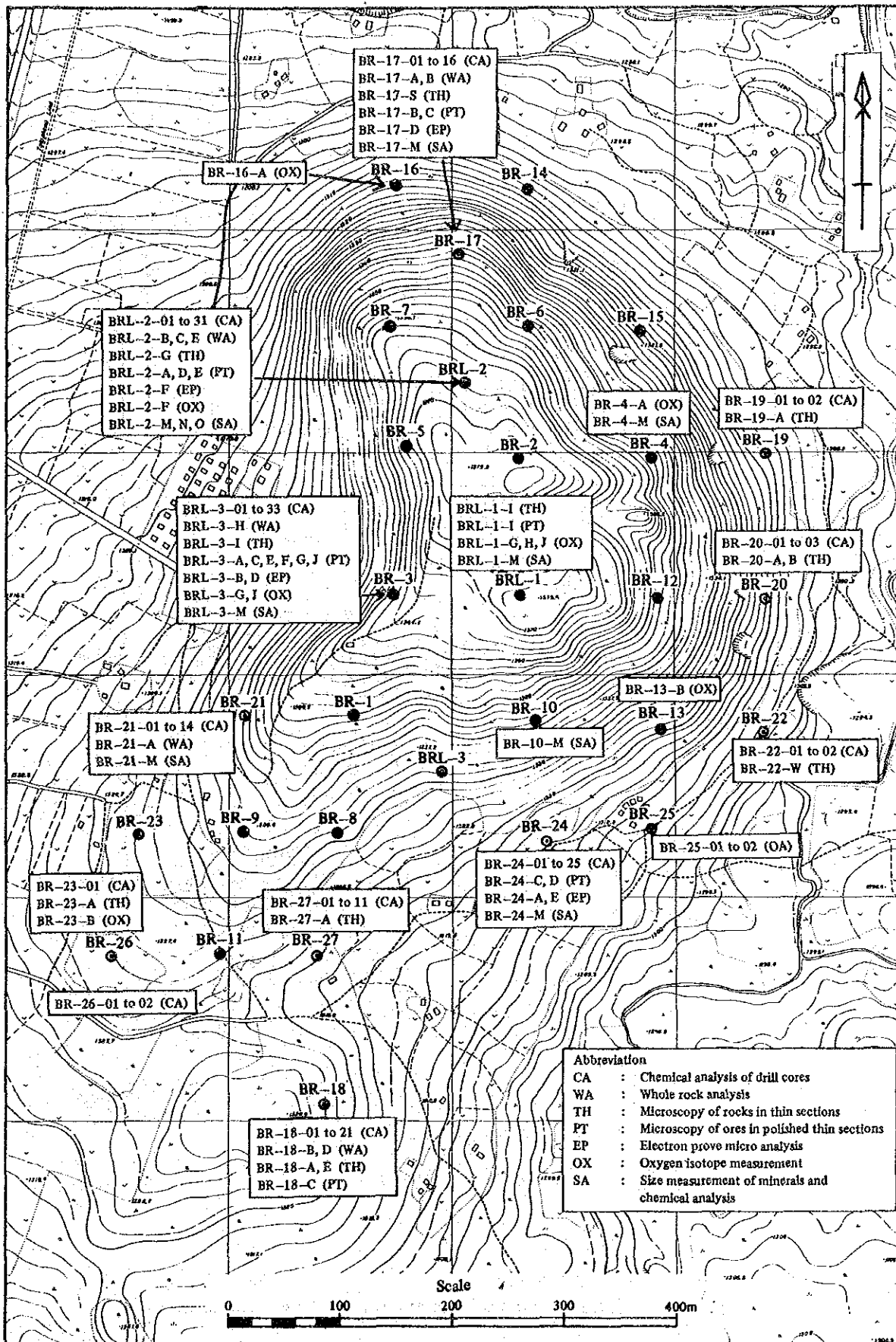
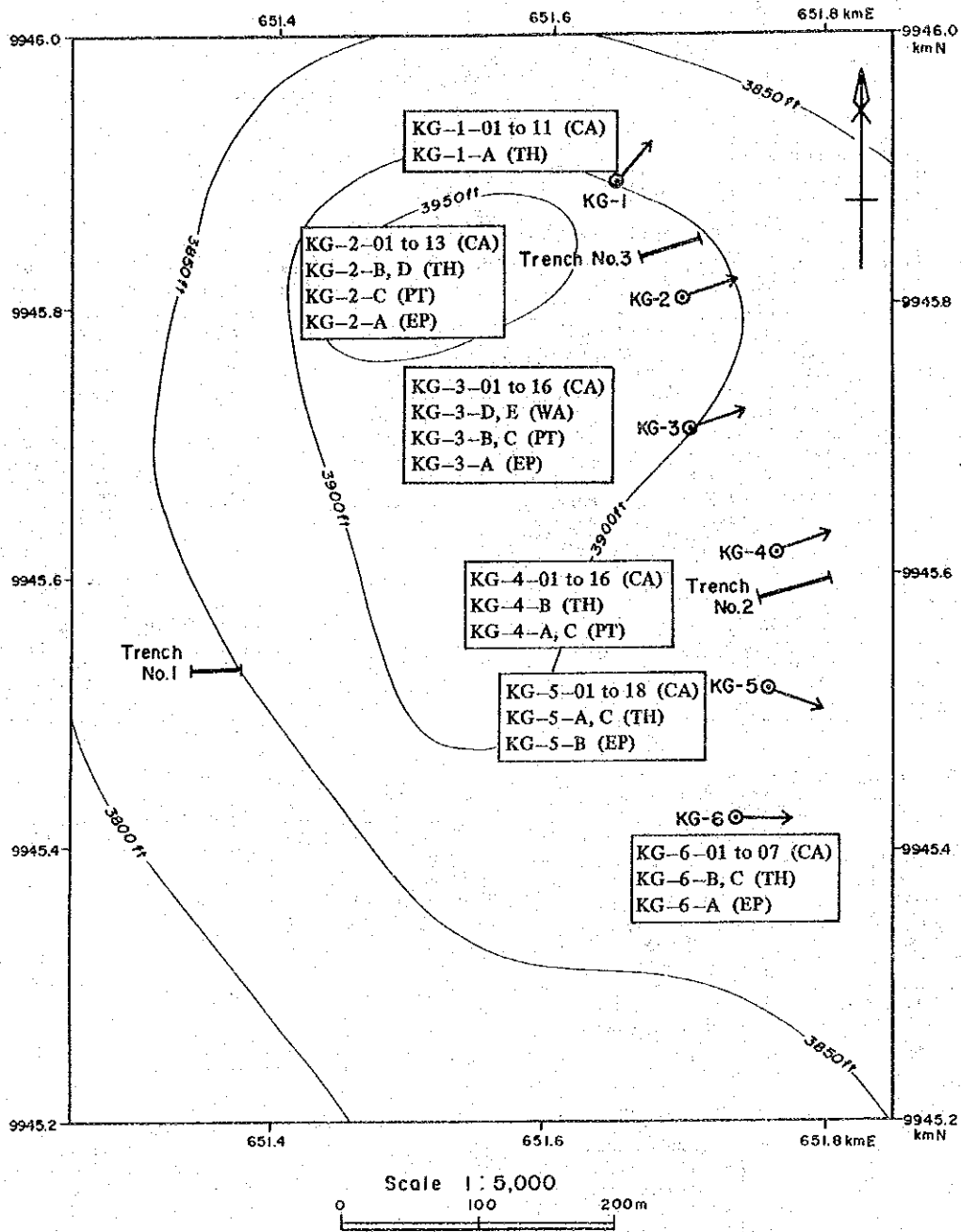


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Apx. 1 Location Map of Tested Samples, Buru Hill Area



Apx. 2 Location Map of Tested Samples, Kuge-Lwala Area

Apx. 3 Summary of Microscopic Observation - Thin Sections -

Sample description		Minerals														
Number	Depth (m)	Type	Neph	Kf	Ser	Qtz	Carb	Pl	Biot	Flu	Epi	Chl	Amph	Px	Opaque	Others
BR-17-S	Surface	Erec. Gn		○	△	○									△	
BR-18-A	5.40	Frac. Gn		○	○	○									○	
BR-18-E	50.60	Frac. Gn		○	△	○							△		○	smectite
BR-19-A	31.00	Amph. Gn					△	○	△		○		actinolite ◎		△	
BR-20-A	25.20	Erec. Gn		○	△		○	○				○			△	
BR-20-B	34.00	carbonatite					◎			△	△				×	
BR-22-W	Surface	Frac. Gn		◎	△	○					○				×	
BR-22-A	18.30	Gneiss		○	△	○		○							△	
BR-27-A	14.30	Erec. Gn		○	△	◎									△	
BR-1-1	148.00	Carbonatite					◎		○	△					△	pyrochlore
BR-2-G	95.90	Phonolite		△	+		○								△	glass
BR-3-I	67.30	Erec. Gn		◎	△	△	○	○		△					△	
KG-1-A	57.80	Nephelinite	○				◎						alkali amphibole ○		△	olivine, spinel(?)
KG-2-B	15.20	Carbonatite	△				◎								○	
KG-2-D	57.80	Erec. Phn	△				◎								○	
KG-4-B	26.10	Alt. Phn		○			◎								△	smectite
KG-5-A	21.10	Alt. Bst					△	◎			△	○			○	
KG-5-C	36.50	Carbonatite		Sanidine △			◎		△						○	
KG-6-B	48.70	Alt. phn	○				○								△	smectite
KG-6-C	Surface	Phonolite	○	△									alkali amph ○	△		smectite, sphene

◎ : abundant ○ : common △ : little × : rare

Abbreviations

- Neph : nepheline
- Carb : carbonate minerals
- Flu : fluorite
- Px : alkali pyroxene
- Erec. Gn : brecciated gneiss, Frac. Gn : fractured gneiss, Amph. Gn : amphibole gneiss
- Erec. Phn : brecciated phonolite, Alt. phn : altered phonolite, Alt. Bst : altered basalt
- Kf : k-feldspar
- Pl : plagioclase
- Epi : epidote
- Ser : sericite
- Biot : biotite
- Chl : chlorite
- Qtz : quartz
- Amph : amphibole

Apx. 4 Microscopic Observation of Rocks in Thin Sections

- BR-17-S: brecciated gneiss
Breccias composed of anhedral K-feldspar grains (up to 0.8mm in size), aggregates of tiny quartz grains and film-like sericite (ca. 0.1 x 0.02mm in size) are present in a glassy matrix.
- BR-18-A: fractured gneiss
Anhedral K-feldspar grains (up to 0.8 x 0.4mm in size), tiny quartz aggregates, and film-like sericite (up to 0.2 x 0.02mm in size) are cut by many veinlets of opaque minerals, probably goethite and hematite (up to 0.5mm in width).
- BR-18-E: fractured gneiss
Anhedral K-feldspar grains (up to 2.0 x 1.5mm in size) and tiny quartz aggregates (which are very similar to texture of chert) are cut by networks of goethite - smectite - amphibole. Amphibole ruins are altered to goethite and smectite, probably nontronite.
- BR-19-A: actinolite - epidote schist
Acicular crystals of amphibole, probably actinolite - tremolite series minerals (ca. 0.4 x 0.1mm in size), and anhedral to subhedral plagioclase grains (up to 1.0 x 0.4mm in size) show lepidoblastic texture. Short prismatic epidote (up to 0.3 x 0.2mm in size), euhedral biotite grains (up to 0.4 x 0.1mm in size) and carbonate minerals (probably calcite) veins (up to 0.2mm in width) are present.
- BR-20-A: brecciated gneiss
Breccias composed of anhedral K-feldspar (up to 2.4 x 1.0mm in size) and plagioclase (up to 2.6 x 1.2mm in size) with sericite are cemented by carbonate minerals (up to 0.6 x 0.5mm in size), aggregates of fine-grained sericite along their rims and cracks.
- BR-20-B: carbonatite (alvikite?)
Carbonate minerals (up to 1.0 x 0.8mm in size, but most of them are very fine-grained) show a saccharoidal texture. Small amounts of euhedral to subhedral fluorite (up to 0.4 x 0.4mm in size), euhedral to subhedral epidote (up to 0.1 x 0.05mm in size) and opaque minerals are associated with carbonate minerals.
- BR-22-W: altered, fractured gneiss
It is composed of anhedral K-feldspar (up to 2.0 x 1.5mm in size), euhedral to subhedral plagioclase (up to 1.0 x 1.0mm in size), and anhedral quartz grains. It is fractured and altered to form sericite (up to 0.2 x 0.05mm in size) and long prismatic epidote (up to 0.2 x 0.04mm in size).
- BR-23-A: gneiss
Porphyroblastic plagioclase (up to 2.0 x 1.0mm in size) and K-feldspar (up to 1.6 x 1.0mm in size) are present in the groundmass of fine-grained plagioclase, K-feldspar, quartz, sericite and opaque minerals (mainly goethite).
- BR-27-A: brecciated gneiss
Breccias composed of porphyroblastic K-feldspar (up to 1.2 x 1.2mm in size) and aggregates of tiny grains of sericite and quartz are cemented mainly by opaque minerals, probably goethite.
- BRL-1-1: carbonatite (alvikite?)
Carbonate minerals (ca. 0.2 x 0.2mm in size) with euhedral-biotite grains (up to 0.4 x 0.4mm in size) show a saccharoidal texture. Small amounts of euhedral opaque minerals (pyrochlore up to 0.5 x 0.5mm in size, and probably pyrite etc.) and anhedral fluorite around the opaque minerals are present.
- BR-2-0: phonolitic fine tuff? (weided tuff?)
It consists of glassy fine-grained particles with lamination. Some of them are identified to K-feldspar (up to 0.1 x 0.1mm in size). Devitrified brownish glasses (up to 0.8 x 0.1mm in size) and carbonate mineral veinlets (0.2 - 0.3mm in width) are also present.
- BR-3-1: brecciated gneiss
Porphyroblastic K-feldspar (up to 3.2 x 2.0mm in size) and plagioclase (up to 1.0 x 0.5mm in size) with fine-grained quartz and

sericite etc. are brecciated and altered to form carbonate minerals (up to 0.8 x 0.5mm in size), massive fluorite, and opaque minerals as networks. Carbonate minerals also occur as veinlets up to 0.8cm in width.

KG-1-A: altered porphyritic olivine nephelinite

Phenocrysts of nepheline (up to 1.8 x 1.8mm in size), alkali amphibole (up to 1.0 x 0.8mm in size), olivine (up to 1.2 x 0.6mm in size), spinel (?) (up to 0.8 x 0.6mm in size), are strongly altered to fine-grained carbonate minerals.

KG-2-B: carbonatite (ferrocarbonatite?)

Carbonate minerals, probably siderite (ca. 0.4 - 0.5mm in size), euhedral nepheline crystals (up to 0.8 x 0.5mm in size) and anhedral opaque minerals, perhaps goethite are constituents.

KG-2-D: brecciated phonolite

Phenocrysts of sanidine (up to 1.6 x 0.2mm in size) and nepheline or leucite (up to 0.4 x 0.4mm in size) in a fine-grained groundmass are strongly altered to carbonate minerals. This phonolitic rock is brecciated and cemented by carbonate and opaque minerals. Veins of nepheline - carbonate minerals - opaque minerals - smectite (the width ranges from 0.5 to 1.5mm) are present.

KG-4-B: strongly altered phonolite?

Phenocrysts (up to 1.6 x 1.2mm in size) and groundmass are strongly altered to carbonate minerals, smectite, and opaque minerals. Some of phenocrysts are identified to K - feldspar.

KG-5-A: altered aphyric basalt

It consists of euhedral plagioclase (ca. 0.6 x 0.1mm in size), anhedral epidote (probably clinzoisite, up to 0.8 x 0.1mm in size), massive chlorite and opaque minerals. Carbonate mineral veins (0.3 - 1.0 mm in width) are present.

KG-5-C: carbonatite (ferrocarbonatite?)

Carbonate (ca. 0.4 x 0.4mm in size) and opaque minerals are

predominant. Phonolitic breccias composed of phenocrysts of sanidine (ca. 2.0 x 0.6mm in size) and biotite (ca. 0.7 x 0.6mm in size) in a fine-grained groundmass are included and partly altered to carbonate minerals.

KG-6-B: altered phonolite

Phenocrysts of nepheline (up to 0.7 x 0.7mm in size) and alkali pyroxene (up to 0.3 x 0.2mm in size) and fine-grained groundmass are altered to carbonate minerals. Veinlets (up to 1.2mm in width) of carbonate minerals, smectite and opaque minerals are present.

KG-6-C: phonolite

Phenocrysts of nepheline (up to 4.5 x 2.5mm in size), partly altered to K - feldspar, alkali amphibole (up to 1.6 x 1.0mm in size) with alkali pyroxene relicts in the cores, isotropic brownish crystals (probably spinel up to 0.4 x 0.4mm in size), sphene (up to 1.0 x 0.6mm in size) and fine-grained and partly glassy groundmass show porphyritic texture. Some of alkali amphibole are altered to epidote.

Apex 5 Summary of Microscopic Observation - Polished Thin Sections -

Sample description			Opaque minerals													Transparent minerals										Remarks
Number	Depth (u)	Type	Goe	Hem	Lep	Mag	Py	Mc	Ga	Go	Pyl	Psi	Man	Pyc	Carb	Flu	Qtz*	Kf	Biot	Mont	Ser	Cr	Best	Bar	Neph	Qtz*
BR-17-B	25.50	Fe-Mn ore	⊙	⊙	Δ						Δ					Δ						×	×	×		
BR-17-C	44.10	Fe-Mn ore	○	⊙	×						Δ		×			Δ							×	×		
BR-18-C	15.50	Brac. Gn	○								×				×		⊙	○			×					quartz>opal
BR-24-C	43.00	Carbonatite	Δ		Δ										⊙	○						×	Δ			
BR-24-D	46.50	Carbonatite		Δ							Δ				⊙	○				×		×	×			
BR-1-1	155.00	Carbonatite	Δ	×										×	⊙	Δ			Δ				×	×	Δ	
BR-2-A	9.20	Fe ore	⊙	○												Δ	Δ									opal
BR-2-D	33.80	Fe-Mn ore	⊙	○	Δ						○		Δ			Δ	×			○						quartz
BR-2-E	42.00	Fe-Mn ore		⊙								○				Δ	×							×		quartz
BR-3-A	7.80	Fe-Carb	⊙	○	Δ								○		⊙	Δ			Δ							
BR-3-C	27.60	Fe-Carb	⊙	⊙	Δ										⊙	○										
BR-3-E	41.70	Carbonatite	⊙	○											⊙		Δ			Δ						opal
BR-3-F	56.10	Carbonatite			Δ						Δ	⊙	○		⊙	Δ			Δ							
BR-3-G	57.40	Carbonatite	○	Δ							○	Δ	×		⊙	Δ										
BR-3-J	84.50	Brec. Carb													⊙	Δ										
KG-2-C	45.30	Carbonatite	Δ	Δ	×										⊙	○										opal
KG-3-B	14.80	Carbonatite	Δ	×	×	○									⊙	○										
KG-3-C	37.80	Fe-Carb	○	Δ	×	Δ									⊙	○	○									opal
KG-4-A	13.30	Fe-ore	⊙	○	×	Δ									⊙	○	Δ			×						
KG-4-C	41.80	Fe-ore	⊙	○	×										Δ	○	Δ									

⊙ : abundant ○ : common Δ : little × : rare

Abbreviations

- Goe : goethite Hem : hematite Lep : lepidocrocite Carb : carbonate minerals (calcite, siderite, dolomite etc.)
- Mag : magnetite Py : pyrite Mc : marcasite Flu : fluorite Qtz* : quartz Opal : chalcedonic quartz
- Ga : galena Co : gold Pyl : pyrochlore Kf : k-feldspar Biot : Biotite Ser : sericite
- Psi : psilomelane Man : manganite Pyc : pyrochlore Cr : crandallite group mineral, probably nontronite
- Bar : barite Neph : nepheline

Apx. 6 Microscopic Observation of Ores in Polished Thin Sections

BR-17-B: Fe - Mn ore

It is composed of aggregates (up to 5 x 5mm in size) of hematite, goethite, and lepidocrocite, radiated pyrolusite crystals (ca. 0.1mm in length), and a small amount of manganese. Some goethite and hematite show a dendritic texture. Anhydrous fluorite, crandallite group minerals, bastnaesite (up to 0.04 x 0.02mm in size) and barite (up to 0.04 x 0.02mm in size) occupy irregular interspaces.

BR-17-C: Fe - Mn ore

Aggregates of fine-grained hematite, goethite, lepidocrocite, and pyrolusite and a less amount of anhydrous manganese (up to 0.1 x 0.05mm in size) are predominant. These minerals seem to have replaced short prismatic crystals (ca. 0.2 x 0.1mm in size). Small amounts of fluorite, bastnaesite (up to 0.08 x 0.03mm in size), and barite (up to 0.05 x 0.02mm in size) occur as irregular interspaces or are included in opaque minerals.

BR-18-C: brecciated gneiss

Gneiss composed mainly of massive quartz (partly chalcocite) and K-feldspar (altered to sericite up to 0.06 x 0.03mm in size along the rims or cracks) are fractured, brecciated, and cemented by carbonate minerals, goethite (up to 0.1 x 0.04mm in size) and pyrolusite.

BT-24-C: carbonatite (alvikite?)

Carbonate minerals (ca. 0.1 - 0.2mm in size) and massive fluorite are predominant. Aggregates of fine-grained bastnaesite, crandallite group minerals (up to 0.2 x 0.2mm in size), anhydrous pyrite (up to 0.05 x 0.03mm in size) and fine-grained goethite around pyrite grains are also present.

BR-24-D: carbonatite (alvikite?)

It is composed of carbonate minerals (ca. 0.1 - 0.2mm in size), fluorite (as cubes up to 0.5 x 0.5mm in size) or massive aggregates, and small amounts of crandallite group minerals (up to 0.2 x 0.1mm in size in massive fluorite) and subhedral aggregates of fine-grained

bastnaesite, pyrite (up to 0.2 x 0.1mm in size) and hematite (up to 0.1 x 0.1mm in size).

BRL-1-I: weakly layered carbonatite (alvikite?)

It consists of carbonate minerals (up to 3.8 x 3.0mm in size, but most of them are fine-grained and anhedral), massive fluorite, euhedral biotite (up to 0.6 x 0.4mm in size), nepheline (ca. 0.2 x 0.2mm in size), bastnaesite (up to 4.0 x 3.5mm in size), barite veinlets (ca. 0.2mm in width) and pyrite (up to 0.6 x 0.5mm in size). Small amounts of goethite and hematite occur as replacement products of pyrite. Native gold (?) particles are included in anhedral pyrite grains. Euhedral pyrochlore crystals (ca. 0.15 x 0.15mm in size) are associated with euhedral pyrite grains.

BRL-2-A: Fe ore

Anhydrous goethite and hematite are predominant. Small amounts of anhedral fluorite and chalcocite quartz occur as irregular interspaces or as veinlets. Some of hematite grains show cubelike grains as pseudomorphs of pyrite (up to 0.1 x 0.1mm in size).

BRL-2-O: weakly layered Fe - Mn ore

It is composed mainly of massive aggregates of goethite, hematite and lepidocrocite, in which some layers of anhedral pyrolusite and manganese enriched, and interstitial fluorite and quartz are present.

BRL-2-E: Fe - Mn ore

Anhydrous hematite, psilomelane and fluorite are predominant. Hematite and psilomelane sometimes show dendritic texture. Small amounts of euhedral barite grains (up to 0.3 x 0.2mm in size), quartz (ca. 0.05mm in size, 0001) and aggregates of tiny smectite grains are present.

BRL-3-A: weakly layered carbonatite (ferrocarbonatite?)

Aggregates of goethite, hematite and lepidocrocite with long prismatic manganese grains (up to 0.8 x 0.1mm in size) indicate layered texture in carbonate minerals (ca. 0.1 - 0.2mm in size) - euhedral biotite (up to 0.3 x 0.2mm in size) - massive fluorite assemblage. Some

- of hematite and goethite show cubeshaped forms (up to 0.4 x 0.4mm in size) probably indicating pseudomorphs of pyrite.
- BRL-3-C: carbonatite (ferrocarbonatite ?)**
Anhedral carbonate minerals (ca. 0.3mm in size), fluorite, goethite and hematite are predominant. Anhedral magnetite grains (up to 0.04 x 0.02mm in size) occur in hematite. Hematite - goethite veins (ca. 0.4mm in width) are present.
- BRL-3-E: carbonatite**
Carbonate minerals (ca. 0.3 x 0.3mm in size) and aggregates of fine - grained goethite and hematite are predominant. Small amounts of massive smectite and chalcedonic quartz are also present.
- BRL-3-F: carbonatite**
Carbonate minerals (up to 0.4 x 0.5mm in size) and aggregates of psilomelane and manganese are predominant. Subhedral to anhedral pyrolusite grains (ca. 0.2 x 0.1mm in size), euhedral to subhedral magnetite grains (ca. 0.02 - 0.04mm in size), anhedral K - feldspar (up to 0.8 x 0.5mm in size) and fluorite are also constituents.
- BRL-3-G: carbonatite (alvikite ?)**
It consists mainly of carbonate minerals (ca. 0.4 x 0.4mm in size), fluorite, pyrite, hematite and goethite. Pyrite and marcasite occur as pseudomorphs of prismatic crystals (ca. 0.6 x 0.2mm in size). Aggregates of galena cubes (up to 0.15 x 0.15mm in size) are associated with hematite. Euhedral to subhedral pyrochlore grains (ca. 0.2 x 0.2mm in size) are present.
- BRL-3-J: brecciated carbonatite (alvikite ?)**
This rock is brecciated. Carbonate minerals (euhedral crystals up to 0.4 x 0.3mm in size, but fine - grained aggregates are predominant) and less amounts of smectite, K - feldspar and fluorite are main constituents. Isolated euhedral crystals of pyrite (up to 0.04 x 0.04mm in size) are rarely present.
- KG-2-C: carbonatite (carbonatized phonolite ?)**
It is composed of anhedral carbonate minerals, fluorite, massive smectite, chalcedonic quartz, cube - shaped hematite (up to 0.8 x 0.8mm in size, probably as pseudomorphs of pyrite), goethite, lepidocrocite and fine - grained magnetite (up to 0.01 x 0.01mm in size). Carbonate minerals occur as replacement products of phenocrysts, veinlets, networks and irregular interspaces.
- KG-3-B: carbonatite (ferrocarbonatite ?)**
Euhedral to subhedral magnetite (up to 0.4 x 0.3mm in size) are replaced by hematite along the rims and cracks. Carbonate minerals and fluorite occur as irregular interspaces of magnetite, hematite, goethite and lepidocrocite.
- KG-3-C: carbonatite (ferrocarbonatite ?)**
Magnetite occurs in cores of hematite grains (cube - shaped, up to 0.5 x 0.4mm in size). Aggregates of cube - shaped hematite and goethite are also present. These observations suggest that pyrite was originally formed, but replaced by magnetite, and magnetite was replaced by hematite, goethite and lepidocrocite.
Sequence of formation of these opaque minerals is estimated: pyrite → magnetite → hematite → goethite + lepidocrocite. Carbonate minerals, rounded fluorite grains (up to 0.2mm in diameter) and chalcedonic quartz occur as irregular interspaces.
- KG-4-A: Fe ore**
Aggregates of goethite, hematite and lepidocrocite and aggregates of fine - grained carbonate minerals are predominant. Magnetite (up to 0.5 x 0.5mm in size) occurs in cores of hematite. Euhedral pyrochlore (up to 0.5 x 0.5mm in size) is present. Aggregates of fine - grained bastnaesite, euhedral biotite grains (up to 0.4 x 0.2mm in size) and massive fluorite are also present.
- KG-4-C: Fe ore**
It is composed of aggregates of goethite, hematite and lepidocrocite (totally up to 0.6 x 0.6mm in size, but each grain size is ca. 0.08 - 0.1 mm), and interstitial carbonate minerals and fluorite.

Apx. 7 Results of Whole Rock Analysis of Carbonatites and Related Rocks

SAMPLE DESCRIPTION	SiO ₂ %	Al ₂ O ₃ %	Fe ₂ O ₃ %	MgO %	CaO %	Na ₂ O %	K ₂ O %	TiO ₂ %	P ₂ O ₅ %	MnO %	BaO %	LOI %	TOTAL %	F %	CO ₂ %	FeO %
BR-17-A	4.67	1.24	63.64	0.19	6.71	0.17	0.20	0.12	0.18	6.36	1.84	12.62	97.95	4.58	0.5	0.08
BR-17-B	1.52	1.32	67.12	0.36	0.43	0.07	0.19	0.01	0.32	15.23	1.56	10.67	98.81	0.27	< 0.2	0.06
BR-18-B	40.17	10.31	24.21	0.17	0.61	0.30	8.89	0.49	0.30	3.27	3.33	5.91	97.97	0.23	< 0.2	0.09
BR-18-D	44.78	5.81	28.67	0.23	0.48	0.21	4.40	0.46	0.88	2.54	2.56	6.48	97.50	< 0.10	0.6	0.11
BR-21-A	11.18	1.82	43.15	0.37	7.12	0.17	1.03	0.11	0.38	10.27	8.13	15.76	99.50	4.58	< 0.2	0.09
BR-24-B	4.47	0.50	51.17	0.48	8.17	0.10	0.18	0.09	0.16	12.92	4.41	14.65	97.30	5.34	0.7	0.06
BRL-2-B	4.05	1.09	44.26	0.16	17.02	0.13	0.34	0.66	0.35	3.54	6.18	13.71	91.47	10.90	< 0.2	0.08
BRL-2-C	1.92	1.26	61.63	0.37	4.61	0.07	0.18	1.02	0.16	11.70	1.65	11.85	96.42	3.36	0.3	0.08
BRL-2-E	2.50	0.93	51.98	0.47	5.98	0.09	0.36	0.66	0.61	12.11	6.70	11.60	93.97	4.58	0.5	0.06
BRL-3-H	14.70	3.29	27.45	1.54	10.76	0.64	1.90	0.47	0.85	6.48	9.16	17.61	94.85	3.36	12.0	0.07
KG-3-D	4.37	1.15	27.26	1.01	25.80	0.09	0.72	0.27	0.24	4.06	5.21	24.66	94.85	0.61	22.1	0.05
KG-3-E	4.17	1.02	27.35	0.78	25.37	0.09	0.59	0.15	0.91	5.46	2.93	26.12	94.94	0.34	20.9	0.05

Description of samples

- BR-17-A Weathered brown amorphous iron ore
- BR-17-B Weathered black porous MN-Fe ore
- BR-18-B Weathered brecciated granitic gneiss cemented by goethite rich matrix
- BR-18-D Strongly brecciated gneiss filled with khaki goethite rich matrix
- BR-21-A Weathered brown iron ore (possibly ferrocarbonatite dyke)
- BR-24-B Weathered dark brown porous ferrocarbonatite
- BRL-2-B Laterite (weathered fine porous carbonatite)
- BRL-2-C Weathered fine porous ore (MN-Fe ore)
- BRL-2-E Weathered black porous MN-Fe Ore
- BRL-3-H Fresh pale grey carbonatite breccia rich in chlorite matrix
- KG-3-D Pale grey slightly banded carbonatite (transitional facies to ferrocarb.
- KG-3-E Brown massive ferrocarbonatite

Apx. 8 Summary of EPMA Test-1, Mineral List Identified by Qualitative Analysis

Sample Number	Depth(m)	Rock Type	Constituents of Minerals		
			Major	Common	Rare
BRL-2-F	83.50	Carbonatite	Cal, Mn-Sid,	Ba,	Pyc, Py, Sp, Bst, Ap, Phl,
BRL-3-B	10.75	Carbonatite	Cal, Mn-Sid, Goe	Hem, Ba, Sd, Ap,	Pyc, Ply, Bst,
BRL-3-D	30.30	Carbonatite	Cal, Mn-Sid, Goe	Flu, Ba, Hem,	Ran, REE-Carb,
BR-17-D	50.00	Carbonatite	Flu, Goe,	Ba, Ap. Ran	
BR-24-A	34.50	Ferrocarnonatite	Hem, Mn-Sid, Cal, Goe,	Flu,	Pyc, Ran, Bst
BR-24-E	48.30	Carbonatite	Cal, Mn-Sid, Hem	Ba, Ank, Phl,	Ga
KG-2-A	5.00	Ferrocarnonatite	Mn-Sid, Hem,	Ran, Bar, Goe, Phl,	Pyc, Bst
KG-3-A	5.30	Carbonatite	Cal, Hem, Goe,	Ba, Bst, Phl,	Ran
KG-5-B	29.40	Ferrocarnonatite	Cal, Mn-Sid, Hem,	Goe, Ba, Ran,	Phl
KG-6-A	12.80	Ferrocarnonatite	Cal. Mn-Sid, Hem, Ap	Ba, Goe, Phl,	

Abbreviations

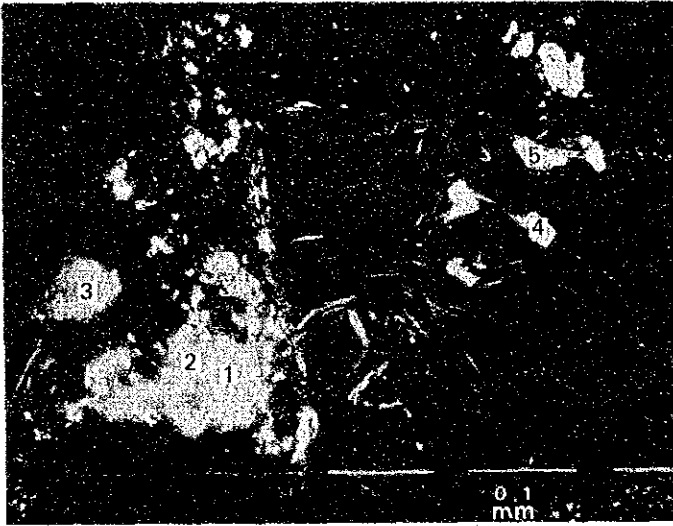
Cal; calcite, Mn-Sid; Mn-rich siderite, Ba; barite, Pyc; pyrochlore, Py; pyrite,
 Sp; sphalerite, Bst; bastnaesite, Ap; apatite, Phl; phlogopite, Goe; goethite,
 Hem; hematite, Mn-Sid; Mn rich siderite, Flu; flourite, Ran; rancieite (Ba-rich), REE-Carb;
 Ree-rich carbonate, Ank; ankerite, Ga; galena,

Apx. 9 Summary of EPMA Test-2, Quantitative Analysis of Minerals

Sample Number	Minerals	Components	Results(weight %)			Average	
BR-2-F	Barite	BaO	1	2	3	66.47	
		SO ₃	66.65	66.17	66.58	66.47	
		CaO	33.25	31.74	32.89	32.63	
Fe ₂ O ₃		0.24	0.18	0.18	0.20		
SrO		0.02	0.10	0.18	0.10		
Total	101.39	98.61	99.88	99.96			
Pyrochlore	Nb ₂ O ₅	4	5	6	65.18		
	Ta ₂ O ₅	65.50	65.65	65.39	65.18		
	TiO ₂	6.89	6.41	6.92	6.74		
	Fe ₂ O ₃	2.91	2.72	2.67	2.77		
	CaO	1.95	1.39	1.00	1.45		
	Na ₂ O	11.12	11.37	11.09	11.19		
	MnO	11.36	11.10	11.86	11.44		
	Total	98.73	98.64	98.93	98.77		
Bastnaesite	CaO	7	8	9	27.52		
	La ₂ O ₃	29.47	26.02	27.06	27.52		
	Nb ₂ O ₅	24.06	21.39	22.10	22.52		
	SrO	5.93	5.92	5.87	5.91		
	CaO	2.55	1.86	2.56	2.31		
	Fe ₂ O ₃	6.27	6.03	6.09	6.13		
	Fe ₂ O ₃	1.10	5.33	1.27	2.57		
	MnO	0.12	0.31	0.10	0.18		
	Total	69.50	66.86	65.05	67.14		
	BR-2-E	Barite	BaO	1	2	3	66.55
SO ₃			67.07	66.06	66.51	66.55	
CaO			33.20	33.24	33.72	33.39	
Fe ₂ O ₃			0.47	0.23	0.08	0.26	
SrO			0.34	0.51	0.69	0.51	
Total	101.58	100.25	101.39	101.07			
Pyrochlore	Nb ₂ O ₅	1	2	3	66.72		
	Ta ₂ O ₅	66.67	66.10	67.40	66.72		
	TiO ₂	6.13	6.46	5.91	6.17		
	Fe ₂ O ₃	3.92	4.08	4.25	4.08		
	CaO	0.57	0.78	0.57	0.64		
	Na ₂ O	13.84	13.74	14.37	13.98		
	MnO	6.97	8.01	7.80	7.59		
	Total	98.19	99.22	100.50	99.30		
	BR-3-B	Barite	BaO	1	2	3	66.04
			SO ₃	67.05	65.55	65.51	66.04
CaO			34.65	33.74	33.10	33.83	
Fe ₂ O ₃			0.34	0.48	0.47	0.43	
SrO			0.03	0.00	0.04	0.02	
Total	102.38	100.06	99.37	100.60			
Pyrochlore	Nb ₂ O ₅	4	5	6	65.34		
	Ta ₂ O ₅	65.17	66.03	64.82	65.34		
	TiO ₂	7.30	6.63	7.52	7.15		
	Fe ₂ O ₃	3.56	3.49	3.66	3.57		
	MnO	1.10	0.70	0.51	0.77		
	CaO	0.43	0.60	0.16	0.40		
	Na ₂ O	11.96	11.98	12.33	12.09		
	MnO	9.48	8.94	9.10	9.17		
	Total	99.00	98.37	98.10	98.47		
	BR-3-D	Barite	BaO	1	2	3	66.48
SO ₃			67.04	65.90	66.50	66.48	
CaO			32.98	33.76	33.23	33.32	
Fe ₂ O ₃			0.01	0.19	0.18	0.13	
SrO			0.00	0.00	0.00	0.00	
Total	100.23	101.25	100.65	100.71			
REE-rich Carbonate Mineral	CaO	4	5	6	11.92		
	La ₂ O ₃	11.76	12.70	11.29	11.92		
	Nb ₂ O ₅	6.15	7.07	6.47	6.56		
	BaO	7.51	6.61	6.27	6.80		
	SrO	4.44	4.41	6.34	5.06		
	CaO	0.95	1.21	1.16	1.11		
	Fe ₂ O ₃	8.52	8.63	7.56	8.24		
	Fe ₂ O ₃	3.56	1.62	1.98	2.39		
	MnO	25.70	25.05	20.23	23.66		
	Total	68.59	67.30	61.30	65.73		
	BR-17-D	Rancieite	BaO	1	2	3	15.85
			SO ₃	16.33	15.91	15.32	15.85
			CaO	0.06	0.44	0.26	0.25
Fe ₂ O ₃			0.84	0.61	1.16	0.87	
SrO			2.05	1.88	2.24	2.06	
Total	59.21	59.05	58.53	59.20			
BR-17-D	Barite	BaO	4	5	6	66.78	
		SO ₃	66.02	67.07	67.25	66.78	
		CaO	32.47	33.19	32.99	32.88	
		Fe ₂ O ₃	0.02	0.40	0.25	0.67	
		SrO	0.00	0.21	0.00	0.22	
Total	98.54	101.57	100.49	100.30			
BR-24-A	Pyrochlore	Nb ₂ O ₅	1	2	3	66.53	
		Ta ₂ O ₅	67.18	66.12	66.29	66.53	
		TiO ₂	10.66	10.01	9.54	10.07	
		Fe ₂ O ₃	4.85	4.16	4.40	4.47	
		CaO	1.84	1.06	1.19	1.63	
	Na ₂ O	11.85	11.54	11.86	11.74		
	MnO	3.39	1.86	2.26	2.50		
	Total	99.93	95.95	95.70	97.20		
	Rancieite	BaO	4	5	6	15.73	
		CaO	15.64	15.52	16.03	15.73	
Fe ₂ O ₃		4.81	4.66	5.02	4.83		
SrO		3.53	4.60	3.31	3.81		
Total		39.60	38.25	39.21	39.02		
BR-24-A	Rancieite	BaO	1	2	3	66.36	
		SO ₃	66.83	65.95	66.29	66.36	
		CaO	33.54	33.39	33.57	33.50	
		Fe ₂ O ₃	0.12	0.12	0.26	0.17	
		SrO	0.10	0.05	0.06	0.07	
Total	100.92	100.10	100.73	100.58			
BR-24-A	Rancieite	MnO	4	5	6	58.01	
		BaO	58.74	58.64	58.64	58.01	
		Fe ₂ O ₃	13.70	14.20	14.24	14.24	
		CaO	3.74	4.20	5.18	4.37	
		SrO	0.78	0.69	1.01	0.83	
Total	77.66	78.69	80.31	78.95			
BR-24-A	Rancieite	BaO	1	2	3	66.36	
		SO ₃	66.83	65.95	66.29	66.36	
		CaO	33.54	33.39	33.57	33.50	
		Fe ₂ O ₃	0.12	0.12	0.26	0.17	
		SrO	0.10	0.05	0.06	0.07	
Total	100.92	100.10	100.73	100.58			

* Numbers on analytical results show analysed points in X-ray Images

Apx. 10 SEM Images of Minerals (EPMA Test) (1)



Sample No.; BRL-2-F
Depth; 83.50m
Rock type; Carbonatite
Mineral name;
Barite: 1.2.3
Pyrochlore: 4.5

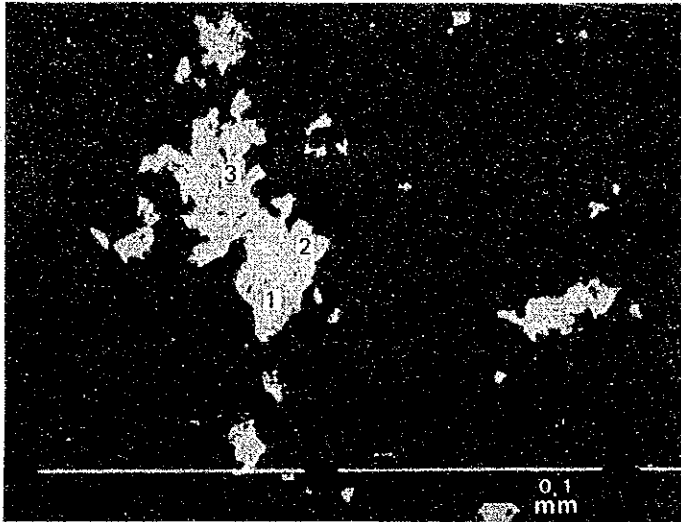


Sample No.; BRL-2-F
Depth; 83.50m
Rock type; Carbonatite
Mineral name;
Pyrochlore: 6

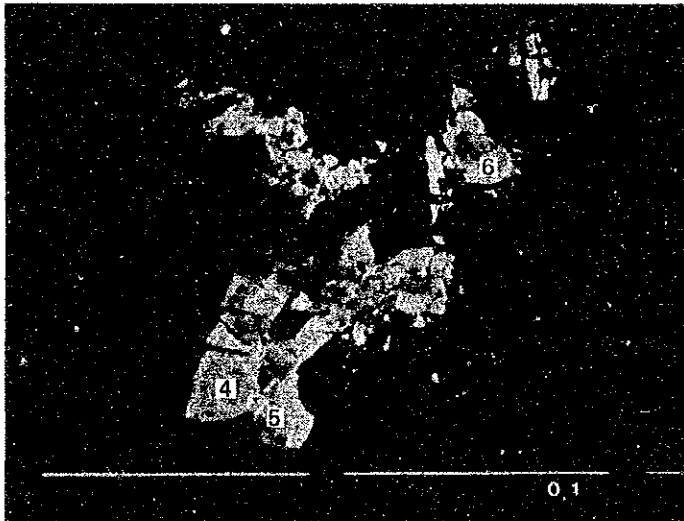


Sample No.; BRL-2-F
Depth; 83.50m
Rock type; Carbonatite
Mineral name;
Bastnaesite: 7.8.9

Apx. 10 SEM Images of Minerals (EPMA Test) (2)

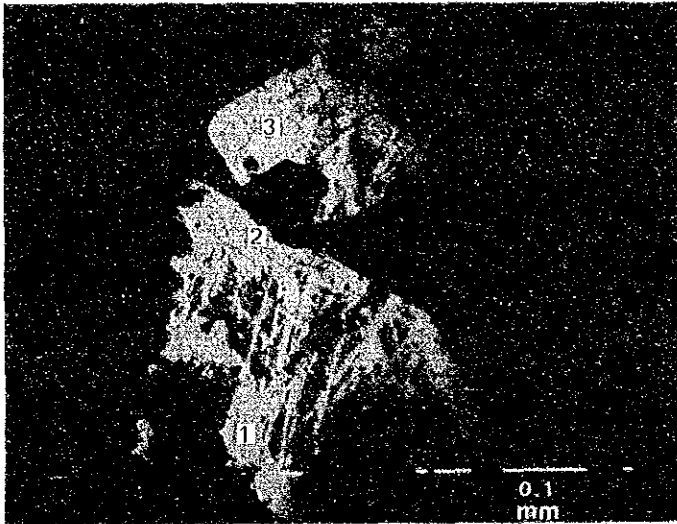


Sample No.; BRL-3-B
Depth; 10.75m
Rock type; Carbonatite
Mineral name;
Barite: 1.2.3

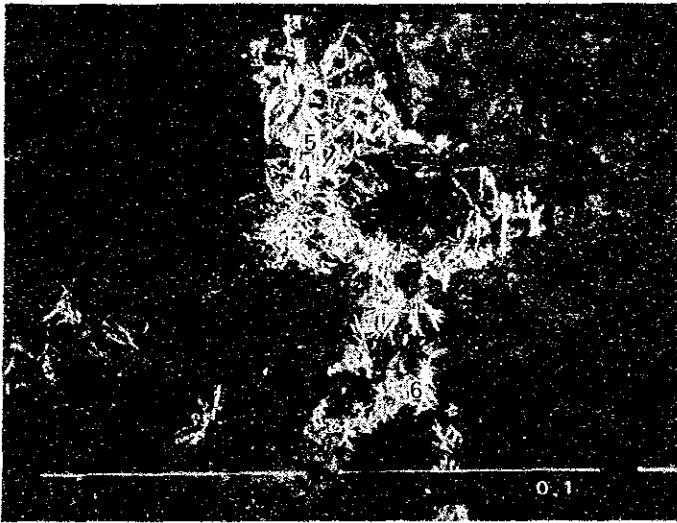


Sample No.; BRL-3-B
Depth; 10.75m
Rock type; Carbonatite
Mineral name;
Pyrochlore: 4.5.6

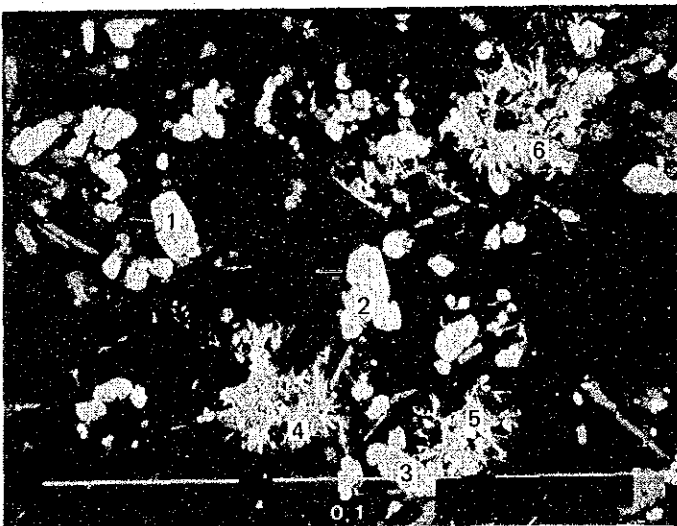
Apx. 10 SEM Images of Minerals (EPMA Test) (3)



Sample No.; BRL-3-D
Depth; 30.30m
Rock type; Carbonatite
Mineral name;
Barite: 1.2.3

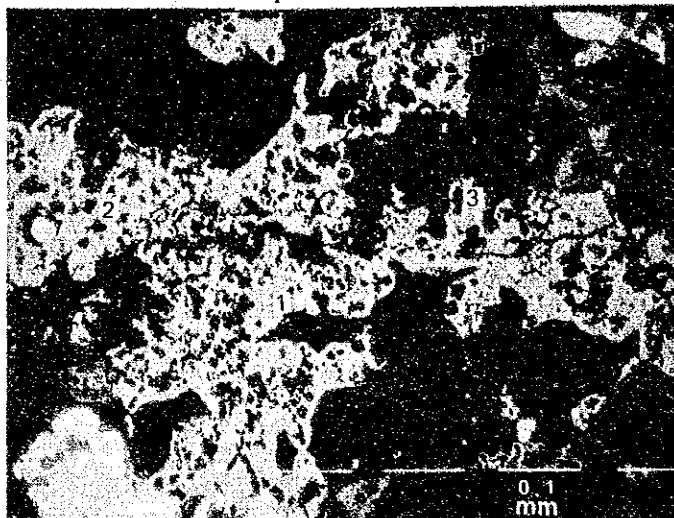


Sample No.; BRL-3-D
Depth; 30.30m
Rock type; Carbonatite
Mineral name;
REE-rich carbonate mineral:
4.5.6

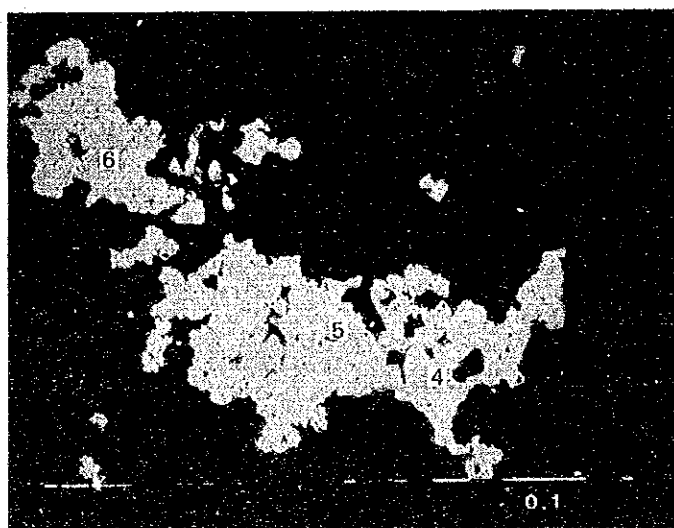


Sample No.; KG-3-A
Depth; 5.30m
Rock type; Carbonatite
Mineral name;
Barite: 1.2.3
Bastnaesite: 4.5.6

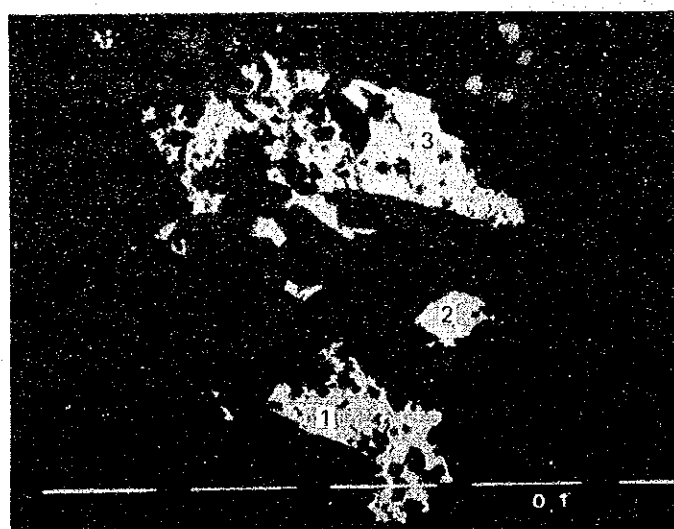
Apx. 10 SEM Images of Minerals (EPMA Test) (4)



Sample No.; BR-17-D
Depth; 50.00m
Rock type; Carbonatite
Mineral name;
Rancieite: 1.2.3

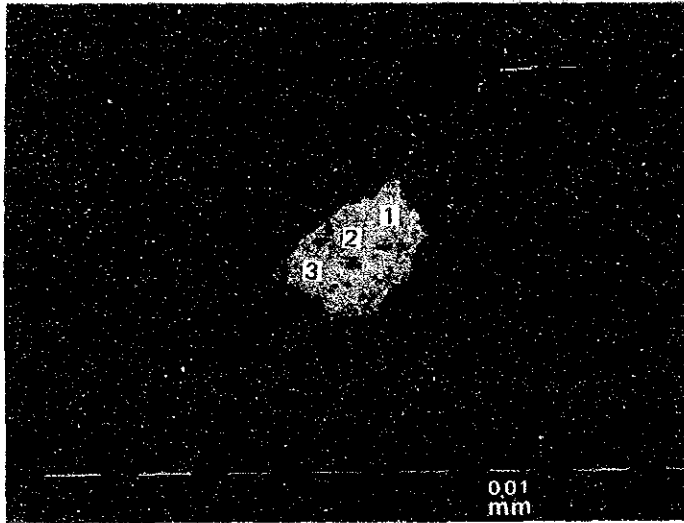


Sample No.; BR-17-D
Depth; 50.00m
Rock type; Carbonatite
Mineral name;
Barite: 4.5.6

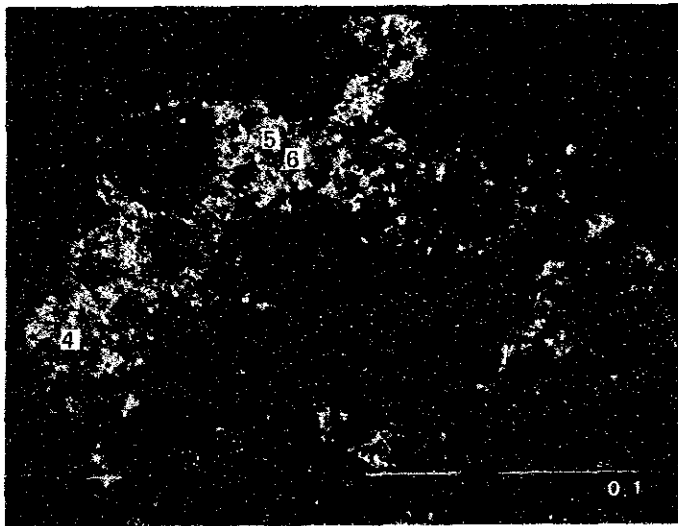


Sample No.; BR-24-E
Depth; 48.30m
Rock type; Carbonatite
Mineral name;
Barite: 1.2.3

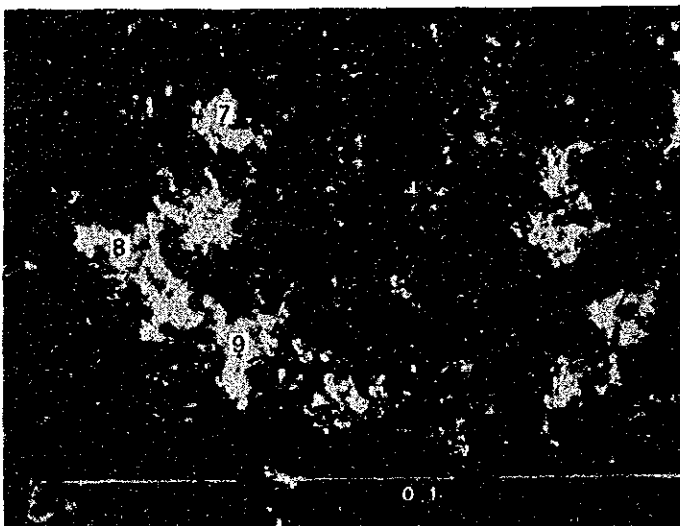
Apx. 10 SEM Images of Minerals (EPMA Test) (5)



Sample No.; BR-24-A
Depth; 34.50m
Rock type; Ferrocarnonatite
Mineral name;
Pyrochlore: 1.2.3

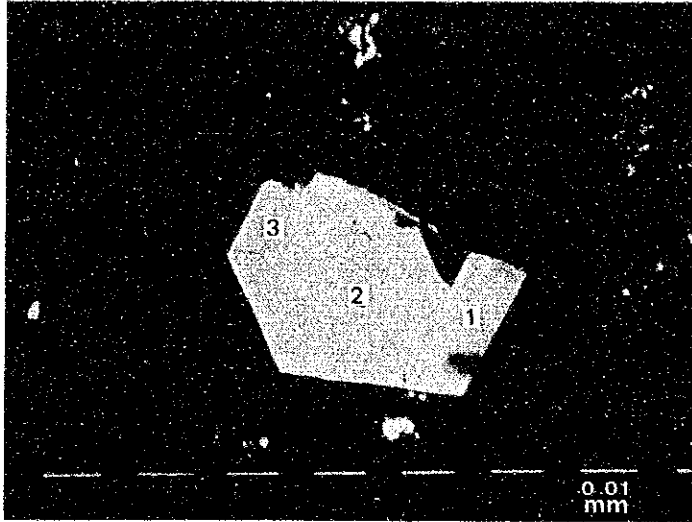


Sample No.; BR-24-A
Depth; 34.50m
Rock type; Ferrocarnonatite
Mineral name;
Rancieite: 4.5.6

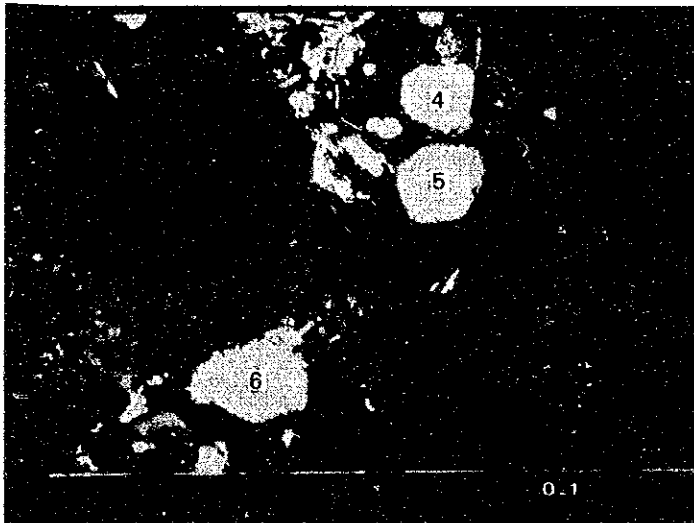


Sample No.; BR-24-A
Depth; 34.50m
Rock type; Ferrocarnonatite
Mineral name;
Bastnaesite: 7.8.9

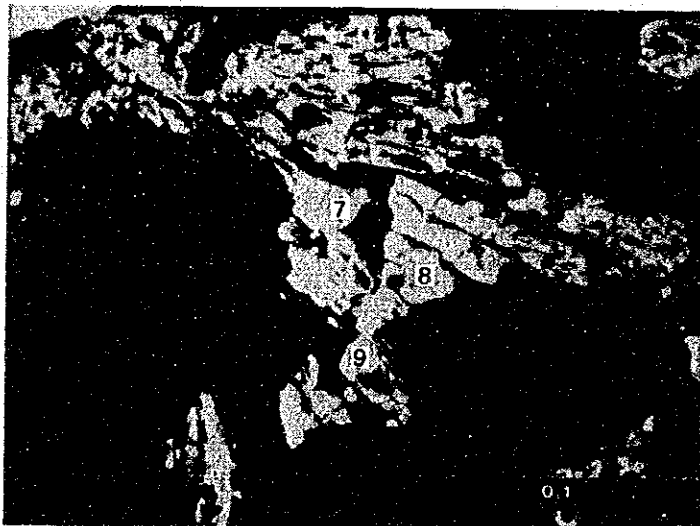
Apx. 10 SEM Images of Minerals (EPMA Test) (6)



Sample No.; KG-2-A
Depth; 5.00m
Rock type; Ferrocarnonatite
Mineral name;
Pyrochlore: 1.2.3

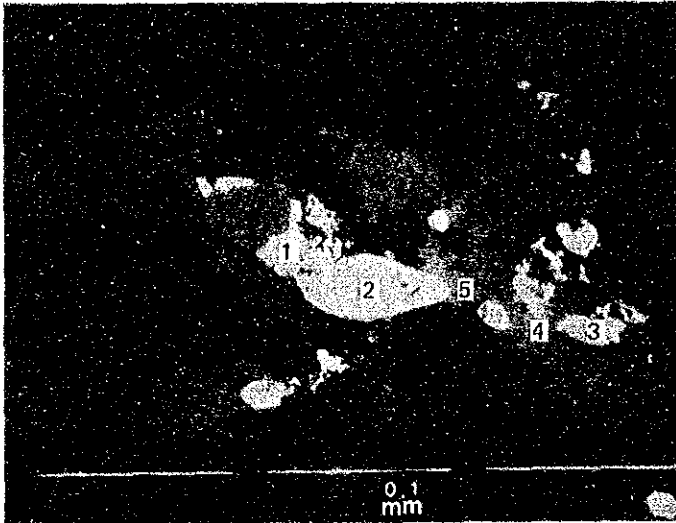


Sample No.; KG-2-A
Depth: 5.00m
Rock type; Ferrocarnonatite
Mineral name
Rancieite: 4.5.6

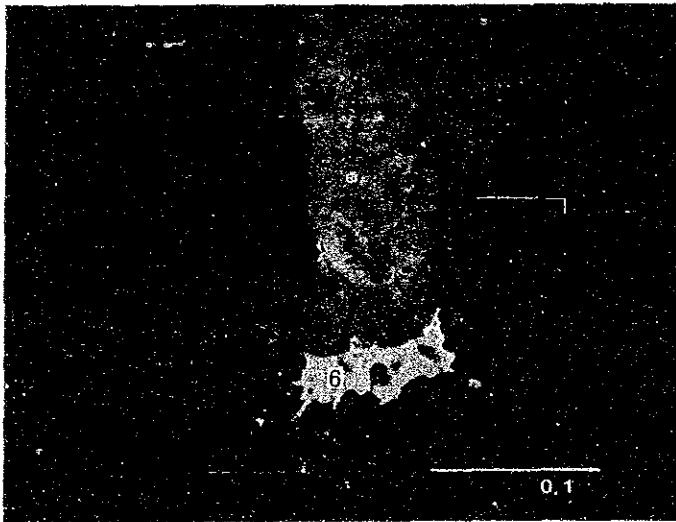


Sample No.; KG-2-A
Depth; 5.00m
Rock type; Ferrocarnonatite
Mineral name;
Bastnaesite; 7.8.9

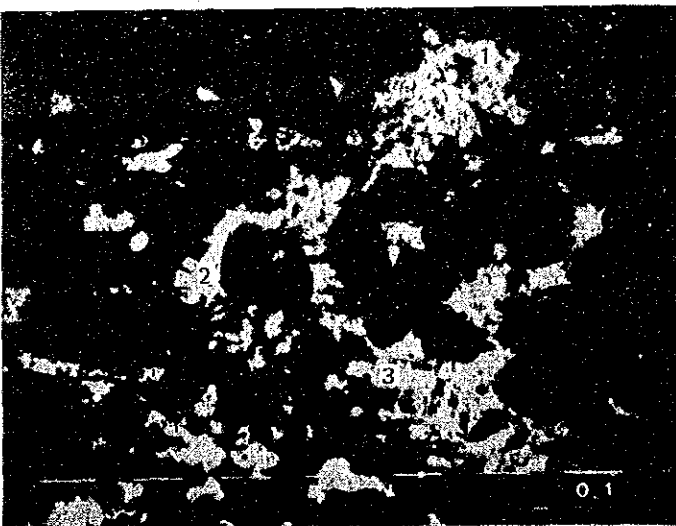
Apx. 10 SEM Images of Minerals (EPMA Test) (7)



Sample No.; KG-5-B
Depth; 29.40m
Rock type; Ferrocarbonatite
Mineral name
Barite: 1.2.3
Rancieite: 4.5



Sample No.; KG-5-B
Depth; 29.40m
Rock type; Ferrocarbonatite
Mineral name;
Rancieite: 6



Sample No.; KG-6-A
Depth; 12.80m
Rock type; Ferrocarbonatite
Mineral name;
Barite: 1.2.3

Ap. 11 Results of Measurement of Size of Rare Earth Minerals

Sample description			Size of measured bastonosite*			
Sample No.	Depth(m)	Type of ore	Maximum (mm)	Minimum (mm)	Number of grains	Average size (mm)
BRL-1-M	198.0	Fe-carb	0.06	0.01	15	0.027
BRL-2-M	42.3	Mn-Fe ore	0.04	0.01	9	0.020
BRL-2-N	75.0	Carbonatite	0.20	0.01	22	0.053
BRL-2-O	83.5	Carbonatite	0.10	0.01	15	0.10
BRL-3-M	12.7	Fe-carb	0.04	0.005	19	0.025
BR-4-M	9.6	Silic ore	0.02	0.01	10	0.015
BR-10-M	31.8	Ca-Fe ore	0.04	0.01	9	0.022
BR-17-M	45.4	Mn-Fe ore	0.50	0.01	15	0.14
BR-21-M	13.0	Silic ore	0.20	0.01	20	0.046
BR-24-M	35.8	Ca-Fe ore	0.10	0.01	18	0.034

* Measurement: by microscopic observation

Abbreviations

Fe-carb : Ferrocyanatite
Mn-Fe ore: Manganiferous iron ore
Silic ore: Siliceous ore
Ca-Fe ore: Calcareous iron ore

Apx. 12 Results of Analysis of Ore Minerals

Sample number	Depth	Type of ore	ThO ₂ %	P ₂ O ₅ %	Ba NAA %	Sr %	Ce NAA %	La NAA %	Nd NAA %	Nb %	Y ₂ O ₃ %
BRL-1-M	198.0	Fe-carb	0.036	6.74	2.52	1.79	0.78	0.740	0.08	0.028	0.031
BRL-2-M	42.3	Mn-Fe ore	0.084	0.24	2.16	0.18	0.23	0.091	0.10	0.026	0.022
BRL-2-N	75.0	Carbonatite	0.060	0.30	7.54	0.35	0.59	0.390	0.08	0.170	0.018
BRL-2-O	83.5	Carbonatite	0.023	0.09	2.03	0.08	0.10	0.090	0.01	0.040	0.003
BRL-3-M	12.7	Fe-carb	0.073	1.29	3.63	0.20	0.88	0.490	0.13	0.096	0.035
BR-4-M	9.6	Silic ore	0.028	0.52	5.18	0.10	0.55	0.490	0.12	0.046	0.036
BR-10-M	31.8	Ca-Fe ore	0.069	0.70	9.69	0.21	1.38	1.040	0.18	0.053	0.046
BR-17-M	45.4	Mn-Fe ore	0.071	0.28	2.18	0.06	0.23	0.081	0.08	0.004	0.025
BR-21-M	13.0	Silic ore	0.037	0.14	3.59	0.04	0.04	0.021	0.01	0.003	0.008
BR-24-M	35.8	Ca-Fe ore	0.055	0.19	2.07	0.07	0.30	0.100	0.09	0.045	0.016

Sample number	Depth	Type of ore	Sm NAA ppm	Lu NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	U NAA ppm
BRL-1-M	198.0	Fe-carb	131.0	5.1	29.0	33.9	10.1	39.0
BRL-2-M	42.3	Mn-Fe ore	221	3.5	48.5	23.5	11.0	28.0
BRL-2-N	75.0	Carbonatite	112.0	2.0	29.0	9.4	13.2	23.0
BRL-2-O	83.5	Carbonatite	15.7	0.2	6.2	1.1	1.1	3.0
BRL-3-M	12.7	Fe-carb	191.0	4.2	48.0	26.4	14.0	24.0
BR-4-M	9.6	Silic ore	169.0	2.4	43.0	23.5	16.4	23.0
BR-10-M	31.8	Ca-Fe Ore	193.0	5.0	51.2	36.1	14.7	24.0
BR-17-M	45.4	Mn-Fe ore	89.9	1.6	26.7	9.0	8.6	14.0
BR-21-M	13.0	Silic ore	85.8	1.4	23.6	7.7	4.8	2.0
BR-24-M	35.8	Ca-Fe ore	31.7	1.8	7.1	8.9	2.6	35.0

Abbreviations

- Fe-carb: Ferocarbonatite
- Mn-Fe ore: Manganiferous iron ore
- Silic ore: Siliceous ore
- Ca-Fe ore: Calcareous iron ore

Apex 13 Results of Chemical Analysis of Drill Core Samples, Buru Hill Area (1)

SAMPLE NUMBER	DEPTH OF SAMPLE (#)	WIDTH (#)	ROCK TYPE	Sm NAA ppm	La NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	Th NAA ppm	U NAA ppm	Ba NAA %	Ce NAA %	La NAA %	Nd NAA %	P ppm (ICP)	Sr ppm (ICP)	Nb-XRF ppm	Y (ORF) ppm
BRL-2-01	0.00	0.45	0.45	235	5.0	81.5	29.8	25.1	834.0	15.4	3.65	0.83	0.550	0.26	1055	2080	650	750
BRL-2-02	0.45	4.50	4.05	190.0	1.6	91.7	14.7	13.7	644.0	10.4	3.01	0.51	0.200	0.20	1290	2340	400	350
BRL-2-03	4.50	9.00	4.50	215	2.8	75.4	18.2	20.6	846.0	10.2	4.75	0.58	0.340	0.23	1120	3250	600	430
BRL-2-04	9.00	11.25	2.25	249	3.3	83.5	20.9	26.8	989.0	11.5	4.28	0.66	0.310	0.24	1290	3890	785	570
BRL-2-05	11.25	16.20	4.95	233	3.3	94.1	24.1	29.1	1051.0	19.8	4.63	0.74	0.420	0.25	1395	2770	1340	690
BRL-2-06	16.20	19.70	3.50	263	3.3	102.5	24.3	34.0	1166.0	57.4	7.09	1.39	0.880	0.40	1360	2600	1490	710
BRL-2-07	19.70	23.40	3.70	237	2.5	95.7	14.7	27.2	1103.0	172.5	4.10	1.06	0.640	0.37	1305	1160	1550	530
BRL-2-08	23.40	27.65	4.25	260	2.3	91.4	11.4	18.2	1117.0	180.0	3.41	0.78	0.640	0.29	1175	883	595	330
BRL-2-09	27.65	28.90	1.25	274	2.2	85.0	14.4	24.2	1061.0	147.0	1.91	0.76	0.480	0.27	1305	635	1360	480
BRL-2-10	28.90	30.40	1.50	221	3.2	81.2	20.5	35.6	961.0	171.0	3.84	0.75	0.490	0.24	1235	1540	875	600
BRL-2-11	30.40	32.70	2.30	236	3.7	80.7	14.6	28.9	1257.0	170.0	2.48	0.91	0.650	0.27	2030	1030	1460	390
BRL-2-12	32.70	35.50	2.80	295	3.6	95.3	19.6	24.0	1405.0	154.0	3.20	0.92	0.580	0.30	2270	2010	1585	520
BRL-2-13	35.50	39.30	3.80	343	3.8	127.0	21.5	26.3	1439.0	119.5	2.23	0.82	0.410	0.30	3240	1725	1475	770
BRL-2-14	39.30	43.50	4.20	352	4.7	128.0	28.2	35.7	1749.0	171.7	3.10	0.89	0.450	0.35	1635	1165	310	750
BRL-2-15	43.50	47.60	4.10	265	2.9	86.6	21.7	16.9	1192.0	69.0	3.67	0.63	0.250	0.29	1270	1505	400	450
BRL-2-16	48.10	49.65	1.55	241	3.7	89.6	20.2	14.3	1004.0	88.0	6.17	0.92	0.500	0.32	1130	1755	745	410
BRL-2-17	49.65	51.00	1.35	213	2.9	77.9	11.8	24.3	1011.0	73.0	3.35	1.06	0.500	0.32	1375	2090	395	400
BRL-2-18	51.00	53.75	2.75	252	4.0	106.0	11.2	29.4	1684.0	96.4	4.16	1.23	0.890	0.27	2610	2580	395	440
BRL-2-19	53.75	57.00	3.25	276	3.9	159.0	6.2	20.8	1413.0	170.0	5.82	2.24	2.04	0.39	4600	2810	810	410
BRL-2-20	57.00	60.70	3.70	205	4.1	97.9	20.9	25.1	1154.0	115.5	4.29	1.20	1.000	0.24	2750	2730	1900	640
BRL-2-21	60.70	64.50	3.80	232	4.4	93.3	21.5	25.2	1092.0	70.4	3.48	1.01	0.710	0.26	2130	1845	990	700
BRL-2-22	64.50	67.70	3.20	184.0	4.4	83.7	22.7	27.7	915.0	49.4	3.73	0.55	0.330	0.16	1870	2180	920	670
BRL-2-23	67.70	69.00	1.30	194	12.0	198.0	57.1	77.6	1699.0	114.5	2.15	0.82	0.360	0.27	4860	1365	4450	1650
BRL-2-24	69.00	73.50	4.50	195.0	3.4	86.9	22.7	28.9	810.0	31.2	2.13	0.62	0.490	0.17	630	1600	960	690
BRL-2-25	73.50	77.70	4.40	244	3.9	94.7	20.1	30.9	918.0	29.0	2.66	0.85	0.660	0.21	550	2370	1300	540
BRL-2-26	77.70	79.05	1.35	172.0	4.0	78.9	19.8	33.0	566.0	31.2	2.03	0.59	0.440	0.14	396	1965	1200	630
BRL-2-27	79.05	81.55	2.50	144.0	2.4	58.7	12.1	13.6	481.0	33.2	1.36	0.40	0.260	0.12	878	1455	1800	310
BRL-2-28	81.55	85.00	3.45	149.0	4.1	61.7	19.5	23.7	622.0	23.0	2.06	0.73	0.640	0.15	433	2070	1700	320
BRL-2-29	85.00	89.50	4.50	197.0	2.7	41.7	18.8	16.8	375.0	19.5	1.00	0.33	0.300	0.07	592	2360	1000	500
BRL-2-30	91.40	95.50	3.90	150.0	5.3	57.4	29.0	17.7	509.0	17.6	2.56	0.85	0.580	0.19	1855	3330	730	630
BRL-3-01	98.30	98.55	0.25	161.0	3.2	35.3	13.9	3.2	437.0	13.8	1.74	0.80	0.540	0.20	733	3510	125	310
BRL-3-02	0.00	3.00	3.00	213	0.4	77.8	35.8	25.5	631.0	30.8	5.81	1.35	1.330	0.26	21300	2780	1150	670
BRL-3-03	3.00	5.50	2.50	238	4.9	85.4	30.9	26.7	694.0	30.5	5.73	1.22	1.170	0.26	9060	1750	1200	680
BRL-3-04	5.50	7.00	1.50	179.0	5.6	67.6	32.3	23.1	607.0	21.9	3.18	0.79	0.660	0.18	2020	3260	1400	620
BRL-3-05	7.00	11.95	4.95	171.0	4.8	59.5	33.5	18.5	541.0	13.0	3.88	1.07	0.970	0.21	11370	2690	1500	520
BRL-3-06	11.95	15.30	3.35	177.0	3.4	58.5	20.6	12.5	741.0	13.4	3.13	0.94	0.730	0.21	5180	1640	830	440
BRL-3-07	15.30	18.80	3.50	197.0	6.4	72.3	36.9	20.1	704.0	16.8	4.57	1.06	0.980	0.22	2400	2190	740	630
BRL-3-08	18.80	22.40	3.60	171.0	5.5	58.4	30.6	17.3	765.0	19.3	3.61	1.20	1.210	0.22	7890	2770	960	540
BRL-3-09	22.40	23.50	1.10	196.0	6.0	78.9	25.8	4.1	649.0	23.6	5.66	2.04	2.26	0.31	11470	3800	540	540
BRL-3-10	23.50	25.50	2.20	163.0	4.7	51.4	28.5	13.2	471.0	20.2	5.30	1.53	1.660	0.25	12180	2930	425	480

Apx. 13 Results of Chemical Analysis of Drill Core Samples, Buru Hill Area (2)

SAMPLE NUMBER	DEPTH OF SAMPLI (m)	WIDTH (m)	ROCK TYPE	Sm NAA ppm	Lu NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	Th NAA ppm	U NAA ppm	Ba NAA %	Ce NAA %	La NAA %	Nd NAA %	P (ICP) ppm	Sr ppm (ICP)	Nb-XRF ppm	Y (XRF) ppm
BRL-3-10	25.50 - 29.10	3.60	CB-FRESH	116.0	3.1	35.4	19.5	12.5	374.0	13.2	1.37	0.46	0.380	0.11	9090	29600	670	330
BRL-3-11	29.10 - 31.90	2.80	CB-FRESH	230	5.2	83.9	36.3	25.9	700.0	16.6	1.69	0.52	0.330	0.17	13180	24300	870	720
BRL-3-12	31.90 - 36.00	4.10	CB-FRESH	185.0	5.0	70.6	32.4	24.7	515.0	22.3	1.97	0.39	0.260	0.12	6940	23800	970	660
BRL-3-13	36.00 - 39.10	3.10	CB-FRESH	281	5.6	76.4	31.9	23.0	585.0	23.8	1.86	0.49	0.310	0.14	7340	23200	1200	700
BRL-3-14	39.10 - 40.70	1.60	FE-CB	370	5.1	123.0	30.9	38.2	988.0	29.5	1.87	0.72	0.270	0.35	8810	2330	960	920
BRL-3-15	40.70 - 45.20	4.50	CB-FRESH	250	4.3	77.3	25.7	22.0	823.0	14.9	4.30	0.94	0.810	0.25	7640	22700	395	640
BRL-3-16	45.20 - 49.40	4.20	CB-FRESH	232	4.3	77.8	28.7	22.9	709.0	10.8	3.75	0.72	0.520	0.21	4780	21400	405	630
BRL-3-17	49.40 - 53.80	4.40	CB-FRESH	190.0	4.2	58.2	28.0	14.4	550.0	10.1	2.58	0.51	0.380	0.16	7770	23400	375	570
BRL-3-18	53.80 - 58.80	5.00	CB-FRESH	158.0	5.3	54.8	34.5	16.2	566.0	8.7	2.62	0.34	0.200	0.12	11250	24500	350	670
BRL-3-19	58.80 - 62.00	3.20	CB-BRC	174.0	3.7	62.8	23.4	18.5	681.0	7.9	3.63	0.68	0.570	0.18	6190	9810	480	530
BRL-3-20	62.00 - 65.00	3.00	CB-BRC	199.0	4.9	78.1	25.6	20.0	949.0	11.2	5.23	1.06	0.890	0.24	6800	29600	410	590
BRL-3-21	65.00 - 68.00	3.00	CB-BRC	121.0	2.8	38.8	18.4	10.4	463.0	9.3	2.56	0.44	0.360	0.11	4100	75800	640	340
BRL-3-22	68.00 - 71.00	3.00	CB-BRC	159.0	3.2	43.7	19.7	15.3	445.0	9.4	3.14	0.45	0.340	0.12	6410	24000	540	370
BRL-3-23	71.00 - 72.40	1.40	GOSSAN	242	6.3	90.0	36.2	24.7	1202.0	27.1	7.01	1.09	0.980	0.27	15360	26700	940	720
BRL-3-24	72.40 - 76.20	3.80	WETH CB	210	6.2	72.9	38.4	17.7	864.0	26.0	5.06	0.71	0.580	0.18	11030	28700	960	720
BRL-3-25	76.20 - 77.10	0.90	CB-FRESH	157.0	3.9	46.9	24.0	11.2	704.0	13.1	3.11	0.62	0.490	0.16	6330	23300	620	450
BRL-3-26	77.10 - 81.60	4.70	CB-BRC	202	4.8	67.8	29.2	21.7	765.0	15.2	4.35	0.72	0.600	0.18	10690	23800	720	630
BRL-3-27	81.60 - 84.90	3.50	CB-BRC	217	4.0	73.2	25.9	21.1	836.0	18.8	5.41	0.85	0.630	0.24	46500	17950	750	540
BRL-3-28	84.90 - 87.00	2.10	CB-FRESH	241	5.9	84.4	37.7	19.2	942.0	26.8	4.60	0.70	0.570	0.20	113300	25100	540	740
BRL-3-29	87.00 - 90.00	3.00	GOSSAN	286	5.8	95.4	25.8	15.8	985.0	26.0	7.23	1.45	1.270	0.36	17270	42100	185	660
BRL-3-30	90.00 - 92.70	2.70	GOSSAN	193.0	6.4	73.0	40.9	15.8	676.0	31.0	3.64	0.70	0.380	0.15	16160	29000	820	710
BRL-3-31	92.70 - 97.60	4.90	WETH CB	262	5.7	86.3	41.1	27.7	588.0	36.2	4.56	0.57	0.280	0.23	8070	19450	1250	680
BRL-3-32	97.60 - 98.60	1.00	GOSSAN	262	6.2	94.1	40.2	31.5	724.0	40.7	8.27	1.10	0.610	0.37	7370	21300	750	730
BRL-3-33	98.60 - 100.70	2.10	ALVIKITE	223	7.7	73.2	24.5	18.9	607.0	22.2	4.10	0.71	0.380	0.23	23300	19600	550	480
BR-17-01	15.95 - 16.50	0.55	SI ORE	427	7.4	135.0	57.2	39.7	1564.0	18.5	3.01	1.06	0.610	0.42	15250	11850	570	1950
BR-17-02	19.60 - 20.70	1.10	MN-FE ORE	265	3.5	75.4	23.3	34.0	879.0	26.6	1.88	0.64	0.220	0.29	993	5260	135	580
BR-17-03	20.70 - 21.90	1.20	FE-CB	239	6.5	80.6	47.2	26.0	961.0	21.5	2.38	0.54	0.330	0.19	876	4320	700	1050
BR-17-04	21.90 - 22.80	0.90	MN-FE ORE	352	4.5	94.8	25.6	22.3	938.0	26.4	1.37	0.48	0.190	0.28	13100	31000	990	550
BR-17-05	22.80 - 24.65	1.85	GNEISS	278	4.2	91.3	30.3	19.2	938.0	21.6	2.19	0.61	0.430	0.20	1749	7886	1450	610
BR-17-06	24.65 - 25.60	0.95	MN-FE ORE	142.0	5.4	47.4	37.8	26.5	528.0	19.7	2.24	0.40	0.150	0.17	1770	3370	165	700
BR-17-07	29.80 - 32.05	2.25	FE-CB	184.0	3.8	61.2	28.1	27.5	594.0	30.2	2.13	0.81	0.400	0.25	2850	9680	450	680
BR-17-08	32.05 - 34.50	2.45	MN-FE ORE	157.0	3.1	48.6	18.3	20.7	424.0	25.7	1.87	0.60	0.250	0.20	16300	22200	700	480
BR-17-09	34.50 - 36.70	2.20	WETH CB	188.0	4.0	73.2	30.2	25.2	715.0	24.8	3.61	0.88	0.660	0.23	1365	18350	1050	940
BR-17-10	36.70 - 39.50	2.80	WETH CB	181.0	3.8	61.7	27.1	17.0	720.0	21.7	2.41	0.66	0.380	0.20	1160	22300	940	810
BR-17-11	41.50 - 43.00	1.50	WETH CB	232	5.5	76.0	28.5	29.7	680.0	25.6	1.97	0.77	0.590	0.23	1365	16050	960	790
BR-17-12	43.00 - 45.00	2.00	MN-FE ORE	229	5.6	72.8	31.3	27.0	840.0	35.1	3.54	0.90	0.500	0.31	2010	21700	740	770
BR-17-13	45.00 - 47.10	2.10	MN-FE ORE	187.0	6.8	73.6	39.0	38.0	950.0	34.2	2.79	0.63	0.340	0.20	3150	10900	620	960
BR-17-14	47.10 - 47.50	0.40	WETH CB	249	12.2	109.0	59.8	46.4	2684.0	80.4	3.00	1.11	1.190	0.21	4820	77800	450	1450
BR-17-15	48.20 - 49.90	1.70	WETH CB	196.0	16.5	67.4	82.1	39.9	1388.0	86.5	5.35	1.26	1.470	0.19	11840	54200	650	1350
BR-17-16	49.90 - 50.20	0.30	WETH CB	174.0	7.9	93.5	57.9	43.9	1309.0	86.0	7.03	1.53	1.680	0.23	2770	52400	225	1400

Apex 13 Results of Chemical Analysis of Drill Core Samples, Buru Hill Area (3)

SAMPLE NUMBER	DIP/III OF SAMPLE (α)	WIDTH ROCK TYPE	Sm NAA ppm	Lu NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	Th NAA ppm	U NAA ppm	Ba NAA %	Ce NAA %	La NAA %	Nd NAA %	P ppm (ICP)	Sr ppm (ICP)	Nb-ORF ppm	Y (ORF) ppm
BR-18-01	9.80 - 10.20	0.40 ORE	180.0	2.7	69.8	20.5	14.0	998.0	8.6	8.48	0.48	0.300	0.20	1950	660	1100	640
BR-18-02	13.75 - 16.70	2.95 ORE	260	4.4	84.4	30.5	33.8	1401.0	14.1	6.35	0.60	0.430	0.26	2630	828	820	770
BR-18-03	16.70 - 17.15	0.45 MN-FE ORE	151.0	3.1	20.3	19.1	18.0	1394.0	11.0	6.73	0.30	0.110	0.16	1250	577	770	400
BR-18-04	23.90 - 24.80	0.90 OX-MI GN	137.0	3.6	50.4	26.7	25.8	680.0	7.9	5.79	0.52	0.380	0.16	2020	585	980	540
BR-18-05	24.90 - 27.45	2.65 OX-MI GN	207	5.3	105.0	51.8	36.9	1301.0	15.6	11.10	1.39	1.270	0.34	4690	1085	1350	1000
BR-18-06	27.45 - 29.60	2.15 OX-MI GN	248	6.0	101.5	40.1	37.3	1235.0	18.8	3.71	0.81	0.560	0.24	3980	886	1550	880
BR-18-07	29.60 - 30.70	1.10 OX-MI GN	238	5.3	112.0	40.8	32.2	744.0	14.8	8.87	0.93	0.680	0.30	3520	899	1650	760
BR-18-08	30.70 - 32.30	1.60 WETH CB	183.0	4.2	61.6	23.8	20.8	899.0	14.4	5.20	0.78	0.520	0.22	3190	751	1150	510
BR-18-09	32.30 - 33.00	0.70 ORE	158.0	5.8	56.9	38.3	24.3	619.0	16.9	4.57	1.26	1.120	0.24	5400	1050	1740	790
BR-18-10	33.00 - 35.50	2.50 WETH CB	223	4.7	83.5	33.5	27.2	703.0	12.5	3.46	0.56	0.330	0.23	4470	923	1450	640
BR-18-11	35.50 - 38.00	2.50 WETH CB	187.0	4.9	71.9	34.8	36.0	705.0	13.9	2.58	0.46	0.280	0.17	2130	1330	760	680
BR-18-12	38.00 - 39.00	1.00 GOSSAN	249	7.2	102.0	57.8	35.9	1299.0	24.4	3.96	1.29	0.990	0.32	7570	1040	910	1100
BR-18-13	39.00 - 39.90	0.90 GOSSAN	206	8.1	64.6	48.5	27.4	1035.0	22.6	3.84	1.43	1.030	0.15	5310	573	560	830
BR-18-14	39.90 - 42.15	2.25 WETH CB	123.0	6.5	45.7	43.1	17.9	658.0	19.5	4.60	0.81	0.540	0.15	8410	988	710	630
BR-18-15	42.15 - 42.70	0.55 FE-CB	187.0	5.0	72.1	30.8	10.8	764.0	16.9	4.61	0.79	0.520	0.20	4350	765	1100	630
BR-18-16	42.70 - 43.90	1.20 WETH CB	287	7.6	57.5	47.1	37.4	1113.0	19.8	3.44	0.80	0.610	0.24	5650	811	1000	990
BR-18-17	43.90 - 44.40	0.50 FE-CB	286	6.8	105.5	51.0	40.2	974.0	19.0	3.98	0.96	0.530	0.32	9680	1145	860	1050
BR-18-18	44.40 - 47.40	3.00 WETH CB	282	5.6	101.0	59.4	11.7	999.0	17.8	3.34	0.80	0.520	0.26	7740	1145	670	940
BR-18-19	47.40 - 47.70	0.30 FE-CB	231	6.0	81.3	37.4	10.0	1019.0	20.8	3.78	0.86	0.500	0.20	12950	1200	1300	780
BR-18-20	47.70 - 50.20	2.50 WETH CB	213	4.6	55.3	32.2	24.5	958.0	17.6	4.49	0.72	0.510	0.20	5860	950	850	700
BR-18-21	50.80 - 52.50	1.70 WETH CB	253	4.5	95.2	30.9	30.4	906.0	15.6	2.86	0.55	0.320	0.17	4230	952	990	750
BR-19-01	56.00 - 57.00	1.00 ORE	339	5.0	110.0	27.5	38.4	1460.0	36.8	1.19	0.72	0.470	0.22	7774	4330	410	800
BR-19-02	57.40 - 57.95	0.55 ORE	240	3.2	93.1	17.8	31.5	1563.0	20.4	2.23	0.75	0.600	0.18	708	2770	195	510
BR-20-01	13.70 - 14.75	1.05 ORE	320	5.8	100.5	38.9	24.2	783.0	15.2	2.00	0.47	0.300	0.18	763	2160	1740	790
BR-20-02	20.60 - 21.40	0.80 ORE	197.0	5.3	58.0	38.6	16.4	775.0	11.6	1.66	0.20	0.088	0.11	236	808	620	630
BR-21-01	11.45 - 15.50	4.05 MN-FE ORE	288	2.7	70.2	23.6	17.3	1023.0	18.3	4.92	0.60	0.300	0.22	679	702	120	520
BR-21-02	16.20 - 17.40	1.20 MN-FE ORE	234	2.5	69.3	15.2	17.8	710.0	19.3	3.35	0.35	0.140	0.19	2530	240	180	330
BR-21-03	22.60 - 22.75	0.15 ORE	224	5.5	103.5	46.3	29.6	1644.0	45.0	10.20	1.78	1.450	0.38	2660	2740	270	1250
BR-21-04	25.10 - 26.20	1.10 ORE	156.0	2.9	42.7	16.7	9.3	571.0	19.3	4.60	0.67	0.400	0.16	3860	695	305	380
BR-21-05	26.80 - 29.00	2.20 WETH CB	230	3.3	84.1	21.2	17.9	905.0	48.2	9.14	1.86	1.490	0.38	5550	1270	235	520
BR-21-06	29.00 - 32.70	3.70 WETH CB	237	3.7	71.8	26.4	16.0	783.0	37.6	7.91	1.32	0.820	0.37	5640	1255	1050	630
BR-21-07	32.70 - 33.80	1.10 MN-FE ORE	194.0	4.5	47.9	20.8	15.6	496.0	38.1	7.19	0.80	0.430	0.27	3330	892	180	380
BR-21-08	33.80 - 37.50	3.70 WETH CB	305	4.5	79.2	33.0	22.6	735.0	63.9	9.15	2.01	1.470	0.50	7740	1250	1050	680
BR-21-09	37.50 - 40.90	3.40 WETH CB	253	13.7	82.8	49.0	25.3	447.0	64.1	5.40	1.41	1.350	0.30	36500	3410	1600	730
BR-21-10	40.90 - 43.30	2.40 WETH CB	335	5.4	104.5	35.4	30.3	518.0	60.6	5.40	1.34	1.130	0.35	11400	1605	2900	690

Ap. 14 Results of Chemical Analysis of Drill Core Samples, Kuge - Lwal Area (1)

SAMPLE NUMBER	DEPTH OF SAMPLI (#)	WIDTH (#)	ROCK TYPE	Sm NAA ppm	La NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	Th NAA ppm	U NAA ppm	Ba NAA %	Ce NAA %	La NAA %	Nd NAA %	P ppm (ICP)	Sr ppm (ICP)	Nb-XRF ppm	Y(XRF) ppm
KG-1-01	7.30	8.20	0.90	CB-FECB	150.0	2.7	40.4	16.3	13.2	461.0	20.5	7.54	1.59	0.28	2290	2270	185	230
KG-1-02	8.70	9.30	0.60	CB-FECB	155.0	2.0	37.0	13.7	11.4	219.0	10.6	1.83	0.73	0.17	2200	1595	250	280
KG-1-03	13.50	14.40	0.90	CB-FECB	107.0	2.0	30.0	8.3	11.4	1245.0	15.9	3.20	0.84	0.16	1615	1550	880	185
KG-1-04	14.40	15.70	1.30	FE-CB	109.0	2.1	70.9	7.6	9.9	251.0	32.6	10.60	2.46	0.36	3200	3280	640	200
KG-1-05	15.70	18.40	2.70	CB-FECB	141.0	2.4	51.1	7.8	9.3	211.0	27.9	2.32	0.99	0.19	7590	3050	510	180
KG-1-06	18.40	19.70	1.50	FE-CB	190.0	2.1	52.7	7.3	9.7	723.0	14.4	4.43	0.92	0.28	5850	3290	1100	190
KG-1-07	21.90	22.80	0.90	CB-FECB	198.0	0.9	51.4	6.8	11.2	1073.0	11.4	1.74	0.20	0.032	3670	2930	280	145
KG-1-08	23.40	24.60	1.20	FE-CB	206	1.4	57.9	7.4	13.1	1245.0	11.3	3.23	0.47	0.044	4090	1405	590	195
KG-1-09	32.10	33.60	1.50	CB-FECB	236	1.3	63.3	6.3	13.5	1347.0	10.8	0.54	0.055	0.23	5380	2250	510	180
KG-1-10	34.80	37.60	2.80	CB-FECB	248	1.3	68.9	3.9	13.9	1660.0	14.4	1.92	0.27	0.032	2630	2220	550	260
KG-1-11	39.00	39.60	0.60	FE-CB	349	0.4	91.6	4.1	14.3	2549	19.3	8.56	0.32	0.017	732	1050	175	125
KG-2-01	1.20	2.60	1.40	CB-FECB	121.0	1.4	35.7	12.9	5.5	234.0	7.8	1.36	0.47	0.360	1305	1060	475	195
KG-2-02	2.60	3.40	0.80	CB-FECB	121.0	2.2	39.9	14.3	10.8	155.0	9.0	1.28	0.60	0.13	1065	1285	530	230
KG-2-03	4.50	8.20	3.70	FE-CB	116.0	2.1	28.4	4.8	7.5	331.0	11.4	6.46	1.15	1.060	1710	2130	1300	130
KG-2-04	9.10	11.80	2.70	FE-CB	106.0	2.3	33.4	6.1	8.7	296.0	12.3	2.52	1.12	1.070	2170	2360	660	155
KG-2-05	11.80	14.30	2.50	CB-FECB	113.0	1.3	37.6	5.9	9.1	831.0	16.8	1.51	0.63	0.610	2110	1700	440	125
KG-2-06	15.10	18.30	3.20	FE-CB	86.4	1.5	24.6	4.6	5.8	263.0	11.3	2.56	0.80	0.770	2050	1470	350	110
KG-2-07	18.70	22.30	3.60	FE-CB	107.0	1.0	37.1	3.3	8.5	437.0	7.2	4.51	0.99	0.780	3360	1895	490	160
KG-2-08	22.50	24.70	2.20	FE-CB	111.0	2.1	55.0	6.6	6.6	326.0	7.8	6.95	1.39	1.320	1810	2360	280	160
KG-2-09	24.90	28.60	5.70	FE-CB	153.0	2.4	47.0	16.0	11.4	413.0	20.4	2.41	1.07	0.810	6970	3230	260	260
KG-2-10	28.90	33.00	4.10	FE-CB	200	1.6	62.1	12.9	15.0	527.0	9.4	5.53	1.39	0.840	1210	2760	375	370
KG-2-11	33.00	36.80	3.80	FE-CB	203	4.9	89.2	48.5	43.0	760.0	8.9	7.33	1.22	0.970	8760	1775	590	1250
KG-2-12	37.90	38.80	0.90	CB-FECB	213	2.9	81.8	23.8	21.4	862.0	11.6	5.10	1.15	0.640	5700	1470	850	720
KG-2-13	49.30	49.80	0.30	FE-CB	293	1.2	71.1	12.3	15.0	2154	17.6	1.87	0.28	0.22	4610	1000	150	280
KG-3-01	2.10	3.30	1.20	CB-FECB	112.0	1.0	44.2	8.2	9.5	307.0	4.3	5.34	0.86	0.770	1340	1752	400	165
KG-3-02	3.30	7.70	4.40	CB-FECB	170.0	1.6	52.2	10.9	12.3	409.0	4.6	4.66	1.02	0.910	985	893	570	195
KG-3-03	7.70	12.10	4.40	SBE-FECB	192.0	3.7	57.7	23.4	19.9	408.0	4.9	3.37	1.04	0.870	1400	1300	405	380
KG-3-04	15.40	16.40	3.00	FE-CB	135.0	3.3	38.7	22.6	11.3	345.0	5.1	3.19	0.92	0.650	1505	1315	775	350
KG-3-05	17.70	18.40	0.70	FE-CB	159.0	4.6	40.0	29.0	15.6	289.0	3.5	2.88	0.60	0.430	1050	872	160	300
KG-3-06	21.70	24.00	2.30	FE-CB	248	9.5	87.3	65.5	32.3	817.0	9.2	5.62	1.54	0.31	2920	1675	185	1100
KG-3-07	24.00	26.70	2.70	FE-CB	255	6.1	80.2	37.5	25.5	1850.0	13.3	7.94	0.79	0.20	4160	1205	490	630
KG-3-08	26.70	28.10	1.40	CB-FECB	190.0	3.0	70.0	18.6	20.4	1371.0	10.8	1.42	0.76	0.20	6480	1130	780	400
KG-3-09	32.10	34.90	2.80	CB-FECB	180.0	3.0	71.6	16.3	28.2	661.0	6.3	1.22	0.69	0.19	8960	2090	150	400
KG-3-10	34.90	38.20	3.30	FE-CB	175.0	3.8	55.3	29.4	16.2	755.0	6.8	3.98	1.28	0.30	10810	2240	465	500
KG-3-11	38.20	40.50	2.30	CB-FECB	155.0	2.7	48.2	15.6	13.9	873.0	8.9	3.66	0.87	0.460	9410	1860	800	300
KG-3-12	40.80	43.15	2.35	CB-FECB	134.0	1.1	43.0	10.7	10.7	343.0	10.6	1.27	0.25	0.10	13680	1390	550	330
KG-3-13	44.70	45.00	0.30	CB-FECB	159.0	1.1	43.9	5.6	6.3	1057.0	7.5	1.62	0.28	0.050	5470	1380	205	195
KG-3-14	49.30	52.00	2.70	FE-CB	196.0	0.9	41.5	10.2	12.9	1030.0	7.9	4.72	1.20	0.39	9200	1580	1500	470
KG-3-15	52.00	55.30	3.30	FE-CB	196.0	2.7	61.7	17.6	20.4	973.0	11.0	4.94	0.78	0.31	6650	824	1920	520
KG-3-16	55.30	60.10	4.80	FE-CB	191.0	1.8	54.2	15.8	13.7	1072.0	14.3	3.77	0.47	0.260	4440	1180	1200	360

Apx. 14 Results of Chemical Analysis of Drill Core Samples, Kuge - Lwal Area (2)

SAMPLE NUMBER	DEPTH OF SAMPLE (#)	WIDTH (#)	ROCK TYPE	Sm NAA ppm	Lu NAA ppm	Eu NAA ppm	Yb NAA ppm	Tb NAA ppm	Th NAA ppm	U NAA ppm	Ba NAA %	Ce NAA %	La NAA %	Nd NAA %	P ppm (ICP)	Sr ppm (ICP)	Nb-XRF ppm	Y (XRF) ppm
KG-4-01	1.70	5.00	3.30	FE-CB	87.0	1.9	25.0	13.1	7.1	453.0	6.3	6.04	0.45	0.330	1082.0	3030	510	200
KG-4-02	5.00	8.00	3.00	FE-CB	126.0	2.5	33.7	14.9	9.5	676.0	9.8	4.64	0.92	0.730	491.0	2530	480	220
KG-4-03	8.00	11.00	3.00	FE-CB	152.0	3.0	39.0	19.7	11.4	764.0	8.1	3.65	0.98	0.630	365.0	1495	740	330
KG-4-04	11.00	14.00	3.00	FE-CB	151.0	2.6	41.5	19.7	9.3	943.0	9.3	3.84	0.91	0.660	1500	1500	540	350
KG-4-05	14.00	16.80	2.80	FE-CB	149.0	2.4	44.0	13.9	9.6	937.0	9.7	5.04	0.79	0.640	1028.0	7510	690	210
KG-4-06	17.70	20.70	3.00	FE-CB	188.0	1.9	41.7	7.6	9.7	1395.0	10.5	2.71	0.51	0.300	394.0	1430	330	110
KG-4-07	23.70	33.00	3.00	CB-FECB	330	1.9	89.1	13.9	19.1	283.0	23.9	2.81	0.21	0.041	750.0	2080	210	300
KG-4-08	26.15	38.00	3.85	CB-PYLC	19.4	0.9	6.9	9.0	3.2	120.0	1.6	0.23	0.04	0.015	4190	860	185	91
KG-4-09	30.00	35.50	3.50	CB-PYLC	34.9	1.2	13.3	7.8	4.0	235.0	2.3	0.21	0.04	0.011	3260	675	305	165
KG-4-10	33.50	37.00	3.50	CB-PYLC	28.0	1.7	11.9	11.0	4.1	170.0	2.7	0.21	0.03	0.012	6480	1625	375	210
KG-4-11	37.00	39.90	2.90	CB-PYLC	53.2	1.7	20.1	13.1	5.3	385.0	3.9	0.37	0.03	0.008	11830	1625	415	230
KG-4-12	39.90	43.60	3.70	FE-CB	248	1.5	68.8	21.4	13.3	1701.0	14.1	1.36	0.15	0.012	3700	1840	78	250
KG-4-13	47.00	49.70	2.70	CB-FECB	201	1.9	52.3	17.9	8.0	1253.0	12.8	2.22	0.36	0.044	3160	1230	455	210
KG-4-14	49.70	52.25	2.55	CB-FECB	235	1.4	54.4	21.1	9.6	1631.0	16.9	2.33	0.32	0.046	1865	873	350	195
KG-4-15	52.25	54.70	2.45	CB-FECB	203	2.4	50.4	24.1	12.6	1266.0	16.8	4.85	0.46	0.075	3120	2090	730	390
KG-5-01	54.70	58.50	3.80	CB-FECB	197.0	1.8	46.5	16.8	13.4	917.0	24.3	2.61	0.50	0.073	3820	1040	1400	330
KG-5-02	1.40	4.80	3.40	FE-CB	86.5	0.9	21.9	5.2	4.0	191.0	8.9	3.28	0.75	0.590	1260	1650	500	160
KG-5-03	8.00	8.00	3.20	FE-CB	89.7	1.0	22.4	4.9	7.2	248.0	4.9	2.69	0.59	0.430	1270	1095	620	120
KG-5-04	12.20	15.20	3.00	FE-CB	61.2	1.3	17.9	3.3	6.6	221.0	3.0	4.05	0.64	0.460	972	1060	540	150
KG-5-05	16.90	18.55	1.65	FE-CB	38.2	0.9	9.7	4.0	2.6	137.0	2.3	1.42	0.24	0.160	3340	1720	445	71
KG-5-06	19.80	22.50	2.70	FE-CB	113.5	1.0	31.2	9.8	5.9	257.0	4.0	1.69	0.43	0.280	917	1723	740	150
KG-5-07	22.50	26.00	3.50	FE-CB	108.5	1.5	28.0	11.1	8.4	328.0	4.3	4.46	0.76	0.900	1165	1140	630	170
KG-5-08	26.00	29.00	3.00	FE-CB	113.5	1.7	28.6	11.1	8.7	398.0	3.7	7.1	0.73	0.580	2180	1730	510	175
KG-5-09	29.00	32.50	3.50	FE-CB	169.0	1.7	28.6	11.1	8.9	521.0	5.4	2.56	0.74	0.570	3130	1920	880	190
KG-5-10	32.50	35.70	3.20	CB-FECB	118.5	1.9	30.5	15.2	8.9	527.0	7.4	2.06	0.72	0.560	4160	1880	520	220
KG-5-11	35.70	38.90	3.20	CB-FECB	133.0	2.3	39.7	14.1	9.0	561.0	8.4	2.13	0.64	0.450	3710	1925	520	280
KG-5-12	38.90	39.35	0.45	FE-CB	186.5	5.2	47.1	30.6	18.2	777.0	11.0	2.63	0.69	0.350	2890	1800	920	290
KG-5-13	39.35	42.30	2.95	FE-CB	169.0	2.8	40.4	14.5	10.7	1050.0	16.9	2.69	0.75	0.360	4910	1365	700	460
KG-5-14	42.30	44.70	2.40	FE-CB	179.0	3.4	41.9	17.8	9.5	1349.0	18.2	3.42	0.68	0.310	9900	2650	600	250
KG-5-15	47.00	51.05	4.05	FE-CB	144.0	2.1	38.1	22.6	10.9	673.0	13.3	3.98	0.40	0.120	6210	4010	500	320
KG-5-16	53.20	55.60	2.40	CB-FECB	67.3	1.8	21.3	10.1	8.9	808.0	11.8	10.50	0.85	0.460	9120	3280	370	230
KG-5-17	57.00	60.10	3.10	CB-FECB	69.7	0.9	18.6	6.0	5.9	591.0	7.1	3.04	0.80	0.670	1505	1130	375	185
KG-6-01	1.00	4.00	3.00	CB-FECB	104.0	1.1	33.0	8.4	8.8	154.0	4.6	3.34	0.48	0.360	907	1040	760	125
KG-6-02	7.60	9.85	2.25	CB-FECB	82.8	1.2	26.2	8.3	3.2	155.0	5.9	3.10	0.68	0.590	3450	1415	500	230
KG-6-03	9.85	11.60	1.75	CB-FECB	96.8	1.7	30.6	12.2	8.4	212.0	6.2	6.95	0.79	0.660	2780	1615	510	185
KG-6-04	11.60	15.80	2.20	FE-CB	92.5	3.9	33.0	23.7	7.1	288.0	7.8	6.67	1.13	0.940	1135	1235	495	400
KG-6-05	14.20	15.50	1.30	FE-CB	240	2.4	60.6	12.4	12.4	794.0	8.7	6.13	0.64	0.220	1360	1295	260	260
KG-6-06	43.70	45.75	0.30	FE-CB	129.0	1.5	35.9	6.1	9.1	1767.0	17.5	0.82	0.12	0.033	2700	1350	440	130

Ap. 15 Geological Log of Diamond Drilling Hole, BRL-2 (1)

DDH No. BRL-2 LOCATION { X: 740.812m BEARING : -90°
 (UTM GRID) Y: 9,979.113m INCLINATION : -90°
 0-50m ELEVATION : 1,365.5 m LENGTH : 100.50 m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERINGS	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														COMBINED CONTENTS (%)	CORE RECOVERY (%)	DEPTH (m)
											P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb			
0		0.45	Reddish brown surface weathered rock	S	-			BRL-2-0		0.45	10.55	3.85	20.80	690	730	15.4	83.4	0.350	0.63	0.26	235.0	81.3	23.1	20.6	5.0	1.840	0
5		4.50	Khaki laterite rock, partly earthy, partly hard	S	-			BRL-2-02		4.50	12.90	3.01	23.40	400	330	10.4	64.4	0.200	0.51	0.20	190.0	61.7	13.7	14.7	1.6	0.910	5
10		9.00	Khaki laterite, partly earthy, partly hard	S	-			BRL-2-03		9.00	11.20	4.75	35.50	600	430	10.2	64.6	0.340	0.58	0.23	215.0	75.4	20.6	18.2	2.5	1.150	10
15		11.25	Khaki to brown hard siliceous iron ore	S	+			BRL-2-04		11.25	12.90	3.28	38.90	785	570	11.5	90.9	0.310	0.66	0.24	240.0	83.5	26.8	20.9	2.6	1.210	15
20		16.20	9.50-10.50m: Khaki earthy laterite rock 16.20-16.70m: black oxidized iron network vein	S	-			BRL-2-05		16.20	13.95	4.65	27.50	1340	690	19.6	105.1	0.420	0.74	0.25	235.0	94.1	29.1	24.1	3.3	1.410	20
25		19.70	Khaki fine porous laterite rock with black hematite spots, original rock: carbonatite	S	-			BRL-2-06		19.70	13.90	7.09	26.00	1490	710	57.4	116.6	0.680	1.29	0.40	265.0	102.3	34.0	24.3	3.3	2.670	25
30		21.80	Khaki fine porous laterite rock, partly siliceous	S	-			BRL-2-07		21.80	13.05	4.10	11.60	1550	530	172.4	110.3	0.640	1.06	0.32	257.0	95.7	27.2	14.7	2.5	2.020	30
35		23.40	22.80-23.40m: Purplish brown ferrocyanite Dark grey to black hematite rich porous ore original rock: Mn-Fe ore 27.65-28.20m: Brown siliceous iron-oxide ore	S	-			BRL-2-08		23.40	11.75	3.41	8.85	595	350	160.1	111.7	0.640	0.68	0.29	200.0	93.4	18.2	11.4	2.3	1.610	35
40		27.65	Brown to purplish brown laterite rock, goethite rich	S	-			BRL-2-09		27.65	13.05	1.91	6.35	1360	480	167.2	108.1	0.490	0.75	0.27	274.0	85.0	24.2	14.4	2.2	1.310	40
45		28.30	Grey porous leached out rock (carbonatite origin)	S	-			BRL-2-10		28.30	12.35	3.84	15.40	675	600	171.2	96.1	0.490	0.75	0.24	221.0	81.2	35.6	20.5	3.2	1.480	45
50		30.40	Grey porous leached out rock (carbonatite origin) 30.40-30.70m, 31.30-32.00m: orange brown iron-oxide ore original rock: Mn-Fe ore	S	-			BRL-2-11		30.40	20.30	2.48	10.30	1460	390	170.2	125.7	0.650	0.91	0.27	236.0	80.7	28.9	14.6	3.7	1.830	50
55		32.70	Khaki fine porous goethite rich rock (carbonatite origin) with black spots	S	-			BRL-2-12		32.70	22.70	5.20	20.10	965	500	154.0	140.5	0.580	0.93	0.30	295.0	94.3	24.0	19.6	3.6	1.810	55
60		35.50	Khaki to brown goethite rich rock, partly siliceous	S	-			BRL-2-13		35.50	32.40	2.23	12.25	475	770	119.3	143.9	0.410	0.82	0.30	343.0	127.0	26.3	21.5	3.8	1.530	60
65		39.30	Dark grey to black, partly purplish red, fine porous Mn-Fe ore	S	-			BRL-2-14		39.30	16.35	3.10	11.65	310	750	71.7	174.9	0.450	0.69	0.35	332.0	128.0	35.7	26.2	4.7	1.690	65
70		43.50	43.00-43.50m: banding structure (carbonatite)	S	-			BRL-2-15		43.50	12.70	3.67	15.05	400	490	69.0	119.2	0.250	0.63	0.29	263.0	85.6	16.9	21.7	2.9	1.170	70
75		45.00	Dark grey fine porous leached out rock original rock: Calcareous Fe ore	S	-			BRL-2-16		45.00	11.30	6.17	17.55	745	410	66.0	100.4	0.500	0.93	0.32	241.0	86.6	14.3	20.2	3.2	1.750	75
80		46.10	Brown to black hematite stained gneissous rock	S	-			BRL-2-17		46.10	11.30	6.17	17.55	745	410	66.0	100.4	0.500	0.93	0.32	241.0	86.6	14.3	20.2	3.2	1.750	80
85		49.65	Brown to dark brown porous rock (ferrocarbonatite origin) Dark brown to black goethite rich rock (Mn-Fe ore)	S	-			BRL-2-18		49.65	11.30	6.17	17.55	745	410	66.0	100.4	0.500	0.93	0.32	241.0	86.6	14.3	20.2	3.2	1.750	85

Key: Weathering S: strong M: moderate W: weak F: fresh Reaction to HCl +: react -: not react Magnetic test +: magnetic -: non magnetic Vein V: vein part A: abundant C: common R: rare N: not veined Tested Samples WA: whole rock analysis Y: thin section P: polished thin section E: EPMA test O: oxygen isotopes S: size measurement of minerals

Apx. 16 Geological Log of Diamond Drilling Hole, BRL-2 (2)

DOH No. BRL-2 LOCATION { X : 740.812mE BEARING : -90°
 50-100m (UTM GRID) { Y : 9.979.113mN INCLINATION : 100.50m
 ELEVATION : 1,355.5m LENGTH : 100.50m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS															
										P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	COMBINED La, Ce and Nd CONTENTS (%)
50		51.00	Dark brown to black scabbite rich ore (Mn-Fe ore)	S	-	-	V	BRL-2-17	51.00	375	535	2090	395	400	73.0	50.1	0.550	1.01	0.32	215.0	77.9	24.3	11.8	2.9	1.930
55		53.75	Brown porous fragile rock - carbonatite origin	S	-	-	R	BRL-2-18	53.75	2610	4.16	2.580	395	440	96.4	16.84	0.890	1.23	0.27	262.0	105.0	23.4	11.2	4.0	2.390
60		57.00	Fale brown to brown very porous rock consisting of ferro-oxide and secondary quartz, i.e. leached out carbonatite	S	-	-	R	BRL-2-19	57.00	4600	5.92	2810	810	410	170.1	141.3	2.040	2.24	0.39	276.0	125.0	20.8	6.2	3.9	4.670
65		64.50	Dark grey porous fragile rock Siliceous fragments occur in some part.	S	-	-	P	BRL-2-20	64.50	3750	4.29	2730	1900	640	113.4	115.4	1.000	1.20	0.24	205.0	97.9	25.1	20.9	4.1	2.440
70		67.70	Orange brown porous leached out rock, carbonatite origin	S	-	-	P	BRL-2-21	67.70	2130	3.48	1843	990	700	70.4	109.2	0.70	1.01	0.26	232.0	93.3	25.2	21.5	4.4	1.980
75		68.00	Grey very porous rock fragments ; grey clay at the bottom 69.00 m : Water Table	S	-	-	R	BRL-2-22	68.00	1870	3.73	2180	920	670	49.4	97.5	0.350	0.55	0.16	184.0	83.7	27.7	22.7	4.4	1.040
80		77.70	Fale brown, partly stained black, weakly weathered massive carbonatite. Original colour : white. Veinlets of iron-oxide are common.	M	+	-	C	BRL-2-23	77.70	4860	2.15	1365	4450	1650	114.6	165.9	0.500	0.85	0.27	294.0	199.0	77.6	57.3	12.0	1.620
85		79.05	Siliceous iron ore : 73.15-73.20m, 73.80-73.85m, 74.45-74.50m	M	+	-	C	BRL-2-24	79.05	630	2.13	1600	960	690	31.2	81.0	0.490	0.65	0.17	195.0	86.6	26.9	22.7	3.4	1.310
90		81.55	Fale brown, partly stained black, weakly weathered Dark greenish grey chlorite rich carbonatite containing fragments of white fine-grained carbonatite	M	+	-	C	BRL-2-25	81.55	550	2.66	2370	1300	540	230	91.8	0.560	0.85	0.21	244.0	94.7	30.9	20.1	3.9	1.720
95		85.00	Fale grey, partly brown by oxidation of veinlets of iron ore, banded fine-grained carbonatite. Sporadic latest albite veinlets-developed.	M	+	-	C	BRL-2-26	85.00	396	2.93	1965	1200	830	31.2	56.6	0.440	0.59	0.14	172.0	78.9	35.0	19.8	4.0	1.170
98		86.15	Grey brecciated fine-grained carbonatite with chlorite veinlets	M	+	-	C	BRL-2-27	86.15	878	1.36	1455	1600	340	33.2	4.81	0.260	0.40	0.12	144.0	58.7	13.6	12.1	2.4	0.790
99		88.00	Fale grey, partly greenish grey to dark grey, fine-grained banded carbonatite; chlorite irregularly developed in the section.	M	+	-	C	BRL-2-28	88.00	433	2.06	2070	700	520	23.0	62.2	0.640	0.73	0.15	149.0	61.7	33.7	19.5	4.1	1.520
100		95.30	Grey glassy, brecciated, phonolite, with chlorite vein, albite veinlets and banded carbonatite vein. Grey banded to heterogenous fine-grained carbonatite, containing breccias of grey glassy phonolite. Chlorite rich zone exists in some part.	F	+	-	N	BRL-2-29	95.30	592	1.00	2360	1000	500	19.5	37.3	0.300	0.33	0.06	97.0	41.7	16.8	18.8	2.7	0.690
100		98.30	Grey glassy thin banded phonolite	F	+	-	N	BRL-2-30	98.30	1855	2.56	3350	750	630	17.6	50.9	0.580	0.95	0.19	150.0	57.4	17.7	28.0	5.3	1.620
100		98.55	100.40-100.50m: grey heterogenous fine-grained carbonatite-dyke	F	+	-	N	BRL-2-31	98.55	733	1.74	2510	125	310	13.8	45.2	0.540	0.86	0.20	161.0	35.3	3.2	13.9	3.2	1.690

Key: Weathering: S-strong, M-moderate, W-weak, F-fresh, +react, -not react. Reaction to HCl: +magnetic, -non magnetic. Vein: V-vein part, A-abundant, C-common. Magnetic test: +magnetic, -non magnetic. Vein: V-vein part, R-rare, N-not veined. Tested Samples: WA-whole rock analysis, P-polished thin section, T-thin section, E-EPMA test. O: oxygen isotopes, S: size measurement of minerals.

Ap. 17 Geological Log of Diamond Drilling Hole, BRL-3 (1)

DDH No. BRL-3 LOCATION { X : 740.791mE
 0-50m (UTM GRID) { Y : 9979.113mN
 BEARING : -90°
 INCLINATION : -90°
 ELEVATION : 1,332.5m
 LENGTH : 100.70m

DEPTH (m)	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	Magnetic test	Vein	Position of TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														CORE RECOVERY (%)	
										P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb		Lu
0		Reddish brown weathered earthy rock	S	-				BRL-3-01	3.00	2190	5.81	2780	1150	670	30.8	65.1	1330	1.35	0.26	213.0	77.8	25.5	35.8	6.4	2.940
3.00		Turkish brown to olive brown weathered earthy rock	M	+				BRL-3-02	3.00	3060	5.73	1750	1200	680	30.5	69.4	1170	1.22	0.26	238.0	85.4	26.2	30.9	4.9	2.650
5.50		Khaki to brown earthy rock or weathered porous rock	M	+				BRL-3-03	5.50	2000	3.18	3260	1400	640	21.9	60.7	0.680	0.79	0.18	179.0	67.6	23.1	32.3	5.6	1.630
7.00		Grey and variously stained banded carbonatite, moderately veined by orange brown Fe-oxide, 8.50-9.10m; magnetite remained as dissemination bands	M	+				BRL-3-04	7.00	1495	3.88	2690	1500	520	15.0	54.1	0.370	1.07	0.21	171.0	56.5	18.5	33.5	4.6	2.250
11.95		Reddish brown massive ferrocarbonatite	M	+				BRL-3-05	11.95	3339	5.13	1640	930	440	13.4	74.1	0.750	0.94	0.21	177.0	58.5	12.5	20.6	3.4	1.890
14.50		14.50-14.85m: pale brown, banded carbonatite	M	+				BRL-3-06	14.50	3400	4.57	2190	740	630	16.8	79.4	0.900	1.06	0.22	191.0	72.3	20.1	36.9	6.4	2.260
15.30		Brown to khaki stained fine-grained banded carbonatite banded structure; disseminated bands of magnetite	M	+				BRL-3-07	15.30	7890	3.61	2770	960	540	19.3	76.5	1.210	1.21	0.22	177.0	58.4	17.3	30.6	5.5	2.640
22.40		Brown porous banded ferrocarbonatite	S	-				BRL-3-08	22.40	11470	5.66	3800	540	540	23.6	64.9	2.260	2.04	0.31	186.0	78.9	4.1	25.8	6.0	4.610
23.50		Brown hematite (after magnetite) rich banded carbonatite	W	+				BRL-3-09	23.50	1280	5.30	2930	425	480	20.2	47.1	1.660	1.53	0.25	163.0	51.4	13.2	28.5	4.7	3.440
25.50		Pale grey to white fine-grained banded carbonatite, partly rich in magnetite bands	W	+				BRL-3-10	25.50	5090	1.37	2960	670	330	15.2	37.4	0.380	0.46	0.11	116.0	33.4	12.9	19.5	3.1	0.950
29.10		Pale grey to white (stained brown) fine-grained banded carbonatite, veinlets of Fe-oxide developed	W	+				BRL-3-11	29.10	13180	1.69	2430	870	720	16.6	70.0	0.330	0.52	0.17	230.0	83.9	23.9	36.3	5.2	1.020
31.90		Pale grey to white fine-grained banded carbonatite banded structure; hematite after magnetite	W	+				BRL-3-12	31.90	6940	1.37	2300	970	660	22.3	51.5	0.260	0.39	0.12	195.0	70.6	24.7	35.4	5.0	0.770
35.00		Pale grey to white (stained brown) banded carbonatite, moderately veined by Fe-oxide 0.5m in width	W	+				BRL-3-13	35.00	7340	1.86	2320	1200	700	29.8	58.6	0.310	0.49	0.14	201.0	76.4	25.0	31.9	5.6	0.940
39.10		Dark grey to brown, porous leached out ferrocarbonatite carbonatite.	W	-				BRL-3-14	39.10	8810	7.27	2330	660	920	23.5	98.8	0.720	1.02	0.35	370.0	122.8	38.2	30.9	5.1	2.090
40.70		Pale grey to brown (by stain) fine-grained banded carbonatite. Iron-oxide veinlets sporadically developed.	W	+				BRL-3-15	40.70	7640	4.30	2270	335	640	14.9	82.3	0.810	0.94	0.25	250.0	77.3	22.0	25.7	4.3	2.000
45.20		(45.20m: Water Table)																							
49.00		Pale grey to white fresh carbonatite with dots and dissemination of magnetite.	F	+				BRL-3-16	49.00	4780	3.25	2140	405	630	10.6	70.9	0.520	0.72	0.21	232.0	77.8	22.9	28.7	4.3	1.450
48.40		49.00-49.40m: brown massive ferrocarbonatite							49.40																

Key: Weathering S:strong M:moderate V:vein part A:abundant C:common R:rare N:not veined
 Reaction to HCl +:react -:not react
 Magnetic test +:magnetic -:non magnetic
 Tested Samples WA:whole rock analysis T:thin section
 Polished thin section E:EPMA test
 O: oxygen isotopes S: size measurement of minerals

Apex 18 Geological Log of Diamond Drilling Hole, BRL-3 (2)

DDH No. BRL-3 LOCATION { X: 740.79 mE BEARING : -90°
 (UTM GRID) { Y: 9979.113 mN INCLINATION : 100.70 m
 ELEVATION : 1,332.5 m LENGTH : 100.70 m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION OF TESTED SAMPLES	DEPTH WIDTH (mm)	ANALYTICAL RESULTS													CORE RECOVERY (%)									
										P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)		Yb (ppm)	Lu (ppm)	La, Ce and Nd CONTENTS (%)						
50																																
55		53.80 55.80 60.00	Pale grey to white fresh banded fine-grained carbonate, partly brecciated 53.80-55.90m; fractured zone	F + + N	F + + N			(P) BRL-3-F 56.10 m ← 57.40 m BRL-3-G (O)	14.40 33.80 53.80	2.58 7.770	234.0 3.75	5.70	10.1	3.50	0.360	0.51	0.16	190.0	58.2	1.44	28.0	4.2	1.050									
60		58.80 40°	Carbonate same as above Magnetic bands and disseminated zones occur throughout the section.	F + + N	F + + N				15.20 62.00	6.90	981.0	4.90	5.50	6.01	0.570	0.68	0.18	174.0	62.8	18.5	22.4	3.7	1.430									
65			Carbonate breccia with green chlorite matrix. Facies of intrusive breccia; original rock is pale grey to white fluorite bearing fine-grained carbonate with very fine magnetite.	F + + N	F + + N			(WA) BRL-3-H 66.40 m ← 67.30 m BRL-3-I (T)	15.00 68.00	6.00	2060.0	4.10	5.90	11.2	0.949	1.06	0.24	195.0	78.1	2.00	25.6	4.9	2.190									
70		71.00 72.40	Beige albite veins of latest stage occur throughout the section.	S - - V	S - - V				71.00 11.40 72.40	10.850	7.01	2870	9.40	7.20	1.202	0.980	1.09	0.27	262.0	90.0	24.7	36.2	6.3	3.440								
75			Brown to orange brown porous gossan. Brownish grey to brown earthy material. Strongly weathered zone of carbonatic along a fault.	S - - V	S - - V				12.80 76.20 77.10	11.030	5.06	2870	9.60	7.20	8.64	0.560	0.71	0.18	203.0	72.9	1.77	38.4	6.2	1.470								
80			Pale grey to white banded carbonate rich in magnetite Pale grey, partly dark greenish grey (chlorite) finely brecciated heterogeneous carbonatic. Intruded by beige albite veins.	F + + N	F + + N				76.20 77.10	10.690	4.35	2480	7.80	6.30	7.65	0.800	0.72	0.18	232.0	67.8	21.7	23.2	4.8	1.500								
85		81.60 84.90 85.70 87.00	Pale grey brecciated carbonate with irregular chlorite veins. Pale grey to white banded carbonate Pale grey brecciated carbonate with chlorite veins Brown to orange brown porous gossan consisting of goethite and chlorite quartz	F + + N	F + + N			(R) BRL-3-J (P) 84.50 m 86.50 m	81.60 13.30 84.90	4.650	5.41	1795	7.50	5.40	8.36	0.630	0.85	0.24	217.0	73.2	21.1	23.9	4.0	1.720								
90				S - - V	S - - V				87.00	7.270	7.23	4210	1.85	6.60	9.83	1.270	1.45	0.36	285.0	95.4	15.8	25.8	5.6	3.060								
95		92.70	Dark brown earthy material consisting of fine fragments of hematite and brown powder; possibly cave filling material or weathered carbonate	S - - V	S - - V				92.70	16160	3.64	3900	8.20	7.10	6.76	0.380	0.49	0.19	193.0	73.0	15.8	40.9	6.4	1.020								
100		97.60 98.60 100.70	Orange brown to brown gossan of earthy material Pale grey very fine-grained albite of the latest stage	S - - V	S - - V				97.60 98.60 100.70	7370	8.27	1150	7.50	7.90	40.7	0.80	1.10	0.37	262.0	93.1	31.5	45.2	6.2	2.080								

Key: Weathering: S strong, M moderate, F fresh, W weak, +react, -not react
 Vein: V vein part, A abundant, C common
 Reaction to HCl: +react, -not react
 Magnetic test: +magnetic, -non magnetic
 Reaction to HCl: +react, -not react
 Vein: V vein part, A abundant, C common
 Tested Samples: WA-whole rock analysis, T thin section
 P-polished thin section, E-EPMA test
 O-oxygen isotopes, S-size measurement of minerals

Apex 19 Geological Log of Diamond Drilling Hole, BR-17

DDH No. BR-17 LOCATION { X : 740,807mE BEARING 90°
 (UTM GRID) { Y : 9,979,577mN INCLINATION -90°
 ELEVATION : 1,340.5m LENGTH : 50.20m

DEPTH (m)	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION OF TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														CORE RECOVERY (%)	DEPTH (m)	
										P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)			Lu (ppm)
0	1.50	Grey to brown strongly weathered gneiss	S	-	-	-																				
5	1.20	Light grey, partly brownish grey strongly weathered biotite bearing gneiss (quartz-dialspathic; granitic) Black porous veinlets of iron oxide: 1.50-1.70m, 2.30-2.60m, 4.60-4.80m, 5.40-5.70m, 10.10-10.30m.	S	-	-	-																				
10	1.20	Khaki to brownish grey strongly weathered biotite bearing gneiss, veined by iron-oxide	S	-	-	-																				
15	1595, 1650, 18.60	Brown amorphous siliceous iron ore Light grey, medium-grained biotite bearing felsic gneiss, iron-oxide vein: 17.70-17.85m	S	-	-	-																				
20	20.70, 21.35, 21.90, 22.80	Black fine porous oxidized Mn-Fe ore Gneiss intruded by ferrocarbonate (21.35-21.90m) Black, partly red, fine porous oxidized Mn-Fe ore Greenish grey strongly weathered amphibole bearing gneiss. carbonate vein: 23.10-23.20m, 24.15-24.25m	M	-	-	-																				
25	24.65, 25.60	Black massive porous oxidized Mn-Fe ore Greenish grey strongly weathered amphibole bearing gneiss, black porous Mn-Fe vein: 27.05-27.20m, brown porous Mn-Fe vein: 27.80-28.00m	S	-	-	-																				
30	29.80	Brown, with black spots, porous weathered ferrocarbonate, partly earthy	S	-	-	-																				
35	32.00, 32.70, 33.50, 34.20, 35.50, 36.70	Black, partly brown, fine-porous Mn-Fe ore with xenolithic occurrence of granitoid gneiss Brown to dark grey or other banded carbonate, non calcareous by leaching	S	-	-	-																				
40	38.50	Brown earthy weathered rock, possibly carbonate in origin, including breccia of gneiss	S	-	-	-																				
45	41.50, 43.00, 45.00	Brecciated granitoid gneiss black porous Mn-Fe ore (vein): 40.90-41.10m Brown porous loose rock, possibly carbonate in origin	S	-	-	-																				
50	47.00, 47.50, 48.20, 49.90, 50.20	Black porous Mn-Fe ore, partly brown porous Fe-oxide ore Pale brown porous rock (upper part), grey gneiss (lower part) Grey to dark grey porous rock (carbonate origin), pale grey granitic gneiss: 49.90-50.00m	S	-	-	-																				

Key: Weathering: S: strong, M: moderate, I: fresh
 Reaction to HCl: +: react, -: not react
 Magnetic test: +: magnetic, -: non magnetic
 Vein: V: vein part, A: abundant, C: common
 Tested Samples: WA: whole rock analysis, P: polished thin section, T: thin section, E: EPMA test
 R: rare, N: not veined

Ap. 20 Geological Log of Diamond Drilling Hole, BR-18

DDH No. BR-18 LOCATION { X : 740.687m
(UTM GRID) { Y : 9,978.815m BEARING -90°
INCLINATION 52.50m
ELEVATION

DEPTH (m)	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION OF SAMPLES	VEIN	ANALYTICAL RESULTS														COMBINED LA, CO AND Wt %	CORE RECOVERY (%)	
									P	Ba	Sr	Nb	Y	U	Th	La	Co	Nd	Sm	Eu	Tb	Yb			Lu
0		Light grey to black, strongly weathered brecciated gneiss.	S	-	-				1390	348	546	100	640	0.6	298	0.50	0.48	0.20	1820	28.8	14.0	20.5	2.7	0.960	
2.00		Black, partly dark grey, strongly weathered, gneiss, veined by other iron oxide.	S	-	-																				
4.10		Fractured and moderately veined (by other iron-oxide) schistose gneiss.	S	-	-		6.40 m (P)																		
6.10		Pale brown strongly fractured gneiss. Original rock: schistose igneous gneiss. Brown to dark brown vein, veinlets and irregular network veinlets developed throughout the section.	S	-	-		6.50 m (P)																		
15.70		Dark brown to black Mn-Fe ore	M	-	-		15.30 m (P)																		
17.15		Pale brown moderately veined schistose granitic gneiss	M	-	-		16.70 m (P)																		
18.70							18.40 m (P)																		
19.65							19.30 m (P)																		
20.15							20.00 m (P)																		
21.20		Light grey to white weakly veined schistose gneiss	W	-	-		20.90 m (P)																		
22.80		Light grey to white moderately veined schistose granitic gneiss	W	-	-		22.50 m (P)																		
24.80		Gradual change from the above network-veined gneiss	W	-	-		24.50 m (P)																		
27.45		Dark brown, partly reddish brown, secondary iron rich lateritic rock with fragments of gneiss	M	-	-		27.10 m (P)																		
29.60		Black massive, partly porous, secondary iron (oxidized) rich rock	M	-	-		29.30 m (P)																		
30.70		Dark brown iron-oxide vein with fine brucina of gneiss	M	-	-		30.40 m (P)																		
32.30		Black iron-oxide (epithermal) lateritic rock (carbonate)	M	-	-		32.00 m (P)																		
33.90		Black iron-oxide ore consisting of goethite and secondary lateritic rock	M	-	-		33.60 m (P)																		
35.00		Black to brown massive, partly porous lateritic rock consisting mainly goethite and secondary quartz	M	-	-		34.70 m (P)																		
38		Original rock: carbonate or ferrocarbonate	M	-	-		37.50 m (P)																		
39.00		Dark greyish brown earthy material	S	-	-		38.70 m (P)																		
39.00		Brown mass with black stain	S	-	-		38.70 m (P)																		
39.90		Black to ochre massive partly spherulitic material consisting mainly of goethite, possibly leached out carbonate.	S	-	-		39.60 m (P)																		
42.15		Dark brown to black porous vein (ferrous-carbonate)	S	-	-		41.85 m (P)																		
42.70							42.40 m (P)																		
43.90							43.60 m (P)																		
44.40							44.10 m (P)																		
47.40		Xenolith of gneiss: 50.20-50.80 m	S	-	-		47.10 m (P)																		
47.40							47.10 m (P)																		
50.30							50.00 m (P)																		
50.80							50.50 m (P)																		
52.50							52.20 m (P)																		

Key: Weathering: S-strong, M-moderate, F-fresh, W-weak
Reaction to HCl: +react, -not react
Magnetic test: +magnetic, -non magnetic
Vein: V-vein part, A-abundant, C-common
Position of Samples: P-polished thin section, T-thin section, W-whole rock analysis
Tested Samples: W-whole rock analysis, T-thin section, O-oxygen isotopes, S-size measurement of minerals

Apx. 21 Geological Log of Diamond Drilling Hole, BR-19

DDH No. BR-19
 LOCATION { X : 74 1.080mE
 (UTM GRID) { Y : 9,979,397mN
 BEARING : -90°
 INCLINATION :
 ELEVATION : 1,308.0m
 LENGTH : 50.10m

DEPTH (m)	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS																	
										P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	COMBINED La, Ce and Nd CONTENTS (%)	CORE RECOVERY (%)	
0	1.00	Dark reddish brown clayey deposit	S	-	-	-																					
	3.00	Brown strongly weathered granitic gneiss	S	-	-	-																					
	5.50	Pale grey weathered gneiss (fractured core)	S	-	-	-																					
	9.00	Pale grey granitic gneiss with porphyroclasts of pink K-feldspar	M	-	-	-																					
	10.00	Grey granitic gneiss	W	-	-	-																					
	21.00	Grey granitic gneiss with porphyroclastic occurrence of pink K-feldspar	W	-	-	-																					
	27.00	Grey strongly fractured granitic gneiss with porphyroclastic K-field, lower part of the section : brecciated core suggesting fault zone.	M	-	-	-																					
	28.00	Fault zone consisting of fine breccia of amphibolite	M	-	-	-																					
	29.00	Strongly fractured amphibolite (greyish green)	M	-	-	-																					
	30.00	Greyish green schistosed amphibolite (homogeneous fine-grained facies)	F	-	-	-																					
	36.00	Weakly fractured greyish green amphibolite	W	-	-	-																					
	37.00	Brown goethite vein with banded structure.	W	-	-	-																					
	37.40	Greyish brown weakly to moderately fractured amphibolite with limonitic stain on fractured surface	W	-	-	-																					
	43.90	Greyish green fine-grained homogeneous amphibolite, partly stained by limonite	W	-	-	-																					
	50.00		F	-	-	-																					

Key: Weathering S:strong M:moderate W:weak F:fresh
 Reaction to HCl +:react --:not react
 Magnetic test +:magnetic --:non magnetic
 Vein V:vein part A:abundant C:common R:rare N:not veined
 Tested Samples WA:whole rock analysis T:thin section P:polished thin section E:EPMA test
 O: oxygen isotopes S: size measurement of minerals

Ap. 22 Geological Log of Diamond Drilling Hole, BR-20

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and COPE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														COMBINED La, Ce and Nd CONTENTS (%)	CORE RECOVERY (%)
										P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)		
0			Khaki surface deposit consisting of earthy material and fragments of granitic gneiss	S	-																				
5		3.00	Pale brownish grey feldspathic granitic gneiss, moderately veined by limonitized iron-oxide	S	-	C																			
10		6.20	Strongly fractured feldspathic granitic gneiss. Green veinlets; aegirine augite?	S	-	C																			
15		10.00	Pale grey feldspathic granitic gneiss, moderately veined by limonitized iron-oxide	S	-	C																			
17.00		13.70	Grey feldspathic granitic gneiss veined by limonitized iron-oxide, 17.00-17.30: sheared zone	S	-	A																			
17.30		17.00		S	-	A																			
21.70		21.70	Sheared zone: Greenish grey, chlorite bearing granitic gneiss with heterogeneous chlorite lenses after elongated mafic minerals	F	-		R	BR-20-01 25.20 m BR-20-A (1)																	
28.70		28.70	Greenish grey strongly fractured chlorite bearing granitic gneiss	F	-	R																			
31.90		31.90	Pale greenish grey gneiss veined by albite	F	-	C																			
33.40		33.40	Beige very fine-grained dolomitic albite	F	-	V																			
34.75		34.75	Greenish grey fractured chlorite bearing gneiss with relict of pink K-feldspar	F	-	C																			
37.10		37.10	Greenish grey chlorite bearing granitic gneiss veined by beige very fine-grained dolomitic albite of the latest stage of carbonatic activity.	F	-	C																			
44.30		44.30	Greenish grey chlorite bearing granitic gneiss, heterogeneous appearance by chlorite after elongated mafic minerals.	F	(+)	R																			
50.20		50.20																							

DDH No. BR-20 LOCATION (UTM GRID) { X: 741.083mE BEARING INCLINATION: -90° LENGTH: 50.20m
 ELEVATION: 1,312.0m

Key: Weathering Reaction to HCl Magnetic test Vein V: vein part R: rare Tested Samples

S: strong W: weak +: react -: not react +: magnetic -: non magnetic A: abundant V: vein part R: rare W: whole rock analysis P: polished thin section O: oxygen isotope

M: moderate F: fresh -: not react -: non magnetic C: common A: abundant V: vein part R: rare T: thin section E: EPMA test S: size measurement of minerals

Ap. 23 Geological Log of Diamond Drilling Hole, BR-21

DDH No. BR-21
 LOCATION { X: 740.613mE
 (UTM GRID) Y: 9979.163mN
 BEARING : -90°
 INCLINATION : -90°
 ELEVATION : 1,340.0m
 LENGTH : 50.10m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERED REACTION to HCl	MAGNETIC TEST	POSITION of TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														COVERED CONTENTS (wt. %)	
								P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb		Lu
0-15	Light grey strongly weathered bleached granitic gneiss	3.80 60°		S - - R				679	4.92	702	120	350	183	1023	0.200	0.60	0.22	208.0	70.2	173	23.6	2.7	1.120
15-20	Light grey to white granitic gneiss with small amounts of porphyroclasts of pink K-feldspar Limonitized Fe-oxide vein: 4.50-4.60m 6.90-7.00m, 9.60-9.70m	11.45 10°		M - - V		BR-21-01 13.00 15.00m BR-21-M (S)	11.45																
20-25	Brown iron rich ore consisting goethite and minor amounts of hematite, containing very minor amounts of xenolith of gneiss	11.45 10°		W - - C			13.50																
25-30	Faint grey granitic gneiss Dark brown manganese iron ore Pale grey granitic gneiss (crushed core)	13.50 15.20 16.40 17.40		S - - V			15.20																
30-35	Faint grey silty granitic gneiss with very minor amounts of mica seam, veined by thin limonitic vein (0.1 to 1 cm in width). 22.60-22.75m: Fe-oxide vein	16.40 17.40 18.40		M - - R			17.40																
35-40	Brown to dark brown iron ore (vein), partly porous Granitic gneiss Orange brown, partly dark brown, porous limonitic rock; possibly carbonatite in origin	18.40 19.40 20.40		W - - C			18.40																
40-45	Dark brown, partly orange brown, earthy goethite rich rock; possibly carbonatite origin Black manganese earthy material (Mn-Fe ore) Dark greyish brown to orange brown strongly weathered earthy rock; possibly carbonatite/ferrocarbonatite origin. 40.85-40.90: wet clay like water table	20.40 21.40 22.40 23.40		S - - V			20.40																
45-50	Orange brown earthy rock; carbonatite/ferro-carbonatite origin Pale grey earthy material (original rock?) Brown to dark brown hard siliceous iron ore Orange brown iron-rich earthy rock; (carbonatite origin?)	23.40 24.40 25.40 26.40		S - - C			23.40																

Key: Weathering S: strong M: moderate W: weak F: fresh Reaction to HCl +: react -: not react Magnetic test +: magnetic -: non magnetic Vein V: vein part A: abundant C: common R: rare N: not veined Tested Samples WA: whole rock analysis P: polished thin section T: thin section O: oxygen isotopes S: size measurement of minerals

Ap. 24 Geological Log of Diamond Drilling Hole, BR-22

DDH No. BR-22
 LOCATION { X: 741,080mE
 (UTM GRID) { Y: 9979,146mN
 ELEVATION : 1,303.5m
 BEARING : -90°
 INCLINATION : 50.10 m

DEPTH (m)	BOUNDARY DEPTH(m) and CORE ANGLE(°)	GEOLOGIC COLUMN	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														COBALTED Lu, Ce and Nd CONTENTS (%)	CORE RECOVERY	DEPTH (m)
										P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)			
0 - 5	0.50	Dark brown surface soil Pale brown to khaki strongly weathered gneiss	S	S	I	R	BR-22-W outcrop surface (T)	4.70 5.00 6.00																		
5 - 10	4.70 5.00 6.00	Orange brown ore (iron-oxide vein) Grey strongly weathered earthy gneiss Grey, partly orange brown (by limonite stain), strongly sheared granitic gneiss. 9.80-10.00m : gossan like ore	S	S	I	R																		3.6	0.700	
10 - 15	10.30	Fault zone consisting of yellow ochre earthy material and breccias of sheared granitic gneiss	S	S	I	C																			1.650	
15 - 20	15.20	Pale grey strongly fractured granitic gneiss, mostly breccia-like core	S	S	I																					
20 - 25	18.50	Fault zone consisting of fragments of granitic gneiss and sandy material	S	S	I																					
25 - 30	27.10 27.50	Fault zone consisting of fragments of granitic gneiss and sandy material 27.10-27.50m : sheared granitic gneiss stained by limonite	S	S	I																					
30 - 40	30.00	Fault zone consisting of breccia and matrix Breccia : chlorite (after mafics) bearing granitic gneiss, subrounded Matrix : pale greyish brown earthy material	S	S	I																					
40 - 45	41.40	Fault zone in greenish grey granitic gneiss. Main constituents : fine breccias less than 3cm in size	S	S	I																					
45 - 50	50.10		S	S	I																					

Key: Weathering S:strong M:moderate W:weak F:fresh
 Reaction to HCl +:react -:not react
 Magnetic test +:magnetic -:non magnetic
 Vein V:vein part A:abundant C:common
 R:rare N:not veined
 Tested Samples W:A:whole rock analysis T:thin section
 P:polished thin section
 E:EPMA test
 O:oxygen isotopes
 S:size measurement of minerals

Apex 25 Geological Log of Diamond Drilling Hole, BR-23

DDH No. BR-23 LOCATION BEARING INCLINATION LENGTH

(UTM GRID) { X : 740,520mE
 { Y : 9,979,057mN

ELEVATION : 1,328.0m : -90° : 50.20m

DEPTH (m)	BOUNDARY DEPTH (m) AND CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION OF TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														CORE RECOVERY (%)			
									P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb		Lu	COMBINED La, Ce and Nd CONTENTS (%)	
0	0.50	Dark brown soil	S	-	-	-																				
2.00	2.00	Pale brown to brownish grey strongly weathered gneiss	S	-	-	-																				
3.10	3.10	Light grey weathered granitic gneiss	S	-	-	-																				
4.40	4.40	Pale brown to brown weathered gneiss stained by limonite	S	-	-	-																				
10-50	10-50	Pale grey to light grey granitic gneiss with porphyroclasts of pink K-feldspar. Gneissosed structure by thin compositional bands is very common. Brown iron rich veinlets occur sporadically throughout the section. Thickness of the veinlets is 1 to 7cm.	W	-	-	-																				
18.45	18.45	Dark brown limonitized vein with banding structure					BR-23-A (T)	18.45																		
18.75	18.75	Pale grey to light grey strongly banded granitic gneiss. Elongated porphyroclasts of pink K-feldspar are very common with wavy banding structure 30.90-21.70m; fractured zone 34.85-34.90m; brown iron rich ore (vein)	F	-	-	R	BR-23-B (O)	18.75																		
30.90	30.90																									
31.70	31.70																									
35.55	35.55																									
35.70	35.70																									
36.40	36.40																									
38.00	38.00	Sheared zone consisting of fragments of gneiss	M	-	-	R																				
41.90	41.90	Pale brown fractured granitic gneiss weakly stained by limonite	F	-	-	R																				
42.80	42.80	Sheared zone consisting of fragments of gneiss. Pale grey to white finely gneissosed granitic gneiss with porphyroclasts of pink K-feldspar and elongated quartz crystals	M	-	-	R																				
50.20	50.20																									

Key: Weathering: S: strong, M: moderate. Reaction to HCl: +: react, -: not react. Magnetic test: +: magnetic, -: non magnetic. Vein: V: vein part abundant, A: abundant, C: common. R: rare, N: not veined. Tested Samples: W: whole rock analysis, T: thin section. P: polished thin section, E: EPMA test. C: oxygen isotopes, S: size measurement of minerals.

Ap. 26 Geological Log of Diamond Drilling Hole, BR-24

LOCATION (X : 740.882mE
 (UTM GRID) Y : 9979051mN
 BEARING : 90°
 INCLINATION : -90°
 LENGTH : 50.50m
 ELEVATION : 1,315.0m

DDH No. BR-24

DEPTH (m)	GEOLOGIC COLUMN and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	YEAR	POSITION of TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	ANALYTICAL RESULTS															COMBINED La, Ce and Nd CONTENTS (%)
										P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	
0	1.00	Purplish brown strongly weathered earthy rock	S	-	A	-	BR-24-0	1180	5830	4.19	1030	1250	550	57.8	657	0.270	0.52	0.17	65.0	84.5	11.0	28.4	8.5	1.260	
	2.30	Brown to pale brown bleached banded carbonatite	S	-	A	-	BR-24-01	1190	5620	4.28	123	1600	630	21.2	1462	0.670	0.80	0.20	155.0	43.3	12.7	33.4	4.8	1.630	
	3.60	Light grey bleached finely banded carbonatite	S	-	A	-	BR-24-02	1200	730	2.25	534	560	260	3.7	454	0.160	0.23	0.08	100.0	31.2	5.6	4.9	3.0	0.490	
	4.10	3.60-4.10m : beige finely brecciated matrix	S	-	A	-	BR-24-03	1210	730	1.09	226	560	105	5.1	197	0.061	0.10	0.03	42.0	10.9	2.6	6.7	1.1	0.191	
	5.30	Grey hard compact very fine-grained siliceous iron ore	S	-	A	-	BR-24-04	1220	5020	5.21	782	1250	380	10.7	403	0.140	0.23	0.09	125.0	29.1	16.2	25.0	3.5	0.490	
		Pale grey finely brecciated carbonatite veined by iron-oxide and siliceous iron ore	M	-	A	-	BR-24-05	1230	4940	5.67	962	2600	610	17.4	627	0.250	0.39	0.16	197.0	64.0	26.5	33.2	5.2	0.800	
	6.00	Pale brown strongly limonitized rock with xenolith of gneiss	S	-	A	-	BR-24-06	1240	6300	6.59	1375	1900	410	40.3	679	0.800	1.01	0.27	187.0	43.6	19.0	13.4	3.9	2.090	
	9.20	Pale brown hard compact siliceous-iron ore	S	-	A	-	BR-24-07	1250	8690	10.70	2160	2850	720	105.9	756	1.920	2.02	0.44	231.0	96.9	24.8	21.9	4.1	4.900	
	10.70	Brownish grey earthy rock to clay	S	-	A	-	BR-24-08	1260	7060	7.02	1945	1950	530	102.1	459	1.410	1.42	0.28	175.0	56.3	18.3	27.4	3.7	3.110	
	13.20	Brown goethite rich rock (carbonatite origin)	S	-	A	-	BR-24-09	1270	8530	4.38	1985	900	420	60.0	568	1.650	1.52	0.26	164.0	36.3	11.4	11.1	5.6	3.430	
	14.30	Brown strongly limonitized rock with breccias of gneiss	S	-	A	-	BR-24-10	1280	8800	6.20	1530	1750	540	45.7	675	1.290	1.26	0.26	185.0	46.9	5.7	23.7	5.3	2.810	
	16.00	Pale brown compact siliceous ore with earthy part	S	-	A	-	BR-24-11	1290	9870	4.03	1995	1950	430	11.4	55	0.840	0.92	0.20	151.0	35.0	11.1	18.5	3.5	1.960	
	17.40	Pale brown to khaki earthy rock	S	-	A	-	BR-24-12	1300	3240	5.35	623	1450	280	9.2	354	0.470	0.60	0.15	113.0	26.6	3.5	11.6	2.0	1.220	
	18.30	Grey to dark grey clay or earthy rock : carbonatite?	S	-	A	-	BR-24-13	1310	8620	6.49	1960	1950	460	16.5	612	1.230	1.22	0.25	181.0	36.5	11.2	27.0	4.4	2.700	
	21.20	Brownish grey earthy, partly clayey rock with dark grey hard siliceous ores in several pieces	S	-	A	-	BR-24-14	1320	4640	3.00	1195	1150	250	18.2	371	0.490	0.58	0.12	95.9	25.3	8.2	21.6	2.2	1.180	
	27.60	Finely brecciated gneiss with network vein of iron rich ore	S	-	A	-	BR-24-15	1330	4710	2.47	1960	990	480	58.5	583	0.760	0.94	0.20	167.0	38.7	14.4	25.1	4.1	1.890	
	28.60	Brown leached out carbonatite strongly veined by iron-rich ore	S	-	A	-	BR-24-16	1340	4610	1.38	1240	560	470	27.4	636	0.330	0.44	0.16	202.0	49.5	14.9	18.5	5.2	0.930	
	31.00	Swarm of ferrocarbonatite dyke into host fractured gneiss	M	+	A	-	BR-24-17	1350	5380	2.89	3130	760	620	63.6	1031	0.560	1.04	0.42	312.0	68.0	18.9	34.2	9.9	1.820	
	32.30	Dark brown to black porous ferrocarbonatite	M	+	R	-	BR-24-18	1360	2600	2.90	1310	700	600	55.9	580	0.170	0.56	0.33	355.0	107.7	28.5	31.5	4.7	1.060	
	33.80	Pale grey banded carbonatite	M	+	R	-	BR-24-19	1370	1205	5.27	593	730	630	25.8	610	0.690	0.96	0.45	425.0	118.6	25.3	29.3	8.1	1.920	
	34.20	Dark grey to black, somewhat porous ferrocarbonatite, strongly stained by limonite	M	+	R	-	BR-24-20	1380	2745	27.45	3590	420	22.9	799	0.600	0.81	0.23	272.0	69.8	5.0	17.5	2.5	1.690		
	37.45	Pale reddish brown heterogeneous porous carbonatite	W	+	-	-	BR-24-21	1390	9740	4.77	3230	280	340	16.7	490	1.650	1.55	0.24	103.0	66.8	6.6	19.8	3.4	3.480	
	38.30	Pale brownish grey weakly banded fine-grained carbonatite, sometimes cut by very fine-grained albite of the latest stage of carbonatite activity	W	+	C	-	BR-24-22	1400	12380	4.83	2760	455	260	25.1	417	1.170	1.97	0.38	305.0	44.0	7.1	6.3	2.7	3.220	
	40.00	Pale grey to white fine-grained carbonatite with broad bands of magnetite concentration	F	+	N	-	BR-24-23	1410	13860	1.06	2470	1320	480	27.2	398	0.200	0.31	0.09	90.5	28.6	10.1	34.4	5.3	0.550	
	42.40	Dark grey and white banded (compositional) carbonatite	F	+	N	-	BR-24-24	1420	5390	4.31	1720	745	360	37.6	491	0.690	1.12	0.33	202.0	52.2	11.0	19.6	5.0	2.130	
	45.90	Pale grey to white fine-grained carbonatite with magnetic rich bands	F	+	N	-	BR-24-25	1430																	

Key: Weathering: S-strong, M-moderate
 Reaction to HCl: +react, -not react
 Magnetic test: +magnetic, -non magnetic
 Vein part: V-vein part, R-rare
 Abundance: A-abundant, C-common
 Core recovery: R-recovered, N-not veined

Apx. 27 Geological Log of Diamond Drilling Hole, BR-25

DDH No. BR-25 LOCATION BEARING INCLINATION ELEVATION

(UTM GRID) { X : 740 979mE
 { Y : 9979 061mN

 : -90°

 : 50.10m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														COMBINED La, Ce and Nd CONTENTS (%)	CORE RECOVERY (%)	DEPTH (m)	
										P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb				Lu
0			Dark brown soil	S	-	-																					
1.00			Pale grey strongly weathered (bleached) schistose gneiss with minor chlorite seams.	S	-	-	R																				
4.00		55°	Pale grey schistose granitic gneiss with green chlorite seams and porphyroclasts of pink K-feldspar.	M	-	-	R																				
6.70			Pale grey to pale green schistose granitic gneiss with characteristic thin chlorite seams, sporadically veined by iron rich ore. Main vein part : 6.70-7.00m, 11.60-12.00m, 15.60-15.70m.	M	-	-	C																				
17.00			Pale green chlorite seam rich schistose granitic gneiss	M	-	-	R																				
21.30		10°	Pale grey, mostly stained brown, fractured gneiss veined by limonitized iron rich ore. Main vein parts : 27.35-27.50m, 27.60-27.65m	M	-	-	C																				
26.00		25°	Chlorite seam rich fractured granitic gneiss	M	-	-	R																				
29.30			Pale grey finely brecciated chlorite poor granitic gneiss	M	-	-	C																				
31.20		30°	Dark brown limonitized iron-rich ore Fault zone consisting of fine breccias (less than 1cm in size) of gneiss and brown earthy material. Gneiss : pale green chlorite seam bearing granitic gneiss with porphyroclasts of K-feldspar	M	-	-	V																				
38.10		40°	Pale greenish grey fractured gneiss	M	-	-	N																				
42.00			Fault zone consisting of fine breccias of granitic gneiss and brown earthy material	S	-	-	N																				
46.00		30°	Pale grey to white granitic gneiss with porphyroclasts of plagioclase and K-feldspar	F	-	-	N																				
50.10																											

Key: Weathering Reaction to HCl Magnetic test Vein Tested Samples

S: strong W: weak +: magnetic V: vein part W: whole rock analysis

M: moderate F: fresh -: non magnetic A: abundant T: thin section

 E: EPMA test

 O: oxygen isotopes

 S: size measurement of minerals

Apx. 28 Geological Log of Diamond Drilling Hole, BR-26

DDH No. BR-26 LOCATION { X : 740.496mE
(UTM GRID) { Y : 9978.948mN
ELEVATION : 1,326.0m BEARING : -90°
INCLINATION : 50.40m LENGTH :

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION to HCl	MAGNETIC TEST	VEIN	POSITION of TESTED SAMPLES	DEPTH and WIDTH (m)	ANALYTICAL RESULTS														CORE RECOVERY (%)	DEPTH (m)	
										P (%)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)			Lu (ppm)
0			Dark brown soil	S	-																					
1.00			Pale grey strongly weathered granitic gneiss	S	-																					
3.00			Pale grey weakly fractured granitic gneiss	S	-																					
8.00			Pale grey finely fractured granitic gneiss	W	-																					
9.00			Dark brown limonitized ore	W	-																					
9.30			Light grey to white granitic gneiss with porphyroclasts of pink K-feldspar.	W	-																					
14.80			Thin veinlets of iron-rich ore occur moderately throughout the section	W	-																					
17.80			Light grey strongly fractured gneiss	W	-																					
26.90			Light grey weakly fractured granitic gneiss with characteristic occurrence of pink K-feldspar, weakly stained by limonite.	W	-																					
36.10			Light grey to white moderately fractured granitic gneiss without pink K-feldspar	F	-																					
39.80			Light grey to white strongly fractured granitic gneiss, partly earthy appearance, Pale brown stain is dominant.	F	-																					
44.20			Light grey to white granitic gneiss without pink K-feldspar and mafic minerals.	F	-																					
44.20			Weak mineralization																							
45.20			44.20-44.45m : orange brown vein (width 2cm)																							
45.20			45.20-45.70m : brecciated vein with limonitic vein																							
45.20			47.50-47.70m : orange brown vein																							
47.50																										
47.50																										
50.40																										

Key: Weathering: S-strong, M-moderate, F-fresh, W-weak; Reaction to HCl: +react, -not react; Magnetic test: +magnetic, -non magnetic; Vein: V-vein part, A-abundant, C-common; Test: R-rare, N-not veined; Tested Samples: W-whole rock analysis, T-thin section; Polished thin section: O-oxygen isotopes, E-EPMA test; Size measurement of minerals: S-size measurement of minerals.

Apex 29 Geological Log of Diamond Drilling Hole, BR-27

DDH No. BR-27 LOCATION { X : 740.678 mE
 BEARING { Y : 9978.946 mN
 INCLINATION : -90°
 LENGTH : 50.50 m
 ELEVATION : 1,320.0m

DEPTH (m)	BOUNDARY DEPTH (m) and CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN	POSITION OF TESTED SAMPLES	SAMPLE No.	DEPTH and WIDTH (m)	P (ppm)	Ba (%)	Sr (ppm)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	La, Ce and Nd CONTENTS (%)
0	0.50	Dark brown soil	S	-	-	-																			
2.80	2.80	Brown to dark brown strongly weathered gneiss	S	-	-	-																			
4.10	4.10	Pale brownish grey, strongly weathered granitic gneiss	S	-	-	-																			
12.50	12.50	Strongly brecciated feldspathic gneiss, cemented by brown goethite rich matrix. Goethite occurs also fissure filling veinlets. 12.60-12.90m: goethite rich zone	S	-	-	-																			
13.60	13.60	Brown siliceous iron ore containing fine breccias of gneiss	M	-	-	-			14.30m																0.430
15.90	15.90	Brown brecciated granitic gneiss cemented by goethite rich matrix	M	-	-	-			BR-27-01																
17.90	17.90	Grey to brown weakly veined (by goethite) granitic gneiss	M	-	-	-			BR-27-A																
19.50	19.50	Brown siliceous iron ore with small (0.5cm) breccias of gneiss	M	-	-	-																			
21.70	21.70	Pale brown earthy rock (carbonate origin?)	S	-	-	-																			
23.10	23.10	Brown goethite rich earthy rock, partly siliceous	S	-	-	-																			
25.20	25.20	Brown, partly light brown, strongly weathered earthy rock (possibly carbonate origin)	S	-	-	-																			
28.00	28.00	Dark greyish brown, partly brown to light brown, strongly weathered earthy rock (possibly cavity filling material)	S	-	-	-																			
31.10	31.10	Dark greyish brown, partly brown to light brown, strongly weathered earthy rock (possibly cavity filling material)	S	-	-	-																			
39.00	39.00	Greyish brown earthy rock (carbonate origin)	S	-	-	-																			
40.10	40.10	Strongly weathered granitic rock	M	-	-	-																			
41.00	41.00	Pale grey weakly fractured granitic gneiss	M	-	-	-																			
44.50	44.50	Dark brown to orange brown goethite rich ore, partly siliceous	M	-	-	-																			
47.50	47.50	Grey fractured gneiss, weakly veined by limonitic ore	M	-	-	-																			
49.50	49.50	Brown earthy rock (carbonate origin?)	S	-	-	-																			
50.50	50.50		S	-	-	-																			

Key: Weathering: S: strong, M: moderate, N: none
 Reaction to HCl: +: react, -: not react
 Magnetic test: +: magnetic, -: non magnetic
 Vein: V: vein part, A: abundant, C: common
 R: rare, N: not veined
 Tested Samples: W: whole rock analysis, T: thin section
 P: polished thin section, E: EPMA test
 O: oxygen isotopes, S: size measurement of minerals

Ap. 30 Geological Log of Diamond Drilling Hole, KG-1

DDH No. KG-1 LOCATION { X: 651,650mE
(UTM GRID) { Y: 9945,895mN
BEARING : 40°
INCLINATION : -50°
ELEVATION : 1,185m LENGTH : 60.10m

DEPTH (m)	GEOLOGIC COLUMN AND CORE ANGLE (°)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	Magnetic test	Vein	POSITION of TESTED SAMPLES	VEIN	ANALYTICAL RESULTS															CORE RECOVERY (%)
									P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	
0		Calcrete consisting of carbonatite and metabasalt gravels.																						
5.80		Strongly fractured bleached metabasalt, cemented by subordinate minerals	S	+	-	N																		
7.30		Brown fine-grained magnesian rhyolite	S	+	-	N	KG-1-01																	
8.70		8.20-8.70m: intruded metabasalt (country rock)	S	+	-	N	KG-1-02																	
9.30		Strongly shattered bleached metabasalt filled with carbonatite material, with minor vein of carbonatite (5cm in width)	S	+	-	N	KG-1-03																	
13.50		Greenish brown fine-grained magnesian rhyolite	S	+	-	N	KG-1-04																	
14.40		Dark brown to black weathered ferrocarbonatite	S	+	-	N	KG-1-05																	
15.70		Pale brown banded magnesian rhyolite with impregnation of greenish grey secondary minerals	S	+	-	N	KG-1-06																	
16.40		18.40-19.00m: black to dark brown ferrocarbonatite	S	+	-	N	KG-1-07																	
17.30		Purplish grey strongly weathered volcanic rock, phonolite or phonolitic nephelinite (rare)	S	+	-	N	KG-1-08																	
21.80		Brown strongly weathered carbonatite to ferrocarbonatite	S	+	-	N	KG-1-09																	
23.40		Dark brown to black strongly weathered ferrocarbonatite	S	+	-	N	KG-1-10																	
24.60		Purplish grey to pale brown, strongly weathered volcanic rocks.	S	+	-	N																		
25.60			S	+	-	N																		
27.20		original rock: phonolite or phonolitic nephelinite	S	+	-	N																		
27.40		original rock: 25.10-25.60m, 27.20-27.40m carbonatite dyke	S	+	-	N																		
28.10		28.10-28.80m, 31.50-31.70m	S	+	-	N																		
31.50			S	+	-	N																		
32.70		Brown weathered carbonatite with remnant of volcanics	S	+	-	N	KG-1-11																	
33.60		Purplish grey volcanic rocks: strongly altered	S	+	-	N																		
34.80		Brown strongly weathered carbonatite intruded by ferrocarbonatite dykes (max 40cm, minimum 5cm wide)	S	+	-	N																		
37.60		Purplish grey fractured porphyritic volcanics	S	+	-	N																		
39.00		Brown weathered ferrocarbonatite (dyke)	S	+	-	N																		
39.60		Grey slightly weathered medium-grained porphyritic phonolite or phonolitic nephelinite, calcite veins developed	S	+	-	N																		
43.40		43.40-43.60m: fractured zone	S	+	-	N																		
43.85		Grey slightly weathered medium-grained porphyritic phonolite, ferrocarbonatite veins (5-10cm in width) developed throughout the section	S	+	-	N																		
45.05			S	+	-	N																		
47.50		45.05-45.15m: ferrocarbonatite dyke	S	+	-	N																		
47.55		47.55-47.50m: strongly fractured zone	S	+	-	N																		
49.75		49.75m: Water Table	S	+	-	N																		
53.60		Grey fresh porphyritic phonolite to phonolitic nephelitic strongly carbonatized: felsic mineral + calcite, calcite veins	S	+	-	N	KG-1-A																	

Key: Weathering S: strong, M: moderate, I: indistinct
Reaction to HCl +: react, -: not react
Magnetic test +: magnetic, -: non magnetic
Vein V: vein part, A: abundant, C: common
Position of tested samples R: rare, N: not named
Tested Samples W: whole rock analysis, T: thin section
Polished thin section E: EPMA, T: test
O: oxygen isotope, S: size measurement of minerals

Ap. 31 Geological Log of Diamond Drilling Hole, KG-2

DDH No. KG-2
 LOCATION { X: 531.695 mE
 (UTM GRID) Y: 9945.80 5mN
 BEARING : 70°
 INCLINATION : -50°
 LENGTH : 60.10m
 ELEVATION : 1,185m

DEPTH (m)	GEOLOGIC COLUMN	BOUNDARY BEHAVIOR (incl. and angle)	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	VEIN	MAGNETIC TEST	VEN	POSITION OF TESTED SAMPLES	SAMPLE No.	DEPTH WIDTH (m)	ANALYTICAL RESULTS														CORE RECOVERY (%)			
												P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb		Lu	La, Ce and Yb CONCENTRATIONS (%)	
1.20			Calcrete consist of strands of carbonate and metabasalt	S	+	-	-			KG-2-01	1.20	1955	1.36	1060	478	195	7.8	23.4	0.260	0.47	0.11	12.0	35.7	5.5	12.9	1.4	0.940		
3.00			Fine grey to greyish brown fine-grained carbonate	S	+	-	-			KG-2-02	3.00	1085	1.28	1285	350	230	9.0	18.5	0.250	0.40	0.13	12.0	39.8	10.8	14.3	2.2	1.250		
3.50			Pale grey to greyish brown fractured metabasalt	M	-	-	-																						
4.00			Brown line to medium-grained magnetite rich ferro-carbonate or carbonate	M	+	-	-																						
5.00			5.00m magnetite-hematite or goethite	M	+	-	-																						
8.20			Strongly fractured metabasalt with invasion of ferrocarbonate	M	+	-	-																						
9.10			Brown to dark brown line to medium-grained ferro-carbonate rich in talcoid metabasalt breccias	M	+	-	-																						
11.80			Brown to dark brown magnetite rich laminated carbonate	M	+	-	-																						
12.30			Brown heterogeneous ferrocarbonate with metabasalt breccia	M	+	-	-																						
14.30			Pale greenish grey to white altered metabasalt	M	-	-	-																						
15.10			Brown moderately weathered ferrocarbonate	M	+	-	-																						
15.90			15.90m strongly fractured and weathered earthy nearby blocks of metabasalt (xenolith), small breccias of metabasalt are sparsely included throughout the section	M	+	-	-																						
16.70			major metabasalt blocks; 16.90-17.10m, 18.30-25.70m, 20.30-20.50m, 22.30-22.50m, 24.70-25.10m, 25.60-25.90m	M	+	-	-																						
22.30				M	+	-	-																						
23.70				M	+	-	-																						
24.70				M	+	-	-																						
25.90				M	+	-	-																						
28.60			Brown moderately weathered fine-grained massive partly banded ferrocarbonate	M	+	-	-																						
33.80			metabasalt inclusion; very minor	M	+	-	-																						
36.80			Brown moderately weathered ferrocarbonate (lavas) intruded by brown to dark brown carbonite vein	M	+	-	-																						
37.80			intruded by ferrocarbonate dykes	M	+	-	-																						
38.80			dyke: 40.40-40.90m, 41.70-42.00m	M	+	-	-																						
39.30				M	+	-	-																						
43.60			Brown weathered carbonate and intruded phonolite	M	+	-	-																						
45.00			Pale grey fine porphyritic glassy phonolite (lavas)	M	-	-	-																						
47.50			ferrocarbonate dyke: 45.40-45.55m	M	-	-	-																						
49.30			Purplish grey to grey fractured lapilli tuft to tuft	M	-	-	-																						
49.80			Brown weathered ferrocarbonate (dyke)	M	+	-	-																						
51.80			Grey to dark grey lapilli tuft to tuft (phonolitic nephelinitic?)	M	+	-	-																						
53.70			strongly veined by carbonate minerals	M	+	-	-																						
54.30			Grey tuft to lapilli tuft (nephelinitic matrix) fractured zone: 55.70-54.30m, 56.00-56.70m	M	+	-	-																						
56.00			Grey to pale purplish grey porphyritic phonolite (lavas) weakly veined by carbonate minerals	M	+	-	-																						
56.70				M	+	-	-																						
57.80				M	+	-	-																						
58.10				M	+	-	-																						
60.10				M	+	-	-																						

Key: Weathering: S: strong, M: moderate, W: weak, F: fresh
 Reaction to HCl: +react, -not react
 Magnetic test: +magnetic, -non magnetic
 Vein: V: vein part, A: abundant, C: common
 R: rare, N: non-veined
 Tested Samples: W: whole rock analysis, T: thin section
 P: polished thin section, E: EPMA, last
 O: oxygen isotopes, S: size measurement of minerals

Apex 32 Geological Log of Diamond Drilling Hole, KG-3

DDH No. KG-3 LOCATION (X: 651,702mE BEARING : 70°
 (UTM GRID) (Y: 9,945,710mN INCLINATION : -50°
 ELEVATION : 1,183 m LENGTH : 60.10 m

DEPTH (m)	BOUNDARY DEPTH (m) and CORE SAMPLE NO.	GEOLOGICAL DESCRIPTION	WEATHERING	REACTION TO HCl	MAGNETIC TEST	VEIN PART	Piston TESTED SAMPLES	DEPTH (m)	P (%)	Bt (%)	Sf (%)	Nb (ppm)	Y (ppm)	U (ppm)	Th (ppm)	La (%)	Ce (%)	Nd (%)	Sm (ppm)	Eu (ppm)	Tb (ppm)	Yb (ppm)	Lu (ppm)	Lanthanide contents (%)	CORE RECOVERY (%)
0		Clayey consisting of carbonaceous and metabasalt breccia	S	+	N		KG-3-01	2.10	13.40	5.34	7.52	400	185	4.3	0.770	0.36	0.16							1.790	
5	2.10 3.30	Pale brown slightly banded fine-grained carbonaceous matrix with scattered dark brown to black carbonaceous clasts and very minor amounts of small metabasalt breccia	M	+	N		KG-3-02	14.40	385	4.66	893	570	195	4.6	4.09	0.910	1.92	0.20	7700	92.2	12.3	10.9	1.6	2.130	
10	3.30 8.00	Brown massive ferrocarbonatic	M	+	N		KG-3-03	7.70	1460	3.37	1300	405	360	4.9	4.08	0.690	1.04	0.20	1920	57.7	18.9	25.6	3.7	2.110	
15	8.00 13.40	Strongly fractured grey metabasalt	M	+	N		KG-3-04	0.00	1505	31.9	1313	273	350	5.1	3.45	0.650	0.92	0.18	1350	56.7	11.3	22.6	5.3	1.730	
20	13.40 16.40	Brown massive ferrocarbonatic containing yellow line secondary minerals	M	+	N		KG-3-05	16.40	1030	2.88	87.2	16.0	500	3.3	3.88	0.820	0.80	0.13	1230	4.00	13.6	20.0	4.6	1.160	
25	16.40 21.70	Dark brown strongly weathered ferrocarbonatic	M	+	N		KG-3-06	21.70	2820	5.62	1675	166	1100	9.2	0.17	1.86	1.54	0.31	2480	87.3	32.3	63.3	9.5	3.030	
30	21.70 23.40	Dark brown strongly weathered ferrocarbonatic, partly earthy, 22.50-23.40: fractured core	S	+	N		KG-3-07	23.40	4160	2.94	1205	490	830	13.3	1.80	0.430	0.70	0.20	2250	86.2	20.5	37.3	0.1	1.420	
35	23.40 26.70	Brown strongly weathered ferrocarbonatic, half of the section is earthy	M	+	N		KG-3-08	26.70	6480	1.42	1130	760	490	10.8	13.71	0.830	0.76	0.20	1620	70.0	20.4	18.6	3.0	1.340	
40	26.70 28.10	Pale grey carbonatic cemented by ferrocarbonatic vein	M	+	N		KG-3-09	28.10	8410	3.68	1560	800	300	6.9	8.73	0.890	0.87	0.23	1850	48.2	13.9	15.6	2.7	1.590	
45	28.10 32.10	Strongly altered and altered zone consisting mainly of breccia of metabasalt, partly carbonatic cementing material	M	+	N		KG-3-10	32.10	8960	1.22	2090	1150	430	6.5	8.61	0.340	0.69	0.19	1800	71.6	28.3	16.3	3.9	1.220	
50	32.10 34.90	Pale brown weathered heterogeneous carbonatic with small fragments of green metabasalt	S	+	N		KG-3-11	34.90	10910	5.98	2240	465	500	6.8	7.95	0.790	1.28	0.30	1750	58.3	16.2	29.4	3.6	2.370	
55	34.90 38.20	Brown to dark brown massive ferrocarbonatic rich in pale green secondary minerals	M	+	N		KG-3-12	38.20	9410	3.68	1560	800	300	6.9	8.73	0.890	0.87	0.23	1850	48.2	13.9	15.6	2.7	1.590	
60	38.20 40.80	Strongly weathered pale brown carbonatic rich in yellowish green secondary minerals	S	+	N		KG-3-13	40.80	10880	1.27	1390	550	330	10.6	3.83	0.10	0.28	0.10	1540	43.9	10.7	10.7	1.1	0.880	
65	40.80 43.15	Green shaltered metabasalt: xenolith	M	+	N		KG-3-14	43.15	13470	1.62	1380	205	193	7.5	10.57	0.050	0.28	0.18	1390	43.9	6.3	5.6	1.1	0.510	
70	43.15 44.70	Pale brown weathered fine-grained carbonatic	M	+	N		KG-3-15	44.70	4440	3.77	1180	1020	360	14.3	10.72	0.080	0.47	0.25	191.0	54.2	13.7	15.8	1.8	0.608	
75	44.70 46.00	Purple grey porphyritic volcanic rock (phonite), strongly fractured and cemented by white calcite	M	+	N																				
80	46.00 49.20	Brown weathered ferrocarbonatic to carbonatic, partly strongly fractured. Blocks of brecciated phonite are contained in several parts of the section	M	+	N																				
85	49.20 50.60	Brown strongly weathered carbonatic to ferrocarbonatic, some parts are earthy	S	+	N																				
90	50.60 54.80																								
95	54.80 56.10																								
100	56.10 60.10																								

Key: Weathering W-weak F-frash Reaction to HCl +-react --not react Magnetic test +-magnetic --non magnetic Vein V-vein part Abundant C-common Piston P-vein part Abundant C-common R-rare N-not veined Tested Samples W-whole rock analysis P-polished thin section O-oxygen isotopes S-size measurement of minerals

Apex 33 Geological Log of Diamond Drilling Hole, KG-4

DDH No. KG-4

LOCATION

X : 651.764 mE

BEARING : 70°

(UTM GRID)

Y : 9945.620 mN

INCLINATION : -50°

ELEVATION

: 1,180 m

LENGTH

: 60.10 m

DEPTH (m)	GEOLOGIC COLUMN (CODE)	BOUNDARY DEPTH (m)	GEOLOGICAL DESCRIPTION	REACTION TO HCl	WEARING	MAGNETIC TEST	VENEN	POSITION OF TESTED SAMPLES	DEPTH AND WIDTH (mm)	ANALYTICAL RESULTS														COMBINED LA, Ce and Ba CONTENTS (%)	CORE RECOVERY (%)	
										P	Ba	Sr	Nb	Y	U	Th	La	Ce	Nd	Sm	Eu	Tb	Yb			Lu
0-1.70		1.70	Calcrete, carbonatic and ferrocyanitic	S																						
1.70-4.00		4.00	Brown massive ferrocyanitic containing small bleached metabasalt breccia (1 to 2 cm in size)	M				KG-4-01																		
4.00-5.00		5.00	Strongly fractured zone of ferrocyanitic					KG-4-02																		
5.00-6.00		6.00	Brown massive ferrocyanitic same as above. Spores or spots of black hematite are common. Pale green to white small secondary minerals are impregnated throughout the section	M				KG-4-03																		
6.00-11.00		11.00	Fractured part : 13.30-13.45m, 13.50-13.60m, 13.90-13.95m, 14.25-14.50m, 14.85-14.95m	M				KG-4-04																		
11.00-16.80		16.80	Grey to white altered bleached metabasalt	M				KG-4-05																		
16.80-17.70		17.70	Brown massive heterogeneous ferrocyanitic same as 5.00-16.80m	M				KG-4-06																		
17.70-20.70		20.70	Brown strongly weathered (porous) carbonatic; leached out fabric	M				KG-4-07																		
20.70-23.70		23.70	Grey strongly weathered fine porphyritic rock (phonolite)	M				KG-4-08																		
23.70-25.75		25.75	Carbonate mineral (veinlets, replacing developed)					KG-4-09																		
25.75-26.15		26.15	Altered zone					KG-4-10																		
26.15-31.5		31.5	Fine grey to pale brown (due to limonite stain) calcareous coarse turf to Papili turf; partly turf breccia. Feasibly effusive facies of carbonatic. Matrix : mainly calcite vein. Breccia : grey volcanic rock (phonolite) Fractured zone : 31.10-31.30m, 34.50-34.60m	M				KG-4-11																		
31.5-37.00		37.00	Brown massive ferrocyanitic with black spots and black iron concentrated parts.	S				KG-4-12																		
37.00-43.60		43.60	Grey weathered fine porphyritic phonolite, strongly altered ; felsic minerals to clay mineral, calcite veinlets	M				KG-4-13																		
43.60-47.00		47.00	Grey fine-grained strongly weathered (oxidized) carbonatic, magnetite changed to black iron-oxide	S				KG-4-14																		
47.00-52.25		52.25	Grey strongly weathered early carbonatic	S				KG-4-15																		
52.25-54.70		54.70	Brown strongly weathered fine-grained carbonatic, magnetite-hematite or goethite	S				KG-4-16																		
54.70-59.50		59.50	Strongly altered porphyritic phonolite	S				KG-4-17																		
59.50-60.10		60.10		S																						

Key: Weathering S: strong M: moderate
 Reaction to HCl +: react - : not react
 Magnetic test +: magnetic -: non magnetic
 Venen V: ven part A: abundant C: common
 Tested Samples W: whole rock analysis T: thin section
 Polished thin section E: EPMA test
 O: oxygen isotopes S: size measurement of minerals