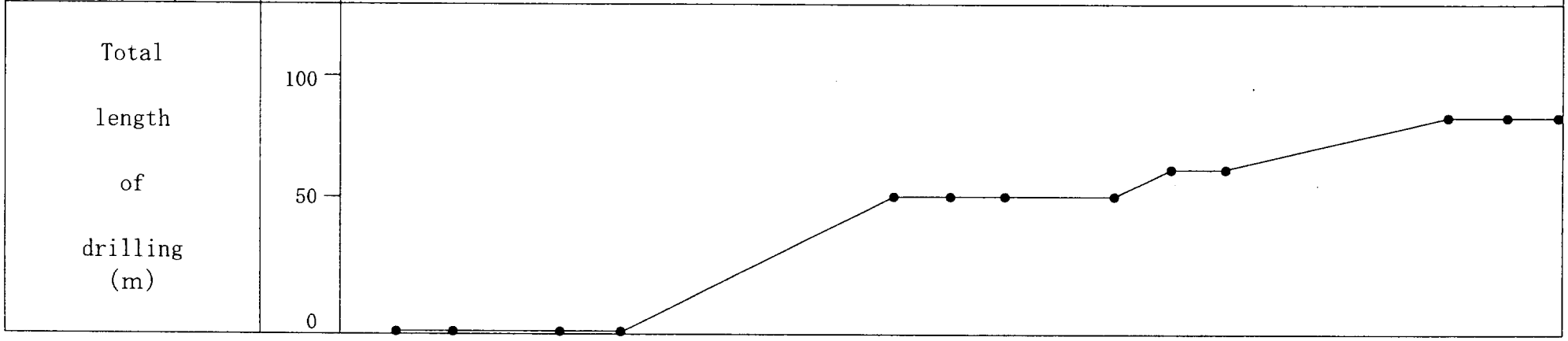
District	Line No.	Hole No.	Length of drill (m)
South of Placer No. 1			
	Transportation		
	Moving		
	38	MJBK-3	41.00
	38	MJBK-4	36.00
	38	MJBK-5	37.00
	38	MJBK-2	44.00
	38	MJBK-1	32.00
	Total	5 holes	190.00





Appendix 3-3 Progress Record of Drilling (4) [Drilling Machine No.1(2)]

District	Line No.	Hole No.	Length of drill (m)	Sept. 27	28	29	30	Oct. 1	2	3	4	5	6	7
South of Placer No.1														
	Moving													
	3 4	MJBK -9	42.00											
										Repair of generator				
	3 4	MJBK -10	36.00											
												Repair of generator		
	Dismount													
	Total	2holes	78.00											



Appendix 3-3 Progress Record of Drilling (5) [Drilling Machine No.2(1)]

District	Line No.	Hole No.	Length Of drill (m)
South of Placer No.1	Transportation		
	Moving		
	3 4	MJBK -8	43.00
	3 4	MJBK -7	43.00
	3 4	MJBK -6	30.00
	Total	3holes	116.00

Sept.

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

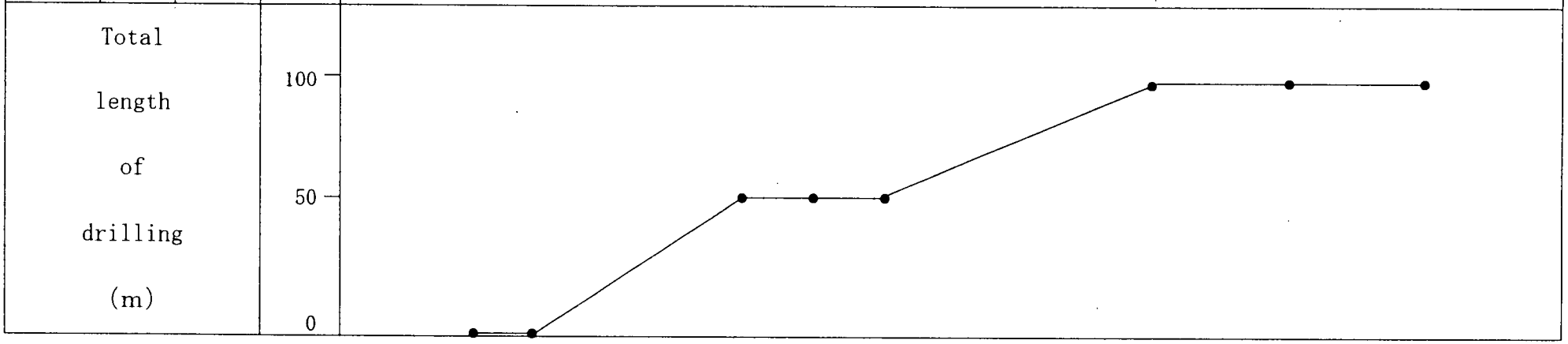
Repair of generator

Total length of drilling (m)

200
150
100
50
0

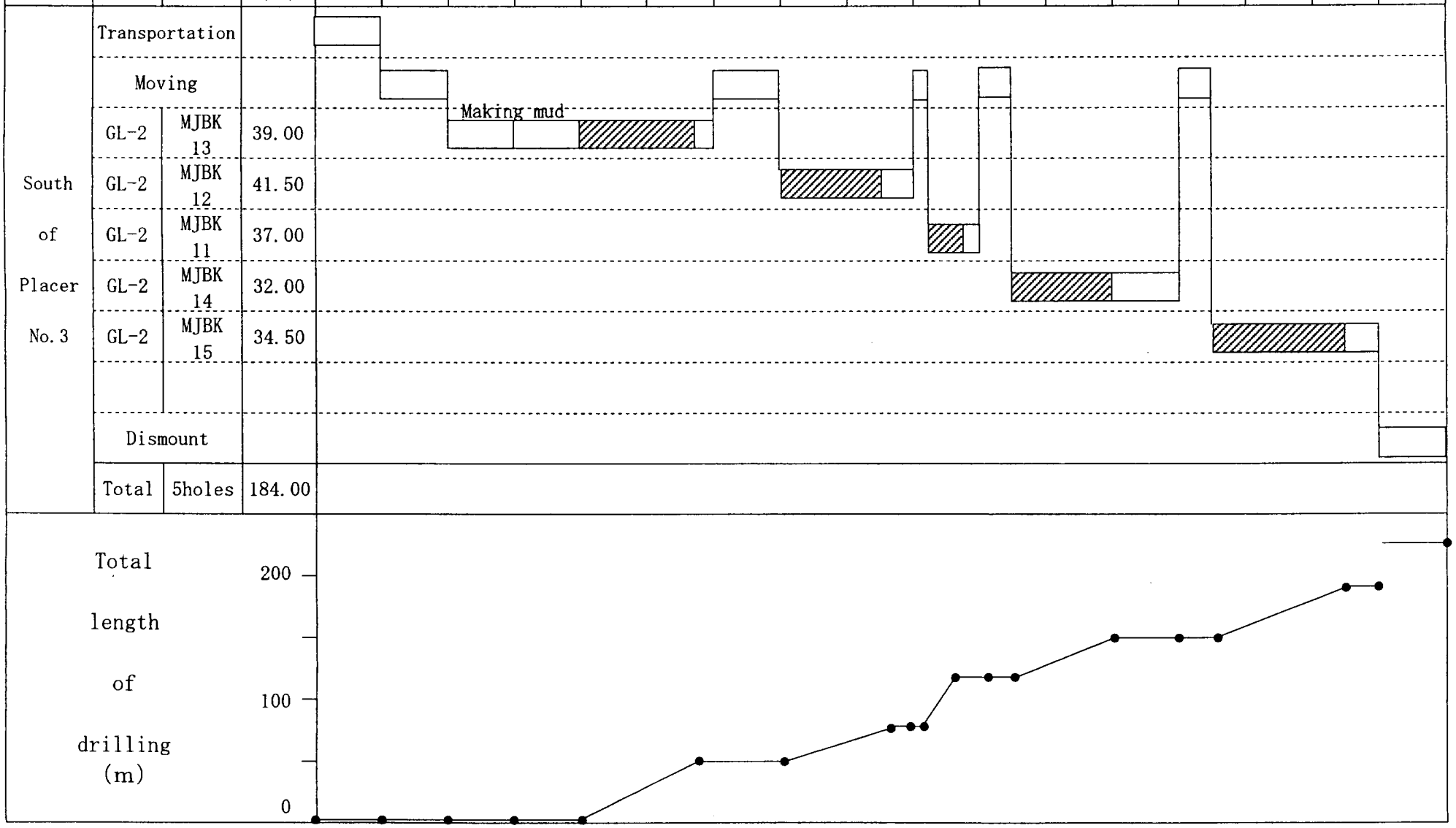
Appendix 3-3 Progress Record of Drilling (6) [Drilling Machine No.2(2)]

District	Line NO.	Hole NO.	Length of drill (m)	Sept. 29	Sept. 30	Oct. 1	Oct. 2	Oct. 3	Oct. 4	Oct. 5	Oct. 6
South of Placer No.1											
	Moving										
	30	MJBK-16	41.00								
	30	MJBK-17	46.00								
	Dismount										
	Total	2holes	87.00								



Appendix 3-3 Progress Record of Drilling (7) [Drilling Machine No. 3]

District	Line No.	Hole No.	Length of drill (m)
South of Placer No. 3	Transportation		
	Moving		
	GL-2	MJBK 13	39.00
	GL-2	MJBK 12	41.50
	GL-2	MJBK 11	37.00
	GL-2	MJBK 14	32.00
	GL-2	MJBK 15	34.50
	Dismount		
	Total	5holes	184.00



Appendix 4. Amount of Exploration Works by the Kazakh Side

Appendix 4. Amount of Exploration Works by the Kazakh Side

Placer deposit	Exploration method	Quantities
1 . Bektemir (Satpaev) deposit		
①	Grid drilling (C_2 Category)	250 x 100 m
②	Grid drilling (C_1 Category)	500 x 100 m
③	Grid drilling (B Category)	125 x 50 m
④	Percussion drilling	3,894 m (187 drillholes)
⑤	Pit	98 m (6 pits)
2 . Karaotkel deposit		
①	Grid drilling (C_1 Category)	400 x 100 m
②	Grid drilling (B Category)	200 x 50 m
③	Percussion drilling	48,929 m (2,879 drillholes)
④	Pit and water well (ϕ 700 mm)	1,971 m (121 wells)
⑤	Pit for samples of separation test	12,000 m^3 (4 pits)