

APPENDIX I

ANALYTICAL METHODS

XRF SAMPLE PREPARATION

TABLE OF STANDARDS AND LIMITS OF DETECTION

ISOTOPE ANALYSIS, THERMAL IONIZATION MASS SPECTROMETRY

TABLE OF Sm/Nd ANALYSIS

ICP-MS SAMPLE PREPARATION

LECO SAMPLE PREPARATION

STANDARD DEVIATION AND LIMIT OF DETECTION XRF

Element	Standard Deviation	Limit of Detection
As	0.001	0.001
Ba	0.001	0.001
Bi	0.001	0.001
Br	0.001	0.001
Ca	0.001	0.001
Co	0.001	0.001
Cr	0.001	0.001
Cu	0.001	0.001
Fe	0.001	0.001
Li	0.001	0.001
Mn	0.001	0.001
Ni	0.001	0.001
Pb	0.001	0.001
Pt	0.001	0.001
S	0.001	0.001
Se	0.001	0.001
Si	0.001	0.001
Sr	0.001	0.001
Ta	0.001	0.001
Tb	0.001	0.001
Ti	0.001	0.001
V	0.001	0.001
Zn	0.001	0.001
Zr	0.001	0.001
Total	0.001	0.001

XRF Analysis.

APPARATUS: ARL 8420 wavelength dispersive XRF Spectrometer.

SAMPLE PREPARATION: Samples were dried and roasted at 1000°C to determine % Loss on Ignition.

Major element analyses were executed on fused beads, following the standard method used in the XRF laboratory of the University of Pretoria, as adapted from Bennet and Oliver's (1992) proposed method. 1g pre-roasted sample + 6g Lithium Tetra borate flux mixed in a 5% Au/Pt crucible and fused at 1050°C in a muffle furnace with occasional swirling. A glass disk is poured into a preheated Pt/Au mould and bottom surface analyzed.

Trace elements were analyzed on pressed powder pellets, using a saturated Movial solution as a binder.

CALIBRATION: XRF Spectrometer was calibrated with Certified reference materials. NBSGSC fundamental parameter program was used for matrix correction of major elements as well as Cl, Co, Cr, V, Ba, Sc and S. Rh Compton peak ratio method was used for the other trace elements.

Standard deviation and limit of detection are listed in the Table

STANDARD DEVIATION AND LIMITS OF DETECTION ON XRF

	std dev. (%)	LOD	LIT		GSNcert	JG1cert
SiO ₂	0.4	0.02	<0.02	SiO ₂	65.8	72.3
TiO ₂	0.03	0.0032	<0.01	TiO ₂	0.68	0.26
AL ₂ O ₃	0.3	0.01	<0.01	AL ₂ O ₃	14.67	14.2
Fe ₂ O ₃	0.3	0.0097	<0.01	Fe ₂ O ₃	3.75	2.14
MnO	0.0065	0.0013	<0.01	MnO	0.056	0.063
MgO	0.1	0.0118	<0.01	MgO	2.3	0.74
CaO	0.07	0.01	<0.01	CaO	2.5	2.18
Na ₂ O	0.11	0.0265	<0.03	Na ₂ O	3.77	3.39
K ₂ O	0.06	0.005	<0.01	K ₂ O	4.63	3.97
P ₂ O ₅	0.08	0.01	<0.01	P ₂ O ₅	0.28	0.097
Cr ₂ O ₃	0.0053	0.0006	<0.01	Cr ₂ O ₃	0.008	0.0094
NiO	0.01	0.0013	<0.01	NiO	0.0043	0.0008
V ₂ O ₅	0.0018	0.0008	<0.01	V ₂ O ₅	0.0116	0.0045
ZrO ₂	0.005	0.0009	<0.01	ZrO ₂	0.0317	0.0146
CuO	0.0037	0.0003	<0.01	CuO	0.0025	0.0002
LOI				LOI	1.32	0.46
TOTAL				TOTAL	0	0

	std dev. (ppm)	LOD	LIT	PPM	GSNcert	JG1cert
Cu	3	2	<2	Cu	20	1.5
Ga	2	2	<2	Ga	22	17
Mo	1	1	<1	Mo	1.2	1.46
Nb	3	2	<2	Nb	21	12.6
NI	6	3	<3	NI	34	6
Pb	3	3	<3	Pb	53	26.2
Rb	5	3	<3	Rb	185	181
Sr	4	3	<3	Sr	570	184
Th	6	5	<5	Th	42	13.5
U	6	3	<3	U	8	3.3
Y	3	3	<3	Y	19	30
Zn	5	4	<4	Zn	48	41.5
Zr	6	10	<10	Zr	235	108
Ba	50	50	<50	Ba		
Cl	100	11	<11	Cl	1400	462
Cr	40	15	<15	Cr	450	60
%S	0.02	0.01	<0.01	%S	65	4
Sc	5	1	<1	Sc	55	64.6
V	10	1	<1	V	0.01	0.001
				Sc	7.3	6.5
				V	65	25

GSNcert and JGI cert are Certified standards used in the XRF Laboratories in Pretoria

LOD = Limit of detection LIT = limit noted in results table

Sm/Nd Analysis

APPARATUS:

Automated VG 354 Thermal Ionization Mass Spectrometer with 5 collectors

SAMPLE PREPARATION:

Approximately 0.2. grams of sample powder and about 2 drops (approximately 10-15 mg) of spike (contains known concentration of Sm and Nd) are added into clean teflon containers. Half a milliliter of 16N nitric acid (HNO_3) and 5 ml 42% HF acid are added, enough to cover the bottom of the bomb. Seal the bomb-vessels and heat sample at 100°C overnight to dissolve.

Open vessels and allow the liquid to evaporate off. To the dried residue add 1 ml of Boric acid and 5 ml of 2.5N HCl to dissolve any insoluble fluoride salts that might have been produced by reaction of the rock powder with HF. Dry off the sample at about 50°C overnight.

Dissolve the dry residue in 1 ml of 2.5.norm. HCl. The sample solution is then centrifuged to separate out the undissolved substance from the dissolved.

Different chemical elements (such as lead, uranium, strontium, rare earth elements, and others) are separated from the rest of the components of the rock using "ion exchange chromatography" using dilute acids (hydrochloric acid) and special columns and resins.

The purified elemental salt is evaporated down onto a wire filament about a millimeter wide, and a group of these "beads" are loaded into the source of a mass spectrometer, which can hold about five beads at once.

The sample is heated until it vaporizes and ionizes, and the electrically charged ions are accelerated down a tube and deflected by a magnetic field (magnet shown at right), which separates particles of the element with different masses (isotopes). The ratio of different isotopes is measured.

A table of the analysis is shown in the table.

ICP-MS Analysis (from UCT <http://www.uct.ac.za/depts/geolsci/icpms/home/home.html>)

APPARATUS:

Perkin Elmer / Sciex Elan 6000 inductively coupled plasma mass spectrometer equipped with an acid-resistant cross flow nebuliser, a *Ryton*TM Scott-type spraychamber and a Perkin Elmer AS 90 autosampler.

SAMPLE PREPARATION:

In the case of solid samples analyzed by laser ablation ICP-MS and liquid samples analyzed by solution ICP-MS, sample preparation may be minimal. Rock samples to be analyzed by solution ICP-MS have to be dissolved by *acid digestion*. Various digestion methods involving a range of different ultra clean acids (e.g. HF, HNO₃, HCl, HClO₄, aqua regia) may be used to dissolve various types of materials. Digestion in a microwave oven may speed-up the procedure and help to ensure that all of the sample material is dissolved. Fusion procedures using one of a number of fluxing agents may be required to dissolve refractory minerals such as zircon in some instances. For quantitative analysis, it is crucial that all of the sample material is entirely dissolved.

One of the simplest acid digestion procedures involves the digestion of 50-100 mg of fine, homogenous sample powder in a mixture of HNO₃ and HF in heated, closed teflon beakers, followed by evaporation to complete dryness and two further stages of digestion in HNO₃ and evaporation. The final stage of sample preparation involves dissolution in ~ 2 % HNO₃ internal standard stock solution containing 10 ppb of all the internal standards required for analysis. Most rock samples have to be diluted by a factor of at least 1000-2000 times in order to lower the total dissolved solid content of the final solution to a level at which clogging of interface cone orifices is not a problem

CALIBRATION:

For quantitative ICP-MS analysis, calibration is most commonly achieved by *external standardization*. The signal intensities of all analyte isotopes are measured in a blank as well as in one or more artificial or natural standards with different, known analyte concentrations that cover the concentration range of interest. The (hopefully) linear relationship between the blank-corrected standards on a diagram of signal intensity vs concentration is used to establish a calibration curve that may be used to calculate the

concentration of the analytes in samples of unknown composition. Isotopes commonly used as internal standards in solution ICP-MS include ^9Be , ^{45}Sc , ^{89}Y , ^{103}Rh , ^{115}In and ^{209}Bi .

ANALYTICAL RANGE AND DETECTION LIMITS:

The analytical range of solution ICP-MS extends from the ppt (parts per trillion) to the ppm (parts per million) regions. Solution ICP-MS combines perfectly with a good major and minor element technique such as X-ray fluorescence spectrometry (XRFS). For most elements that can be determined by solution ICP-MS, best-scenario theoretical detection limits are in the ppt range (some in the ppb range).

ACCURACY AND PRECISION:

In most cases, accuracies and precisions of $\sim 1 - 3\%$ may be expected for solution ICP-MS for all elements. Accuracies and precisions of $\sim 1 - 10\%$ are typical for most elements analyzed by laser ablation ICP-MS.

LECO Analysis.

APPARATUS:

Perkin Elmer Elan 6000, Autosampler, FIAS
LECO CHN 1000

SAMPLE PREP:

- Preferably finely ground, oven-dried material stored in desiccators, or air-dried and corrected for moisture content.
- 200-400 mg soil
- The reference solutions (or standards) are prepared using pure solutions bought for the atomic absorption or using rocks known (reference samples) amalgamated and put in solution in the same way as the unknown ones. The technique of calibration compared to natural rocks is used as it is less practical and not easy to make sure that the setting in solution is perfect. Moreover, it is necessary to make several dilutions to be within the detection limits of the apparatus (typically between 1 and 5 g/mL. The solutions must have concentrations of 1000 g/mL and they should be diluted to be in the linear part of the spectrum.

FINAL DILUTIONS:

- Samples are generally acidified solutions (1% HNO₃) with <2% TDS (total dissolved solids)
- An internal standard of Rh or Ir is usually added to the samples, blanks and standards
- Should be made up with MilliQ 18MW water into acid washed vials
- Note that for extract solutions, a final dilution to <0.2% TDS may make the heavy metals of interest undetectable
- The sample volume required depends on number of elements measured; minimum 10 mL
- Final dilutions should not be prepared until you're ready to measure them as ppb range must be used within 1 week and stored in the fridge.
- Measurement Range: > 0.05% C or S

APPENDIX II

ANALYTICAL DATA

MAJOR AND TRACE ELEMENT DATA FROM XRF

PGE, Au AND Cu DATA FROM INAA

SULPHUR CONTENT FROM LECO TITRATION

TRACE ELEMENT DATA FROM ICP-MS

Ni AND Fo VALUES FOR OLIVINE

LIST OF SAMPLES ANALYSED

Sample	Depth (m)	Rock Type	Rock Unit
SH176 UP 1	135.41 - 135.65	Gabbro	top chill
SH176 UP 2	137.45 - 137.83	Gabbro	GN Unit
SH176 UP 3	152.25 - 152.58	Gabbro	GN Unit
SH176 UP 4	163.33 - 163.69	Gabbro	GN Unit
SH176 UP 5	181.09 - 181.40	Gabbro	GN Unit
SH176 UP 6	192.25 - 192.59	Gabbronorite	GN Unit
SH176 UP 7	202.29 - 202.64	Gabbronorite	GN Unit
SH176 UP 8	216.22 - 216.53	Norite	GN Unit
SH176 UP 9	217.28 - 217.72	Norite	GN Unit
SH176 UP 10	229.21 - 229.52	Norite	GN Unit
SH176 UP 11	246.52 - 246.93	Norite	GN Unit
SH176 UP 12	264.52 - 264.79	Norite	GN Unit
SH176 UP 13	278.54 - 278.79	Norite	GN Unit
SH176 UP 14	286.40 - 268.67	Norite	GN Unit
SH176 UP 15	303.17 - 303.48	Pyroxenite	GN Unit
SH176 UP 16	313.12 - 313.47	Norite	GN Unit
SH176 UP 17	329.19 - 329.71	Norite	GN Unit
SH176 UP 18	358.33 - 358.65	Norite	GN Unit
SH176 UP 19	375.42 - 375.77	Pyroxenite	GN Unit
SH176 UP 20	382.48 - 382.80	Norite	GN Unit
SH176 UP 21	402.64 - 402.97	Norite	GN Unit
SH176 UP 22	409.04 - 409.28	Norite	GN Unit
SH176 UP 23	432.11 - 432.49	Norite	GN Unit
SH176 UP 24	450.44 - 450.74	Norite	GN Unit
SH176 UP 25	458.36 - 458.71	Norite	GN Unit
SH176 UP 26	459.75 - 459.99	Pyroxenite	PXT Unit
SH176 UP 27	467.30 - 467.55	Pyroxenite	PXT Unit
SH176 UP 28	481.48 - 481.87	Pyroxenite	PXT Unit
SH176 UP 29	492.04 - 492.42	Pyroxenite	PXT Unit
SH176 UP 30	507.15 - 507.49	Pyroxenite	PXT Unit
SH176 UP 31	516.08 - 516.37	Pyroxenite	PXT Unit
SH176 UP 32	527.04 - 527.38	Pyroxenite	PXT Unit
SH176 UP 33	532.17 - 532.43	Peridotite	MHZBG Unit
SH176 UP 34	547.66 - 547.94	Peridotite	MHZBG Unit
SH176 UP 35	567.14 - 567.45	Peridotite	MHZBG Unit
SH176 UP 36	584.22 - 584.55	Pyroxenite	MHZBG Unit
SH176 UP 37	603.60 - 603.90	Peridotite	MHZBG Unit
SH176 UP 38	620.50 - 620.83	Peridotite	MHZBG Unit
SH176 UP 39	639.10 - 639.46	Peridotite	MHZBG Unit
SH176 UP 40	647.60 - 647.79	Peridotite	MHZBG Unit
SH176 UP 41	662.34 - 662.67	Peridotite	MHZBG Unit
SH176 UP 42	673.34 - 673.63	Peridotite	MHZBG Unit
SH176 UP 43	696.61 - 696.94	Pyroxenite	MHZBG Unit
SH176 UP 44	716.60 - 716.95	Peridotite	MHZBG Unit
SH176 UP 45	741.04 - 741.29	Peridotite	MHZBG Unit
SH176 UP 46	751.42 - 751.67	Peridotite	MHZBG Unit
SH176 UP 47	775.52 - 775.88	Peridotite	MHZBG Unit
SH176 UP 48	791.06 - 791.44	Peridotite	MHZBG Unit
SH176 UP 49	807.04 - 807.44	Peridotite	MHZBG Unit
SH176 UP 50	828.32 - 828.76	Peridotite	MHZBG Unit
SH176 UP 51	854.06 - 854.37	Pyroxenite	PCR
SH176 UP 52	890.56 - 890.84	Chromititic Pyroxenite	PCR
SH176 UP 53	905.16 - 905.61	Chromititic Pyroxenite	PCR
SH176 UP 54	922.05 - 922.41	Pyroxenite	LHZBG
SH176 UP 55	931.50 - 931.82	Pyroxenite	LHZBG
SH176 UP 56	974.61 - 974.95	Wherlite	LHZBG
SH176 UP 57	974.67 - 974.93	Peridotite	LHZBG
SH176 UP 58	985.33 - 985.84	Peridotite	LHZBG
SH176 UP 59	987.55 - 987.89	Gabbro	BGAB
SH176 UP 60	990.29 - 990.49	Gabbro	BGAB

MAJOR, TRACE AND PGE DATA

Rock Unit	UGAB		UGAB		UGAB		UGAB		UGAB		GN		GN		GN		GN		GN	
Sample	GSN	SH176UP1	SH176UP2	SH176UP3	SH176UP4	SH176UP5	SH176UP6	SH176UP7	SH176UP8	SH176UP9	SH176UP10	SH176UP11	SH176UP12	SH176UP13	SH176UP14	SH176UP15	SH176UP16			
Depth (m)	135.41	137.45	152.25	163.33	181.09	192.25	202.29	216.22	217.28	229.21	246.52	264.52	278.54	286.40	303.17	313.12				
SiO ₂	66.90	57.05	57.03	57.84	56.36	54.10	55.74	56.39	69.45	70.39	70.25	61.91	57.81	57.19	54.80	56.94	48.17			
TiO ₂	0.65	0.56	0.61	0.64	0.61	0.42	0.48	0.52	0.74	0.68	0.78	1.43	1.82	1.75	1.72	0.49	2.17			
Al ₂ O ₃	15.04	13.96	14.84	14.97	15.22	17.00	11.57	12.40	12.86	13.04	13.79	13.82	12.95	14.07	13.40	13.89	12.17			
Fe ₂ O ₃	3.63	13.42	10.41	10.31	10.56	8.54	11.10	11.01	4.20	3.65	2.05	7.13	8.06	7.68	8.01	11.44	22.03			
MnO	0.05	0.16	0.15	0.14	0.16	0.12	0.17	0.16	0.05	0.04	0.05	0.08	0.08	0.11	0.09	0.16	0.26			
MgO	2.27	5.58	5.83	4.56	4.89	10.10	10.53	9.40	0.55	0.53	0.77	1.70	2.01	1.92	1.92	7.27	2.73			
CaO	2.51	6.58	6.73	6.71	6.01	6.65	5.79	5.36	3.67	3.29	5.21	6.70	8.65	8.81	11.93	6.50	6.52			
Na ₂ O	4.01	1.24	2.42	2.46	4.02	1.68	1.42	2.14	6.18	6.30	5.93	5.94	5.34	5.17	4.48	1.77	2.17			
K ₂ O	4.72	1.36	0.50	1.82	1.34	2.11	1.19	1.52	0.05	0.02	0.08	0.38	0.10	0.25	0.06	1.41	1.24			
P ₂ O ₅	0.31	0.15	0.10	0.10	0.09	0.09	0.07	0.08	0.16	0.15	0.17	0.21	0.26	0.46	0.95	0.12	0.90			
Cr ₂ O ₃	0.01	0.05	0.03	0.02	0.01	0.01	0.15	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0.08	<0.01			
NiO	0.01	0.01	0.01	0.01	0.01	0.00	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0.02	<0.01			
V ₂ O ₅	0.01	0.03	0.03	0.03	0.03	0.01	0.03	0.03	0.01	0.01	0.01	0.02	0.03	0.02	0.00	0.03	0.02			
ZrO ₂	0.03	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.05	0.04	0.03	0.03	0.04	0.03	0.01	0.02	0.01			
LOI	1.29	1.22	1.85	1.06	1.30	1.05	1.14	1.22	2.50	2.67	2.26	1.82	1.49	1.16	2.01	1.34	1.44			
TOTAL	101.43	101.40	100.57	100.70	100.62	101.88	99.43	100.41	100.47	100.81	101.39	101.17	98.64	98.62	99.39	101.47	99.82			
ppm																				
As	3	3	3	5	3	3	3	3	3	4	3	3	3	3	3	5	4			
Cu	-	114	21	47	67	7	44	59	13	25	16	13	7	14	13	39	30			
Ga	20	10	17	17	18	17	14	16	19	17	20	19	19	18	19	18	21			
Mo	1	4	3	2	2	1	2	2	1	1	1	1	1	1	1	1	3			
Nb	24	8	8	11	9	6	6	8	19	17	18	17	16	20	14	9	11			
Ni	35	105	101	75	73	175	239	204	3	5	6	11	11	14	12	138	14			
Pb	54	23	13	17	15	7	17	16	3	5	6	6	5	3	6	13	11			
Rb	186	89	25	93	71	84	57	76	3	3	7	11	5	3	2	59	53			
Sr	563	115	123	175	146	221	119	144	165	91	221	225	291	228	264	168	276			
Th	41	9	12	14	11	7	8	8	8	13	7	9	3	7	11	8	4			
U	7	3	6	3	3	3	3	4	3	3	3	3	3	3	3	3	3			
W	481	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6			
Y	21	23	23	25	22	16	18	20	35	35	36	40	28	39	31	23	30			
Zn	43	86	40	67	78	40	73	81	18	14	17	18	22	19	20	90	138			
Zr	216	128	128	135	116	92	102	101	368	338	291	203	200	194	127	128	123			
Cl	580	1310	382	702	278	273	301	450	263	242	485	528	519	588	621	599	1956			
Co	47	73	59	57	59	54	72	73	13	13	19	28	27	31	28	66	104			
Cr	60	262	222	104	74	550	1166	1108	21	22	20	32	25	29	19	473	26			
F	2678	100	100	100	100	100	100	100	257	332	238	145	189	284	316	100	100			
S	-	170	<50	<50	60	<50	<50	<50	270	230	560	120	130	100	350	120	1140			
Se	9	24	27	26	32	23	33	33	10	9	15	21	20	34	14	32	35			
V	65	195	178	176	189	154	190	190	42	44	45	116	117	179	33	165	86			
Ni	-	105	101	75	73	175	239	204	3	5	6	11	11	14	12	138	14			
ppb																				
Os	<0.6	<0.4	<0.4	<0.3	<0.5	0.5	<0.6	<0.4	<0.5	<0.7	<0.3	<0.4	<0.6	<0.3	<0.3	0.5				
Ir	0.083	0.053	0.057	0.020	0.100	0.113	0.110	0.008	0.009	0.010	0.019	0.012	0.160	0.010	0.060	0.020				
Ru	5	5	<2	<4	4	<1	<2	<2	<2	<3	<2	<1	<4	<2	3	<4				
Rh	0.8	0.7	1.1	0.8	1.0	1.2	1.3	<0.3	<0.3	<0.5	<0.4	<0.4	<0.7	<0.7	0.6	0.2				
Pt	32	7	4	4	11	5	12	<3	4	<2	2	1	23	<2	<8	<2				
Pd	8	10	11	10	6	5	10	<3	<5	<6	1	<2	2	<4	7	<2				
Au	2.67	2.39	6.76	3.83	5.34	3.24	3.28	1.37	1.53	4.94	1.69	0.87	3.06	2.66	1.04	2.63				
Re	0.17	0.21	<0.24	<0.25	<0.21	<0.21	<0.22	0.28	0.20	<0.23	0.38	<0.22	0.12	0.14	<0.19	<0.14				
Se	109	21	61	74	6	50	57	11	24	17	17	10	16	13	47	43				

<1 = below detection limit of 1

MAJOR, TRACE AND PGE DATA

Rock Unit	GN	GN	GN	GN	GN	GN	GN	GN	GN	GN	PXT	PXT	PXT	PXT	PXT	PXT	PXT
Sample	SH176UP17	SH176UP18	SH176UP19	SH176UP20	SH176UP21	SH176UP22	SH176UP23	SH176UP24	SH176UP25	SH176UP26	SH176UP27	SH176UP28	SH176UP29	SH176UP30	SH176UP31	SH176UP32	
Depth (m)	329.19	358.33	375.42	382.48	402.64	409.04	432.11	450.44	458.36	459.75	467.30	481.48	492.04	507.15	516.08	527.04	
SiO ₂	50.40	49.56	42.44	49.05	54.71	45.02	52.40	49.27	53.14	52.60	52.29	54.02	54.34	54.17	53.79	47.80	
TiO ₂	2.23	2.33	2.09	3.61	0.32	2.87	0.34	0.32	0.27	0.32	0.30	0.27	0.24	0.34	0.27	0.13	
Al ₂ O ₃	15.80	13.43	9.91	15.34	7.05	16.92	16.07	17.65	12.78	7.09	7.13	6.14	5.49	4.29	6.35	3.84	
Fe ₂ O ₃	16.80	20.52	34.67	18.15	12.71	18.63	9.78	10.54	10.38	12.17	12.14	12.86	11.97	12.56	10.40	9.04	
MnO	0.17	0.24	0.31	0.20	0.20	0.17	0.15	0.13	0.16	0.20	0.20	0.25	0.31	0.20	0.18	0.14	
MgO	2.67	4.03	6.77	4.48	19.65	5.81	8.22	8.48	14.62	18.69	19.04	21.00	22.61	24.73	26.31	33.66	
CaO	6.70	6.74	4.19	6.78	5.06	8.00	10.50	9.29	7.35	4.76	4.81	4.49	3.72	3.11	2.68	2.58	
Na ₂ O	2.50	2.01	0.99	1.92	0.59	1.74	1.66	1.43	0.98	0.66	0.58	0.44	0.33	0.04	0.01	0.01	
K ₂ O	1.46	1.06	0.67	0.90	0.44	0.55	0.49	0.73	0.49	0.45	0.43	0.31	0.33	0.19	0.22	0.17	
P ₂ O ₅	0.84	0.58	0.08	0.06	0.02	0.03	0.04	0.02	0.03	0.04	0.04	0.04	0.04	0.02	0.01	0.01	
Cr ₂ O ₃	<0.01	<0.01	0.01	<0.01	0.20	0.03	0.02	0.06	0.14	0.2	0.23	0.36	0.38	0.44	0.50	0.71	
NiO	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.01	0.02	0.08	0.06	0.11	0.12	0.08	0.08	0.10	0.21	
V ₂ O ₅	0.02	0.02	0.03	0.08	0.03	0.22	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	
ZrO ₂	0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
LOI	1.89	0.40	-1.16	0.25	0.12	0.50	0.91	2.25	0.78	0.73	1.39	0.68	0.14	-0.05	0.08	2.76	
TOTAL	101.49	100.93	101.01	100.85	101.18	100.49	100.63	100.23	101.24	98.01	98.73	101.01	100.02	100.16	100.91	101.10	
ppm																	
As	4	3	5	3	3	5	3	3	3	3	3	3	4	3	3	3	
Cu	29	21	13	33	37	53	62	22	315	164	387	278	115	9	49	35	
Ga	21	20	16	22	23	24	16	15	12	10	10	7	7	7	7	6	
Mo	1	2	2	1	2	1	2	2	1	1	1	2	1	1	1	1	
Nb	11	10	6	10	7	5	3	4	3	4	4	3	3	4	2	3	
Ni	15	14	31	30	33	51	94	150	637	481	846	906	677	718	720	1615	
Pb	9	7	8	15	7	10	3	3	6	3	13	9	9	6	3	3	
Rb	58	46	34	38	23	25	19	27	18	20	17	15	14	10	11	8	
Sr	302	270	196	292	331	325	237	244	166	93	106	94	90	54	55	54	
Th	6	4	4	3	3	3	3	3	4	3	3	4	3	3	3	3	
U	3	3	6	3	3	3	3	3	3	3	3	3	3	3	3	3	
W	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Y	23	20	13	14	12	10	15	9	11	12	10	10	9	7	8	8	
Zn	110	117	139	144	87	84	61	49	63	74	88	77	77	62	62	52	
Zr	105	80	85	92	65	48	59	42	45	51	42	43	41	32	30	26	
Cl	1287	1313	1623	1153	593	496	346	252	196	234	676	202	411	190	226	306	
Co	92	106	201	98	92	113	60	64	84	101	106	111	98	94	87	97	
Cr	26	31	38	56	70	131	156	357	1051	1558	1813	2768	2990	3429	3909	4861	
F	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
S	1070	650	260	1320	1350	1630	780	420	3820	1500	3140	3970	1470	120	340	440	
Se	31	27	11	35	24	22	21	18	26	36	31	31	31	27	23	19	
V	91	106	130	417	268	1147	164	143	141	172	180	163	150	127	125	87	
Ni	15	14	31	30	33	51	94	150	637	481	846	906	677	718	720	1615	
ppb																	
Os	<0.6	0.4	<0.5	<0.5	<0.5	<0.5	<0.3	<0.3	<0.4	<0.6	<0.7	1.8	<0.2	0.8	1.7	2.6	
Ir	0.020	0.018	0.023	0.019	0.058	0.038	0.036	0.037	0.057	0.053	0.050	2.012	0.550	0.619	1.348	2.238	
Ru	<4	<4	<3	<2	<2	<2	1	<2	<2	<3	<4	5	<8	3	16	23	
Rh	0.2	<0.4	<0.2	<0.2	<0.2	<0.1	<0.2	0.3	<0.3	<0.4	0.2	5.2	3.3	1.9	2.4	3.1	
Pt	33	<1	<1	1	1	2	1	1	3	3	3	46	18	91	21	13	
Pd	<2	<3	<5	<2	<3	1	1	<2	<3	<3	6	82	53	5	7	<8	
Au	3.55	1.34	1.29	0.88	0.80	0.40	0.56	1.13	1.48	1.60	4.09	11.12	5.90	1.58	1.97	3.03	
Re	0.12	21	13	33	37	53	62	22	315	164	387	278	115	9	49	35	
Se	37	29	21	43	48	70	69	27	307	170	340	266	133	56	55	40	

<1 = below detection limit of 1

MAJOR, TRACE AND PGE DATA

Rock Unit Sample Depth (m)	MHZBG SH176UP33	MHZBG SH176UP34	MHZBG SH176UP35	MHZBG SH176UP36	MHZBG SH176UP37	MHZBG SH176UP38	MHZBG SH176UP39	MHZBG SH176UP40	MHZBG SH176UP41	MHZBG SH176UP42	MHZBG SH176UP43	MHZBG SH176UP44	MHZBG SH176UP45	MHZBG SH176UP46	MHZBG SH176UP47	MHZBG SH176UP48
	532.17	547.66	567.14	584.22	603.60	620.50	639.10	647.60	662.34	673.34	696.61	716.60	741.04	751.42	775.52	791.06
SiO ₂	40.87	37.47	39.53	37.41	36.40	39.25	39.32	39.77	38.36	38.30	36.22	39.46	37.24	38.46	35.94	35.62
TiO ₂	0.11	0.11	0.11	0.10	0.16	0.13	0.15	0.16	0.15	0.16	0.13	0.13	0.15	0.15	0.15	0.18
Al ₂ O ₃	2.73	3.12	1.76	2.76	2.92	2.69	2.65	2.71	2.86	2.70	2.36	2.51	2.89	3.22	3.60	3.23
Fe ₂ O ₃	9.61	9.66	10.34	11.63	12.91	11.18	10.71	10.51	10.94	10.84	9.07	10.55	12.99	10.54	12.40	12.54
MnO	0.13	0.13	0.13	0.13	0.11	0.12	0.09	0.10	0.10	0.11	0.17	0.10	0.09	0.15	0.11	0.16
MgO	36.47	35.82	39.53	35.07	34.25	35.52	34.35	36.01	34.83	35.29	28.81	34.18	33.18	33.73	32.54	33.14
CaO	1.81	1.67	1.15	1.42	1.01	1.20	1.63	1.47	1.50	1.51	2.71	1.36	1.21	1.56	1.06	1.60
Na ₂ O	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01
K ₂ O	0.10	0.12	0.13	0.05	0.27	0.16	0.13	0.16	0.14	0.16	0.00	0.14	0.12	0.15	0.04	0.19
P ₂ O ₅	0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.14	0.12	0.15	0.04	0.19
Cr ₂ O ₃	0.93	3.62	1.54	3.64	2.18	0.88	1.22	1.74	2.51	2.09	1.31	1.27	1.80	1.69	5.57	3.74
NiO	0.24	0.30	0.33	0.29	0.61	0.32	0.32	0.34	0.30	0.34	0.28	0.36	0.51	0.32	0.65	0.61
V ₂ O ₅	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.03	0.02
ZrO ₂	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01
LOI	8.88	8.65	6.99	8.38	9.07	9.35	8.12	7.72	7.82	7.49	18.14	8.89	9.07	9.15	9.07	10.03
TOTAL	101.92	100.69	101.58	100.91	99.93	100.83	98.73	100.72	99.55	99.04	99.23	99.00	99.29	99.14	101.16	101.07
ppm																
As	3	4	3	3	3	3	3	3	3	3	101	3	3	3	3	4
Cu	21	25	14	11	740	6	27	48	26	38	10	54	858	76	560	955
Ga	5	4	5	4	6	6	6	5	5	5	5	5	5	5	7	5
Mo	2	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1
Nb	4	2	2	2	3	3	3	4	3	3	3	2	3	2	2	3
Ni	1857	2512	2583	2551	3593	2515	2647	2668	2322	2484	1799	2889	4091	2431	5206	4490
Pb	3	3	8	3	40	3	6	3	6	3	3	4	3	6	3	3
Rb	7	3	8	8	9	7	11	11	8	9	2	9	8	10	4	12
Sr	19	16	43	32	21	28	25	16	18	20	66	24	13	30	10	17
Th	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3
U	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
W	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Y	6	7	6	6	7	8	7	6	8	6	6	6	6	6	6	6
Zn	50	54	49	48	82	48	55	47	50	44	80	42	66	56	93	53
Zr	26	19	22	25	26	28	31	30	29	29	24	28	29	28	20	38
Cl	926	879	756	1592	225	615	391	293	401	209	8	331	182	667	115	334
Co	112	109	137	128	177	130	120	121	114	120	89	165	172	114	159	153
Cr	5241	16950	22027	8394	16767	4558	12573	10884	15415	7796	6751	7920	11341	9030	34937	11581
F	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
S	330	360	240	170	10640	270	500	660	620	350	180	660	10770	800	9040	14980
Sc	11	11	11	10	10	10	12	12	12	11	8	13	10	11	12	9
V	49	80	71	50	65	42	63	62	67	56	44	57	66	59	114	54
Ni	1857	2512	2583	2551	3593	2515	2647	2668	2322	2484	1799	2889	4091	2431	5206	4490
ppb																
Os	2.4	9.7	19.9	5.0	30.0	2.3	6.0	7.1	7.5	4.6	4.8	3.6	8.5	3.6	25.6	18.1
Ir	2.410	9.441	18.286	5.658	15.072	1.824	5.410	5.740	5.280	4.360	3.680	3.160	6.940	3.210	18.310	12.179
Ru	8	32	55	18	87	12	23	22	24	18	<12	17	40	15	107	66
Rh	1.1	4.9	15.9	1.1	13.9	1.4	8.3	10.0	6.1	7.3	5.3	7.9	9.4	5.3	21.9	28.4
Pt	25	25	116	9	71	7	41	164	16	102	59	97	79	50	170	205
Pd	4	6	16	<3	120	4	69	49	33	49	<28	79	117	27	278	409
Au	1.86	2.06	4.69	1.55	12.79	1.69	4.43	16.48	1.69	7.12	5.90	9.19	19.35	3.62	31.44	30.16
Re	21	25	<0.30	0.26	7.91	<0.2	0.24	0.21	0.59	0.44	<0.93	0.34	6.45	1.05	8.58	955
Se	23	26	117	44	835	72	33	47	25	41	7	83	852	71	590	1012

<1 = below detection limit of 1

MAJOR, TRACE AND PGE DATA

Rock Unit	MHZBG	PCR	PCR	PCR	LHZBG	LHZBG	LHZBG	LHZBG	LHZBG	LHZBG	BGAB	BGAB
Sample	SH176UP49	SH176UP50	SH176UP51	SH176UP52	SH176UP53	SH176UP54	SH176UP55	SH176UP56	SH176UP57	SH176UP58	SH176UP59	SH176UP60
Depth (m)	807.04	828.32	854.06	890.56	905.16	922.05	931.50	974.61	974.67	985.33	987.55	990.29
SiO2	36.80	36.39	35.12	38.70	35.40	38.27	38.51	43.80	35.41	44.05	47.39	50.65
TiO2	0.13	0.16	0.21	0.25	0.48	0.18	0.44	0.82	0.47	0.81	0.97	1.64
Al2O3	2.42	3.72	4.62	4.85	10.84	3.77	5.27	6.79	3.73	6.82	13.27	14.04
Fe2O3	11.58	12.60	8.58	10.59	16.30	13.57	13.88	17.47	27.20	17.49	16.74	11.93
MnO	0.10	0.11	0.11	0.18	0.23	0.18	0.16	0.17	0.15	0.17	0.14	0.17
MgO	35.07	33.43	33.42	29.29	13.45	29.94	24.65	16.85	21.69	17.01	5.59	5.12
CaO	0.86	1.06	1.75	3.10	2.70	6.89	9.83	6.84	3.39	6.84	8.09	7.25
Na2O	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.20	0.01	0.19	2.73	3.39
K2O	0.15	0.03	0.29	0.15	0.05	0.22	0.69	1.77	0.16	1.78	1.62	2.35
P2O5	0.01	<0.01	0.03	0.02	0.01	<0.01	0.05	0.08	0.03	0.08	0.07	0.17
Cr2O3	2.71	6.19	4.77	5.11	19.70	0.15	0.88	0.07	0.04	0.07	0.01	0.00
NiO	0.42	0.66	0.30	0.25	0.19	0.26	0.28	0.46	0.57	0.46	0.54	0.01
V2O5	0.02	0.03	0.04	0.05	0.08	0.01	0.02	0.03	0.02	0.03	0.03	0.04
ZrO2	0.01	<0.01	0.00	0.00	0.00	0.01	0.01	0.01	<0.01	0.03	0.01	0.02
LOI	9.52	7.03	8.23	8.15	1.24	7.50	5.80	3.83	7.16	3.83	2.51	1.60
TOTAL	99.81	101.43	97.48	100.69	100.68	100.93	100.47	99.18	100.02	99.66	99.71	98.36
ppm												
As	3	3	3	3	4	4	3	3	4	3	3	3
Cu	685	464	490	509	505	736	1133	2199	3271	6262	6961	171
Ga	8	7	9	9	24	7	9	5	7	11	16	19
Mo	1	2	1	1	3	1	1	3	2	1	3	1
Nb	3	3	3	4	4	3	7	2	5	7	5	10
Ni	4388	4027	3848	2701	3407	1920	2073	11815	4331	3126	3997	73
Pb	3	3	3	5	9	10	6	14	7	4	20	9
Rb	14	11	15	11	7	10	32	4	9	101	52	77
Sr	21	38	22	25	16	39	35	10	20	68	458	383
Th	3	3	3	3	5	5	4	3	3	5	3	6
U	3	3	3	3	3	3	3	3	3	3	3	3
W	6	6	6	6	6	6	6	6	6	6	6	6
Y	10	9	8	9	10	9	10	8	10	18	21	29
Zn	74	83	106	126	343	43	63	120	113	108	104	86
Zr	40	29	28	51	53	36	70	21	55	105	91	170
Cl	348	221	247	195	187	528	386	56	160	508	369	540
Co	140	135	150	132	168	106	114	305	224	165	167	68
Cr	22038	31290	39489	37099	156467	993	5577	175	179	377	79	54
F	100	100	100	100	100	100	100	100	100	100	100	100
S	4250	6760	9340	10560	10030	17440	17180	27860	48640	21390	34650	760
Se	9	7	8	12	18	8	3	9	14	14	17	21
V	77	94	146	156	416	59	81	39	90	143	158	229
Ni	4388	4027	3848	2701	3407	1920	2073	11815	4331	3126	3997	73
ppb												
Os	11.2	13.5	17.9	94.4	49.7	15.9	9.5	N/D	2.2	20.4	14.9	<0.5
Ir	8.766	10.600	13.300	22.011	38.487	8.130	7.996	N/D	2.920	30.250	40.653	0.180
Ru	32	54	90	38	183	25	11	N/D	<4.8	13	13	<2
Rh	17.7	17.4	21.3	33.3	49.4	26.1	19.6	N/D	1.9	25.7	27.3	0.4
Pt	112	114	123	691	316	197	210	N/D	428	404	341	3
Pd	222	201	265	466	410	501	478	N/D	868	526	399	4
Au	19.16	15.36	13.29	24.19	33.93	36.38	15.12	N/D	156.68	170.74	77.96	1.00
Re	685	464	490	509	505	736	1133	2199	3271	6262	6961	171
Se	673	553	546	542	782	746	1139	2497	3481	6007	6956	186

<1 = below detection limit of 1

N/D = NOT DETECTED

FeO, Mg# VALUES CALCULATED FOR BOREHOLE CORE SH176

Sample	GSN	SH176UP1	SH176UP2	SH176UP3	SH176UP4	SH176UP5	SH176UP6	SH176UP7	SH176UP8	SH176UP9	SH176UP10
FeO		12.20	9.46	9.37	9.60	7.76	10.09	10.01	3.76	3.27	1.75
Fe ₂ O ₃ +FeO	3.63	13.42	10.41	10.31	10.56	8.54	11.10	11.01	4.20	3.65	2.05
MgO	2.27	5.58	5.83	4.56	4.89	10.10	10.53	9.40	0.55	0.53	0.77
Mg#	1.000	0.449	0.523	0.465	0.476	0.699	0.650	0.626	0.207	0.225	0.439

Sample	SH176UP11	SH176UP12	SH176UP13	SH176UP14	SH176UP15	SH176UP16	SH176UP17	SH176UP18	SH176UP19	SH176UP20	SH176UP21
FeO	6.45	7.30	6.96	7.21	10.38	19.80	15.06	18.53	31.46	16.24	11.29
Fe ₂ O ₃ +FeO	7.13	8.06	7.68	8.01	11.44	22.03	16.80	20.52	34.67	18.15	12.71
MgO	1.70	2.01	1.92	1.92	7.27	2.73	2.67	4.03	6.77	4.48	19.65
Mg#	0.319	0.329	0.329	0.322	0.555	0.197	0.240	0.280	0.277	0.330	0.756

Sample	SH176UP22	SH176UP23	SH176UP24	SH176UP25	SH176UP26	SH176UP27	SH176UP28	SH176UP29	SH176UP30	SH176UP31	SH176UP32
FeO	16.62	8.75	9.50	8.71	14.82	13.17	10.93	10.64	11.35	9.44	8.17
Fe ₂ O ₃ +FeO	18.63	9.78	10.54	10.38	16.62	15.14	12.86	11.97	12.56	10.40	9.04
MgO	5.81	8.22	8.48	14.62	5.05	23.48	21.00	22.61	24.73	26.31	33.66
Mg#	0.384	0.626	0.614	0.750	0.378	0.761	0.774	0.791	0.795	0.833	0.880

Sample	SH176UP33	SH176UP34	SH176UP35	SH176UP36	SH176UP37	SH176UP38	SH176UP39	SH176UP40	SH176UP41	SH176UP42	SH176UP43
FeO	8.70	8.71	9.36	10.55	9.72	10.15	9.65	9.44	9.85	9.82	8.20
Fe ₂ O ₃ +FeO	9.61	9.66	10.34	11.63	12.91	11.18	10.71	10.51	10.94	10.84	9.07
MgO	36.47	35.82	39.53	35.07	34.25	35.52	34.35	36.01	34.83	35.29	28.81
Mg#	0.882	0.880	0.883	0.856	0.863	0.862	0.864	0.872	0.863	0.865	0.862

Sample	SH176UP44	SH176UP45	SH176UP46	SH176UP47	SH176UP48	SH176UP49	SH176UP50	SH176UP51	SH176UP52	SH176UP53	SH176UP54
FeO	9.49	9.75	9.42	9.55	8.55	9.76	10.16	5.98	8.47	12.92	8.94
Fe ₂ O ₃ +FeO	10.55	12.99	10.54	12.40	12.54	11.58	12.60	8.58	10.59	16.30	13.57
MgO	34.18	33.18	33.73	32.54	33.14	35.07	33.43	33.42	29.29	13.45	29.94
Mg#	0.865	0.859	0.865	0.859	0.874	0.865	0.854	0.909	0.860	0.650	0.857

Sample	SH176UP55	SH176UP56	SH176UP57	SH176UP58	SH176UP59	SH176UP60
FeO	9.31	15.88	24.72	15.90	15.22	10.84
Fe ₂ O ₃ +FeO	13.88	17.47	27.20	17.49	16.74	11.93
MgO	24.65	16.85	21.69	17.01	5.59	5.12
Mg#	0.825	0.654	0.610	0.656	0.396	0.457

ICP-MS DATA

Rock Unit Sample Depth (m)	UGAB SH176 UP1 135.41	UGAB SH176 UP5 181.09	GN SH176 UP8 216.22	GN SH176 UP11 246.52	GN SH176 UP15 303.17	GN SH176 UP19 375.42	GN SH176 UP22 409.04	GN SH176 UP23 432.11	GN SH176 UP25 458.36	PXT SH176 UP26 459.75	PXT SH176 UP28 481.48	PXT SH176 UP31 516.08
Sc	21.8	20.1	9.69	18.8	25.6	9.11	19.9	25.1	24.0	29.4	25.8	17.7
Se	0.23	<i>n.d.</i>	<i>n.d.</i>	<i>n.d.</i>	1.07	<i>n.d.</i>	0.15	<i>n.d.</i>	0.17	0.55	1.18	0.17
Rb	93.1	78.4	0.86	8.05	55.2	28.8	20.7	16.4	16.2	17.0	11.6	8.58
Sr	116	228	175	228	167	186	314	241	167	87.8	88.9	50.2
Y	17.5	12.7	30.2	36.0	19.1	8.97	6.18	9.42	6.51	7.24	6.15	3.32
Zr	115	80.8	274	134	123	55.3	45.1	56.9	34.8	39.6	31.7	19.4
Nb	7.41	5.62	18.6	17.2	8.38	5.82	3.31	2.79	2.14	2.19	1.86	0.75
Mo	2.73	0.31	0.26	0.53	1.02	0.92	0.46	0.58	0.37	0.40	0.70	0.32
Sb	1.76	1.49	1.45	1.22	0.44	0.21	0.085	0.15	0.088	0.10	0.15	0.061
Cs	14.9	1.66	0.072	0.21	4.31	2.88	3.08	2.63	2.66	1.53	1.39	0.93
Ba	280	323	73.2	211	331	175	122	154	160	114	96.8	85.3
La	21.4	15.0	57.7	35.2	22.8	12.6	7.37	8.54	7.06	7.08	5.66	2.80
Ce	44.6	30.2	104	78.0	48.2	26.4	15.3	18.3	14.7	14.8	12.1	5.91
Pr	4.89	3.27	10.6	9.87	5.57	2.98	1.72	2.14	1.69	1.64	1.42	0.69
Nd	19.1	12.6	39.7	43.5	22.9	12.1	7.07	8.92	6.79	6.88	5.87	2.87
Sm	3.75	2.48	6.99	9.36	4.53	2.26	1.41	1.89	1.33	1.30	1.19	0.61
Eu	0.83	0.63	1.57	2.03	1.28	0.90	0.73	0.69	0.40	0.39	0.35	0.17
Gd	3.60	2.41	6.20	8.46	4.25	2.11	1.31	1.84	1.27	1.31	1.21	0.55
Tb	0.55	0.37	0.90	1.23	0.62	0.30	0.19	0.28	0.20	0.21	0.19	0.087
Dy	3.54	2.37	5.51	7.40	3.80	1.80	1.19	1.81	1.21	1.30	1.21	0.58
Ho	0.71	0.48	1.10	1.36	0.76	0.35	0.23	0.37	0.25	0.28	0.24	0.13
Er	2.11	1.41	3.23	3.84	2.14	1.01	0.68	1.06	0.71	0.80	0.71	0.41
Tm	0.31	0.21	0.47	0.52	0.31	0.15	0.10	0.15	0.11	0.12	0.10	0.061
Yb	2.04	1.37	3.25	3.34	2.09	0.99	0.67	1.02	0.73	0.85	0.75	0.43
Lu	0.30	0.21	0.51	0.45	0.31	0.15	0.10	0.15	0.11	0.13	0.11	0.067
Hf	3.01	2.15	7.84	5.08	3.15	1.53	1.19	1.43	0.89	1.01	0.84	0.47
Ta	1.14	0.91	1.64	1.55	0.93	0.68	0.47	0.41	0.34	0.32	0.35	0.14
Pb	17.8	3.87	2.31	10.5	10.0	4.64	3.50	4.24	2.82	2.24	6.43	2.42
Th	10.4	6.87	9.85	7.30	5.98	3.20	1.47	2.08	1.32	1.73	1.40	0.83
U	5.63	2.48	3.66	2.44	2.40	1.11	0.60	0.91	0.43	0.50	0.81	0.37

Rock Unit Sample Depth (m)	PXT SH176 UP32 527.04	Upper MHZBG SH176 UP33 532.17	Upper MHZBG SH176 UP35 567.14	Upper MHZBG SH176 UP40 647.6	Lower MHZBG SH176 UP49 807.04	PCR SH176 UP51 854.06	PCR SH176 UP52 890.56	LHZBG SH176 UP54 922.05	LHZBG SH176 UP57 979.67	BGAB SH176 UP59 987.55	BGAB SH176 UP60 990.29
Sc	12.7	5.09	7.07	7.48	7.26	6.90	10.2	11.1	12.1	19.2	20.2
Se	1.30	<i>n.d.</i>	0.98	0.86	1.67	3.13	1.39	3.50	16.1	7.38	<i>n.d.</i>
Rb	5.97	0.16	5.44	7.17	11.4	12.3	7.47	7.25	6.14	47.7	71.1
Sr	50.5	65.1	40.0	11.4	15.3	17.3	19.7	35.1	13.5	453	590
Y	2.90	1.92	2.09	3.23	4.84	3.84	5.50	4.59	5.41	15.8	22.9
Zr	13.5	15.1	9.77	22.8	31.5	15.1	31.8	28.7	41.4	91.9	164
Nb	0.92	0.91	0.61	1.23	1.99	1.20	2.11	2.17	2.43	4.72	10.5
Mo	0.39	0.19	0.24	0.57	0.59	0.51	0.44	0.28	0.53	1.01	0.80
Sb	0.077	0.10	0.031	0.051	0.28	0.27	4.31	1.02	2.21	0.56	0.96
Cs	0.67	0.14	0.67	0.99	1.11	2.09	1.62	1.19	1.20	1.54	1.78
Ba	51.5	3.39	69.0	28.8	46.6	35.4	17.8	38.8	29.0	321	899
La	2.61	1.94	2.04	3.45	4.63	4.78	4.74	4.60	4.14	12.7	20.8
Ce	5.44	3.57	7.22	4.19	10.9	9.84	11.0	10.2	9.62	29.0	47.0
Pr	0.63	0.42	0.48	0.84	1.50	1.13	1.31	1.15	1.22	3.74	5.89
Nd	2.55	1.73	2.01	3.38	5.30	4.43	5.52	4.40	5.41	16.5	26.1
Sm	0.53	0.37	0.41	0.66	1.12	0.88	1.13	0.87	1.25	3.80	5.63
Eu	0.17	0.24	0.14	0.17	0.22	0.27	0.24	0.28	0.25	1.22	1.70
Gd	0.53	0.34	0.41	0.64	1.03	0.82	1.07	0.84	1.19	3.61	5.53
Tb	0.085	0.054	0.062	0.10	0.16	0.12	0.16	0.13	0.18	0.54	0.80
Dy	0.55	0.34	0.40	0.60	0.94	0.75	1.07	0.83	1.10	3.27	4.71
Ho	0.11	0.074	0.080	0.12	0.18	0.15	0.21	0.18	0.21	0.62	0.89
Er	0.34	0.22	0.24	0.35	0.52	0.43	0.59	0.52	0.61	1.70	2.50
Tm	0.051	0.032	0.032	0.052	0.079	0.065	0.080	0.073	0.083	0.23	0.34
Yb	0.36	0.22	0.24	0.36	0.52	0.45	0.57	0.54	0.54	1.53	2.22
Lu	0.056	0.036	0.036	0.056	0.083	0.068	0.080	0.079	0.079	0.22	0.32
Hf	0.36	0.38	0.25	0.55	0.80	0.38	0.81	0.74	1.00	2.36	4.06
Th	0.26	0.18	0.20	0.25	0.41	0.32	0.30	0.27	0.33	0.49	0.95
Ta	1.54	1.96	5.10	1.52	2.40	1.15	1.35	4.07	1.88	15.7	4.72
Pb	0.73	0.52	0.40	0.72	1.89	0.73	1.13	0.72	0.80	1.59	2.97
U	0.47	0.15	0.10	0.26	0.49	0.17	0.24	0.30	0.22	0.44	0.84

APPENDIX III
Ni AND Fo VALUES FOR OLIVINE OF SELECTED SAMPLES FOR BOREHOLE CORE SH176

Sample	Depth (m)	Ni (ppm)	Fo (mol%)	Unit
SH176UP16	313.12	34	9.41	GN
SH176UP19	375.42	32	19.89	GN
SH176UP28	481.48	528	85.13	PXT
SH176UP29	492.04	3514	86.81	PXT
SH176UP32	527.04	3395	87.20	PXT
SH176UP33	532.17	2907	88.94	MHZBG
SH176UP34	542.66	3225	85.97	MHZBG
SH176UP35	567.14	3494	88.74	MHZBG
SH176UP36	584.22	3382	88.01	MHZBG
SH176UP37	603.60	2035	87.50	MHZBG
SH176UP38	620.50	3548	86.12	MHZBG
SH176UP40	647.60	3618	87.05	MHZBG
SH176UP41	662.34	3321	86.52	MHZBG
SH176UP42	673.34	3593	86.54	MHZBG
SH176UP44	716.60	3453	86.70	MHZBG
SH176UP45	741.04	3252	86.81	MHZBG
SH176UP46	751.42	1930	86.19	MHZBG
SH176UP47	775.52	2213	86.71	MHZBG
SH176UP48	791.06	2293	86.80	MHZBG
SH176UP49	807.04	2317	86.90	MHZBG
SH176UP50	828.32	1932	86.03	MHZBG
SH176UP51	854.06	1690	86.59	PCR
SH176UP53	905.16	1333	83.67	PCR
SH176UP55	931.50	1910	86.21	LHZBG

APPENDIX III

NORMALIZED DATA

CIPW NORM

ICPMS DATA NORMALIZED TO CHONDRITE AND PRIMITIVE MANTLE

PGE DATA NORMALIZED TO PRIMITIVE MANTLE

CIPW NORM DATA

Rock Unit Sample Depth (m)	top chill SH176UP1 135.41	UGAB SH176UP2 137.45	UGAB SH176UP3 152.25	UGAB SH176UP4 163.33	UGAB SH176UP5 181.09	UGAB SH176UP6 192.25	UGAB SH176UP7 202.29	GN SH176UP8 216.22	GN SH176UP9 217.28	GN SH176UP10 229.21	GN SH176UP11 246.52	GN SH176UP12 264.52	GN SH176UP13 278.54
SiO ₂	57.05	57.03	57.84	56.36	54.10	55.74	56.39	69.45	70.39	70.25	61.91	57.81	57.19
TiO ₂	0.56	0.61	0.64	0.61	0.42	0.48	0.52	0.74	0.68	0.78	1.43	1.82	1.75
Al ₂ O ₃	13.96	14.84	14.97	15.22	17.00	11.57	12.40	12.86	13.04	13.79	13.82	12.95	14.07
Fe ₂ O ₃	13.42	10.41	10.31	10.56	8.54	11.10	11.01	4.20	3.65	2.05	7.13	8.06	7.68
MnO	0.16	0.15	0.14	0.16	0.12	0.17	0.16	0.05	0.04	0.05	0.08	0.08	0.11
MgO	5.58	5.83	4.56	4.89	10.10	10.53	9.40	0.55	0.53	0.77	1.70	2.01	1.92
CaO	6.58	6.73	6.71	6.01	6.65	5.79	5.36	3.67	3.29	5.21	6.70	8.65	8.81
Na ₂ O	1.24	2.42	2.46	4.02	1.68	1.42	2.14	6.18	6.30	5.93	5.94	5.34	5.17
K ₂ O	1.36	0.50	1.82	1.34	2.11	1.19	1.52	0.05	0.02	0.08	0.38	0.10	0.25
P ₂ O ₅	0.15	0.10	0.10	0.09	0.09	0.07	0.08	0.16	0.15	0.17	0.21	0.26	0.46
Cr ₂ O ₃	0.05	0.03	0.02	0.01	0.01	0.15	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NiO	0.01	0.01	0.01	0.01	0.00	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
V ₂ O ₅	0.03	0.03	0.03	0.03	0.01	0.03	0.03	0.01	0.01	0.01	0.02	0.03	0.02
ZrO ₂	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.05	0.04	0.03	0.03	0.04	0.03
LOI	1.22	1.85	1.06	1.30	1.05	1.14	1.22	2.50	2.67	2.26	1.82	1.49	1.16
TOTAL	101.40	100.57	100.70	100.62	101.88	99.43	100.41	100.47	100.81	101.39	101.17	98.64	98.62
Q (S)	14.02	12.26	10.49	2.86	1.22	8.83	6.63	25.4	26.49	27.26	10.41	7.92	7.34
or (KAS6)	8.04	3	10.81	7.99	12.38	7.18	9.08	0.3	0.12	0.48	2.26	0.61	1.52
ab (NAS6)	10.47	20.74	20.89	34.23	14.08	12.24	18.27	53.35	54.28	50.58	50.56	46.49	44.86
an (CAS2)	28.45	28.51	24.5	19.64	32.22	22.08	19.91	7.35	7.37	10.86	9.98	11.39	14.81
lc(KAS4)	0	0	0	0	0	0	0	0	0	0	0	0	0
ne(NAS2)	0	0	0	0	0	0	0	0	0	0	0	0	0
C(A)	0	0	0	0	0.03	0	0	0	0	0	0	0	0
ac(NFS4)	0	0	0	0	0	0	0	0	0	0	0	0	0
ns(NS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Di wo(CS)	1.38	1.99	3.49	4.13	0	2.84	2.71	4.3	3.5	3.77	9.29	13.05	11.4
Di en(MS)	0.57	0.95	1.49	1.8	0	1.65	1.52	0.95	0.84	1.94	3.11	4.58	3.99
Di fs(FS)	0.83	1.01	2.01	2.32	0	1.06	1.08	3.64	2.87	1.72	6.48	8.81	7.7
Hy en(MS)	13.37	13.83	9.96	10.52	25.05	25.2	22.22	0.46	0.51	0	1.17	0.6	0.94
Hy fs(FS)	19.48	14.77	13.41	13.59	12.8	16.21	15.79	1.75	1.75	0	2.45	1.15	1.81
Ol fo(M2S)	0	0	0	0	0	0	0	0	0	0	0	0	0
Ol fa(F2S)	0	0	0	0	0	0	0	0	0	0	0	0	0
mt(FF)	2	1.54	1.51	1.57	1.23	1.64	1.61	0.72	0.62	0.48	1.1	1.26	1.19
he(F)	0	0	0	0	0	0	0	0	0	0	0	0	0
il(FT)	1.06	1.18	1.22	1.17	0.79	0.93	1	1.44	1.32	1.5	2.74	3.56	3.41
ap(CP)	0.33	0.22	0.22	0.2	0.19	0.16	0.18	0.36	0.33	0.37	0.46	0.58	1.03
Total	100	100	100	100	100	100	100	100	100	98.95	100	100	100
opx	32.85	28.6	23.37	24.11	37.85	41.41	38.01	2.21	2.26	0	3.62	1.75	2.75
cpx	2.78	3.95	6.99	8.25	0	5.55	5.31	8.89	7.21	7.43	18.88	26.44	23.09
plag	46.96	52.25	56.2	61.86	58.68	41.5	47.26	61	61.77	61.92	62.8	58.49	61.19
sulphur	0.017	0	0	0.006	0	0	0	0.027	0.023	0.056	0.012	0.013	0.01

CIPW NORM DATA

Rock Unit Sample Depth (m)	GN SH176UP14 286.40	GN SH176UP15 303.17	GN SH176 UP16 313.12	GN SH176UP17 329.19	GN SH176UP18 358.33	GN SH176UP19 375.42	GN SH176UP20 382.48	GN SH176UP21 402.64	PX in GN SH176UP22 409.04	GN SH176UP23 432.11	GN SH176UP24 450.44	GN Base SH176UP25 458.36
SiO ₂	54.80	56.94	48.17	50.40	49.56	42.44	49.05	54.71	45.02	52.40	49.27	53.14
TiO ₂	1.72	0.49	2.17	2.23	2.33	2.09	3.61	0.32	2.87	0.34	0.32	0.27
Al ₂ O ₃	13.40	13.89	12.17	15.80	13.43	9.91	15.34	7.05	16.92	16.07	17.65	12.78
Fe ₂ O ₃	8.01	11.44	22.03	16.80	20.52	34.67	18.15	12.71	18.63	9.78	10.54	10.38
MnO	0.09	0.16	0.26	0.17	0.24	0.31	0.20	0.20	0.17	0.15	0.13	0.16
MgO	1.92	7.27	2.73	2.67	4.03	6.77	4.48	19.65	5.81	8.22	8.48	14.62
CaO	11.93	6.50	6.52	6.70	6.74	4.19	6.78	5.06	8.00	10.50	9.29	7.35
Na ₂ O	4.48	1.77	2.17	2.50	2.01	0.99	1.92	0.59	1.74	1.66	1.43	0.98
K ₂ O	0.06	1.41	1.24	1.46	1.06	0.67	0.90	0.44	0.55	0.49	0.73	0.49
P ₂ O ₅	0.95	0.12	0.90	0.84	0.58	0.08	0.06	0.02	0.03	0.04	0.02	0.03
Cr ₂ O ₃	0.00	0.08	<0.01	<0.01	<0.01	0.01	<0.01	0.20	0.03	0.02	0.06	0.14
NiO	0.00	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.01	0.02	0.08
V ₂ O ₅	0.00	0.03	0.02	0.02	0.02	0.03	0.08	0.03	0.22	0.03	0.02	0.03
ZrO ₂	0.01	0.02	0.01	0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01
LOI	2.01	1.34	1.44	1.89	0.40	-1.16	0.25	0.12	0.50	0.91	2.25	0.78
TOTAL	99.39	101.47	99.82	101.49	100.93	101.01	100.85	101.18	100.49	100.63	100.23	101.24
or (KAS6)	7.19	10.1	2.66	4.08	3.1	0	3.87	0.03	0	3.18	0	3.06
ab (NAS6)	0.36	8.34	7.46	8.67	6.24	3.88	5.3	2.49	3.26	2.91	4.41	2.89
an (CAS2)	38.89	14.96	18.65	21.22	16.9	8.19	16.15	4.77	14.74	14.08	12.35	8.27
lc(KAS4)	16.7	25.75	20.1	27.65	24.34	19.91	30.39	14.6	36.78	35.03	40.4	28.93
ne(NAS2)	0	0	0	0	0	0	0	0	0	0	0	0
C(A)	0	0	0	0	0	0	0	0	0	0	0	0
ac(NFS4)	0	0	0	0	0	0.09	0	0	0	0	0	0
ns(NS)	0	0	0	0	0	0	0	0	0	0	0	0
Di wo(CS)	0	0	0	0	0	0	0	0	0	0	0	0
Di en(MS)	14.44	2.43	3.1	0.33	2.32	0	1.15	3.88	1.19	7.11	2.76	3.05
Di fs(FS)	4.93	1.21	0.6	0.08	0.64	0	0.4	2.41	0.46	3.98	1.51	2.03
Hy en(MS)	9.92	1.16	2.73	0.27	1.8	0	0.78	1.23	0.75	2.84	1.14	0.79
Hy fs(FS)	0	16.96	6.33	6.62	9.39	8.53	10.75	44.55	9.31	16.64	19.53	34.45
OI fo(M2S)	0	16.2	28.58	22.2	26.44	25.86	21.26	22.74	15.33	11.85	14.75	13.45
OI fa(F2S)	0	0	0	0	0	5.63	0	0	3.36	0	0.43	0
mt(Ff)	0	0	0	0	0	18.83	0	0	6.1	0	0.36	0
he(F)	1.32	1.7	3.6	2.77	3.17	5.02	3.01	2.68	3.19	1.65	1.69	2.51
il(FT)	0	0	0	0	0	0	0	0	0	0	0	0
ap(CP)	3.36	0.93	4.19	4.26	4.41	3.89	6.83	0.58	5.47	0.65	0.62	0.51
Total	2.13	0.26	2	1.84	1.26	0.17	0.13	0.04	0.07	0.09	0.04	0.07
	99.24	100	100	100	100	100	100	100	100	100	100	100
opx	0	33.16	34.91	28.82	35.83	34.39	32.01	67.29	24.64	28.49	34.28	47.9
cpx	29.29	4.8	6.43	0.68	4.76	0	2.33	7.52	2.4	13.93	5.41	5.87
plag	55.95	49.05	46.21	57.54	47.48	31.98	51.84	21.86	54.78	52.02	57.16	40.09
sulphur	0.035	0.012	0.114	0.107	0.065	0.026	0.132	0.135	0.163	0.078	0.042	0.382

CIPW NORM DATA

Rock Unit Sample Depth (m)	PXT SH176UP26 459.75	PXT SH176UP27 467.30	PXT SH176UP28 481.48	PXT SH176UP29 492.04	PXT SH176UP30 507.15	PXT SH176UP31 516.08	PXT SH176UP32 527.04	U. MHZBG SH176UP33 532.17	U. MHZBG SH176UP34 547.66	U. MHZBG SH176UP35 567.14	U. MHZBG SH176UP36 584.22	U. MHZBG SH176UP37 603.60
SiO ₂	52.60	52.29	54.02	54.34	54.17	53.79	47.80	40.87	37.47	39.53	37.41	36.40
TiO ₂	0.32	0.30	0.27	0.24	0.34	0.27	0.13	0.11	0.11	0.11	0.10	0.16
Al ₂ O ₃	7.09	7.13	6.14	5.49	4.29	6.35	3.84	2.73	3.12	1.76	2.76	2.92
Fe ₂ O ₃	12.17	12.14	12.86	11.97	12.56	10.40	9.04	9.61	9.66	10.34	11.63	12.91
MnO	0.20	0.20	0.25	0.31	0.20	0.18	0.14	0.13	0.13	0.13	0.13	0.11
MgO	18.69	19.04	21.00	22.61	24.73	26.31	33.66	36.47	35.82	39.53	35.07	34.25
CaO	4.76	4.81	4.49	3.72	3.11	2.68	2.58	1.81	1.67	1.15	1.42	1.01
Na ₂ O	0.66	0.58	0.44	0.33	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01
K ₂ O	0.45	0.43	0.31	0.33	0.19	0.22	0.17	0.10	0.12	0.13	0.05	0.27
P ₂ O ₅	0.04	0.04	0.04	0.04	0.02	0.01	0.01	0.01	<0.01	0.01	<0.01	0.01
Cr ₂ O ₃	0.20	0.23	0.36	0.38	0.44	0.50	0.71	0.93	3.62	1.54	3.64	2.18
NiO	0.06	0.11	0.12	0.08	0.08	0.10	0.21	0.24	0.30	0.33	0.29	0.61
V ₂ O ₅	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.01
ZrO ₂	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
LOI	0.73	1.39	0.68	0.14	-0.05	0.08	2.76	8.88	8.65	6.99	8.38	9.07
TOTAL	98.01	98.73	101.01	100.02	100.16	100.91	101.10	101.92	100.69	101.58	100.91	99.93
or (KAS6)	0	3.69	2.73	2.32	1.61	0.42	0	0	0	0	0	0
ab (NAS6)	3.48	2.55	1.84	1.96	1.13	1.3	1.03	0.64	0.81	0.83	0.33	1.81
an (CAS2)	15.75	4.55	3.73	2.81	0.34	0.08	0.09	0.09	0.1	0.09	0.1	0.1
lc(KAS4)	37.56	15.01	13.87	12.59	10.99	13.22	10.18	7.73	9.2	4.71	7.96	5.63
ne(NAS2)	0	0	0	0	0	0	0	0	0	0	0	0
C(A)	0	0	0	0	0	0	0	0	0	0	0	0
ac(NFS4)	0	0	0	0	0	1.23	0	0	0	0	0.12	0.9
ns(NS)	0	0	0	0	0	0	0	0	0	0	0	0
Di wo(CS)	0	0	0	0	0	0	0	0	0	0	0	0
Di en(MS)	1.27	4.1	3.43	2.4	1.83	0	1.21	0.83	0.09	0.58	0	0
Di fs(FS)	0.5	2.75	2.34	1.66	1.27	0	0.93	0.64	0.07	0.44	0	0
Hy en(MS)	0.78	1.04	0.82	0.54	0.4	0	0.15	0.1	0.01	0.07	0	0
Hy fs(FS)	12.05	45.9	50.25	55.21	60.77	65.63	40.91	19.44	10.44	10.72	11.94	13.45
OI fo(M2S)	18.6	17.31	17.5	17.85	19.11	16	6.82	3.19	1.75	1.75	2.48	2.39
OI fa(F2S)	0.02	0	0	0	0	0	31.2	55.43	63.79	66.81	60.93	58.66
mt(FF)	0.04	0	0	0	0	0	5.74	10.04	11.83	12.07	13.99	11.49
he(F)	2.79	2.48	2.9	2.11	1.86	1.59	1.46	1.62	1.68	1.67	1.95	5.21
il(FT)	0	0	0	0	0	0	0	0	0	0	0	0
ap(CP)	7.08	0.58	0.51	0.46	0.65	0.51	0.25	0.23	0.24	0.23	0.21	0.35
Total	0.09	0.05	0.09	0.09	0.04	0.02	0.02	0.02	0	0.02	0	0.02
	100	100	100	100	100	100	100	100	100	100	100	100
opx	30.65	63.21	67.75	73.06	79.88	81.63	47.73	22.63	12.19	12.47	14.42	15.84
cpx	2.55	7.89	6.59	4.6	3.5	0	2.29	1.57	0.17	1.09	0	0
plag	56.79	22.11	19.44	17.36	12.46	14.6	11.3	8.46	10.11	5.63	8.39	7.54
sulphur	0.15	0.314	0.397	0.147	0.012	0.034	0.044	0.033	0.036	0.024	0.017	1.064

CIPW NORM DATA

Rock Unit Sample Depth (m)	U. MHZBG SH176UP38 620.50	U. MHZBG SH176UP39 639.10	U. MHZBG SH176UP40 647.60	U. MHZBG SH176UP41 662.34	U. MHZBG SH176UP42 673.34	U. MHZBG SH176UP43 696.61	U. MHZBG SH176UP44 716.60	L. MHZBG SH176UP45 741.04	L. MHZBG SH176UP46 751.42	L. MHZBG SH176UP47 775.52	L. MHZBG SH176UP48 791.06	L. MHZBG SH176UP49 807.04
SiO ₂	39.25	39.32	39.77	38.36	38.30	36.22	39.46	37.24	38.46	35.94	35.62	36.80
TiO ₂	0.13	0.15	0.16	0.15	0.16	0.13	0.13	0.15	0.15	0.15	0.18	0.13
Al ₂ O ₃	2.69	2.65	2.71	2.86	2.70	2.36	2.51	2.89	3.22	3.60	3.23	2.42
Fe ₂ O ₃	11.18	10.71	10.51	10.94	10.84	9.07	10.55	12.99	10.54	12.40	12.54	11.58
MnO	0.12	0.09	0.10	0.10	0.11	0.17	0.10	0.09	0.15	0.11	0.16	0.10
MgO	35.52	34.35	36.01	34.83	35.29	28.81	34.18	33.18	33.73	32.54	33.14	35.07
CaO	1.20	1.63	1.47	1.50	1.51	2.71	1.36	1.21	1.56	1.06	1.60	0.86
Na ₂ O	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01
K ₂ O	0.16	0.13	0.16	0.14	0.16	0.00	0.14	0.12	0.15	0.04	0.19	0.15
P ₂ O ₅	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	<0.01	0.02	0.01
Cr ₂ O ₃	0.88	1.22	1.74	2.51	2.09	1.31	1.27	1.80	1.69	5.57	3.74	2.71
NiO	0.32	0.32	0.34	0.30	0.34	0.28	0.36	0.51	0.32	0.65	0.61	0.42
V ₂ O ₅	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.03	0.02	0.02
ZrO ₂	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01
LOI	9.35	8.12	7.72	7.82	7.49	18.14	8.89	9.07	9.15	9.07	10.03	9.52
TOTAL	100.83	98.73	100.72	99.55	99.04	99.23	99.00	99.29	99.14	101.16	101.07	99.81
or (KAS6)	0	0	0	0	0	0	0	0	0	0	0	0
ab (NAS6)	1.05	0.86	1.04	0.93	1.06	0	0.94	0.81	1.01	0.28	1.3	1.02
an (CAS2)	0.09	0.09	0.09	0.1	0.09	0	0.1	0.1	0.1	0	0.1	0.1
lc(KAS4)	6.53	7.63	7.56	8.25	7.68	8.09	7.22	6.84	8.74	6.13	9.03	4.83
ne(NAS2)	0	0	0	0	0	0	0	0	0	0	0	0
C(A)	0	0	0	0	0	0	0	0	0	0	0	0
ac(NFS4)	0.37	0	0	0	0	0	0	0.61	0.25	1.89	0.16	0.8
ns(NS)	0	0	0	0	0	0	0	0	0	0	0	0
Di wo(CS)	0	0	0	0	0	0	0	0	0	0	0	0
Di en(MS)	0	0.58	0.17	0.02	0.28	3.66	0.15	0	0	0	0	0
Di fs(FS)	0	0.44	0.13	0.02	0.21	2.74	0.11	0	0	0	0	0
Hy en(MS)	0	0.08	0.02	0	0.04	0.54	0.02	0	0	0	0	0
Hy fs(FS)	17.43	19.32	17.25	15.18	13.76	23.15	22.07	19.3	18.16	18.99	12.88	14.34
OI fo(M2S)	3.43	3.72	3.09	2.93	2.61	4.58	4.18	3.53	3.52	3.61	1.96	2.71
OI fa(F2S)	56.65	53.67	57.15	57.92	59.54	45.31	52.1	52.56	54.38	53.04	57.88	60.4
mt(FF)	12.3	11.4	11.3	12.34	12.48	9.89	10.89	10.62	11.64	11.13	9.72	12.6
he(F)	1.84	1.86	1.84	1.96	1.87	1.71	1.93	5.31	1.86	4.59	6.53	2.9
il(FT)	0	0	0	0	0	0	0	0	0	0	0	0
ap(CP)	0.27	0.32	0.33	0.32	0.34	0.31	0.28	0.32	0.32	0.33	0.39	0.28
Total	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0	0.05	0.03
	100	100	100	100	100	100	100	100	100	100	100	100
opx	20.86	23.04	20.34	18.11	16.37	27.73	26.25	22.83	21.68	22.6	14.84	17.05
cpx	0	1.1	0.32	0.04	0.53	6.94	0.28	0	0	0	0	0
plag	7.67	8.58	8.69	9.28	8.83	8.09	8.26	7.75	9.85	6.41	10.43	5.95
sulphur	0.027	0.05	0.066	0.062	0.035	0.018	0.066	1.077	0.08	0.904	1.498	0.425

CIPW NORM DATA

Rock Unit Sample Depth (m)	L. MHZBG SH176UP50 828.32	PCR SH176UP51 854.06	PCR SH176UP52 890.56	PCR SH176UP53 905.16	LHZBG SH176UP54 922.05	LHZBG SH176UP55 931.50	LHZBG SH176UP56 974.61	LHZBG SH176UP57 974.67	BGAB SH176UP58 985.33	Basal top SH176UP59 987.55	BGAB Chill SH176UP60 990.29
SiO ₂	36.39	35.12	38.70	35.40	38.27	38.51	43.80	35.41	44.05	47.39	50.65
TiO ₂	0.16	0.21	0.25	0.48	0.18	0.44	0.82	0.47	0.81	0.97	1.64
Al ₂ O ₃	3.72	4.62	4.85	10.84	3.77	5.27	6.79	3.73	6.82	13.27	14.04
Fe ₂ O ₃	12.60	8.58	10.59	16.30	13.57	13.88	17.47	27.20	17.49	16.74	11.93
MnO	0.11	0.11	0.18	0.23	0.18	0.16	0.17	0.15	0.17	0.14	0.17
MgO	33.43	33.42	29.29	13.45	29.94	24.65	16.85	21.69	17.01	5.59	5.12
CaO	1.06	1.75	3.10	2.70	6.89	9.83	6.84	3.39	6.84	8.09	7.25
Na ₂ O	0.01	0.01	0.00	0.01	0.01	0.01	0.20	0.01	0.19	2.73	3.39
K ₂ O	0.03	0.29	0.15	0.05	0.22	0.69	1.77	0.16	1.78	1.62	2.35
P ₂ O ₅	<0.01	0.03	0.02	0.01	<0.01	0.05	0.08	0.03	0.08	0.07	0.17
Cr ₂ O ₃	6.19	4.77	5.11	19.70	0.15	0.88	0.07	0.04	0.07	0.01	0.00
NiO	0.66	0.30	0.25	0.19	0.26	0.28	0.46	0.57	0.46	0.54	0.01
V ₂ O ₅	0.03	0.04	0.05	0.08	0.01	0.02	0.03	0.02	0.03	0.03	0.04
ZrO ₂	<0.01	0.00	0.00	0.00	0.01	0.01	<0.01	<0.01	0.03	0.01	0.02
LOI	7.03	8.23	8.15	1.24	7.50	5.80	3.83	7.16	3.83	2.51	1.60
TOTAL	101.43	97.48	100.69	100.68	100.93	100.47	99.18	100.02	99.66	99.71	98.36
or (KAS6)	0	0	0	0	0	0	0	0	0	0.14	8.83
ab (NAS6)	0.2	2.04	1.02	0.37	1.29	0	11.05	1.03	11.06	9.92	7.18
an (CAS2)	0.1	0.1	0	0.11	0	0	1.78	0.09	1.69	23.88	12.24
lc(KAS4)	6.01	10.12	14.66	16.79	10.3	13.13	13.06	10.46	13.1	19.81	22.08
ne(NAS2)	0	0	0	0	0.09	3.42	0	0	0	0	0
C(A)	0	0	0	0	0.05	0.05	0	0	0	0	0
ac(NFS4)	1.99	1.39	0	7.39	0	0	0	0	0	0	0
ns(NS)	0	0	0	0	0	0	0	0	0	0	0
Di wo(CS)	0	0	0	0	0	0	0	0	0	0	0
Di en(MS)	0	0	1.2	0	11.04	16.17	9.29	3.17	9.21	8.9	2.84
Di fs(FS)	0	0	0.92	0	8.44	12.04	6.36	2.18	6.09	5.15	1.65
Hy en(MS)	0	0	0.14	0	1.42	2.51	2.18	0.73	2.44	3.33	1.06
Hy fs(FS)	16.71	11.54	24.75	41.92	0	0	21.68	22.75	19.63	9.31	25.2
Ol fo(M2S)	3.36	1.25	3.87	25.65	0	0	7.43	7.65	7.87	6.01	16.21
Ol fa(F2S)	55.16	61.43	40.86	0.27	50.41	37.72	11.48	23.7	13.25	0	0
mt(FF)	12.24	7.36	7.05	0.19	9.38	8.69	4.34	8.79	5.86	0	0
he(F)	3.88	4.22	4.94	6.14	7.21	7.09	9.53	18.41	8.02	11.48	1.64
il(FT)	0	0	0	0	0	0	0	0	0	0	0
ap(CP)	0.35	0.47	0.55	1.15	0.37	0.89	1.64	0.97	1.62	1.91	0.93
Total	0	0.08	0.05	0.03	0	0.12	0.18	0.07	0.18	0.16	0.16
	100	100	100	100	100	101.83	100	100	100	100	100
opx	20.07	12.79	28.62	67.57	0	0	29.11	30.4	27.5	15.32	41.41
cpx	0	0	2.26	0	20.9	30.72	17.83	6.08	17.74	17.38	5.55
plag	6.31	12.26	15.68	17.27	11.59	13.13	25.89	11.58	25.85	53.61	41.5
sulphur	0.676	0.934	1.056	1.003	1.744	1.718	2.786	4.864	2.139	3.465	0.076

ICP-MS DATA NORMALIZED

NORMALIZED DATA TO CHONDRITE

Rock Unit Sample	UGAB SH176 UP1	UGAB SH176 UP5	GN SH176 UP8	GN SH176 UP11	GN SH176 UP15	GN SH176 UP19	GN SH176 UP22	GN SH176 UP23	GN SH176 UP25	PXT SH176 UP26	PXT SH176 UP28	PXT SH176 UP31	
Depth (m)	Chondrite	135.41	181.09	216.22	246.52	303.17	375.42	409.04	432.11	458.36	459.75	481.48	516.08
Sc	5.92	3.69	3.39	1.64	3.17	4.32	1.54	3.37	4.23	4.06	4.97	4.36	2.99
Se	21	0.01	0.00	0.00	0.00	0.05	0.00	0.01	0.00	0.01	0.03	0.06	0.01
Rb	2.3	40.47	34.08	0.38	3.50	23.99	12.50	9.02	7.14	7.04	7.41	5.04	3.73
Sr	7.25	15.99	31.44	24.16	31.47	23.07	25.59	43.27	33.26	23.08	12.11	12.26	6.92
Y	1.57	11.12	8.07	19.21	22.92	12.17	5.71	3.94	6.00	4.15	4.61	3.92	2.12
Zr	3.82	30.09	21.14	71.71	35.15	32.30	14.47	11.81	14.90	9.12	10.37	8.29	5.07
Nb	0.024	30.88	23.43	77.62	71.70	34.90	24.25	13.81	11.64	8.91	9.11	7.76	3.14
Mo	0.09	3.03	0.35	0.29	0.59	1.14	1.02	0.51	0.65	0.41	0.45	0.78	0.35
Sb	0.014	12.60	10.65	10.39	8.72	3.13	1.51	0.60	1.07	0.63	0.72	1.10	0.43
Cs	0.019	78.19	8.75	0.38	1.08	22.70	15.15	16.20	13.83	13.99	8.04	7.33	4.89
Ba	0.000241	116.13	134.19	30.36	87.46	137.36	72.43	50.42	63.96	66.42	47.42	40.15	35.40
La	0.0237	90.48	63.47	243.35	148.61	96.30	53.06	31.12	36.05	29.80	29.89	23.89	11.83
Ce	0.0613	72.71	49.21	170.20	127.24	78.68	43.14	24.90	29.78	23.99	24.15	19.80	9.65
Pr	0.00928	52.72	35.24	113.98	106.35	60.04	32.15	18.49	23.03	18.22	17.71	15.32	7.44
Nd	0.0457	41.86	27.67	86.76	95.17	50.12	26.38	15.47	19.52	14.86	15.05	12.84	6.28
Sm	0.0148	25.34	16.75	47.23	63.24	30.58	15.29	9.55	12.76	8.96	8.77	8.07	4.15
Eu	0.00563	14.68	11.15	27.85	36.06	22.78	16.01	13.03	12.29	7.11	6.92	6.17	3.07
Gd	0.0199	18.09	12.11	31.18	42.53	21.36	10.58	6.59	9.27	6.38	6.59	6.06	2.77
Tb	0.00361	15.20	10.32	25.03	34.05	17.09	8.26	5.32	7.84	5.43	5.91	5.20	2.42
Dy	0.0246	14.39	9.64	22.41	30.07	15.43	7.33	4.85	7.34	4.90	5.30	4.93	2.34
Ho	0.00546	13.01	8.74	20.23	24.96	13.94	6.39	4.30	6.69	4.60	5.12	4.46	2.34
Er	0.016	13.18	8.83	20.17	24.02	13.36	6.34	4.25	6.62	4.45	5.02	4.43	2.59
Tm	0.00247	12.42	8.60	19.11	21.03	12.36	5.98	4.01	6.19	4.35	4.82	4.20	2.46
Yb	0.0161	12.66	8.49	20.16	20.75	12.99	6.13	4.19	6.36	4.50	5.31	4.65	2.70
Lu	0.00246	12.25	8.38	20.82	18.38	12.43	5.93	4.12	6.04	4.45	5.28	4.36	2.70
Hf	0.0103	29.18	20.87	76.14	49.35	30.62	14.84	11.54	13.87	8.66	9.85	8.11	4.59
Th	0.0029	359.36	236.74	339.59	251.68	206.07	110.29	50.86	71.76	45.61	59.61	48.21	28.47
Ta	0.00136	83.95	66.75	120.32	114.15	68.41	50.32	34.63	30.48	24.88	23.62	25.39	10.62
Pb	0.247	7.22	1.57	0.93	4.23	4.07	1.88	1.42	1.72	1.14	0.90	2.60	0.98
U	0.0007	803.90	354.86	522.33	349.06	342.50	158.47	86.04	129.68	61.74	70.99	115.07	52.25
K	550	11293.44	17516.17	405.78	3146.68	11712.01	5578.61	4533.03	4072.13	4032.95	4908.59	2581.85	1865.43
Ti	440	3367.39	2511.91	4434.80	8579.08	2947.74	12514.20	17226.99	2041.90	1619.31	22399.12	1602.46	1600.67
[Th/La] _n		3.97	3.73	1.40	1.69	2.14	2.08	1.63	1.99	1.53	1.99	2.02	2.41
[Sm/Ta] _n		0.30	0.25	0.39	0.55	0.45	0.30	0.28	0.42	0.36	0.37	0.32	0.39

SELECTED NORMALIZED DATA TO PRIMITIVE MANTLE

	PRIMITIVE MANTLE												B1	B3	
Ba	6.89	41	47	11	31	48	25	18	22	23	17	14	12	51.39	26.55
Rb	0.635	147	123	1	13	87	45	33	26	25	27	18	14	58.36	17.55
Th	0.085	123	81	116	86	70	38	17	24	16	20	16	10	38.34	9.94
K	250	45	70	2	13	47	22	18	16	16	20	10	7	28.23	11.29
Nb	0.713	10	8	26	24	12	8	5	4	3	3	3	1	6.01	2.65
La	0.687	31	22	84	51	33	18	11	12	10	10	8	4	24.82	11.70
Ce	1.775	25	17	59	44	27	15	9	10	8	8	7	3	19.08	9.27
Sr	21.1	5	11	8	11	8	9	15	11	8	4	4	2	8.42	15.88
Nd	1.354	14	9	29	32	17	9	5	7	5	5	4	2	10.96	6.43
Zr	11.2	10	7	24	12	11	5	4	5	3	4	3	2	5.89	2.77
Sm	0.444	8	6	16	21	10	5	3	4	3	3	3	1	6.01	4.67
Ti	1300	3	2	3	7	2	10	13	2	1	17	1	1	1.43	2.12
Eu	0.168	5	4	9	12	8	5	4	4	2	2	2	1	4.81	5.45
Yb	0.493	4	3	7	7	4	2	1	2	1	2	2	1	2.17	2.42
Lu	0.074	4	3	7	6	4	2	1	2	1	2	1	1	2.30	2.49

(Chondrite values from McDonough and Sun, 1995)

(Primitive mantle values from Sun and McDonough, 1989)

(B1 and B3 values from Curl, 2001)

ICP-MS DATA NORMALIZED

NORMALIZED DATA TO CHONDRITE

Rock Unit Sample Depth (m)	Chondrite	PXT SH176 UP32 527.04	Upper MHZBG SH176 UP33 532.17	Upper MHZBG SH176 UP35 567.14	Upper MHZBG SH176 UP40 647.6	Lower MHZBG SH176 UP49 807.04	PCR SH176 UP51 854.06	PCR SH176 UP52 890.56	LHZBG SH176 UP54 922.05	LHZBG SH176 UP57 979.67	BGAB SH176 UP59 987.55	BGAB SH176 UP60 990.29
Sc	5.92	2.15	0.86	1.19	1.26	1.23	1.17	1.73	1.87	2.05	3.24	3.42
Se	21	0.06	0.00	0.05	0.04	0.08	0.15	0.07	0.17	0.77	0.35	0.00
Rb	2.3	2.60	0.07	2.37	3.12	4.94	5.34	3.25	3.15	2.67	20.72	30.90
Sr	7.25	6.97	8.98	5.52	1.58	2.11	2.39	2.72	4.84	1.86	62.55	53.78
Y	1.57	1.85	1.22	1.33	2.06	3.08	2.44	3.50	2.92	3.44	10.08	14.59
Zr	3.82	3.53	3.95	2.56	5.98	8.26	3.95	8.34	7.51	10.83	24.06	42.99
Nb	0.024	3.81	3.79	2.54	5.11	8.29	5.00	8.79	9.03	10.12	19.66	43.78
Mo	0.09	0.44	0.21	0.27	0.63	0.65	0.57	0.49	0.31	0.59	1.12	0.89
Sb	0.014	0.55	76.05	0.22	1.99	1.90	30.76	7.31	15.76	3.98	6.88	0.89
Cs	0.019	3.50	0.74	3.50	5.21	5.86	10.99	8.55	6.26	6.32	8.09	9.35
Ba	0.000241	21.39	1.41	28.63	11.94	19.35	14.70	7.37	16.10	12.05	133.31	373.06
La	0.0237	11.01	8.20	8.61	14.56	19.55	20.19	19.99	19.40	17.46	53.51	87.77
Ce	0.0613	8.87	5.83	6.84	11.78	17.76	16.06	18.00	16.64	15.70	47.30	76.59
Pr	0.00928	6.75	4.57	5.14	9.00	14.04	12.16	14.15	12.35	13.16	40.32	63.43
Nd	0.0457	5.58	3.79	4.39	7.41	11.59	9.69	12.09	9.63	11.84	36.19	57.22
Sm	0.0148	3.57	2.48	2.77	4.47	7.55	5.94	7.60	5.91	8.45	25.65	38.05
Eu	0.00563	3.02	4.19	2.53	3.07	3.94	4.85	4.29	4.94	4.51	21.65	30.27
Gd	0.0199	2.64	1.69	2.08	3.23	5.19	4.10	5.38	4.22	5.97	18.13	27.80
Tb	0.00361	2.34	1.50	1.72	2.83	4.29	3.39	4.53	3.56	5.01	14.92	22.15
Dy	0.0246	2.25	1.37	1.63	2.45	3.83	3.07	4.33	3.38	4.47	13.28	19.13
Ho	0.00546	2.09	1.35	1.46	2.20	3.36	2.66	3.78	3.25	3.79	11.29	16.36
Er	0.016	2.15	1.36	1.47	2.20	3.26	2.70	3.67	3.28	3.80	10.65	15.60
Tm	0.00247	2.07	1.31	1.29	2.10	3.21	2.64	3.26	2.94	3.37	9.32	13.62
Yb	0.0161	2.26	1.37	1.49	2.22	3.22	2.77	3.51	3.38	3.36	9.52	13.78
Lu	0.00246	2.29	1.47	1.48	2.28	3.39	2.78	3.26	3.20	3.23	9.05	13.09
Hf	0.0103	3.46	3.67	2.41	5.30	7.77	3.66	7.87	7.22	9.68	22.87	39.45
Th	0.0029	25.02	17.85	13.81	24.98	65.30	25.29	39.05	24.67	27.57	54.89	102.33
Ta	0.00136	18.91	13.49	15.03	30.45	86.54	33.76	21.98	20.00	24.52	35.79	69.75
Pb	0.247	0.62	0.80	2.06	0.61	0.97	0.47	0.55	1.65	0.76	6.36	1.91
U	0.0007	66.96	22.02	15.00	37.72	70.09	24.70	34.67	43.44	31.46	62.67	120.18
K	550	1395.57	806.24	1077.37	1303.75	1261.87	2410.76	1237.75	1786.07	1315.29	13449.68	19513.09
Ti	440	788.94	653.87	684.15	963.34	806.54	1279.99	1485.38	1055.18	2810.88	5830.86	9846.31
[Th/La] _n		2.27	2.18	1.60	1.72	3.34	1.25	1.95	1.27	1.58	1.03	1.17
[Sm/Ta] _n		0.19	0.18	0.18	0.25	0.25	0.25	0.35	0.30	0.34	0.72	0.55

SELECTED NORMALIZED DATA TO PRIMITIVE MANTLE

PRIMITIVE MANTLE

Ba	6.89	7	0	10	4	7	5	3	6	4	47	130
Rb	0.635	9	0	9	11	18	19	12	11	10	75	112
Th	0.085	9	6	5	9	22	9	13	8	9	19	35
K	250	6	3	4	5	5	10	5	7	5	54	78
Nb	0.713	1	1	1	2	3	2	3	3	3	7	15
La	0.687	4	3	3	5	7	7	7	7	6	18	30
Ce	1.775	3	2	2	4	6	6	6	6	5	16	26
Sr	21.1	2	3	2	1	1	1	1	2	1	21	18
Nd	1.354	2	1	1	2	4	3	4	3	4	12	19
Zr	11.2	1	1	1	2	3	1	3	3	4	8	15
Sm	0.444	1	1	1	1	3	2	3	2	3	9	13
Ti	1300	1	1	1	1	1	1	1	1	2	4	8
Eu	0.168	1	1	1	1	1	2	1	2	2	7	10
Yb	0.493	1	0	0	1	1	1	1	1	1	3	4
Lu	0.074	1	0	0	1	1	1	1	1	1	3	4

(Chondrite values from McDonough and Sun, 1995)

(Primitive mantle values from Sun and McDonough, 1989)

(B1 and B3 values from Curt, 2001)

PGE NORMALIZED

Whole rock PGE analyses of borehole SH176, together with normalized data for primitive mantle

Rock Unit	top chill	UGAB	UGAB	UGAB	UGAB	UGAB	UGAB	GN	GN	GN	GN	GN	GN	GN	GN	GN	GN
Sample	SH176 UP1	SH176 UP2	SH176 UP3	SH176 UP4	SH176 UP5	SH176 UP6	SH176 UP7	SH176 UP8	SH176 UP9	SH176 UP10	SH176 UP11	SH176 UP12	SH176 UP13	SH176 UP14	SH176 UP15	SH176 UP16	SH176 UP17
Depth	135.41	137.45	152.25	163.33	181.09	192.25	202.29	216.22	217.28	229.21	246.52	264.52	278.54	286.4	303.17	313.12	329.19
Ni (ppm)	105	101	75	73	175	239	204	3	5	6	11	11	14	12	138	14	15
Os (ppb)	<0.6	<0.4	<0.4	<0.3	<0.5	0.5	<0.6	<0.4	<0.5	<0.7	<0.3	<0.4	<0.6	<0.3	<0.3	0.5	<0.6
Ir (ppb)	0.083	0.053	0.057	0.110	0.100	0.113	0.110	0.008	0.009	0.010	0.019	0.012	0.160	0.010	0.060	0.020	0.020
Ru (ppb)	5	5	<2	<4	4	<1	<2	<2	<2	<3	<2	<1	<4	<2	3	<4	<4
Rh (ppb)	0.8	0.7	1.1	0.8	1.0	1.2	1.3	<0.3	<0.3	<0.5	<0.4	<0.4	<0.7	<0.7	0.6	0.2	0.2
Pt (ppb)	32	7	4	4	11	5	12	<3	4	<2	2	1	23	<2	<8	<2	<2
Pd (ppb)	8	10	11	10	6	5	10	<3	<5	<6	1	2	2	<4	7	<2	<2
Au (ppb)	2.67	2.39	6.76	3.83	5.34	3.24	3.28	1.37	1.53	4.94	1.69	0.87	3.06	2.66	1.04	2.63	3.55
Cu (ppm)	114	21	47	67	7	44	59	13	25	16	13	7	14	13	39	30	29
Re (ppm)	0.17	0.21	<0.24	<0.25	<0.21	<0.21	<0.22	0.28	0.20	<0.23	0.38	<0.22	0.12	<0.14	<0.19	<0.14	0.12
Se (ppm)	109	21	61	74	6	50	57	11	24	17	17	10	16	13	47	43	37

NORMALIZED TO PRIMITIVE MANTLE

Ni (ppb)	0.0525	0.0505	0.0375	0.0365	0.0875	0.1195	0.1020	0.0015	0.0025	0.0030	0.0055	0.0055	0.0070	0.0060	0.0690	0.0070	0.0075
Os (ppm)	-	-	-	-	-	0.1389	-	-	-	-	-	-	-	-	-	0.1399	-
Ir (ppb)	0.0243	0.0157	0.0168	0.0059	0.0294	0.0333	0.0324	0.0024	0.0027	0.0029	0.0056	0.0036	0.0471	0.0029	0.0176	0.0059	0.0059
Ru (ppb)	0.9558	1.0485	-	-	0.7475	-	-	-	0.4000	-	-	-	-	-	0.6921	-	-
Rh (ppb)	0.8687	0.7368	1.1579	0.8421	1.0526	1.2632	1.3684	-	-	-	0.2556	0.1555	3.3271	-	-	0.2105	0.1958
Pt (ppb)	4.5278	0.9357	0.5171	0.5494	1.5957	0.7129	1.6461	-	0.6143	-	-	-	-	0.7500	1.7500	0.2500	0.2500
Pd (ppb)	2.0723	2.5000	2.7500	2.5000	1.5000	2.5000	2.5000	0.5000	1.0000	1.2500	0.2500	0.2500	0.5942	3.0906	2.6891	1.0524	2.6565
Au (ppb)	2.6952	2.4153	6.8331	3.8658	5.3921	3.2740	3.3156	1.3847	1.5469	4.9870	1.7048	0.8802	3.0906	2.6891	1.0524	2.6565	3.5888
Cu (ppb)	4.0714	0.7500	1.6786	2.3929	0.2500	1.5714	2.1071	0.4643	0.8929	0.5714	0.4643	0.2500	0.5000	0.4643	1.3929	1.0714	1.0357
[Ni/Ir]n	2.1636	3.2214	2.2368	6.2050	2.9750	3.5892	3.1527	0.9239	1.0200	0.9791	1.5081	0.1488	2.0400	3.9100	1.1900	1.2750	1.2750
[Cu/Pd]n	1.9647	0.3000	0.6104	0.9571	0.1667	1.2571	0.8429	0.9286	0.8929	0.4571	1.8571	1.0000	0.8415	0.6190	0.7959	4.2857	4.1429

Normalization factors from Barnes and Maier, 1999

Rock Unit	GN	GN	GN	GN	PX in GN	GN	GN	GN Base	PXT	PXT	PXT	PXT	PXT	PXT	PXT	U.MHZBG	U.MHZBG
Sample	SH176 UP18	SH176 UP19	SH176 UP20	SH176 UP21	SH176 UP22	SH176 UP23	SH176 UP24	SH176 UP25	SH176 UP26	SH176 UP27	SH176 UP28	SH176 UP29	SH176 UP30	SH176 UP31	SH176 UP32	SH176 UP33	SH176 UP34
Depth	358.33	375.42	382.48	402.64	409.04	432.11	450.44	458.36	459.75	467.3	481.48	492.04	507.15	516.08	527.04	532.17	542.66
Ni (ppm)	14	31	30	33	51	94	150	637	481	846	906	677	718	720	1615	1857	2512
Os (ppb)	0.4	<0.5	<0.5	<0.5	<0.5	<0.3	<0.3	<0.4	<0.6	<0.7	1.8	<0.2	0.8	1.7	2.6	2.4	9.7
Ir (ppb)	0.018	0.023	0.019	0.058	0.038	0.036	0.037	0.057	0.053	0.050	2.012	0.550	0.619	1.348	2.238	2.410	9.441
Ru (ppb)	<4	<3	<2	<2	1	<2	<2	<2	<3	<4	5	<8	3	16	23	8	32
Rh (ppb)	<0.4	<0.2	<0.2	<0.2	<0.1	<0.2	0.3	<0.3	<0.4	0.2	5.2	3.3	1.9	2.4	3.1	1.1	4.9
Pt (ppb)	<1	<1	1	1	2	1	1	3	3	3	46	18	91	21	13	25	25
Pd (ppb)	<3	<5	<2	<3	1	1	<2	<3	<3	6	82	53	5	7	<8	4	6
Au (ppb)	1.34	1.29	0.88	0.80	0.40	0.56	1.13	1.48	1.60	4.09	11.12	5.90	1.58	1.97	3.03	1.86	2.06
Re (ppm)	<0.17	0.10	0.19	0.11	0.40	0.40	0.13	1.79	0.80	1.92	1.38	1.60	<0.13	<0.65	<0.60	<0.76	0.23
Cu (ppm)	21	13	33	37	53	62	22	315	387	278	115	9	49	35	21	25	25
Se (ppm)	29	21	43	48	70	69	27	307	170	340	266	133	56	55	40	23	26

NORMALIZED TO PRIMITIVE MANTLE

Ni (ppb)	0.0070	0.0155	0.0015	0.0165	0.0255	0.0470	0.0075	0.3185	0.2405	0.4230	0.4530	0.3385	0.3590	0.3600	0.8075	0.9285	2.6060
Os (ppm)	0.1172	-	-	-	-	-	-	-	-	-	0.5419	-	0.2261	0.4975	0.7537	0.6921	2.8454
Ir (ppb)	0.0054	0.0068	0.0055	0.0169	0.0111	0.0106	0.0110	0.0168	0.0155	0.0146	0.5916	0.1618	0.1821	0.3965	0.6582	0.7088	2.7767
Ru (ppb)	-	-	-	-	-	0.2610	-	-	-	-	0.9386	-	0.6560	3.2284	4.5712	1.6023	6.3612
Rh (ppb)	-	-	-	-	-	-	0.3158	-	-	0.2105	5.4737	3.4492	2.0222	2.5659	3.2421	1.1158	5.1579
Pt (ppb)	-	-	0.1455	0.1524	0.2163	0.1671	0.2079	0.4274	0.3834	0.3834	6.5167	2.5714	13.0100	2.9953	1.8917	3.5237	3.6127
Pd (ppb)	0.5000	1.0000	0.2500	0.5000	0.2500	0.2500	0.5000	0.5000	1.5000	20.4175	13.1750	1.1750	1.6500	1.9891	3.0617	1.8794	2.0821
Au (ppb)	1.3522	1.3062	0.8937	0.8058	0.3997	0.5662	1.1422	1.4984	1.6193	4.1308	11.2290	5.9582	1.5987	1.7500	1.2500	0.7500	0.8929
Cu (ppb)	0.7500	0.4643	1.1786	1.3214	1.8929	2.2143	0.7857	11.2500	5.8571	13.8214	9.9286	4.1071	0.3214	1.7500	1.2500	0.7500	0.8929
[Ni/Ir]n	1.2935	2.2814	0.2713	0.9740	2.2876	4.4389	0.6836	18.9318	15.5456	28.8795	0.7657	2.0925	1.9713	0.9079	1.2269	1.3099	0.9385
[Cu/Pd]n	1.5000	0.4643	4.7143	2.6429	7.5714	8.8571	3.1429	22.5000	11.7143	9.2143	0.4863	0.3117	0.2736	1.0606	0.7143	0.7317	0.5952

Primitive Mantle (from Barnes and Maier (1999))

Ni (ppm)	2000	Os (ppm)	3.4	Ir (ppb)	3.4	Ru (ppb)	5	Rh (ppb)	0.95	Pt (ppb)	7	Pd (ppb)	4	Au (ppb)	0.99	Cu (ppm)	28
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University of Pretoria etd – Gomwe, T E S (2006)

PGE NORMALIZED

Rock Unit Sample Depth	U.MHZBG SH176 UP35 567.14	U.MHZBG SH176 UP36 584.22	U.MHZBG SH176 UP37 603.6	U.MHZBG SH176 UP38 620.5	U.MHZBG SH176 UP39 639.1	U.MHZBG SH176 UP40 647.6	U.MHZBG SH176 UP41 662.34	U.MHZBG SH176 UP42 673.34	U.MHZBG SH176 UP43 696.61	U.MHZBG SH176 UP44 716.6	L. MHZBG SH176 UP45 741.04	L. MHZBG SH176 UP46 751.42	L. MHZBG SH176 UP47 775.52
Ni (ppm)	2583	2551	3593	2515	2647	2668	2322	2484	1799	2889	4091	2431	5206
Os (ppb)	19.9	5.0	30.0	2.3	6.0	7.1	7.5	4.6	4.8	3.6	8.5	3.6	25.6
Ir (ppb)	18.286	5.658	15.072	1.824	5.410	5.740	5.280	4.360	3.680	3.160	6.940	3.210	18.310
Ru (ppb)	55	18	87	12	23	22	24	18	<12	17	40	15	107
Rh (ppb)	15.9	1.1	13.9	1.4	8.3	10.0	6.1	7.3	5.3	7.9	9.4	5.3	21.9
Pt (ppb)	116	9	71	7	41	164	16	102	59	97	79	50	170
Pd (ppb)	16	<3	120	4	69	49	33	49	<28	79	117	27	278
Au (ppb)	4.69	1.55	12.79	1.69	4.43	16.48	1.69	7.12	5.90	9.19	19.35	3.62	31.44
Cu (ppm)	14	11	740	6	27	48	26	38	10	54	858	76	560
Re (ppm)	<0.30	0.26	7.91	<0.2	0.24	0.21	0.59	0.44	<0.93	0.34	6.45	1.05	8.58
Se (ppm)	117	44	835	72	33	47	25	41	7	83	852	71	590
NORMALIZED TO PRIMITIVE MANTLE													
Ni (ppb)	1.2815	1.2755	1.7965	1.2575	1.3235	1.3340	1.1610	1.2420	0.8995	1.4445	2.0455	1.2155	2.6030
Os (ppm)	5.8424	1.4652	8.8292	0.6793	1.7588	2.0962	2.1991	1.3471	1.4000	1.0529	2.5029	1.0588	7.5294
Ir (ppb)	5.3782	1.6642	4.4328	0.5366	1.5912	1.6881	1.5529	1.2824	1.0824	0.9294	2.0412	0.9441	5.3853
Ru (ppb)	10.9064	3.6334	17.4394	2.3588	4.6720	4.3931	4.7776	3.6100	-	3.3900	7.9180	3.0480	21.3600
Rh (ppb)	16.7684	1.1579	14.6316	1.4737	8.7368	10.5263	6.3684	7.6316	5.6105	8.3474	9.8842	5.5579	23.0316
Pt (ppb)	16.5614	1.2335	10.1303	1.0477	5.9229	23.3914	2.2229	14.5129	8.4200	13.7894	11.2611	7.2000	24.3000
Pd (ppb)	4.0000	0.5000	30.0000	1.0000	17.2500	12.2500	8.2500	12.2500	6.7500	19.7500	29.2500	6.7500	69.5000
Au (ppb)	4.7408	1.5667	12.9198	1.7115	4.4758	16.6439	1.7043	7.1869	5.9631	9.2852	19.5476	3.6566	31.7545
Cu (ppb)	0.5000	0.3929	26.4286	0.2143	0.9643	1.7143	0.9286	1.3571	0.3571	1.9286	30.6429	2.7143	20.0000
[Ni/Ir]n	0.2383	0.7664	0.4053	2.3436	0.8318	0.7902	0.7476	0.9685	0.8311	1.5542	1.0021	1.2874	0.4834
[Cu/Pd]n	0.1250	0.7857	0.8810	0.2143	0.0559	0.1399	0.1126	0.1108	0.0529	0.0976	1.0476	0.4021	0.2878
Normalization factors from Barnes and Maier, 1999													

Rock Unit Sample Depth	L. MHZBG SH176 UP48 791.06	L. MHZBG SH176 UP49 807.04	PCR SH176 UP50 828.32	PCR SH176 UP51 854.06	PCR SH176 UP52 890.56	LHZBG SH176 UP53 905.16	LHZBG SH176 UP54 922.05	LHZBG SH176 UP55 931.5	LHZBG SH176 UP56 974.61	LHZBG SH176 UP57 979.61	BGAB SH176 UP58 985.33	Basal top SH176 UP59 987.55	BGAB Chill SH176 UP60 990.29
Ni (ppm)	4490	4388	4027	3848	2701	3407	1920	2073	11815	4331	3126	3997	73
Os (ppb)	18.1	11.2	13.5	17.9	94.4	49.7	15.9	9.5	N/D	2.2	20.4	14.9	<0.5
Ir (ppb)	12.179	8.766	10.600	13.300	22.011	38.487	8.130	7.996	N/D	2.920	30.250	40.653	0.180
Ru (ppb)	66	32	54	90	38	183	25	11	N/D	<4.8	13	13	<2
Rh (ppb)	28.4	17.7	17.4	21.3	33.3	49.4	26.1	19.6	N/D	1.9	25.7	27.3	0.4
Pt (ppb)	205	112	114	123	691	316	197	210	N/D	428	404	341	3
Pd (ppb)	409	222	201	265	466	410	501	478	N/D	868	526	399	4
Au (ppb)	30.16	19.16	15.36	13.29	24.19	33.93	36.38	15.12	N/D	156.68	170.74	77.96	1.00
Re (ppm)	8.73	6.33	8.11	8.38	5.56	6.11	2.04	3.56	N/D	1.08	6.09	13.54	0.84
Cu (ppm)	955	685	464	490	509	505	736	1133	2199	3271	6262	6961	171
Se (ppm)	1012	673	553	546	542	782	746	1139	2497	3481	6007	6956	186
NORMALIZED TO PRIMITIVE MANTLE													
Ni (ppb)	2.2450	2.1940	2.0135	1.9240	1.3505	1.7035	0.9600	1.0365	5.9075	2.1655	1.5630	1.9985	0.0365
Os (ppm)	5.3224	3.2865	3.9603	5.2647	27.7531	14.6047	4.6765	2.7835	-	0.6412	6.0000	4.3706	0.0529
Ir (ppb)	3.5821	2.5783	3.1176	3.9118	6.4737	11.3196	2.3912	2.3518	-	0.8588	8.8971	11.9566	0.0529
Ru (ppb)	13.2000	6.3317	10.7220	18.0758	7.6980	36.5800	5.0000	2.1242	-	-	2.6240	2.6323	0.4211
Rh (ppb)	29.9368	18.6316	18.3053	22.3789	35.0526	52.0000	27.4737	20.6316	-	2.0000	27.0526	28.7368	0.4211
Pt (ppb)	29.3329	15.9286	16.3429	17.5571	98.6874	45.2023	28.0714	30.0613	-	61.1014	57.6571	48.7579	0.3857
Pd (ppb)	102.2500	55.5000	50.2500	66.2500	116.5000	102.5000	125.2500	119.5000	-	217.0000	131.5000	99.7500	1.0000
Au (ppb)	30.4674	19.3511	15.5163	13.4221	24.4374	34.2763	36.7455	15.2739	-	158.2667	172.4636	78.7475	1.0074
Cu (ppb)	34.1071	24.4643	16.5714	17.5000	18.1786	18.0357	26.2857	40.4643	78.5357	116.8214	223.6429	248.6071	6.1071
[Ni/Ir]n	0.6267	0.8509	0.6458	0.4918	0.2086	0.1505	0.4015	0.4407	-	2.5215	0.1757	0.1671	0.6894
[Cu/Pd]n	0.3336	0.4408	0.3298	0.2642	0.1560	0.1760	0.2099	0.3386	-	0.5383	1.7007	2.4923	6.1071
Primitive Mantle (from Barnes and Maier (1999)													
Ni (ppm)	2000	3.4	3.4	5	0.95	7	4	0.99	28				

APPENDIX IV

CALCULATION OF (F)

VALUES FOR Ni, Cu AND PGE CORRECTED FOR SELECTED SAMPLES

CALCULATION OF (F) FOR SELECTED SAMPLES

Sample	Zr (ppm)	Trapped melt (%)	S (wt%)	S Calc	OI% in Sample Est	Ni in Olivine (Measured)	Ni in OI (Calculated)	B1 Ni Conc	Ni (TM)	Comb Ni in Sil wt%	Ni wt%	Ni Calc	Cu (ppm)	B1 Cu Conc (ppm)	Cu (TM)	Cu Calc	Fe(s)	F
SH176UP31	29.64	38.49	0.03	0.05	15	3454.58	518.19	328	126.25	0.06	0.07	0.01	0.01	59	0.0023	0.0021	0.04	1149.08
SH176UP32	25.83	33.54	0.04	0.07	40	3394.75	1357.90	328	110.01	0.15	0.16	0.01	0.00	59	0.0020	0.0013	0.05	893.89
SH176UP33	25.57	33.21	0.03	0.05	60	2907.33	1744.40	328	108.93	0.19	0.19	0.00	0.00	59	0.0020	0.0002	0.05	1197.60
SH176UP34	19.22	24.96	0.04	0.05	70	3225.00	2257.50	328	81.88	0.23	0.25	0.02	0.00	59	0.0015	0.0007	0.04	1094.66
SH176UP35	21.98	28.55	0.02	0.04	70	3493.60	2445.52	328	93.63	0.25	0.26	0.00	0.01	59	0.0017	0.0066	0.03	1560.93
SH176UP36	24.82	32.24	0.02	0.03	70	3382.00	2367.40	328	105.74	0.25	0.26	0.01	0.00	59	0.0019	0.0017	0.02	2282.05
SH176UP37	26.09	33.88	1.06	1.62	65	2035.33	1322.97	328	111.13	0.14	0.36	0.22	0.08	59	0.0020	0.0537	1.36	36.81
SH176UP38	28.09	36.48	0.03	0.04	60	3547.75	2128.65	328	119.66	0.22	0.25	0.03	0.01	59	0.0022	0.0033	0.01	1429.70
SH176UP39	31.10	40.39	0.05	0.08	60	3582.71	2149.63	328	132.48	0.23	0.26	0.04	0.00	59	0.0024	0.0006	0.04	789.43
SH176UP40	30.14	39.14	0.07	0.10	60	3617.67	2170.60	328	128.37	0.23	0.27	0.04	0.00	59	0.0023	0.0015	0.06	596.73
SH176UP41	28.94	37.58	0.06	0.09	60	3320.67	1992.40	328	123.27	0.21	0.23	0.02	0.00	59	0.0022	0.0002	0.07	637.92
SH176UP42	28.56	37.09	0.04	0.05	65	3593.00	2335.45	328	121.66	0.25	0.25	0.00	0.00	59	0.0022	0.0013	0.05	1122.21
SH176UP43	23.65	30.71	0.02	0.03	45	3522.88	1585.29	328	100.73	0.17	0.18	0.01	0.00	59	0.0018	-0.0007	0.02	2216.33
SH176UP44	27.60	35.85	0.07	0.10	65	3452.75	2244.29	328	117.59	0.24	0.29	0.05	0.01	59	0.0021	0.0041	0.04	592.05
SH176UP45	29.10	37.80	1.08	1.64	65	3251.67	2113.58	328	123.97	0.22	0.41	0.19	0.09	59	0.0022	0.0547	1.40	36.37
SH176UP46	28.38	36.86	0.08	0.12	60	1929.67	1157.80	328	120.90	0.13	0.24	0.12	0.01	59	0.0022	0.0032	0.00	490.62
SH176UP47	20.03	26.02	0.90	1.38	65	2213.00	1438.45	328	85.33	0.15	0.52	0.37	0.06	59	0.0015	0.0379	0.97	43.40
SH176UP48	38.37	49.83	1.50	2.29	55	2292.67	1260.97	328	163.44	0.14	0.45	0.31	0.10	59	0.0029	0.0648	1.92	26.19
SH176UP49	40.14	52.13	0.43	0.65	50	2317.33	1158.67	328	170.97	0.13	0.44	0.31	0.07	59	0.0031	0.0424	0.30	91.25
SH176UP50	29.29	38.04	0.68	1.03	50	1931.50	965.75	328	124.78	0.11	0.40	0.29	0.06	59	0.0022	0.0350	0.70	57.93
SH176UP51	28.04	36.42	0.93	1.43	50	1689.50	844.75	328	119.46	0.10	0.38	0.29	0.05	59	0.0021	0.0346	1.10	42.05
SH176UP52	50.87	66.06	1.06	1.61	35	1511.42	529.00	328	216.69	0.07	0.27	0.20	0.05	59	0.0039	0.0331	1.38	37.24
SH176UP53	52.57	68.28	1.00	1.53	30	1333.33	400.00	328	223.95	0.06	0.34	0.28	0.08	59	0.0040	0.0489	1.20	39.06
SH176UP54	36.25	47.08	1.74	2.66	20	1621.50	324.30	328	154.41	0.05	0.19	0.14	0.07	59	0.0028	0.0474	2.47	22.57
SH176UP55	69.90	90.78	1.72	2.62	10	1909.67	190.97	328	297.77	0.05	0.21	0.16	0.11	59	0.0054	0.0715	2.39	22.84
SH176UP56	21.25	27.60	2.79	4.25	15	1333.33	200.00	328	90.53	0.03	1.18	1.15	0.25	59	0.0016	0.1635	2.94	14.04
SH176UP57	54.64	70.96	4.86	7.43	10	1333.33	133.33	328	232.75	0.04	0.43	0.40	0.35	59	0.0042	0.2267	6.80	8.06

VALUES FOR Ni, Cu AND PGE CORRECTED FOR SULPHIDES

Sample	Ni Sul (wt%)	Cu Sul (wt%)	Cu/Ni	Ir (sil) (ppb)	Ir (SUL)	Ru (sil) (ppb)	Ru [SUL]	Rh (sil) (ppb)	Rh (SUL)	Pt (sil) (ppb)	Pt (SUL)	Pd (sil) (ppb)	Pd (SUL)	Au (sil) (ppb)	Au [SUL]
<i>BI DATA</i>				<i>0.35</i>		<i>3.00</i>		<i>1.40</i>		<i>17.00</i>		<i>12.00</i>		<i>3.05</i>	
SH176UP31	8.66	3.74	0.43	1.35	1394.38	16.14	17221.42	2.44	2181.78	20.97	16573.96	6.60	2276.39	1.97	913.77
SH176UP32	13.16	1.79	0.14	2.24	1895.40	22.86	19531.30	3.08	2333.42	13.24	6739.82			3.03	1795.01
SH176UP33	0.46	0.38	0.83	2.41	2747.02	8.01	8401.33	1.06	712.65	24.67	22778.86	4.10	137.53	1.86	1015.22
SH176UP34	18.94	1.22	0.06	9.44	10238.71	31.81	33997.05	4.90	4981.25	25.29	23036.96	6.00	3288.65	2.06	1422.93
SH176UP35	6.86	15.65	2.28	18.29	28386.96	54.53	83783.88	15.93	24241.70	115.93	173382.86	16.00	19627.60	4.69	5966.97
SH176UP36	17.82	5.77	0.32	5.66	12655.25	18.17	39251.13	1.10	1480.29	8.63	7197.85			1.55	1295.60
SH176UP37	7.95	3.00	0.38	15.07	550.45	87.20	3172.50	13.90	494.23	70.91	2398.40	120.00	4267.79	12.79	432.81
SH176UP38	38.13	7.20	0.19	1.82	2425.65	11.79	15297.28	1.40	1271.38	7.33	1618.43	4.00	-540.04	1.69	831.69
SH176UP39	28.81	0.75	0.03	5.41	4159.19	23.36	17484.41	8.30	6105.83	41.46	27308.99	69.00	50644.07	4.43	2525.43
SH176UP40	22.03	1.40	0.06	5.74	3343.19	21.97	12406.88	10.00	5640.33	163.74	93738.12	49.00	26437.18	16.48	9120.29
SH176UP41	13.17	0.16	0.01	5.28	3284.32	23.89	14519.47	6.05	3523.79	15.56	5850.45	33.00	18174.54	1.69	345.15
SH176UP42	3.02	2.19	0.72	4.36	4747.16	18.05	19007.21	7.25	7553.30	101.59	106929.43	49.00	49993.47	7.12	6714.99
SH176UP43	25.00	-2.38	-0.10	3.68	7917.87			5.33	10860.15	58.94	119059.68			5.90	11008.16
SH176UP44	31.21	3.69	0.12	3.16	1796.59	16.95	9398.51	7.93	4397.81	96.53	53539.82	79.00	44225.01	9.19	4794.95
SH176UP45	6.74	3.02	0.45	6.94	247.57	39.59	1398.48	9.39	322.23	78.83	2632.93	117.00	4089.82	19.35	661.83
SH176UP46	56.55	2.39	0.04	3.21	1511.60	15.24	6934.54	5.28	2337.30	50.40	21652.95	27.00	11076.62	3.62	1224.46
SH176UP47	15.98	2.49	0.16	18.31	790.75	106.80	4601.55	21.88	933.85	170.10	7190.88	278.00	11930.51	31.44	1330.02
SH176UP48	8.03	2.57	0.32	12.18	314.34	66.00	1689.08	28.44	726.44	205.33	5154.80	409.00	10553.18	30.16	750.02
SH176UP49	27.91	5.86	0.21	8.77	783.29	31.66	2746.17	17.70	1548.55	111.50	9365.87	222.00	19686.95	19.16	1603.08
SH176UP50	17.01	3.07	0.18	10.60	606.30	53.61	3039.31	17.39	976.49	114.40	6252.13	201.00	11378.73	15.36	822.60
SH176UP51	12.13	2.21	0.18	13.30	553.91	90.38	3754.51	21.26	872.55	122.90	4907.61	265.00	10959.53	13.29	512.05
SH176UP52	7.28	1.87	0.26	22.01	810.95	38.49	1359.38	33.30	1205.49	690.81	25304.21	466.00	17056.33	24.19	825.80
SH176UP53	10.87	2.90	0.27	38.49	1494.13	182.90	7064.93	49.40	1892.46	316.42	11907.28	410.00	15696.49	33.93	1244.25
SH176UP54	3.25	1.62	0.50	8.13	179.74	25.00	532.26	26.10	574.08	196.50	4253.50	501.00	11177.76	36.38	788.48
SH176UP55	3.62	2.48	0.68	8.00	175.37	10.62	180.37	19.60	418.63	210.43	4453.61	478.00	10668.47	15.12	282.12

PGE BI DATA FROM DAVIES AND TREDoux (1985)

APPENDIX V

TEXT VERSION OF BOREHOLE LOG BY R.D. HORNSEY (1999)

Category SURF_DD
 Borehole SH176
 Logged by R. D. Hornsey (1999)

UNIT CODE	DEPTH	DESCRIPTION
OVB	0.00 - 15.05	---- OVERBURDEN; fragments of weathered shale. Timeball Hill Formation
OVB	25.29 - 25.51	---- SHEAR ZONE; sheared; silicified; fine-grained; light brown; non-susceptible; pervasive alteration, minor shearing. Timeball Hill Formation
OVB	27.17 - 27.56	---- SHEAR ZONE; sheared; silicified; fine-grained; light brown; non-susceptible; pervasive alteration. Timeball Hill Formation
OVB	29.94 - 30.25	---- SHALE; veined; silicified; fine-grained; light brown; non-susceptible; Leached. Timeball Hill Formation
OVB	30.81 - 31.25	---- FRACTURED ZONE; fractured; silicified; pegmatitic; dark grey white; non-susceptible; hard; angular shale fragments in vuggy quartz. Some haematitic zones. Timeball Hill Formation
OVB	33.51 - 33.55	---- QUARTZ VEIN; pegmatitic; light grey; non-susceptible; hard; vuggy; milky quartz. Altered shale halo. Uitkomst Suite.
OVB	46.70 - 46.49	---- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; sill, decomposed at contacts. Uitkomst Suite
OVB	51.64 - 53.17	---- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; sill, decomposed at contacts. Uitkomst Suite
OVB	95.08 - 107.46	---- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; chilled margins, occasional. taxitic zones. Sill. Uitkomst Suite
OVB	107.46 - 112.97	---- HORNFELS; homogeneous; metamorphosed; fine-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite - disseminated - clusters - stringers; hard; bedding parallel to mineralization, with occasional. Cross-cutting veinlets. Timeball Hill
OVB	112.97 - 120.14	---- DIABASE; homogeneous; fine-grained; dark grey; non-susceptible; hard; sill. Uitkomst Suite
OVB	120.14 - 134.15	---- HORNFELS; homogeneous; metamorphosed; fine-grained; dark grey; susceptible; <1% sulphides; pyrrhotite - disseminated - clusters - stringers; hard; rare palimpsest sedimentary structures. Timeball Hill Formation.
TOP CHILL	134.15 - 136.65	---- GABBRO; homogeneous; aphanitic; dark grey; non-susceptible; hard; chilled margin to Uitkomst Complex. Amygdaloidal, magmatic deformation features.
TOP CHILL	136.65 - 144.30	---- GABBRO; homogeneous; aphanitic; dark grey; non-susceptible; hard; quenched zone, acicular pyroxene crystals to top, euhedral plagioclase laths lower down. Uitkomst Suite.
UGAB	144.30 - 149.51	---- DIABASE; homogeneous; medium grained; dark grey white; non-susceptible; hard; sill? Chilled margins, similar looking to gabbroic host rock. Uitkomst Suite
UGAB	149.51 - 154.00	---- GABBRO; homogeneous; medium-grained; dark grey white; non-susceptible; hard; euhedral plagioclase laths in fine grained pyroxene matrix. Uitkomst Suite.
UGAB	153.04 - 153.27	---- DOLERITE; homogeneous; aphanitic; dark grey; non-susceptible; hard; dyke? Contains gabbroic xenoliths. Uitkomst Suite.
UGAB	154.00 - 170.91	---- GABBRO; homogeneous; medium-grained; dark grey white; non-susceptible; hard; euhedral plagioclase laths, taxitic, occasional finer grained quench zones. Uitkomst Suite.
UGAB	164.40 - 164.45	---- QUARTZ CARBONATE VEIN; pegmatitic; light grey; non-susceptible; hard; quartz/dolomite vein, with alteration halo. Uitkomst Suite.
UGAB	170.91 - 180.87	---- PYROXENITE; homogeneous; fine-grained; dark grey; non-susceptible; hard, pyroxenitic zone. Uitkomst Suite
UGAB	180.87 - 207.80	---- GABBRO; medium grained; dark grey white; non-susceptible; hard; pyroxenitic. Uitkomst Suite
UGAB	207.80 - 213.23	---- GABBRO; medium grained; dark grey white; non-susceptible; hard; contact zone with magmatic brecciation and cross-cutting diorite veins. Uitkomst Suite
UGAB	123.23 - 234.60	---- NORITE; homogenous; medium grained; light grey; non-susceptible; hard; diorite, with pegmatitic zones. Intrusive into gabbroic roof chill zone. Uitkomst Suite.
GN	248.93 - 251.09	---- NORITE; layered; medium-grained; speckled grey; non-susceptible; hard; Diorite, minor coarse-grained pegmatitic zones. Uitkomst Suite.
GN	253.74 - 253.86	---- PEGMATITE; coarse-grained; light grey; non-susceptible; hard; quartz/feldspar pegmatite vein. Uitkomst Suite.

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UNIT CODE	DEPTH	DESCRIPTION
GN	254.36 - 255.27	---- NORITE; layered; medium-grained; speckled grey; non-susceptible; hard; diorite, minor pyroxene in quartz/feldspar matrix. Uitkomst Suite.
GN	234.60 - 280.10	---- NORITE; layered, fine-grained; dark grey white; non-susceptible; hard; Acicular pxt, minor quartz. occasional pegmatitic zones with granophyric texture. Uitkomst
GN	280.10 - 294.71	---- NORITE; medium-grained; speckled grey; non-susceptible; hard; taxitic diorite with anhedral amphibole - alteration pyroxene in quartz/feldspar matrix. Pegmatite zones at base. Uitkomst Suite.
GN	294.71 - 294.80	---- PYROXENITE; homogeneous; fine-grained; grey green; non-susceptible; hard, melanorite/feldspathic pyroxenite. Uitkomst Suite
GN	294.80 - 295.41	---- PEGMATITE; pegmatitic; light grey; non-susceptible; hard; quartz/feldspar pegmatite with patchy rounded pyroxenitic aggregations. Uitkomst Suite.
GN	295.41 - 305.98	---- PYROXENITE; layered; medium-grained; grey green; non-susceptible; hard, melanorite, slightly sheared, minor thin granophyric layers. Uitkomst Suite
GN	305.98 - 308.25	---- NORITE; medium-grained; light green grey; non-susceptible; hard; diorite, granophyric texture in some zones, anhedral amphibole-alt pyroxene. Uitkomst
GN	317.54 - 317.66	---- PEGMATITE; pegmatitic; dark grey white; non-susceptible; hard; Granophyric texture. Uitkomst Suite.
GN	318.01 - 318.17	---- PEGMATITE; pegmatitic; dark grey white; non-susceptible; hard; irregular body, granophyric texture. Uitkomst Suite.
GN	308.25 - 343.97	---- NORITE; homogenous; medium-grained; grey green; non-susceptible hard; Gabbro norite, magnetite, orthopyroxene, fine-grained clinopyroxene. occasional melanocratic zones. Uitkomst Suite.
GN	325.95 - 326.41	---- NORITE; layered; fine-grained; dark grey white; non-susceptible; hard; Streaky interlayers of melanorite and granophyric textured diorite. Uitkomst Suite.
GN	333.79 - 333.87	---- QUARTZ CARBONATE VEIN; fine-grained; light grey; non-susceptible; hard; with sheared contacts. Uitkomst Suite.
GN	343.97 - 344.63	---- ANORTHOSITE; layered; fine-grained; light grey; non-susceptible; hard; streaky pyroxene layering. Uitkomst Suite.
GN	344.63 - 347.51	---- DIABASE; homogeneous; fine-grained; dark grey white; non-susceptible; hard; chilled top and bottom contacts steep top contact 30deg. (sill). Uitkomst Suite
GN	347.48 - 347.51	---- DOLERITE; homogeneous; aphanitic; dark grey; non-susceptible; hard; sill. Uitkomst Suite.
GN	347.90 - 347.92	---- DOLERITE; homogeneous; aphanitic; dark grey; non-susceptible; hard; sill. Uitkomst Suite.
GN	349.67 - 352.54	---- DIABASE; homogenous; fine-grained; dark grey white; non-susceptible; hard; chilled top and bottom contacts (sill). Uitkomst Suite.
GN	353.13 - 356.47	---- DIABASE; homogenous; fine-grained; dark grey white; non-susceptible; hard; sill with chilled contacts and phenocrysts. Uitkomst Suite.
GN	347.12 - 375.31	---- NORITE; layered; medium-grained; dark grey white; non-susceptible; hard; minor shearing with layered leuco norite. Uitkomst Suite.
GN	375.31 - 376.35	---- PYROXENITE; homogeneous; fine-grained; brown; non-susceptible; hard, pyroxenitic layer. Uitkomst Suite
GN	376.35 - 387.00	---- NORITE; homogeneous; medium-grained; dark grey white; non-susceptible; <1% sulphides; pyrite - cluster; hard; taxitic gabbro norite with some leuco norite layers. Uitkomst Suite.
GN	387.00 - 398.30	---- NORITE; layered; medium-grained; dark grey white; non-susceptible; <1% sulphides; pyrite - clusters; hard; taxitic; with numerous leuco layers and zones of magnetite. Uitkomst Suite.
GN	393.50 - 393.84	---- ANORTHOSITE; layered; fine-grained; yellowish grey; weakly susceptible; hard; streaky pyroxene in yellowish anorthosite. Uitkomst Suite.
GN	394.36 - 395.20	---- ANORTHOSITE; layered; fine-grained; yellowish grey; weakly susceptible; hard; streaky pyroxene with less anorthosite. Uitkomst Suite.
GN	398.30 - 398.92	---- ANORTHOSITE; layered; fine-grained; light grey; non-susceptible; hard; leuco norite with layers of pyroxene. Uitkomst Suite.
GN	404.84 - 405.37	---- ANORTHOSITE; layered; medium-grained; dark grey white; weakly susceptible; hard; representative of a leuco layering. Uitkomst Suite.

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GN	398.92 - 425.63	---- NORITE; layered; medium-grained; brown; non-susceptible; hard; compositional layering occasionally taxitic. Uitkomst Suite.
GN	421.01 - 421.37	---- ANORTHOSITE; layered; medium-grained; light grey; non-susceptible; hard; some pyroxene layers. Uitkomst Suite.
GN	425.63 - 428.15	---- ANORTHOSITE; layered; medium-grained; white; non-susceptible; hard; more pyroxenitic towards base. Uitkomst Suite.
GN	428.15 - 440.94	---- NORITE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; with minor anorthositic layering. Uitkomst Suite.
GN	436.86 - 436.90	---- ANORTHOSITE; layered; medium-grained; light grey; non-susceptible; hard. Uitkomst Suite.
GN	438.38 - 438.45	---- ANORTHOSITE; layered; fine-grained; light grey; non-susceptible; hard; with pyroxene accumulations. Uitkomst Suite.
GN	439.27 - 439.23	---- ANORTHOSITE; layered; fine-grained; light grey; non-susceptible; hard; pyroxene layering. Uitkomst Suite.
GN	441.18 - 441.35	---- NORITE; homogeneous; medium-grained; dark grey white; non-susceptible; hard. Uitkomst Suite.
GN	440.94 - 442.97	---- DOLERITE; homogeneous; fine-grained; dark green; non-susceptible; hard; sill. Uitkomst Suite.
GN	442.97 - 459.00	---- NORITE; layered; medium-grained; dark grey white; non-susceptible; hard; fabric 35deg. Uitkomst Suite
PXT	484.91 - 484.93	---- SHEAR ZONE; sheared; talc alteration; fine-grained; light grey; non-susceptible;
PXT	459.00 - 519.48	---- PYROXENITE; homogeneous; medium-grained; dark grey; weakly susceptible; <1 % sulphides; pyrite-disseminated; hard; minor talc alteration at shear zones. Uitkomst Suite
PXT	496.03 - 496.05	---- SHEAR ZONE; sheared; talc alteration; fine-grained; light grey; non-susceptible;
PXT	519.48 - 529.40	---- PYROXENITE; homogeneous; serpentized; medium-grained; dark grey; susceptible; hard, with <2% feldspar (<1 mm) peridotitic. Uitkomst Suite
MHZBG	529.40 - 555.10	---- PERIDOTITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; medium; poikilitic texture. Uitkomst Suite
MHZBG	544.28 - 545.16	---- DIABASE; homogeneous; slightly altered; fine-grained; light grey; non-susceptible; hard; chilled top and bottom contacts (sill). Uitkomst Suite
MHZBG	555.10 - 557.16	---- DIABASE; homogeneous; medium-grained; dark grey; non-susceptible; hard; chilled to and bottom contacts (sill) Uitkomst Suite.
MHZBG	558.80 - 559.43	---- PYROXENITE; homogeneous; medium-grained; dark green grey; non-susceptible; hard. Uitkomst Suite
MHZBG	557.16 - 564.05	---- PERIDOTITE; homogeneous; serpentized; fine-grained; dark grey brown; weakly susceptible; hard; with ghost poikilitic textures. Uitkomst Suite
MHZBG	564.05 - 569.61	---- PERIDOTITE; homogeneous; serpentized; medium-grained; dark grey; susceptible; hard; poikilitic textures. Uitkomst Suite
MHZBG	569.61 - 569.92	---- CHROMITITIC PYROXENITE; homogeneous; serpentized; fine-grained; dark grey; weakly susceptible; medium. Uitkomst Suite
MHZBG	569.92 - 592.50	---- PYROXENITE; homogeneous; serpentized; fine-grained; dark grey; weakly susceptible; hard, serpentine in thin veins chromitite occasionally concentrated in zones. Uitkomst Suite
MHZBG	590.29 - 590.41	---- SHEAR ZONE; sheared; talc alteration; fine-grained; light grey; non-susceptible;
MHZBG	592.50 - 602.65	---- PERIDOTITE; homogeneous; serpentized; medium-grained; dark grey; susceptible; hard; poikilitic texture with chromitite at 594.35m. Uitkomst Suite
MHZBG	602.65 - 602.73	---- CHROMITITIC PYROXENITE; layered; medium-grained; dark grey; weakly susceptible; hard. Uitkomst Suite.
MHZBG	602.73 - 603.98	---- PERIDOTITE; layered; serpentized; medium-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite-disseminated - net; hard. Uitkomst Suite.
MHZBG	603.98 - 604.05	---- CHROMITITIC PYROXENITE; layered; fine-grained; dark grey; weakly susceptible; <1% sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite.
MHZBG	604.05 - 604.21	---- QUARTZ CARBONATE VEIN; sheared; carbonitisation; medium-grained; white; weakly susceptible; soft; with minor serpentinite layers. Uitkomst Suite.
MHZBG	604.21 - 639.45	---- PERIDOTITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; medium; poikilitic texture and picrolite filled shear at 616.9 m. Shear fabric 30 deg. Uitkomst Suite

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UNIT CODE	DEPTH	DESCRIPTION
MHZBG	639.92 - 640.47	----- SHEAR ZONE; sheared; carbonitisation; fine-grained; dark grey white; weakly susceptible; medium. Uitkomst Suite
MHZBG	639.45 - 641.41	----- PYROXENITE; homogeneous; serpentinized; fine-grained; dark green; weakly susceptible; hard. Uitkomst Suite
MHZBG	641.41 - 651.19	----- PERIDOTITE; homogeneous; serpentinized; medium-grained; dark grey; susceptible; <1 % sulphides; pyrite-disseminated; pyrrhotite; hard; poikilitic texture and sulphides concentrated towards base. Uitkomst Suite
MHZBG	651.19 - 652.00	----- SCHIST; homogeneous; talc alteration; fine-grained; black; non-susceptible; soft. Uitkomst Suite.
MHZBG	652.00 - 655.40	----- DIABASE; veined; slightly altered; medium grained; dark grey brown; non-susceptible; medium; chilled top and bottom contacts (sill). Uitkomst Suite.
MHZBG	655.40 - 663.19	----- PERIDOTITE; homogeneous; serpentinized; medium-grained; dark grey; susceptible; <1 % sulphides; pyrite-disseminated; pyrrhotite; hard; disseminated sulphides throughout. Uitkomst Suite
MHZBG	663.19 - 665.16	----- DIABASE; homogeneous; carbonatation; medium-grained; green; non-susceptible; hard; chilled contacts (sill) Uitkomst Suite.
MHZBG	665.16 - 667.34	----- PERIDOTITE; homogeneous; serpentinized; fine-grained; dark grey; susceptible; <1 % sulphides; pyrite-disseminated; pyrrhotite; hard; poikilitic
MHZBG	667.34 - 668.74	----- PYROXENITE; homogeneous; fine-grained; dark grey; weakly susceptible; hard. Uitkomst Suite
MHZBG	668.74 - 669.13	----- PYROXENITE; veined; carbonitisation; fine-grained; dark green; weakly susceptible; hard. Uitkomst Suite
MHZBG	669.13 - 670.28	----- PYROXENITE; homogeneous; fine-grained; dark green; weakly susceptible; hard, minor carbonate filled veins. Uitkomst Suite
MHZBG	670.28 - 676.54	----- PERIDOTITE; homogeneous; serpentinized; fine-grained; dark grey; susceptible; <1 % sulphides; pyrite-disseminated; pyrrhotite; hard; poikilitic
MHZBG	676.54 - 677.22	----- PYROXENITE; homogeneous; serpentinized; fine-grained; dark green; weakly susceptible; hard. Uitkomst Suite
MHZBG	677.22 - 677.59	----- SHEAR ZONE; sheared; fine-grained; light green grey; weakly susceptible; hard; mylonitic. Uitkomst Suite
MHZBG	677.59 - 679.43	----- PYROXENITE; homogeneous; talc alteration; medium-grained; dark green; weakly susceptible; soft. Uitkomst Suite
MHZBG	679.43 - 679.73	----- SHEAR ZONE; sheared; talc alteration; fine-grained; dark grey white; weakly susceptible; soft. Uitkomst Suite
MHZBG	679.73 - 683.66	----- DIABASE; veined; medium-grained; brown; non-susceptible; hard; faulted contacts (sill). Uitkomst Suite.
MHZBG	683.66 - 694.04	----- DIABASE; veined; medium-grained; light green; non-susceptible; hard; chilled bottom contact (sill). Uitkomst Suite.
MHZBG	688.78 - 689.11	----- QUARTZ VEIN; veined; medium-grained; white; non-susceptible; hard. Uitkomst Suite
MHZBG	689.36 - 692.10	----- QUARTZ VEIN; veined; medium-grained; white; non-susceptible; hard. Uitkomst Suite
MHZBG	694.36 - 695.17	----- DIABASE; homogeneous; medium-grained; green; non-susceptible; hard; piece of diabase core may not be in correct position. Uitkomst Suite.
MHZBG	694.04 - 698.32	----- PYROXENITE; veined; talc alteration; fine-grained; grey; non-susceptible. Uitkomst Suite
MHZBG	698.32 - 689.59	----- QUARTZ CARBONATE VEIN; homogeneous; carbonitisation; coarse-grained; white; non-susceptible; hard. Uitkomst Suite.
MHZBG	698.59 - 703.48	----- DIABASE; homogeneous; carbonatation; medium-grained; dark green; non-susceptible; minor carbonate filled veins. Uitkomst Suite.
MHZBG	703.48 - 704.25	----- SCHIST; homogeneous; talc alteration; fine-grained; black; non-susceptible; soft. Uitkomst Suite.
MHZBG	704.25 - 706.00	----- PYROXENITE; homogeneous; carbonatation; fine-grained; dark green; weakly susceptible; hard, with occasional picrolite filled veins. Uitkomst Suite
MHZBG	706.00 - 717.20	----- PERIDOTITE; homogeneous; serpentinized; medium-grained; dark grey; susceptible; <1 % sulphides; pyrrhotite-disseminated; pyrite; hard. Uitkomst Suite.
MHZBG	717.20 - 721.26	----- PYROXENITE; homogeneous; talc alteration; medium-grained; dark grey; non-susceptible; <1 % sulphides; pyrrhotite-disseminated; soft. Uitkomst Suite

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UNIT CODE	DEPTH	DESCRIPTION
MHZBG	721.26 - 721.32	---- MASSIVE CHROMITITE; homogeneous; fine-grained; black; non-susceptible. Uitkomst Suite
MHZBG	721.32 - 721.35	---- QUARTZ CARBONATE VEIN; homogeneous; fine-grained; white; non-susceptible; hard. Uitkomst Suite.
MHZBG	721.35 - 727.34	---- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; chilled contacts (sill) Uitkomst Suite.
MHZBG	727.34 - 727.48	---- SCHIST; sheared; talc alteration; fine-grained; grey; non-susceptible; soft. Uitkomst Suite.
MHZBG	727.48 - 728.80	---- PYROXENITE; layered; medium-grained; grey; weakly susceptible; hard. Uitkomst Suite
MHZBG	728.80 - 755.10	---- PERIDOTITE; homogeneous; serpentinized; medium-grained; black; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; pyrite-net; hard; poikilitic texture with occasional finer grained zones. Minor picrolite. Uitkomst Suite.
MHZBG	755.10 - 757.00	---- SCHIST; homogeneous; talc alteration; medium-grained; dark grey; non-susceptible; soft; with remnant olivine and ghost poikilitic structures. Uitkomst Suite.
MHZBG	757.00 - 763.47	---- SCHIST; sheared; talc alteration; fine-grained; grey; non-susceptible; soft; minor carbonate in veins. Uitkomst Suite.
MHZBG	763.47 - 767.56	---- PYROXENITE; homogeneous; medium-grained; black; non-susceptible; hard. Uitkomst Suite
MHZBG	767.56 - 770.00	---- PYROXENITE; homogeneous; talc alteration; medium-grained; dark grey; non-susceptible; <1 % sulphides; pyrrhotite-disseminated; poikilitic texture. Uitkomst Suite
PCR	770.00 - 779.65	---- PERIDOTITE; homogeneous; serpentinized; medium-grained; black; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; pyrite-net; hard; thin Cr seams at 777.19, 778.2, 778.51, minor picrolite filled veins and poikilitic. Uitkomst Suite.
PCR	779.65 - 787.20	---- DIABASE; homogeneous; carbonatisation; medium-grained; dark green; non-susceptible; hard; chilled top and bottom contacts (sill). Uitkomst Suite.
PCR	784.70 - 785.24	---- QUARTZ CARBONATE VEIN; veined; carbonitisation; medium-grained; white; non-susceptible; hard. Uitkomst Suite.
PCR	787.20 - 787.30	---- CHROMITITIC PYROXENITE; laminated; carbonitisation; fine-grained; dark grey white; non-susceptible. Uitkomst Suite
PCR	787.30 - 789.89	---- PERIDOTITE; homogeneous; serpentinized; fine-grained; dark grey; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; pyrite-net; hard. Uitkomst Suite.
PCR	789.89 - 789.95	---- MASSIVE CHROMITITE; homogeneous; fine-grained; dark grey; non-susceptible; hard. Uitkomst Suite
PCR	789.85 - 816.04	---- PERIDOTITE; homogeneous; serpentinized; fine-grained; dark grey; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; pyrite-net; hard; with occasional thin Cr seams. Uitkomst Suite.
PCR	816.04 - 816.26	---- DIABASE; homogeneous; medium-grained; green; non-susceptible; hard. Uitkomst Suite.
PCR	816.26 - 817.12	---- PYROXENITE; homogeneous; coarse-grained; dark grey; weakly susceptible; 1-5% sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite
PCR	817.12 - 817.65	---- PYROXENITE; homogeneous; coarse-grained; light green; weakly susceptible; <1% sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite
PCR	817.65 - 818.28	---- DOLERITE; homogeneous; fine-grained; light grey; non-susceptible; hard. Uitkomst Suite.
PCR	818.28 - 823.72	---- PEGMATITE; homogeneous; pegmatite; white; non-susceptible; hard; abundant feldspar. Uitkomst Suite.
PCR	823.72 - 824.10	---- DOLERITE; sheared; slightly altered; fine-grained; dark grey brown; non-susceptible; hard. Uitkomst Suite.
PCR	824.10 - 824.33	---- SHEAR ZONE; sheared; carbonitisation; fine-grained; white; non-susceptible. Uitkomst Suite.
PCR	824.65 - 824.69	---- SHEAR ZONE; sheared; carbonitisation; fine-grained; white; non-susceptible. Uitkomst Suite.

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PCR	825.78 - 825.84	----- SHEAR ZONE; sheared; carbonitisation; fine-grained; white; non-susceptible. Uitkomst Suite.
PCR	824.33 - 833.20	----- PERIDOTITE; homogeneous; serpentized; fine-grained; dark grey; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; pyrite-net; hard; with occasional thin Cr seams. Uitkomst Suite.
PCR	833.20 - 838.73	----- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; <1% sulphides; pyrrhotite-blebby; hard; chilled contacts (sill) with sulphides concentrated in veins. Uitkomst Suite.
PCR	838.73 - 843.23	----- PERIDOTITE; homogeneous; medium-grained; dark grey brown; susceptible; <1% sulphides; pyrrhotite-blebby-disseminated; hard. Uitkomst Suite
PCR	843.23 - 847.92	----- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; chilled contacts (sill). Uitkomst Suite.
PCR	847.92 - 851.10	----- PERIDOTITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 1-5 % sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite.
PCR	851.10 - 851.46	----- CHROMITITIC PYROXENITE; homogeneous; serpentized; medium-grained; dark grey; susceptible; <1% sulphides; pyrrhotite-disseminated; hard. Uitkomst
PCR	851.46 - 852.68	----- PYROXENITE; homogeneous; medium-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite
PCR	852.68 - 853.25	----- CHROMITITIC PYROXENITE; layered; fine-grained; dark grey; weakly susceptible; <1% sulphides; pyrrhotite-disseminated; pyrite; hard. Uitkomst Suite.
PCR	853.25 - 855.10	----- PYROXENITE; homogeneous; medium-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite-disseminated; hard. Uitkomst Suite
PCR	855.10 - 858.61	----- CHROMITITIC PYROXENITE; layered; medium-grained; dark grey; weakly susceptible; 1 - 5% sulphides; pyrrhotite-disseminated; pyrite-blebby; hard; minor carbonate filled veins. Uitkomst Suite.
PCR	858.61 - 859.30	----- CHROMITITIC PYROXENITE; homogeneous; fine-grained; dark grey brown; weakly susceptible; <1% sulphides; pyrrhotite-blebby; pyrite; hard; minor carbonate filled veins. Uitkomst Suite.
PCR	859.30 - 862.20	----- CHROMITITIC PYROXENITE; homogeneous; talc alteration; medium-grained; dark grey; weakly susceptible; 1-5% sulphides; pyrrhotite-blebby; pyrite-disseminated. Uitkomst Suite.
PCR	862.20 - 865.00	----- PYROXENITE; homogeneous; talc alteration; coarse-grained; dark grey; weakly susceptible; <1% sulphides; pyrrhotite-blebby; pyrite; hard. Uitkomst Suite
PCR	865.00 - 867.25	----- PYROXENITE; homogeneous; fine-grained; dark grey; non-susceptible; <1% sulphides; pyrrhotite-blebby; pyrite; hard. Uitkomst Suite
PCR	867.25 - 868.58	----- PYROXENITE; homogeneous; fine-grained; dark green; non-susceptible; <1% sulphides; pyrrhotite-blebby; pyrite; hard.. Uitkomst Suite
PCR	868.58 - 887.78	----- DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; chilled contacts (sill) Uitkomst Suite
PCR	887.78 - 910.50	----- CHROMITITIC PYROXENITE; layered; talc alteration; medium-grained; dark grey; weakly susceptible; <1% sulphides; pyrite-blebby; pyrrhotite-disseminated; hard. Uitkomst Suite.
PCR	910.80 - 911.90	----- CHROMITITIC PYROXENITE; sheared; talc alteration; fine-grained; dark grey white; non-susceptible; <1% sulphides; pyrite-blebby; pyrrhotite stringer; soft. Uitkomst Suite.
PCR	910.50 - 918.00	----- CHROMITITIC PYROXENITE; layered; talc alteration; fine-grained; dark grey; weakly susceptible; <1% sulphides; pyrite-blebby; pyrrhotite; hard; strongly magnetic in places. Uitkomst Suite.
PCR	918.00 - 918.54	----- PYROXENITE; homogeneous; fine-grained; light grey; non-susceptible; hard, <1% sulphides; pyrite-blebby; pyrrhotite; hard. Uitkomst Suite
PCR	918.54 - 921.15	----- CHROMITITIC PYROXENITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 1-5% sulphides; pyrite-blebby; pyrrhotite-disseminated; hard; minor carbonate filled veins with occasional picrolite development. Uitkomst Suite.
PCR	921.15 - 922.72	----- PYROXENITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 1-5% sulphides; pyrite-blebby; pyrrhotite; hard, could still be classed as PCR. Uitkomst Suite

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UNIT CODE	DEPTH	DESCRIPTION
CR	922.72 - 926.00	-----PYROXENITE; homogeneous; coarse-grained; dark grey brown; susceptible; 1-5% sulphides; pyrite-blebby-pods; hard. Uitkomst Suite
CR	926.00 - 927.65	-----PYROXENITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 1-5% sulphides; pyrite-blebby; pyrrhotite; hard, sulphides concentrated towards top of unit. Uitkomst Suite
CR	927.65 - 928.83	-----PYROXENITE; homogeneous; epidotised; coarse-grained; light green; weakly susceptible; <1% sulphides; pyrite-blebby; hard, xenolith. Uitkomst Suite
CR	928.83 - 932.34	-----PYROXENITE; homogeneous; serpentized; medium-grained; dark green; susceptible; 1-5% sulphides; pyrite-blebby; pyrrhotite; hard, moderate picrolitic development with occasional Cr seams. Uitkomst Suite
CR	931.25 - 931.31	-----DOLERITE; homogeneous; fine-grained; light grey; non-susceptible; hard; sill. Uitkomst Suite.
CR	932.34 - 933.80	-----PYROXENITE; xenolith; slightly altered; medium-grained; light green; weakly susceptible; 1-5% sulphides; pyrite-blebby; pyrrhotite; hard, dark pyroxene development towards base. Uitkomst Suite
CR	933.80 - 934.16	-----PYROXENITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 1-5% sulphides; pyrite-blebby-disseminated; hard, ghost poikilitic texture (peridotitic). Uitkomst Suite
PCR	934.33 - 934.39	-----PYROXENITE; homogeneous; serpentized; fine-grained; dark grey brown; susceptible; <1% sulphides; pyrite-disseminated; pyrrhotite; hard. Uitkomst Suite
PCR	934.50 - 934.63	-----PYROXENITE; homogeneous; serpentized; fine-grained; dark grey brown; susceptible; <1% sulphides; pyrite-disseminated; pyrrhotite; hard. Uitkomst Suite
PCR	934.16 - 937.28	-----QUARTZITE; xenolith; epidotisation; medium-grained; light green grey; non-susceptible; 1-5 % sulphides; pyrite-blebby; hard; with minor pyroxene zones at top. Uitkomst Suite.
PCR	937.28 - 937.52	-----PEGMATITE; homogeneous; epidotisation; pegmatitic; light green; non-susceptible; <1% sulphides; pyrite blebby; hard. Uitkomst Suite.
PCR	937.52 - 938.58	-----MASSIVE SULPHIDE; homogeneous; epidotisation; medium-grained; yellow; non-susceptible; >50 % sulphides; pyrite-massive sulphide; hard. Uitkomst Suite.
PCR	937.58 - 938.65	-----QUARTZITE; xenolith; epidotisation; medium-grained; light green grey; non-susceptible; 1-5 % sulphides; pyrite-blebby; hard; slightly pyroxenitic in places. Uitkomst Suite.
PCR	938.65 - 938.86	-----PYROXENITE; homogeneous; coarse-grained; grey green; susceptible; 25-50% sulphides; pyrrhotite-disseminated; pyrite-net; hard; coarse grained sulphides. Uitkomst Suite
PCR	938.86 - 940.05	-----PEGMATITE; homogeneous; epidotisation; medium-grained; light green; weakly susceptible; <1% sulphides; pyrite blebby; medium. Uitkomst Suite.
PCR	940.05 - 940.62	-----PYROXENITE; sheared; epidotisation; fine-grained; yellow; weakly susceptible; <1% sulphides; pyrite-disseminated. Uitkomst Suite
PCR	940.62 - 941.07	-----QUARTZITE; laminated; fine sand; light grey; non-susceptible; hard; bottom contact irregular. Uitkomst Suite.
PCR	941.07 - 966.80	-----DIABASE; homogeneous; medium-grained; dark grey white; non-susceptible; hard; chilled bottom contact with irregular top contact (sill). Uitkomst Suite
PCR	966.80 - 967.00	-----QUARTZITE; homogeneous; fine-grained; light grey; non-susceptible; <1% sulphides; pyrite-blebby; pyrrhotite; hard. Uitkomst Suite.
PCR	967.00 - 968.00	-----PYROXENITE; homogeneous; epidotisation; medium-grained; grey; susceptible; 1-5 % sulphides; pyrite-blebby-disseminated; hard. Uitkomst Suite
PCR	968.00 - 969.93	-----SKARN; homogeneous; epidotisation; medium-grained; grey; non-susceptible; 1-5% sulphides; pyrrhotite-blebby; po. Uitkomst Complex.
PCR	969.93 - 970.36	-----QUARTZITE; homogeneous; carbonitisation; fine sand; light grey; non-susceptible; <1 % sulphides; pyrite-blebby; hard. Uitkomst Suite.
PCR	970.36 - 970.55	-----QUARTZITE; homogeneous; epidotisation; medium sand; light green; non-susceptible; 5-10%; pyrite - blebby; hard. Uitkomst Suite
PCR	970.55 - 970.95	-----PYROXENITE; homogeneous; serpentized; medium-grained; dark grey brown; susceptible; 25-50% sulphides; pyrrhotite-blebby; pyrite-net; hard. Uitkomst Suite
PCR	970.95 - 971.38	-----QUARTZITE; laminated; fine sand; light grey; non-susceptible; hard; <1 % sulphides; pyrite-disseminated; hard. Uitkomst Suite.

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PCR	971.38 - 971.83	---- PYROXENITE; homogeneous; serpentized; fine-grained; dark grey; susceptible; 1-5% sulphides; pyrite-disseminated; pyrrhotite; hard; serpentized towards base with quartz xenoliths in core of unit. Uitkomst Suite
PCR	971.83 - 973.35	---- QUARTZITE; laminated; fine sand; light grey; non-susceptible; hard; <1 % sulphides; pyrite-disseminated; hard. Uitkomst Suite.
LHZBG	973.35 - 974.13	---- WHERLITE; homogeneous; medium-grained; dark grey brown; susceptible; >50% sulphides; pyrrhotite-net; pyrite; hard. Uitkomst Suite.
LHZBG	974.20 - 974.26	---- WEHLRITE; homogeneous; medium-grained; dark grey brown; susceptible; >50% sulphides; pyrrhotite-massive sulphide -net; hard. Uitkomst Suite.
LHZBG	974.13 - 974.60	---- QUARTZITE; homogeneous; fine sand; light grey; non-susceptible; 1-5% sulphides; pyrrhotite-net-massive sulphide; hard; pyrrhotite rich wehrlite in core of unit. Uitkomst Suite.
LHZBG	974.60 - 975.30	---- WEHLRITE; homogeneous; medium-grained; dark grey brown; susceptible; 20 - 50% sulphides; pyrrhotite-net; pyrite; hard. Uitkomst Suite.
LHZBG	975.38 - 975.46	---- QUARTZITE; homogeneous; fine grained; light grey; non-susceptible; hard. Uitkomst Suite.
LHZBG	975.30 - 975.55	---- PERIDOTITE; homogeneous; fine-grained; dark grey brown; susceptible; 1-5% sulphides; pyrrhotite-blebby; pyrite - net; hard. Uitkomst Suite
LHZBG	975.55 - 975.92	---- PERIDOTITE; sheared; medium-grained; dark grey; susceptible; 5-10% sulphides; pyrrhotite-net; pyrite blebby; hard. Uitkomst Suite.
LHZBG	975.92 - 976.18	---- WEHLRITE; homogeneous; medium-grained; dark grey brown; susceptible; >50% sulphides; pyrrhotite-net; pyrite; hard. Uitkomst Suite.
LHZBG	976.18 - 976.25	---- QUARTZITE; fractured; metamorphosed; fine-grained; light green grey; non-susceptible; hard; chloritic veining. Uitkomst Suite.
LHZBG	976.25 - 976.41	---- PYROXENITE; homogeneous; serpentized; medium-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite-blebby; pyrite - net; hard. Uitkomst
LHZBG	976.41 - 977.13	---- WEHLRITE; serpentized; medium-grained; dark grey brown; susceptible; 10 - 25% sulphides; pyrrhotite-net; pyrite; hard. Uitkomst Suite.
LHZBG	977.13 - 978.41	---- QUARTZITE; layered; metamorphosed; fine-grained; light green grey; non-susceptible; <1% sulphides; pyrite-wisps; chalcopyrite-blebby; hard; minor fractures with sulphide Veining. Uitkomst Suite.
LHZBG	978.41 - 979.37	---- PERIDOTITE; layered; serpentized; medium grained; dark grey; susceptible; <1% sulphides; pyrrhotite-disseminated; pyrite; hard; quartzose to top. Uitkomst
LHZBG	979.03 - 979.11	---- DOLOMITE; homogeneous; metamorphosed; fine-grained; grey; non-susceptible; hard; altered siliceous dolomite. Uitkomst Suite.
LHZBG	979.37 - 980.36	---- PERIDOTITE; serpentized; medium-grained; dark grey; susceptible; 1-5% sulphides; pyrrhotite-net; pyrite-clusters; taxitic, with patchy wehrlitic zones. Uitkomst Suite
LHZBG	980.36 - 987.55	---- PERIDOTITE; layered; serpentized; medium-grained; dark grey; susceptible; <1% sulphides; pyrrhotite-disseminated; pyrite; hard; minor troctolitic layers. Uitkomst Suite.
LHZBG	984.82 - 984.87	---- PEGMATITE; pegmatitic; light grey; non-susceptible; hard; quartzose pegmatite. Uitkomst Suite.
BGAB	987.55 - 990.95	---- GABBRO; homogeneous; serpentized; fine-grained; dark grey white; weakly susceptible; 1-5% sulphides; pyrrhotite-disseminated; chalcopyrite-clusters; pyrite; hard; mineralized mainly on top. Well developed basal chill. Uitkomst Suite
BGAB	990.70 - 990.80	---- QUARTZ VEIN; pegmatitic; white; non susceptible; hard. Uitkomst Suite
BGAB	990.95 - 992.39	---- SHEAR ZONE; sheared; carbonitisation; fine-grained; white; non-susceptible. Uitkomst Suite.
BGAB	992.39 - 992.67	---- QUARTZ VEIN; pegmatitic; white; non susceptible; hard; milky quartz. With fragments of sheared country rock. Uitkomst Suite
BGAB	992.67 - 995.83	---- SHEAR ZONE; sheared; carbonitisation; fine-grained; white; non-susceptible. Uitkomst Suite.
COUNTRY	995.83 - 1016.05	---- DIABASE; veined; amphibolitization; fine-grained; dark grey brown; non-susceptible; hard; pervasively altered. Godwan Lava flow.
COUNTRY	1016.05 - 1016.9	---- SHEAR ZONE; mylonitized; amphibolitization; medium-grained; grey green; non-susceptible; pervasive shear fabric. Reverse movement. Godwan Formation
COUNTRY	1016.94 - 1017.0	---- QUARTZITE; homogeneous; amphibolitization; fine-grained; grey-green; non-susceptible; hard; calcareous quartz. Malmani Subgroup.