



## **GEOLOGICAL SURVEY OF CANADA**

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# **Mineralogy and geochemistry of the C14 kimberlite and associated glacial sediments, Kirkland Lake, Ontario**

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**M.B. McClenaghan, I.M. Kjarsgaard, J.A.R. Stirling,  
G. Pringle, B.A. Kjarsgaard, B. Berger**

**1999**



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	<b>Minerals • Minéraux</b>		
<b>Canada</b>			

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## ABSTRACT

The Geological Survey of Canada investigated four kimberlite pipes in the Kirkland Lake area, northeastern Ontario to document indicator signatures in glacial sediments. This report focuses on results from the C14 kimberlite in Clifford Township. The kimberlite has been eroded down by preglacial and glacial weathering to a level approximately 20 to 30 m below the surrounding bedrock. The subcropping surface consists of heterolithic tuffisitic kimberlite breccia. Kimberlite indicator minerals of the C14 pipe are dominated by Cr-pyrope and chromite ( $\pm$  Cr-diopside) derived from lherzolitic xenoliths with only a minor proportion from harzburgite and dunite sources. No evidence of eclogitic xenoliths in the C14 kimberlite were found in this study. The low numbers of Cr-poor pyrope, diopside and Mg-ilmenite point to a low contribution from the Cr-poor megacryst suite which can be dominant in other kimberlites in the Kirkland Lake kimberlite field. The presence of subcalcic garnet and Cr-rich and (magnesio-) chromite suggests a moderate diamond potential for the C14 pipe. The relative abundance of indicator minerals in the C14 kimberlite, listed in decreasing order of abundance, is: pyrope > Cr-diopside > chromite > Mg-ilmenite. These relative abundances are mimicked in till overlying and just down-ice of the kimberlite. Indicator mineral chemistry for grains recovered from the glacial sediments around the C14 kimberlite are also similar to that for the kimberlite. Kimberlite samples from the C14 pipe contain tens of thousands of indicator mineral grains in 10-kg. Incorporation of kimberlite into the till is obvious overlying the C14 kimberlite and just down-ice and is reflected in all size fractions of till. The non-ferromagnetic heavy mineral fraction (coarse to fine sand) of till contains anomalous concentrations of indicator minerals (tens to thousands of grains) and displays elevated concentrations of Cr, Sr, Ta, La, Ce, and Eu. The <0.063 mm (silt+clay) fraction has elevated concentrations of Ba, Co, Cr, Tot Fe, K, Mg, Ni, Sr and Ti and the pebble sized-fraction contains several kimberlite clasts.



## INTRODUCTION

In 1992, the Geological Survey of Canada (GSC) began a five-year project to investigate known kimberlites in the Kirkland Lake area, northeastern Ontario. The purpose of the project was to document glacial dispersal patterns and indicator signatures associated with known kimberlite intrusions as well as regional indicator mineral patterns in glacial sediments collected across the area.

Most bedrock in the Kirkland Lake area is covered by glacial sediments that are a few metres to 100 m thick. Kimberlite, being relatively soft, was differentially eroded by preglacial weathering and glacial erosion such that it subcrops 10 to 35 m below the surrounding bedrock. Because of this deep erosion, all kimberlite pipes in the area are covered by thick sequences of glacial sediment and have no surface expression. By applying a combination of indicator mineral and geophysical methods, several kimberlite pipes and dykes (Fig. 1) have been discovered in the region within the last 15 years (Brummer et al., 1992a; McClenaghan, 1993; Zalnieriunas and Sage, 1995; Sage, 1996).

The C14, B30, A4 and Diamond Lake kimberlite pipes and the Buffonta kimberlite dyke (Fig. 1) have been examined to document kimberlite composition, glacial dispersal patterns, down-hole geophysical signatures and surficial geochemical signatures (McClenaghan et al., 1996, 1998; McClenaghan, 1996a, b). These kimberlites were chosen in order to examine glacial dispersal patterns in tills (C14, B30, A4, Buffonta) and in glaciofluvial esker sediments (Diamond Lake). Thirty-one overburden holes were drilled by the GSC around the four kimberlite pipes in the winter of 1993. Soil and vegetation samples were collected over the C14 and Diamond Lake pipes to examine surficial signatures associated with the pipes (McClenaghan et al., 1995; McClenaghan and Dunn, 1995; Dunn and McClenaghan, 1996). Down-

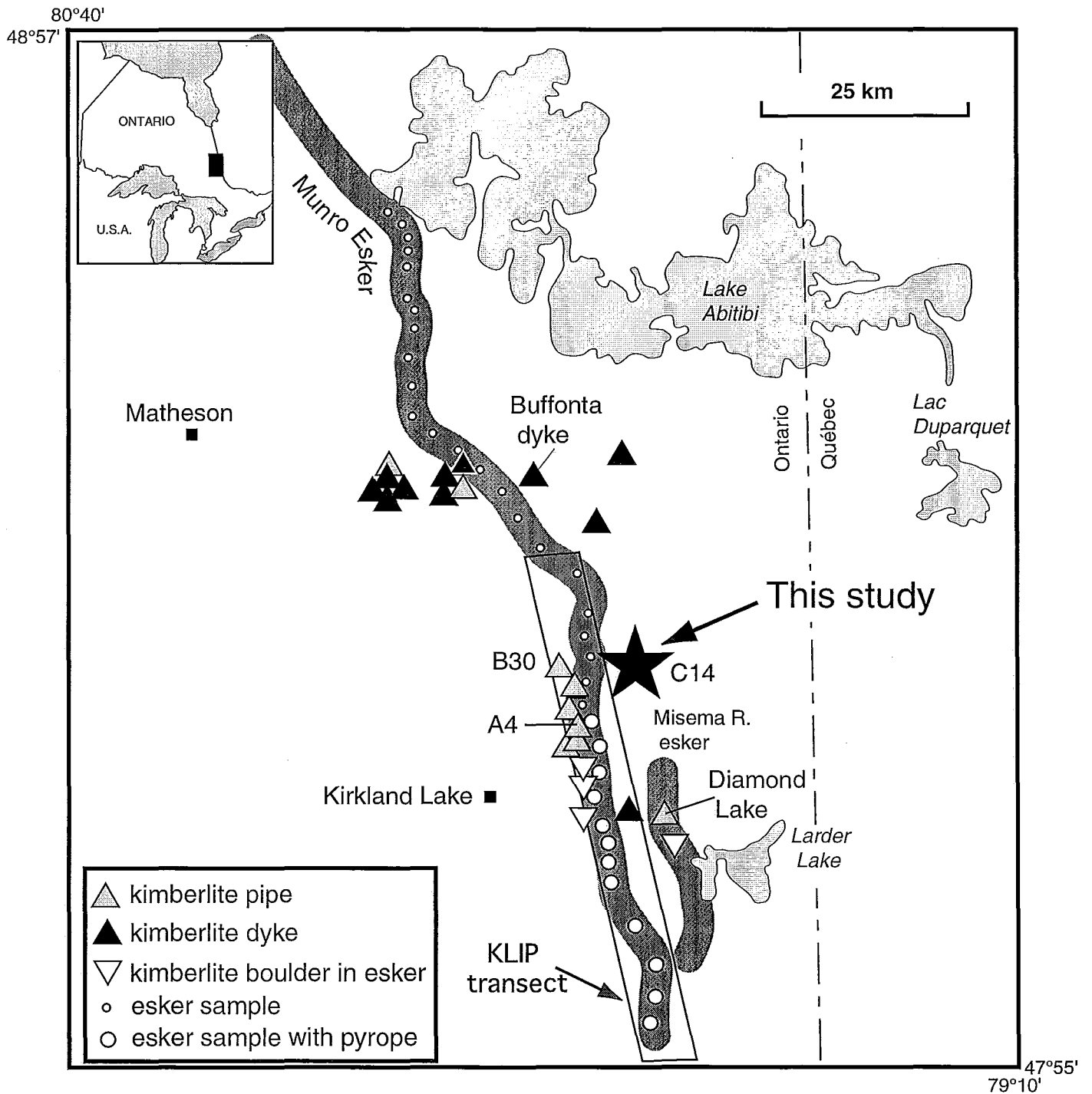


Figure 1. Location of kimberlite intrusions and kimberlite boulders and pyrope found in eskers (kimberlite locations from Zalnieriunas and Sage, 1995; kimberlite boulder locations from McClenaghan, 1993; esker sample data from Lee, 1965).

hole logging was used to document the geophysical character of kimberlites and the glacial sediments overlying them. Sediments and vegetation were also collected over the Buffonta kimberlite dyke to compare the signatures from a small hypabyssal kimberlite intrusion to those of much larger pipes (McClenaghan et al., 1995; McClenaghan and Dunn, 1995; Dunn and McClenaghan, 1996). This report describes results for samples collected around the C14 kimberlite.

### **Location and access**

The Kirkland Lake kimberlite field is in northeastern Ontario, north and east of Kirkland Lake and 100 km southeast of Timmins (Fig. 1). The C14 kimberlite pipe is located in topographic map NTS 32D/5 at 48°17'N and 79°48'W, (UTM Zone 17, 588990, 5348150,) at the southern edge of Clifford Township, approximately 20 km northeast of Kirkland Lake. The property is accessed by a logging road extending east from Highway 672. The Misema River, just southeast of the kimberlite, flows southwest into Kennedy Lake (Fig. 2).

### **Geology**

The Kirkland Lake area is one of several important gold camps in the Abitibi Greenstone Belt of eastern Canada. The Abitibi Belt consists of Archean metavolcanic, metasedimentary and intrusive rocks. At the time of kimberlite emplacement during the Late Jurassic, the Archean rocks were overlain by an estimated 700 m of Devonian to Ordovician carbonate rocks (Armstrong and McCracken, 1996). The C14 kimberlite intruded Archean metavolcanic rocks (Fig. 2) and Paleozoic carbonate rocks approximately 156 Ma ago (Brummer et al., 1992b). During the last 150 million years, the Paleozoic rocks and the upper part of the kimberlite have been eroded away with diatreme facies kimberlite occurring at the present erosion level (Fig. 3). The subcropping surface of the kimberlite is approximately 200 m by 300 m.

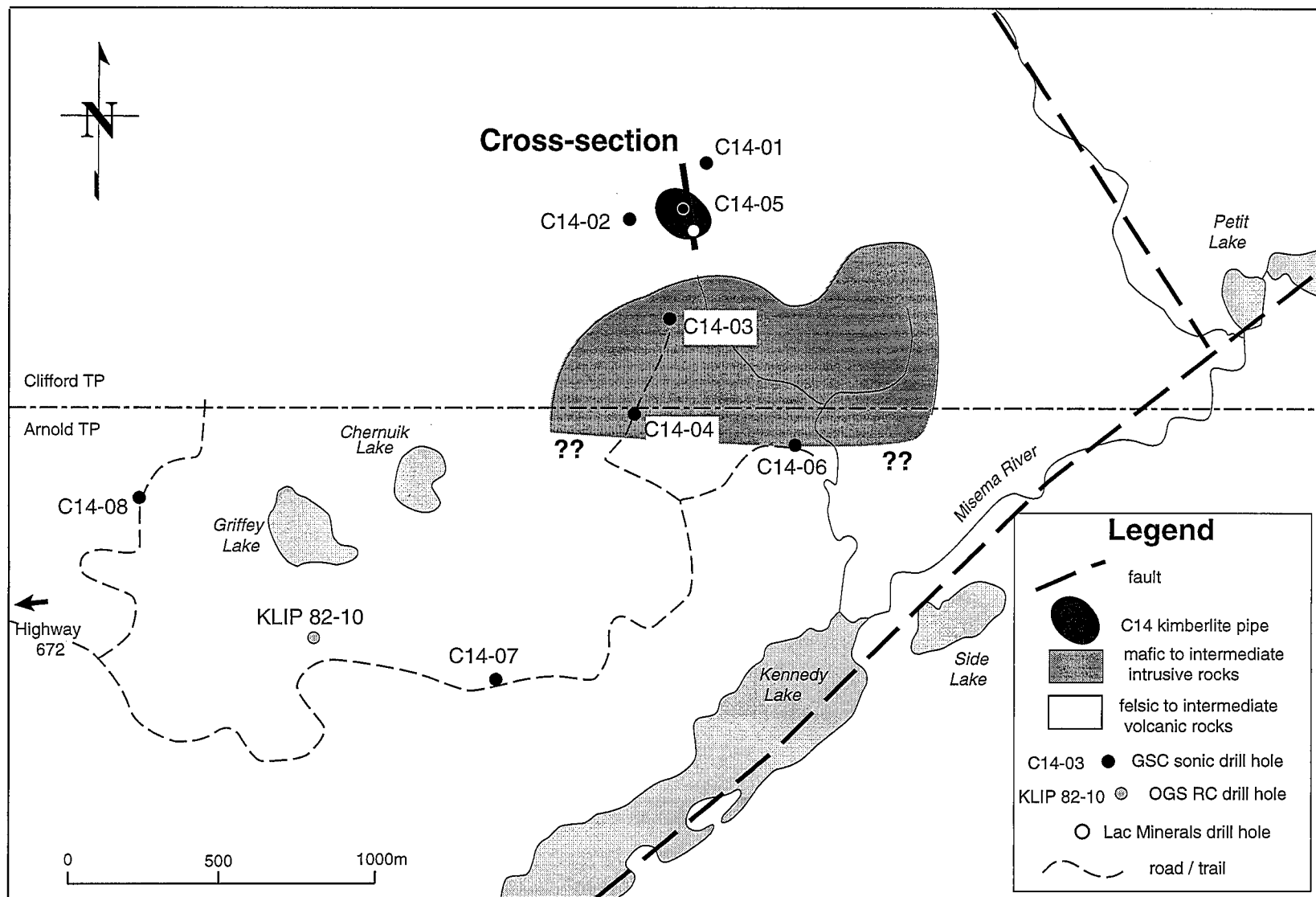


Figure 2. Bedrock geology and location of the C14 kimberlite pipe and drill holes. Geology from Jensen (1975) and Hogg (1964).

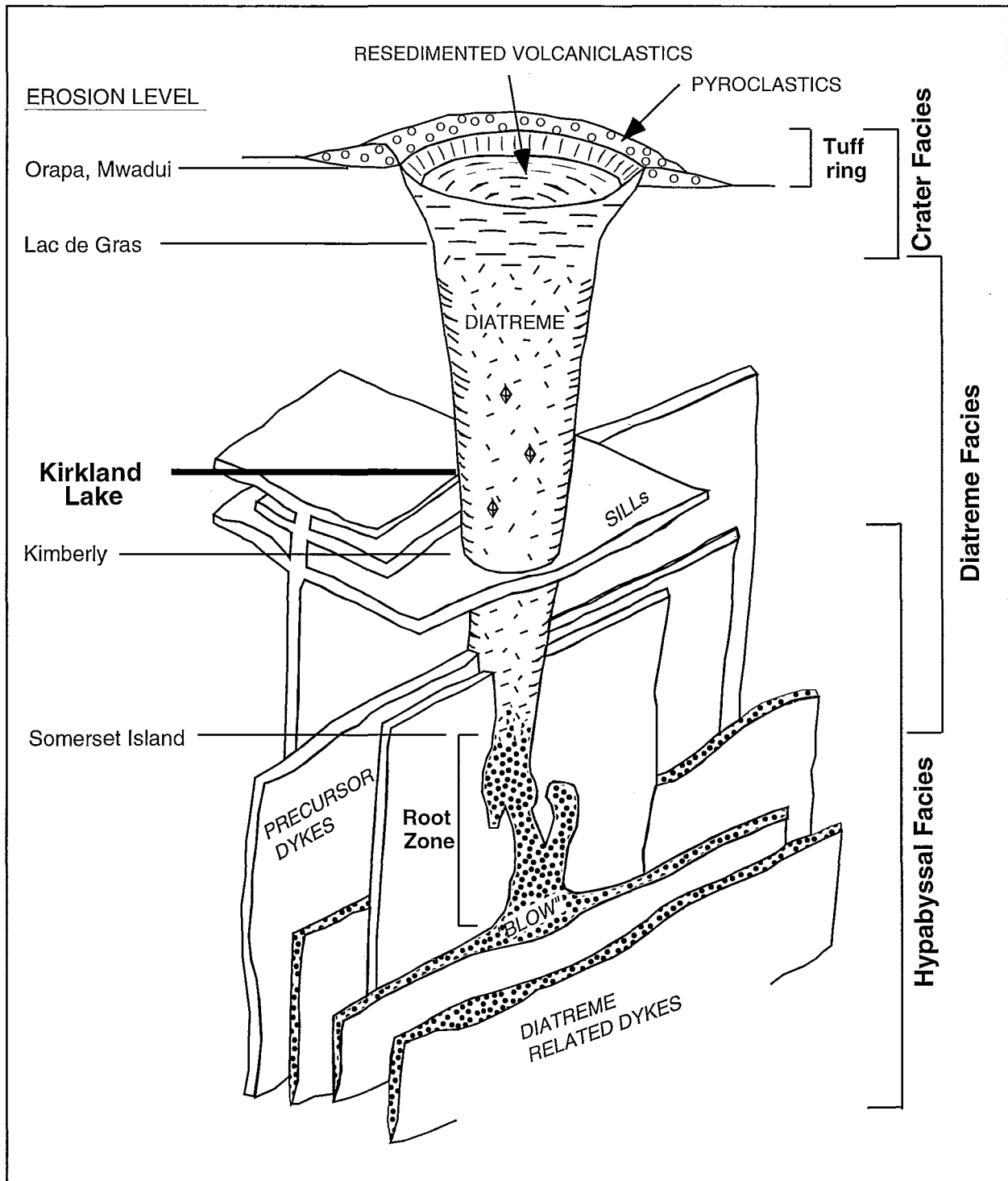


Figure 3. Model of a kimberlite (from Mitchell, 1986) showing present day erosion levels for kimberlites in Kirkland Lake and elsewhere (from Kjarsgaard, 1996).

The rocks are classified as heterolithic tuffisitic kimberlite breccia with pelletal textured groundmass (Photo 1) (for additional photos see Brummer et al., 1992b, p. 362). The kimberlite groundmass consists of serpentine, phlogopite, chlorite and calcite and is dark greenish-grey. Crustal xenoliths (variable, but >20 modal %) of greenish-grey to white Paleozoic limestone fragments are common throughout, ranging in size from 1 cm to 1 m. These wall rocks have been incorporated into the intruding kimberlite magma and drawn down into the pipe below the contact with Archean rocks. Today, the nearest Paleozoic rocks are 300 km north and 80 km south of the kimberlite pipe (Ontario Geological Survey, 1991). Several gem quality microdiamonds have been recovered from the C14 kimberlite (Fipke, 1990; Brummer, 1992b). A 17.55 tonne kimberlite sample yielded 8 macrodiamonds, weighing a total of 0.30 carats, that have good color and clarity (for photos see Brummer 1992b, p. 364). The largest diamond weighed 0.17 carats. The kimberlite has a strong positive magnetic signature (Brummer, 1992b; MacFadyen, 1993; Keating, 1995, 1996) that forms a distinct bulls eye response on airborne magnetic survey maps (Fig. 4) published by the Ontario Geological Survey (Ontario Geological Survey, 1979) and by the Geological Survey of Canada (Geological Survey of Canada, 1993).

The Kirkland Lake region was covered by the Laurentide Ice Sheet during the Wisconsinian which deposited a silty sand till, known locally as Matheson Till (Baker, 1985). Ice flowed west to southwest during the main phase of glaciation (Fig. 5), then south and finally southeast during deglaciation (McClenaghan et al., 1995; Veillette and McClenaghan, 1996). As the glacier retreated northward approximately 10,000 years ago, glacial Lake Ojibway fronted the ice sheet and thick sequences of fine grained glaciolacustrine sediments were deposited over top of the till and bedrock (Baker, 1985). The C14 pipe is covered by Matheson Till, which is in turn overlain by interbedded sand and till. These sediments are overlain by a thick sequence of

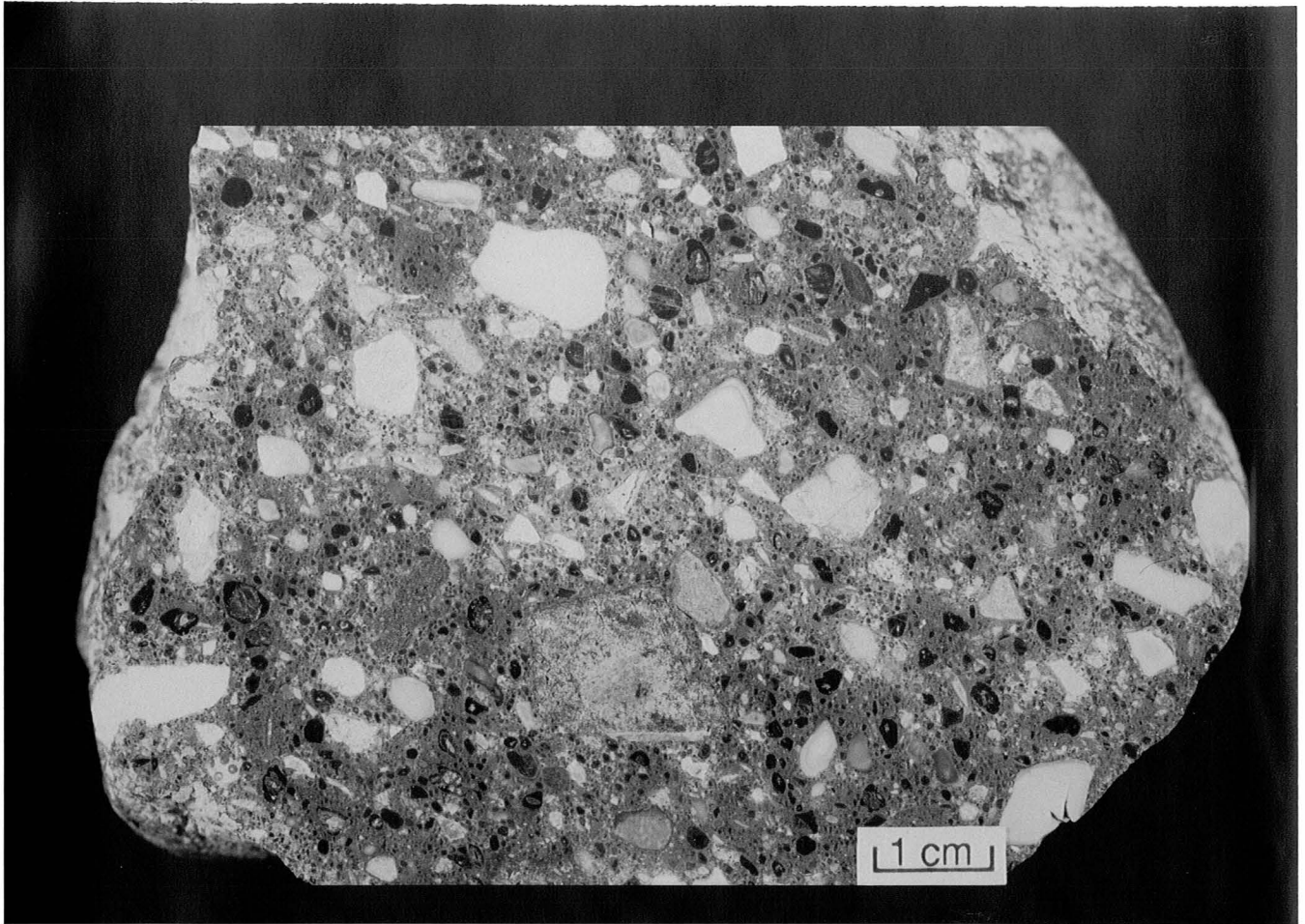


Photo 1. C14 kimberlite breccia.

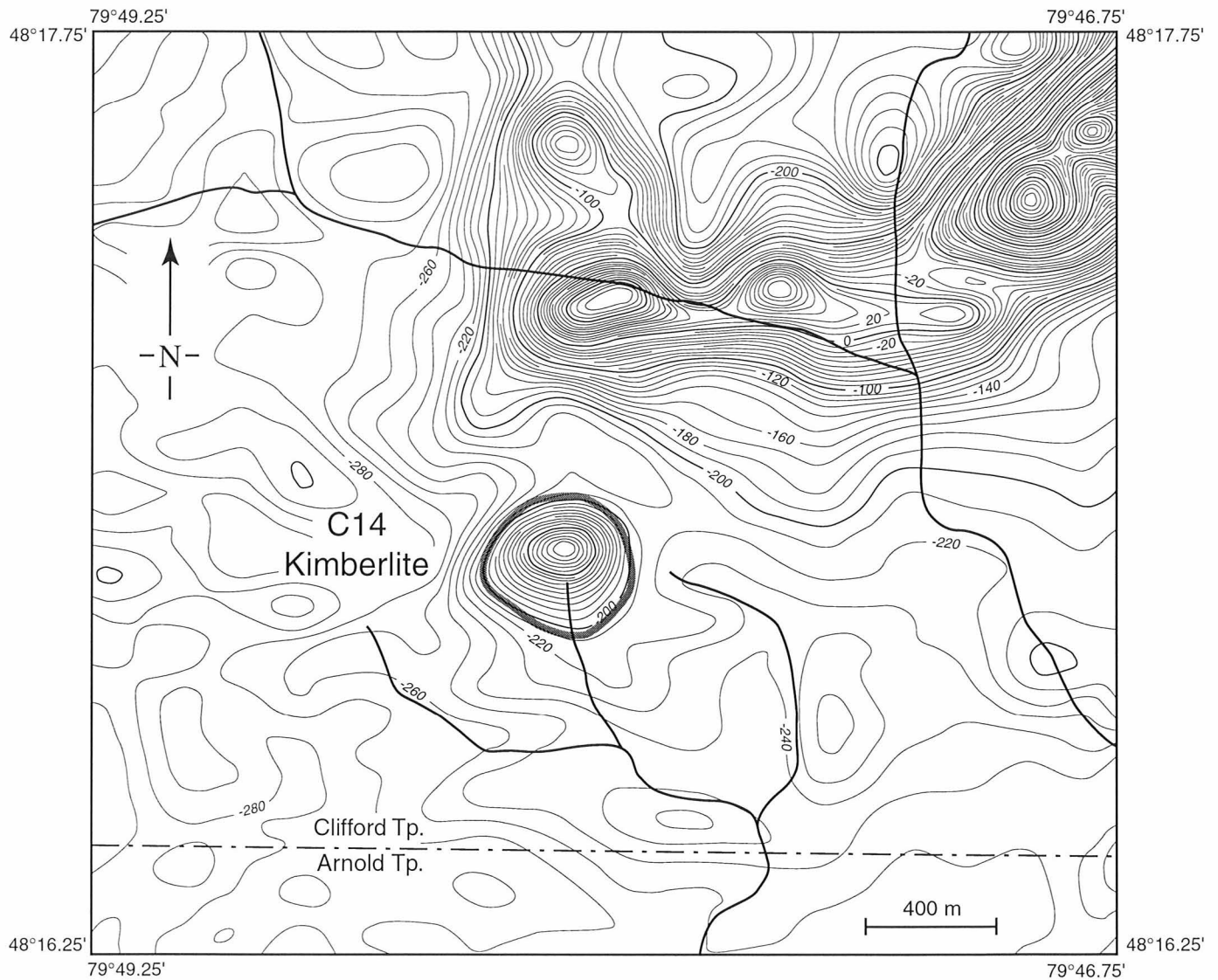


Figure 4. Residual total field magnetic data for the C14 kimberlite in Clifford Township (modified from Geological Survey of Canada, 1993).



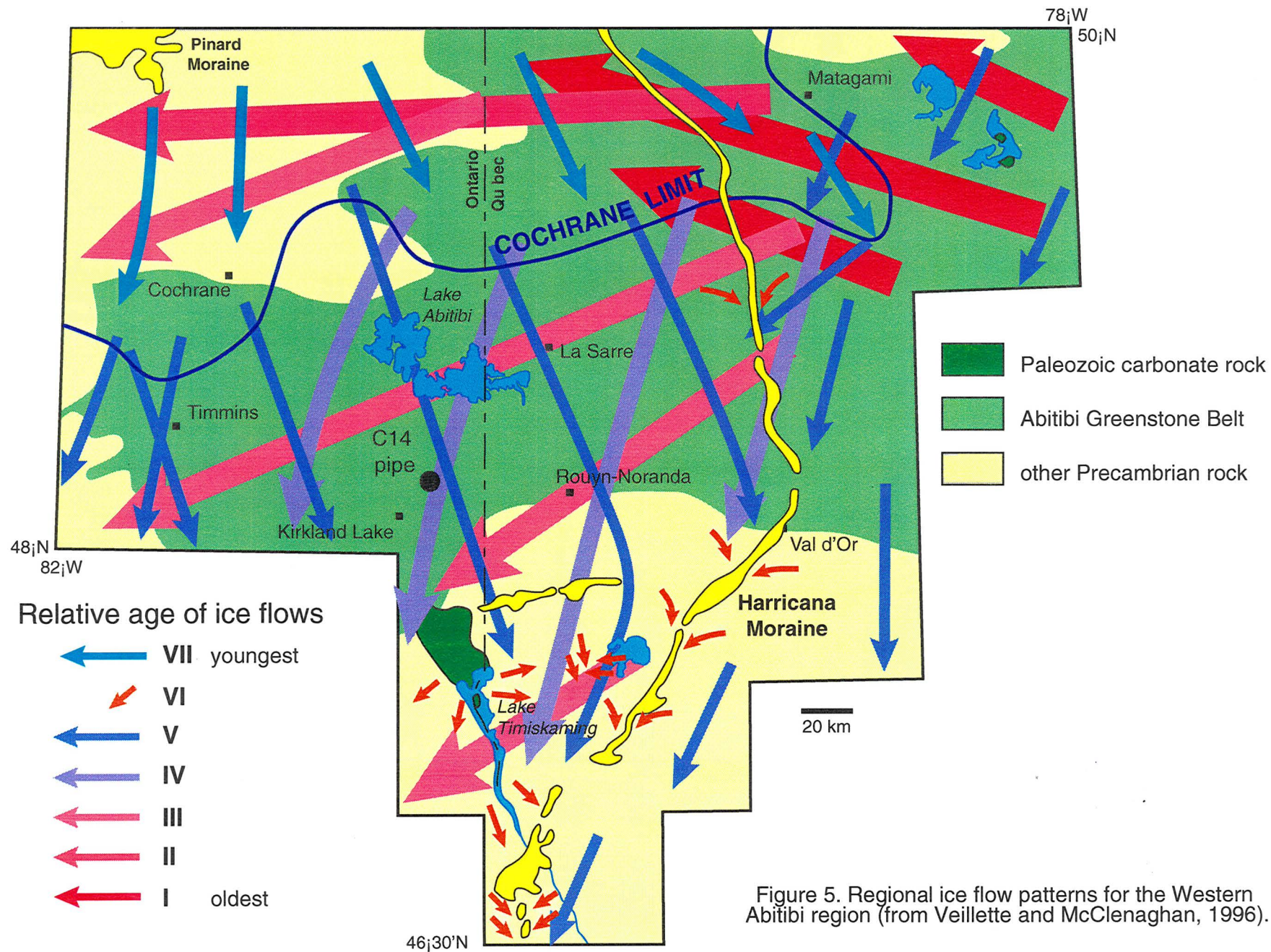


Figure 5. Regional ice flow patterns for the Western Abitibi region (from Veillette and McClenaghan, 1996).

fine-grained glaciolacustrine sediments and capped by 1 to 2 m of aeolian sand and 0.5 to 1 m of organic material. Glacial sediments are thickest directly over the kimberlite which has been differentially eroded to a maximum of 30 m below the adjacent bedrock (Fig. 6) due to preglacial weathering and by glacial and glaciofluvial erosion. Bedrock outcrops just 100 m south of the kimberlite and is common throughout the area surrounding the C14 pipe (Fig. 7). The surface between bedrock outcrops is covered by thick glacial sediments capped by aeolian sand deposited after deglaciation but prior to the establishment of vegetation. Parabolic dunes on surface are common in the area just west of the C14 kimberlite (Baker et al., 1982).

### **Regional kimberlite exploration**

Kimberlite in the Kirkland Lake region was first reported by Satterly in 1949, 35 km north of Kirkland Lake (Satterly, 1949; Brummer et al., 1992a). While studying gold grains in esker sediments, Lee (1965) discovered pyrope garnets in sand along a 120 km segment of the Munro Esker near Kirkland Lake (Fig.1). Lee's elevated pyrope concentrations correspond to the area where several kimberlite pipes were subsequently discovered 20 years later (Fig. 8a). A kimberlite dyke was then discovered 15 km east of Kirkland Lake, in the Upper Canada Gold Mine (Lee, 1968; Lee and Lawrence, 1968). Since that time, several hundred kimberlite boulders have been found in gravel pits in the Munro and Misema River eskers (Fig. 1) (Baker, 1982; Brummer et al., 1992a; McClenaghan, 1993).

Between 1979 and 1982 and prior to the discovery of kimberlite pipes in the region, the Ontario Geological Survey (OGS) sampled till in 171 reverse circulation overburden holes and 200 backhoe pits in the Kirkland Lake region as part of the Kirkland Lake Initiatives Program (KLIP), directed mainly at gold exploration (Fortescue et al., 1984). Pyrope and Cr-diopside were recognized in glacial sediments recovered at several KLIP sites (Averill

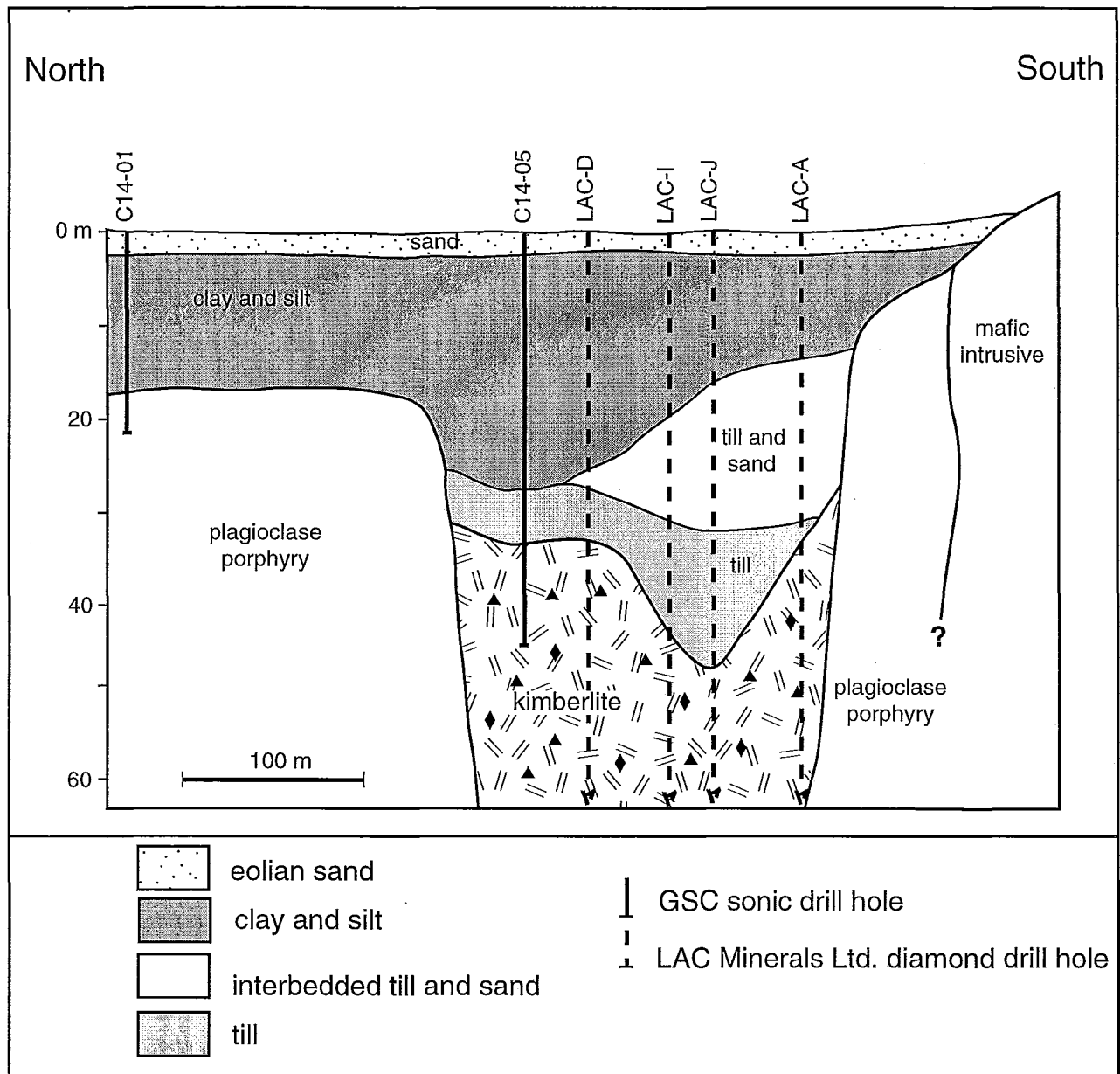


Figure 6. Schematic north-south cross-section over the C14 kimberlite showing glacial stratigraphy and sediment thickness.

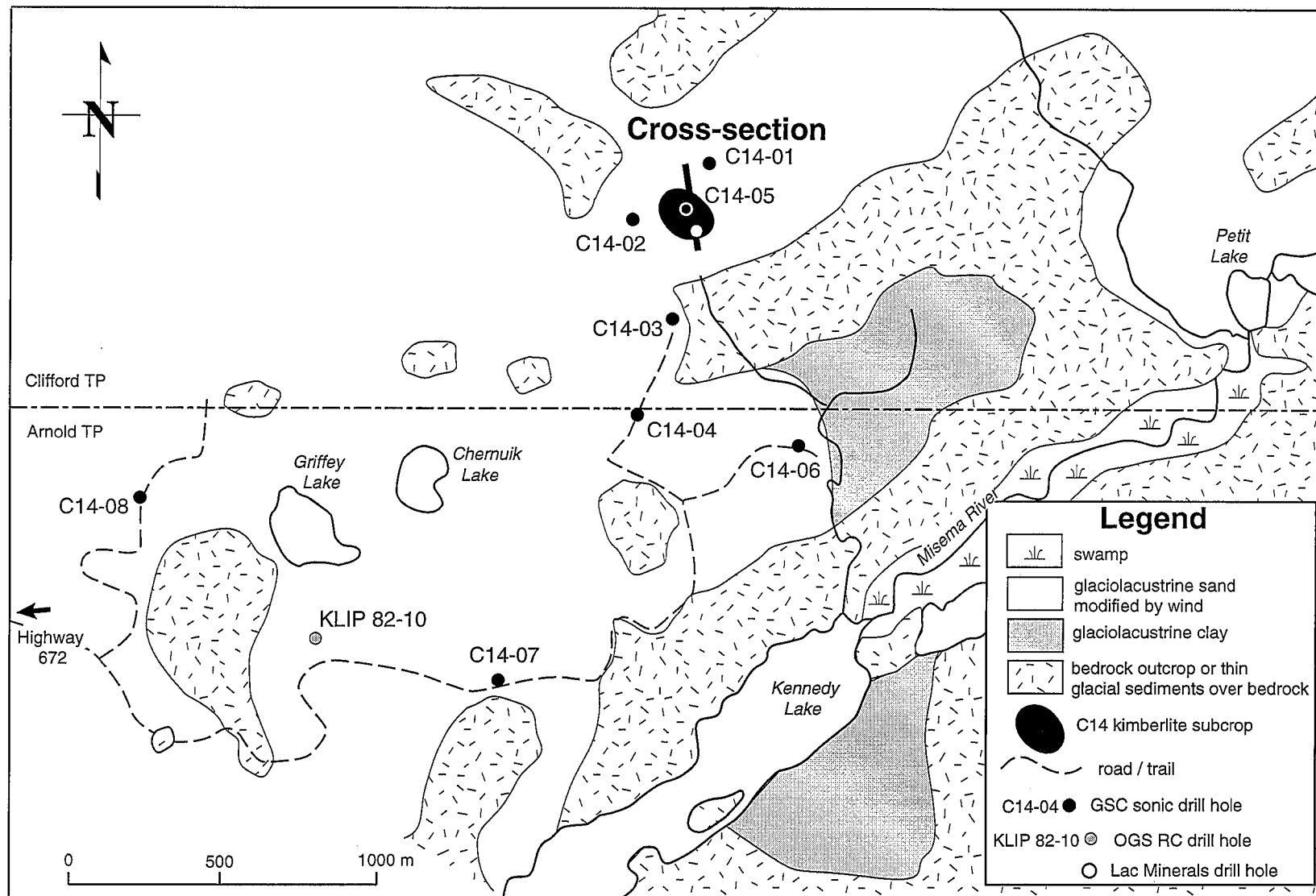


Figure 7. Surficial geology of the C14 kimberlite area and locations of GSC, OGS and LAC Minerals drill holes (geology from Baker et al., 1982).

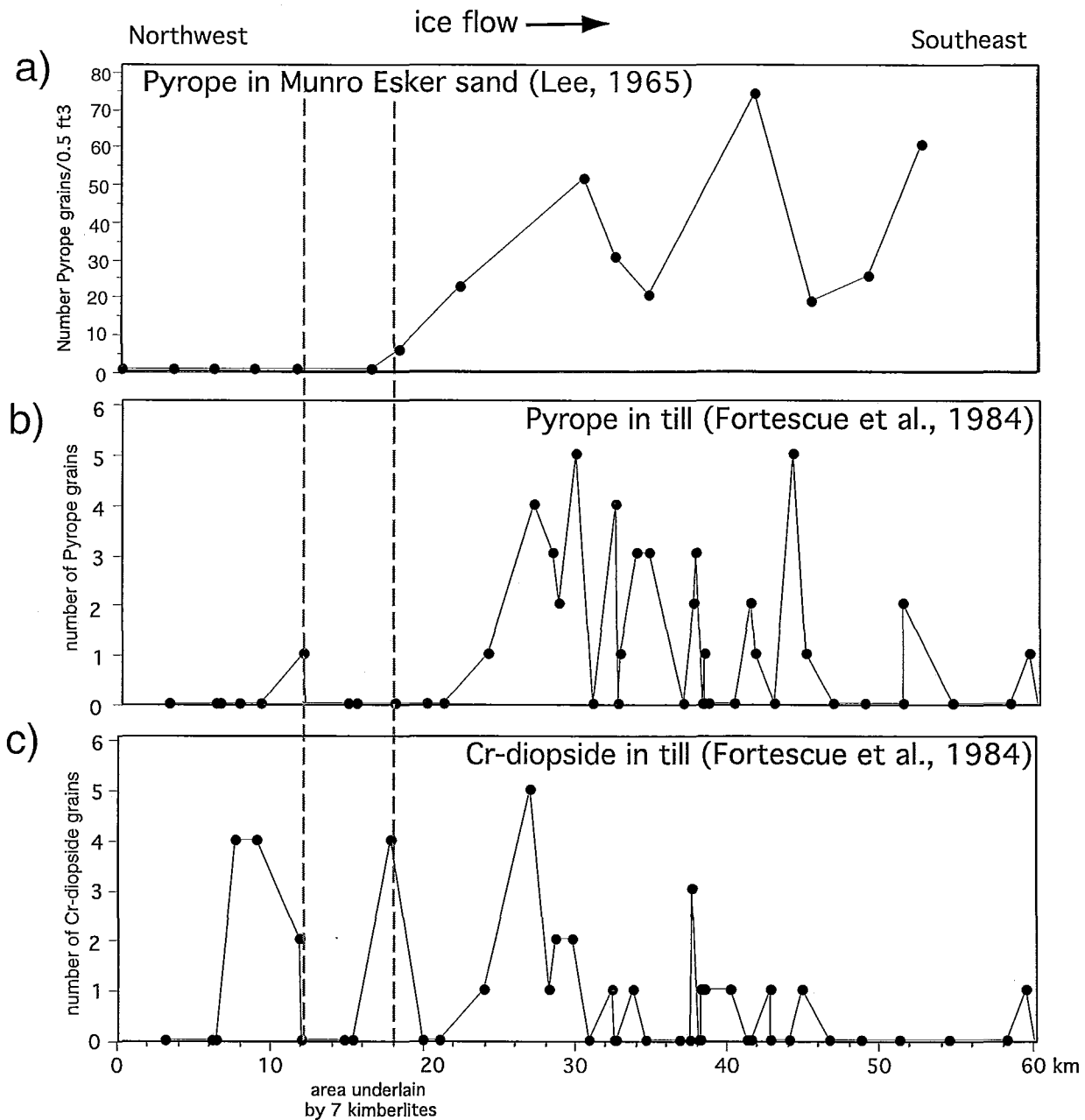


Figure 8 a) Abundance of pyrope in 0.5 ft<sup>3</sup> of sand along the Munro Esker (Lee, 1965); b) pyrope and c) Cr-diopside concentration in a 1/4 split of the heavy mineral fraction of till samples along a northwest-southeast transect through the KLIP study area, Kirkland Lake (from Fortescue et al., 1984, p. 416-424). See Figure 1 for location of the Munro Esker sample sites and the KLIP sample transect.



and Fortescue, 1983; Fortescue et al., 1984) and this information aided in the discovery of several kimberlites near Kirkland Lake (Pegg et al., 1990; Brummer et al., 1992a,b). Pyrope abundance in KLIP till samples (Table 1) along a northwest-southeast transect (Fig. 1) displays a similar dispersal pattern (Fig. 8b) to pyrope in the Munro Esker sediments documented by Lee (1965) some 20 years earlier. In both studies, pyrope appears in glacial sediments in the same general area (subsequently found to contain seven kimberlite pipes) and its presence continues for another 30 to 40 km down-ice. Cr-diopside in till (Fig. \*c), displays a similar pattern but continues for only 25 km down-ice. Remarkably, these data were published before kimberlite pipes were discovered in Kirkland Lake.

Some KLIP sites drilled in 1982 south and southwest of the C14 kimberlite contained pyrope and Cr-diopside and their presence combined with a strong airborne geophysical anomaly indicated by the OGS magnetic survey (Ontario Geological Survey, 1979), aided in the discovery of the C14 kimberlite in 1985 (Fipke et al., 1989; Pegg et al., 1990; Brummer, 1992a). To date, at least 11 kimberlite pipes and several dykes (Fig. 1) have been found in the Kirkland Lake area and several more in the New Liskeard area, 70 km south (Brummer et al., 1992b; Zalnieriunas and Sage, 1995; Sage, 1996).

### **Previous kimberlite research in the Kirkland Lake area**

Much work has been completed on the Kirkland Lake kimberlites in recent years. Schulze (1993a, 1993b, 1995, 1996a, 1996b), Schulze and Anderson (1994), Schulze et al. (1995), Vicker and Schulze (1994), Meyer et al. (1994), Sage (1996), Armstrong et al. (1997), and Vicker (1997) have examined mineral chemistry of garnets, diopsides, ilmenites, and spinels from the C14 kimberlite. Down-hole logging was carried out by the GSC on GSC overburden drill holes and a few LAC Minerals diamond drill holes in the winter of 1993 to document the geophysical character of kimberlites and

Table 1. Location and number of pyrope and Cr-diopside in a 1/4 split of the heavy mineral fraction of till samples in a northwest-southeast transect across the KLIP area. Data are from Fortescue et al., Part II (1984).

KLIP Site Number	KLIP Transect Number	UTM Northing Coordinate	Distance north to south (km)	Site type	Pyrope	Cr-diopside
82-24	3	5356900	56.9	drill hole	0	0
82-22	9	5353900	53.9	drill hole	0	0
82-23	10	5353600	53.6	drill hole	0	0
82-19	11	5352400	52.4	drill hole	0	4
82-18	15	5351000	51.0	drill hole	0	4
82-17	24	5348200	48.2	drill hole	1	2
82-16	23	5348100	48.1	drill hole	0	0
81-19	26	5345300	45.3	drill hole	0	0
82-09	29	5344700	44.7	drill hole	0	0
82-07	33	5342200	42.2	drill hole	0	4
82-05	47	5340200	40.2	drill hole	0	0
82-03	56	5339000	39.0	drill hole	0	0
82-02	68	5336100	36.1	drill hole	1	1
80-237	102	5333100	33.1	backhoe	4	5
81-278	120	5331800	31.8	backhoe	3	1
81-287	122	5331400	31.4	backhoe	2	2
79-40	160	5330300	30.3	drill hole	5	2
81-291	147	5329200	29.2	backhoe	0	0
81-292	159	5327600	27.6	backhoe	4	1
81-347	185	5327500	27.5	backhoe	0	0
79-43	184	5327300	27.3	drill hole	1	0
79-23	196	5326300	26.3	drill hole	3	1
82-26	218	5325400	25.4	drill hole	3	0
81-247	245	5323200	23.2	backhoe	0	0
81-246	258	5322500	22.5	backhoe	2	0
79-21	246	5322300	22.3	drill hole	3	3
81-397	260	5322000	22.0	backhoe	0	0
81-408	261	5321800	21.8	backhoe	1	0
82-28	259	5321800	21.8	drill hole	0	1
81-409	262	5321500	21.5	backhoe	0	1
82-32	278	5319900	19.9	drill hole	0	1
81-266	291	5318700	18.7	backhoe	2	0
79-20	292	5318500	18.5	drill hole	1	0
82-34	303	5317200	17.2	drill hole	0	1
82-33	302	5317200	17.2	drill hole	0	0
79-24	307	5316000	16.0	drill hole	5	0
82-35	308	5315200	15.2	drill hole	1	1
82-36	314	5313400	13.4	drill hole	0	0
79-17	317	5311200	11.2	drill hole	0	0
79-18	320	5308800	8.8	drill hole	0	0
79-15	319	5308700	8.7	drill hole	2	0
79-06	323	5305600	5.6	drill hole	0	0
79-03	325	5301800	1.8	drill hole	0	0
79-14	322	5300600	0.6	drill hole	1	1
79-02	326	5300000	0.0	drill hole	0	0

overlying sediments (Douma, 1995; Mwenifumbo et al., 1993; Mwenifumbo et al., 1996).

McClenaghan et al. (1993) chemically analyzed indicator minerals from archived heavy mineral concentrates from several KLIP holes to confirm the visual identification of kimberlite indicator minerals and to look for undetected indicator minerals. Archived concentrates from the Ontario Geological Survey Black River-Matheson (BRIM) regional till sampling project, immediately north of the KLIP area, were also examined to evaluate the potential for finding additional kimberlites north of the known kimberlite cluster. Several BRIM samples were found to contain elevated concentrations of Cr-pyrope, Cr-diopside and Mg-ilmenite that warrant further investigation. Averill and McClenaghan (1994) described indicator mineral abundance, size and shape down-ice from the C14 and Diamond Lake kimberlite pipes. They documented the ilmenite-poor nature of the C14 pipe and the southwest glacial dispersal of pyrope, Cr-diopside and chromite. Studies of indicator mineral and geochemical signatures of other kimberlites and associated glacial sediments in the Kirkland Lake area include the B30 kimberlite (McClenaghan et al., 1996) and the Diamond Lake kimberlite (McClenaghan et al., 1998).

## **METHODS**

### **Sample collection**

Sediments at eight sites around the C14 kimberlite were cored by the GSC during the winter of 1993 (Fig. 2). Hole C14-02 was drilled 30 m west of the kimberlite and holes C14-03, 04, 06 to 08 were drilled south of the kimberlite to test for dispersal down-ice. Hole C14-01 was drilled 40 m north of the kimberlite to determine regional background values of indicator minerals. Hole C14-05 was drilled directly into the body to document local (few metres) glacial dispersal and to sample kimberlite. Holes were drilled by JR Drilling



Ltd., Hadashville, Manitoba using a rotasonic, more commonly known as sonic, drill that provides 9 cm diameter, continuous core of sediments and bedrock. Approximately 2 m of bedrock were cored at the bottom of holes north and south of the kimberlite and 10 m of bedrock were cored in the kimberlite. Overall drilling costs averaged \$100 per metre for the drilling program. All sonic drill core was boxed on site and taken to the Ontario Ministry of Northern Development and Mines Drill Core Library in Swastika. There, all core was split length wise, logged and photographed. Samples, weighing between 4 and 25 kg were collected for recovery of kimberlite indicator minerals and gold grains. From the eight sites around the C14 kimberlite, 31 samples of till, sand and gravel (samples 93MPB001 to 025, and 048 to 052) were collected over 2 to 4 m intervals. Typically, a 10-kg sample is collected for gold and base metal exploration programs in the region, however, larger samples (up to 25-kg) were collected in this study to determine appropriate sample sizes for indicator mineral counting. Two 17-kg samples of kimberlite (93MPB204 and 205) were collected from hole C14-05 to determine geochemical and mineralogical characteristics of kimberlite for comparison to glacial sediments. A 500 g sample (Fig. 9) was collected from the same intervals as the bulk samples, for geochemical analyses of the fine fraction (<0.063 mm), textural (% sand, silt clay), chittick carbonate (% calcite and dolomite) and some clay mineralogical analyses of the <0.063 mm fraction. Samples were not collected from hole C14-07 because no till, sand or gravel were intersected. Glaciolacustrine silt was sampled in hole C14-05 for geochemical, textural and carbonate analyses to investigate the usefulness of this sampling medium in kimberlite exploration. Drill logs, sample intervals and core descriptions are included in Appendix A.

Kimberlite bedrock from hole C14-05 was logged and sampled by B.A. Kjarsgaard (GSC). Archean bedrock from the other seven sonic drill holes

was logged and sampled by B.R. Berger (Ontario Geological Survey). Selected samples were collected for thin sections and geochemical analyses.

### **Sample preparation**

Glacial sediment and kimberlite samples were processed by Overburden Drilling Management Ltd., Nepean, Ontario, to recover heavy mineral concentrates for geochemical analysis and for examination of kimberlite indicator minerals and gold grains (Sample A- Fig. 9). Kimberlite samples were soaked in water for 3 days prior to processing but were not subjected to any mechanical crushing. Weights for all sample fractions produced during the processing procedure are reported in Appendix B. The >2 mm (+10 mesh) material was screened and retained for pebble lithology classification. The <2 mm fraction was then screened to obtain two separate size fractions: 1) 1.0 to 2.0 mm fraction, and 2) <1.0 mm fraction.

1) The 1.0 to 2.0 mm fraction was not preconcentrated on the shaking table because of the risk of significant losses of coarse heavy minerals. Instead, this fraction was taken directly to methylene iodide (MI) diluted with acetone to a specific gravity (S.G.) of 3.2 to separate the light and heavy mineral fractions. Methylene iodide was diluted from full strength (S.G. 3.3) to maximize the recovery of Cr-diopside (S.G.  $\geq 3.2$ ), the kimberlite indicator mineral with the lowest specific gravity. The light minerals (<3.2 S.G.) were removed and put aside for future reference. The heavy mineral (>3.2 S.G.) split was further refined by removing the ferromagnetic minerals using a hand magnet, to produce a 1.0 to 2.0 mm non-ferromagnetic heavy mineral fraction.

2) The <1.0 mm fraction was processed using a combination of tabling and heavy liquid separation. First, the <1.0 mm material was passed over a shaking table twice to obtain a preconcentrate, which was then panned to recover gold grains. The gold grains were counted, described and returned to

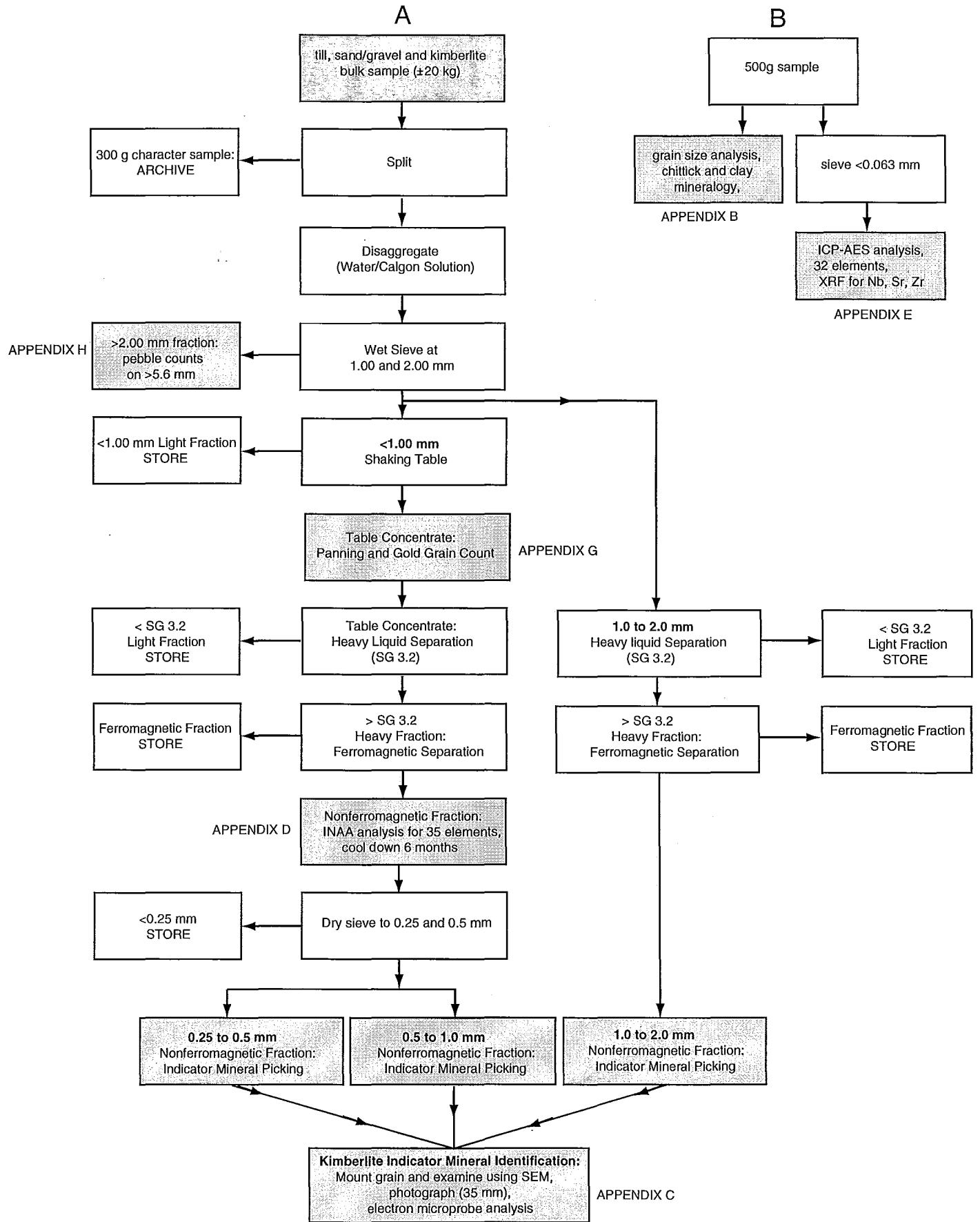


Figure 9. Sample processing flow sheet for kimberlite and glacial sediment samples: A) recovery of kimberlite indicator minerals and gold grains; and B) fine fraction geochemistry. Shaded boxes correspond to data listed in appendices.

the sample. The preconcentrate was then further refined using heavy liquid separation, as described above, to produce a heavy mineral fraction (S.G.>3.2). The ferromagnetic heavy minerals were removed using a hand magnet, leaving a <1.0 mm non-ferromagnetic heavy mineral fraction for picking. This combination of tabling and heavy liquid separation was used to recover indicator minerals because tabling also recovers gold grains that can be examined and counted.

### **Kimberlite indicator mineral identification**

Non-ferromagnetic heavy mineral concentrates were sent to Lakefield Research, Lakefield, Ontario or Overburden Drilling Management Ltd. for indicator mineral picking and mounting. The <1.0 mm concentrates were sieved into three fractions: <0.25 mm (-60 mesh), 0.25 to 0.5 mm and 0.5 to 1.0 mm. The <0.25 mm fraction was set aside. The 0.25 to 0.5 mm and 0.5 to 1.0 mm fractions and the already prepared 1.0 to 2.0 mm fraction were then examined using a binocular microscope and potential kimberlite indicator minerals were removed. Indicator minerals were identified on the basis of visual properties, such as colour, grain morphology and the presence of adhering kimberlite matrix material. Minerals picked included Cr-pyrope (purple,  $\pm$  kelyphite rims), Ti-Cr-pyrope (orange-red to deep red), Cr-diopside (emerald green), Mg-ilmenite (metallic black with conchoidal fractures on broken surfaces, unbroken grains appear as irregular to rounded black grains with grey/white coatings, perovskite overgrowths), and chromite and other Cr-spinel (black with reddish- brown edges, octahedral crystal shape to irregular shaped grains). Picked grains were mounted in 25 mm epoxy mounts and polished in preparation for electron microprobe analysis.

Electron microprobe analyses were carried out at the GSC using operating conditions similar to those described by McClenaghan et al. (1996), and Stirling and Pringle (1996). Analyses were completed using a four

spectrometer Cameca SX50 electron microprobe and all grains were analyzed using the "GARNET" routine. This routine was developed by the GSC to analyze for the major elements required to identify the potential mineral species using a minimum of probe time. The raw data were processed with the Cameca PAP program (Pouchou and Pichoir, 1984). The dead time correction formula (Willis, 1993) has been changed for the SX50 to achieve linearity at higher count rates. The standards and operating conditions are given in Appendix C-Table 1 and calculated detection limits and counting times are given in Appendix C-Table 2. Microprobe analyses are included in Appendix C.1 (digital data file only, on diskette accompanying this report). Subsets of the microprobe analyses for those minerals identified as kimberlite indicator minerals are listed in Appendix C.2 to C.6.

Microprobe data were sorted by chemical composition and the grains were labeled with mineral names. For minerals and mineral groups that form solid solution series, theoretical endmembers compositions (LeMaitre, 1982, Table A13) were used to calculate threshold values (at approximately 50:50 mol %) for individual members of binary solid solution series. These threshold values are shown in Table 2. For minerals that contain substantial amounts of more than two endmembers (which is the case for most garnets and spinels), the threshold values were lowered accordingly (<50 mol % of one endmember). In equivocal cases, molar fractions of the critical oxides were calculated in order to assess the endmember with the highest (name giving) proportion. Other minerals were identified by comparing wt. % oxides to published analyses (Deer et al., 1978). Mineral names of grains with low totals were set in brackets. Prefixes were added to some of the indicator mineral names to emphasize elevated contents of petrogenetically critical elements such as Mg, Cr, and Ti which are important in distinguishing between potential kimberlite minerals and those from other bedrock sources. Threshold values for these prefixes (see Table 2) were chosen arbitrarily and

might differ from those used by other authors. Readers are encouraged to examine the microprobe data and reclassify indicator minerals using their own criteria.

Table 2. Classification criteria for identifying minerals.

	<u>Criteria</u>	<u>Mineral name</u>
Al-garnet	> 21 wt.% MnO =	Spessartine
Al-garnet	> 13 wt.% MgO =	Pyrope
Al-garnet	> 17 wt.% CaO =	Grossular
Garnet	< 11 wt.% Al <sub>2</sub> O <sub>3</sub> & >13 wt.% CaO =	Andradite
Garnet	> 15 wt.% Cr <sub>2</sub> O <sub>3</sub> & >17 wt.% CaO =	Uvarovite
Andradite	> 2 wt.% Cr <sub>2</sub> O <sub>3</sub> =	Cr-Andradite
Andradite	> 5 wt.% MgO =	Serpentinized (Cr-) andradite
Pyrope	> 2 wt.% Cr <sub>2</sub> O <sub>3</sub> =	Cr-Pyrope
Diopside	>0.5 wt.% Cr <sub>2</sub> O <sub>3</sub> =	Cr-Diopside
Cr-Diopside	> 1.5 wt.% Cr <sub>2</sub> O <sub>3</sub> =	HiCr-Diopside
Chromite	Cr <sub>2</sub> O <sub>3</sub> /Al <sub>2</sub> O <sub>3</sub> < 1.5 =	Cr-Spinel
Chromite	> 3 wt.% TiO <sub>2</sub> =	Ti-Chromite
Rutile	> 15 wt.% FeO <sub>tot</sub> =	Fe-Rutile
Ilmenite	> 4 wt.% MgO =	Mg-Ilmenite
Ilmenite	> 53 wt.% FeO <sub>tot</sub> =	Ilmenite (altered)
Ilmenite	< 30 wt.% TiO <sub>2</sub> =	FeTi-Oxide
Pyrope-	< 22 wt.% FeO &	diamond inclusion
Almandine-	15wt.% < MgO < 5wt.%	(Group I) eclogitic
Grossular	& > 4 wt.% CaO	garnet
	& > 0.07 wt.% Na <sub>2</sub> O =	

Enlarged color prints and scanning electron microprobe (SEM) backscatter images of the grain mounts were used to aid mineral identification and to recognize possible inhomogeneities, intergrowths or exsolutions within individual grains. Grain colour was also used to confirm mineral identification. Minerals were identified and named using criteria similar to those of McClenaghan et al. (1996, 1998) and Ward et al. (1995) and are outlined above. A few grains could not be identified because their totals were too low. This was due to insufficient outcrop at the surface of the grain mount, inhomogeneity, strong alteration of the grains or compositions which contained elements not analyzed (e.g. Zr in zircon, S in sulfides). Grains that did not yield analyses with totals high enough to be unequivocally identified were labeled "unknown".

The target minerals in kimberlite exploration in the Kirkland Lake area are black Mg-ilmenite with  $\geq 4$  wt.% MgO (also called magnesian- or picro-ilmenites), purple Cr-pyrope in particular those with low CaO (subcalcic or harzburgite or dunite garnet), orange pyrope-almandine with high CaO and significant trace amounts of Na<sub>2</sub>O and TiO<sub>2</sub> (diamond-inclusion eclogitic garnet), black (magnesio)-chromite with  $>62$  wt.% Cr<sub>2</sub>O<sub>3</sub> and  $>12$  wt.% MgO, and emerald green Cr-diopside with high ( $\geq 1.0$  wt.%) Cr<sub>2</sub>O<sub>3</sub>. Colour photos of these indicator minerals in C14 kimberlite and till samples are included in Averill and McClenaghan (1994) in Plates I and II.

### **Geochemical analysis**

Prior to indicator mineral picking, the  $<1.0$  mm non-ferromagnetic heavy mineral concentrates from glacial sediment and kimberlite samples were analyzed for 35 elements by Activation Laboratories Ltd., Ancaster, Ontario using instrumental neutron activation analysis (INAA) (Fig. 9). Samples were analyzed by this method because it allowed the entire sample to be analyzed without any destruction or loss of heavy minerals prior to indicator mineral

picking. Irradiated samples were stored for 6 months to allow radioactive elements to decay to safe levels prior to mineralogical studies. Concentrates were irradiated in 60 g vials. Samples weighing more than 60 g were split into multiple vials labeled A, B, C and each vial was then analyzed individually. Reported values for a multi-vial sample were then combined into one value using weighted averages (Appendix D). Lower detection limits for each element are listed in Table D.2. Analytical accuracy was monitored using previously irradiated Ontario Geological Survey (BRIM) reference standards (Appendix D) (Bloom, 1987; McClenaghan, 1990). Co results for the standards are not reported in Appendix D because of significant interference problems related to irradiating standards a second time. Analytical precision was monitored by comparing results for multiple vials with similar weights for an individual sample (Appendix D). Data for Ag, Cs, Hg, Ir, Mo, Ni, Se and Sn are not included in this report because the reported values are at or less than the lower detection limits listed in Table D.1.

The 500 g samples of glacial sediment and kimberlite were prepared at Bondar-Clegg and Company Ltd., Ottawa, Ontario, prior to geochemical analysis. Samples were oven dried at  $<40^{\circ}\text{C}$  and sieved to  $<0.063\text{ mm}$  (-230 mesh). The  $<0.063\text{ mm}$  fraction was analyzed by Chemex Labs Ltd., Vancouver, B.C., for 32 elements using ICP-AES following a nitric-aqua regia digestion on a 1.0 g aliquot and for Au, Pt and Pd using fire assay-AFS on a 30 g aliquot. The fine fraction also was analyzed for Rb, Sr, and Zr using XRF on a 5 g pressed pellet, by X-Ray Assay Laboratories, Don Mills, Ontario. Analytical methods and lower detection limits for all methods are listed in Table E.2. Analytical accuracy was monitored by analyzing GSC reference standards. Analytical precision was monitored by comparing duplicate analyses of selected samples. Acceptable data are listed in Appendix E. Data for Ag, Bi, Cd, Ga, Hg, La, Mo, Pt, Pd, Tl, U and W are not included in this



report because the reported values are at or less than the lower detection limits listed in Table E.2.

Two samples of kimberlite from hole C14-05 and three samples from LAC Minerals diamond drill hole C14-M and C14-N were analyzed for whole rock and trace elements by X-Ray Assay Laboratories (XRAL), Don Mills, Ontario. LAC Minerals drill core was donated to D. Schulze at the University of Toronto, and subsequently sampled by B.A. Kjarsgaard. Samples were powdered in an agate mill prior to analysis. Analytical methods and detection limits are listed in Appendix F. Note that XRF-102 is XRF fused disc analysis for major elements with extended count times for the trace elements Rb, Nb, Zr; NA-BAS is instrumental neutron activation analysis; FeO was determined by titration; CO<sub>2</sub> by coulometry; and H<sub>2</sub>O<sup>+</sup> by the Penfield method. Split duplicates, as well as internal standards are not reported for brevity.

Archean bedrock sample 93MPB229 from hole C14-02 and sample 93MPB230 from hole C14-06 also were analyzed by XRAL. Major oxides, Rb, Sr, Y and Zr were analyzed using XRF on a fused disk prepared from a 2 g split. Au was analyzed by FA-DCP on a 30 g aliquot and As, Co, Ni, Cu and Zn were analyzed by ICP-ES on a 2 g aliquot following digestion in nitric and hydrochloric acids. Results are reported in Appendix F.

### **Gold grains**

Gold grains were recovered from the sediment samples because of the proximity of the kimberlites to the Kirkland Lake gold camp and the high potential of the area for hosting additional gold deposits. Gold grains in glacial sediment samples were examined by Overburden Drilling Management Ltd. as part of the sample processing procedure (Fig. 9). Gold grains recovered from the <1.0 mm fraction during tabling and subsequent

panning were counted, their size estimated and then returned to the sample in preparation for geochemical analysis. Gold grains were classified using the three morphologic categories of DiLabio (1990) that reflect increasing distance of glacial transport: pristine, modified and reshaped (Appendix G). Pristine grains retain primary shapes and surface textures and appear not to have been damaged in glacial transport. Modified grains retain some primary surface textures but all edges and protrusions have been damaged during transport. Reshaped grains have undergone enough transport that all primary surface textures have been destroyed and the original grain shape is no longer discernible. The progression from pristine to reshaped grains is interpreted to represent increasing distance of glacial transport. Estimated gold assays for each sample were calculated by Overburden Drilling Management Ltd. based on the abundance and size of the gold grains recovered.

#### **Textural and carbonate analysis**

Textural and matrix carbonate analyses were completed at the GSC Sedimentology Lab. The grain size characteristics (% clay, silt and sand) of the <2.0 mm fraction of till were determined using dry sieving and pipette methods. The textural description of each sample listed in Appendix A.1 was determined using the % clay (<0.002 mm), % silt (0.002 to 0.063 mm), and % sand (0.063 to 2.0 mm). Matrix carbonate content of the <0.063 mm fraction was determined using the Chittick method of Dreimanis (1962).

#### **Pebble lithology**

The 5.6 mm to 6 cm (pebble) fraction was screened from the >2.0 mm (+10 mesh) fraction of sand, gravel and till samples (Fig. 9). Approximately 300 clasts were examined and classified into nine categories that reflect the major rocks types in the region: 1) felsic to intermediate intrusive rocks; 2) mafic intrusive rocks; 3) metavolcanic rocks; 4) ultramafic rocks; 5) metasedimentary rocks; 6) Paleozoic carbonate rocks from the Hudson Bay

Lowlands; 7) kimberlite, including Paleozoic carbonate xenoliths; 8) vein quartz; and 9) other or unknown rock types. Pebble lithology abundances are listed in Appendix H.

Paleozoic carbonate xenoliths eroded from kimberlite are distinguishable from carbonate clasts glacially transported from the Hudson Bay Lowlands. Paleozoic rocks from Hudson Bay Lowlands are small (<1 cm), light brown, well rounded, and many are striated. Paleozoic carbonate xenoliths from the kimberlite are up to 3 cm in size, very angular to subrounded, bluish grey to greenish grey to white and often have thermal alteration rims (e.g. Katsube et al., 1997) or fragments of kimberlite matrix still attached.

### **Biogeochemical sampling**

In the summer of 1992, samples of black spruce bark and twig were collected from 9 sites along a 400 m north-south transect across the C14 kimberlite. Sample collection and preparation as well as analytical methods used for these tree tissue samples are described in detail by McClenaghan and Dunn (1995).

## **RESULTS**

### **Kimberlite indicator mineral chemistry**

Indicator mineral abundances for kimberlite and glacial sediment samples are summarized in Table 3. Only a portion of these grains were analyzed by electron microprobe to confirm and further classify their identity and results along with grain size and colour are reported in Appendix C.1 (on diskette). The most important mineral groups are discussed below.

#### *Pyrope garnet*

Mineral chemistry, size and colour for 695 pyrope grains from the C14 kimberlite and glacial sediments are listed in Appendix C.2. Table 3

Table 3. Abundance of indicator minerals in C14 kimberlite and glacial sediment

SAMPLE	DRILL HOLE	TYPE	Weight <2mm (kg)	No. of indicator minerals picked												No. of indicator minerals normalized to10 kg<2mm												Total	Total	Total	Total
				0.25 to 0.5 mm				0.5 to 1.0 mm				1.0 to 2.0 mm				0.25 to 0.5 mm				0.5 to 1.0 mm				1.0 to 2.0 mm							
				PY	CD	ILM	CR	PY	CD	ILM	CR	PY	CD	ILM	CR	PY	CD	ILM	CR	PY	CD	ILM	CR	PY	CD	ILM	CR				
93MPB001	C14-01	sand	7.40	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	3	0	0	1	
93MPB002	C14-02	sand	20.75	0	0	0	1	5	3	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	2	1	0	0	
93MPB003	C14-02	sand	24.25	3	2	0	1	1	3	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	2	0	1	
93MPB004	C14-02	sand	17.80	1	2	0	4	1	1	0	1	0	0	0	0	1	1	0	2	1	1	0	1	0	0	0	1	2	0	3	
93MPB005	C14-02	till	15.25	1	1	0	1	4	2	1	0	0	0	0	0	1	1	0	1	3	1	1	0	0	0	0	3	2	1	1	
93MPB006	C14-02	till	19.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	
93MPB007	C14-02	till	15.75	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	3	0	0	1	
93MPB008*	C14-02	till	18.10	0	3	0	1	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	2	0	1	
93MPB009*	C14-02	till	16.70	16	13	0	1	5	0	1	0	5	0	0	0	10	8	0	1	3	0	1	0	3	0	0	0	16	8	1	1
93MPB010*	C14-02	till	9.15	32	13	0	6	17	6	0	0	3	2	0	0	35	14	0	7	19	7	0	0	3	2	0	0	57	23	0	7
93MPB011	C14-03	till	7.25	2	0	0	3	0	0	0	4	0	0	0	0	3	0	0	4	0	0	0	6	0	0	0	0	3	0	0	10
93MPB012*	C14-04	till	16.80	0	4	0	3	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2	0	0	2
93MPB013*	C14-04	till	19.85	1	4	0	0	0	3	1	0	0	0	0	0	1	2	0	0	0	2	1	0	0	0	0	0	1	4	1	0
93MPB014	C14-05	sand	7.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93MPB019	C14-05	till	13.20	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0
93MPB020	C14-05	till	3.65	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	5	0	3	0	0	0	0	5	0	3	0
93MPB021*	C14-05	till	5.95	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0
93MPB022*	C14-05	till	18.55	33	4	0	1	12	0	0	1	3	1	0	0	18	2	0	1	6	0	0	1	2	1	0	0	26	3	0	1
93MPB023**	C14-05	till	9.50	5159	55	4	9	752	23	2	54	72	4	1	2	5431	58	4	9	792	24	2	57	76	4	1	2	6298	86	7	68
93MPB024	C14-06	sand	15.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93MPB025	C14-06	sand&gravel	10.25	1	0	0	1	3	0	0	2	0	0	0	0	1	0	0	1	3	0	0	2	0	0	0	0	4	0	0	3
93MPB048	C14-08	till	17.90	4	3	0	1	2	1	0	0	0	0	0	0	2	2	0	1	1	1	0	0	0	0	0	0	3	2	0	1
93MPB049	C14-08	till	24.40	5	0	0	0	3	7	0	0	0	0	0	0	2	0	0	0	1	3	0	0	0	0	0	0	3	3	0	0
93MPB050*	C14-08	till	22.55	15	12	0	2	16	1	0	0	0	0	0	0	7	5	0	1	7	0	0	0	0	0	0	0	14	6	0	1
93MPB051*	C14-08	till	23.05	14	5	0	7	4	1	0	0	0	0	0	0	6	2	0	3	2	0	0	0	0	0	0	0	8	3	0	3
93MPB052*	C14-08	till	14.90	3	3	0	3	1	1	0	0	0	0	0	0	2	2	0	2	1	1	0	0	0	0	0	0	3	3	0	2
93MPB204**	C14-05	kimberlite	9.95	44272	765	0	2	4581	100	3	156	372	4	0	9	44494	769	0	2	4604	101	3	157	374	4	0	9	49472	873	3	168
93MPB205	C14-05	kimberlite	11.70	>200	>200	2	29	>200	19	1	27	167	0	0	1	>200	>200	2	25	>200	16	1	23	143	0	0	1	>500	>400	3	49

## Legend:

PY = pyrope                      ILM= Mg-ilmenite  
 CD = Cr-diopside, >0.5 wt% Cr<sub>2</sub>O<sub>3</sub>      CR = chromite

\*\* Counts calculated from values obtained in smaller splits

\* Sum of grains picked by Lakefield Research and grains picked by ODM (Averill and McClenaghan, 1994)

summarizes pyrope size and abundance in each sample as well as the abundance normalized to 10-kg sample weight. Pyropes are chemically characterized by high MgO levels ( $>13$  wt.% MgO) and varying amounts of  $\text{Cr}_2\text{O}_3$  up to 15 wt. %. MgO- (and  $\text{Cr}_2\text{O}_3$ -) rich pyrope garnets are exceedingly rare in upper crustal rocks. They are found mainly in alpine peridotites, mantle xenoliths carried to the surface by kimberlites or, more rarely, alkaline volcanic rocks with deep mantle sources (see compilation in Deer et al., 1982). Mantle-derived garnets found in kimberlite belong to three major petrogenetically and compositionally different groups: 1) Cr-poor titanian pyrope ( $\leq 4$  wt.%  $\text{Cr}_2\text{O}_3$ ), generally orange to deep red that belong to the Cr-poor megacryst suite which is genetically related to kimberlite; 2) purple (rarely green) Ti-poor, Mg- and Cr-rich pyrope from peridotitic xenoliths; and 3) orange pyrope-almandine-grossular garnets from eclogitic xenoliths. Only garnets of the two latter groups have been found as diamond inclusions; more specifically: purple subcalcic harzburgitic Cr-pyropes and orange Na-bearing pyrope-almandines from group I eclogites (Sobolev, 1977; Sobolev et al., 1973, 1993; Gurney, 1984, 1989; Gurney and Zweistra, 1995; McCandless and Gurney, 1989). These garnets are therefore important targets in diamond exploration. Only their chemical composition distinguishes them from other garnets with similar appearance.

Subcalcic harzburgitic garnets can be differentiated from other lherzolitic, harzburgitic, or dunitic garnets by plotting CaO versus  $\text{Cr}_2\text{O}_3$ , as shown in Figure 10. The striped area in Figure 11 shows the composition of lherzolitic garnets as defined by Sobolev et al. (1973; 1993). The diagonal dashed line separating lherzolitic and harzburgitic garnets is the 85% line defined by Gurney (1984). 85% of diamond inclusion garnets studied by Gurney fell below this line. These garnets are low-Ca, Cr-pyropes from harzburgitic or dunitic sources, which are also called subcalcic or G10 garnets after a classification by Dawson and Stephens (1975). The shaded area in the lower

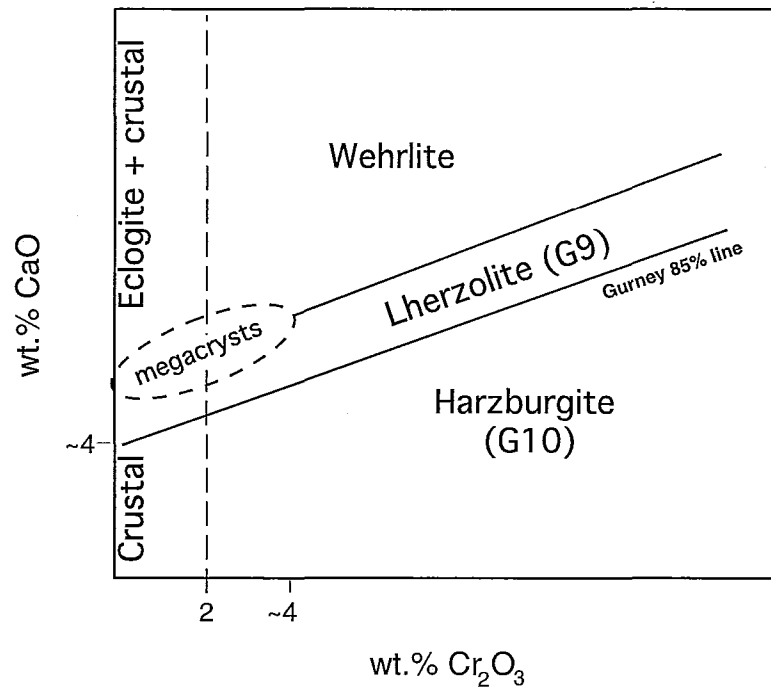
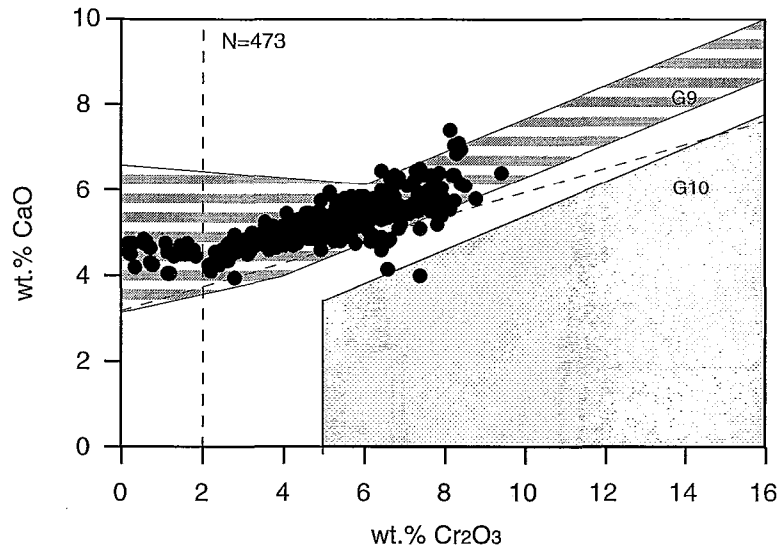


Figure 10. Schematic illustration of CaO and Cr<sub>2</sub>O<sub>3</sub> contents of garnets from various rock types likely to be sources of garnet xenocrysts in kimberlite (modified from Schulze, 1995; in press).

## A) C14 kimberlite



## B) glacial sediments

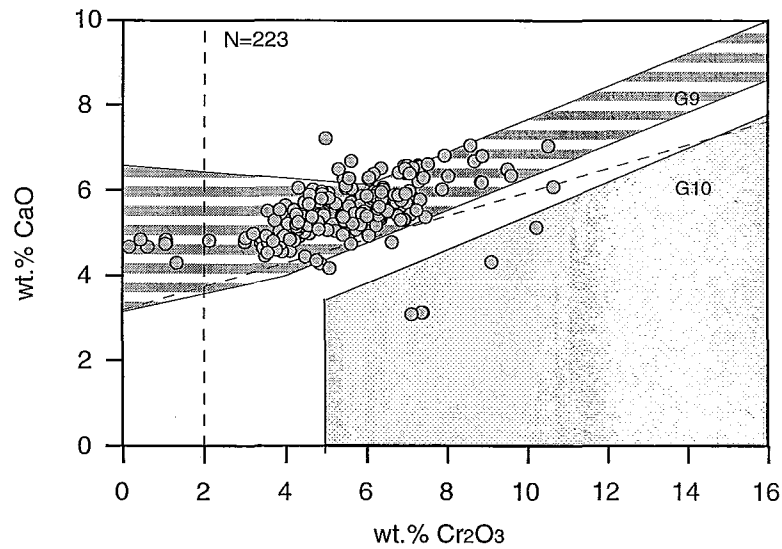


Figure 11. CaO versus Cr<sub>2</sub>O<sub>3</sub> plot for garnets from: A) C14 kimberlite and B) glacial sediments. Striped area is the field for Iherzolite garnets; shaded area is the composition of subcalcic garnets from the diamond stability field (Sobolev, 1977, 1993). Dashed diagonal line separates G9 and G10 garnets (Gurney, 1984). Dashed vertical line at 2 wt.% Cr<sub>2</sub>O<sub>3</sub> is from Fipke et al. (1995).

right part of the plot shows the target field for subcalcic garnets defined by Sobolev (1971; 1977; 1993) and Sobolev et al. (1973; 1977; 1993) which is more restrictive than Gurney's 85% line (eliminating all garnets with  $\text{Cr}_2\text{O}_3 < 5$  wt.%). Most garnets recovered from the two kimberlite samples from the C14 pipe plot within the lherzolite field of Sobolev. Only five garnets from till sample 93MPB023 sitting directly on kimberlite in hole C14-05, and two garnets from the kimberlite sample 93MPB204 plot within Sobolev's subcalcic field (Fig. 11), suggesting a low diamond potential for the C14 kimberlite. Garnets in glacial sediments around the C14 pipe display a similar range of compositions as the C14 kimberlite.

The vertical dashed line at 2 wt. %  $\text{Cr}_2\text{O}_3$  in Figures 10 and 11 separates Cr-poor eclogitic, pyroxenitic and crustal garnets from peridotitic Cr-pyropes (Gurney, 1984; Schulze, 1995; Fipke et al., 1995). Most megacryst garnets also plot left of the 2 % line although some may contain up to 4 wt. %  $\text{Cr}_2\text{O}_3$  (Fipke et al., 1995; Schulze, in press). Only 33 out of 695 garnets plot left of the 2%  $\text{Cr}_2\text{O}_3$  line and most of them (24) have high levels of  $\text{TiO}_2$  (> 0.5 wt.%) characteristic of Cr-poor megacryst garnets. A few Mg-rich almandines and Fe-rich pyropes (Appendix C.2) approach compositions of eclogitic garnets, but none of them have the essential low  $\text{FeO}_{\text{tot}}$  levels (<22 wt. %; Fipke et al., 1995; Schulze, in press) that are characteristic of eclogitic garnets.

#### *Almandine-Spessartine-Grossular garnet*

The majority of orange to red garnets analyzed here are characterized by high FeO and/or MnO contents with additional CaO and MgO. These garnets belong to the almandine-spessartine-grossular solid-solution series and are found mainly in metapelites and metabasites (garnet-schists and amphibolites) (Deer et al., 1982) which are of local derivation from Archean lithologies. Although optically very similar to eclogitic garnets, they are of no interest in kimberlite exploration.



### *Andradite and Cr-andradite garnet*

Numerous pale green to yellow-green andradites were recovered from most glacial sediment samples from the C14 property (Appendix C.3) but not from the kimberlite samples 204 and 205 or the immediately overlying till sample (023). They were picked because of their similarity to Cr-diopside. On closer examination, they can be distinguished from Cr-diopside by their more frosted appearance, yellowish-greenish color and by their isotropic optical character. Cr-diopside, in contrast, is emerald green to pale green or colorless without yellowish tinge, usually transparent, has well developed cleavage and is optically anisotropic. The green andradites are unusual in their composition in that they contain varying amounts of  $\text{Cr}_2\text{O}_3$  up to  $> 9$  wt.% but little  $\text{TiO}_2$  and  $\text{Al}_2\text{O}_3$  ( $< 2$  wt.% each), i.e. they are essentially solid solutions of andradite ( $\text{Ca}_3\text{Fe}_2(\text{SiO}_4)_3$ ) and uvarovite ( $\text{Ca}_3\text{Cr}_2(\text{SiO}_4)_3$ ). Some andradite contain variable amounts of MgO with concomitantly decreasing CaO and  $\text{Fe}_2\text{O}_3$  and increasing  $\text{SiO}_2$  indicating intergrowths with, or gradation to, serpentine.

### *Cr-Diopside*

Diopside mineral chemistry, size and colour for individual grains is reported in Appendix C.4. Diopside size and abundance and normalized abundance is reported in Table 2. Green Cr-diopside is an important kimberlite indicator mineral, originating from mantle xenoliths (lherzolites, pyroxenites and eclogites) and intergrowths with ilmenite (Cr-poor megacryst suite).

Kimberlites contain diopsides with a wide range of  $\text{Cr}_2\text{O}_3$  content (up to 6 wt.%; Stephens and Dawson, 1977). Diopside from other ultrabasic rocks (see Table 52 of Deer et al. 1978) may contain up to approximately 1.5 wt.%  $\text{Cr}_2\text{O}_3$ .

Clinopyroxene, including Cr-diopside, occurs in a variety of rocks in the Kirkland Lake region (Table 6 of Fortescue et al., 1984). Discrimination

between kimberlitic and other diopsides on the basis of  $\text{Cr}_2\text{O}_3$  content therefore is important. It may be difficult, but diopsides with  $\geq 1.5$  wt.%  $\text{Cr}_2\text{O}_3$  are most likely from kimberlites. Diopsides recovered from the C14 area were divided into two groups based on their  $\text{Cr}_2\text{O}_3$  content: 1) Cr-diopside (0.5 to 1.5 wt.%  $\text{Cr}_2\text{O}_3$ ); and 2) HiCr-diopside ( $\geq 1.5$  wt.%  $\text{Cr}_2\text{O}_3$ ). Diopsides recovered from the C14 kimberlite contained between 1.02 and 4.15 wt.%  $\text{Cr}_2\text{O}_3$ , 77% of them were HiCr-diopsides. Glacial sediments contain a similar proportion of HiCr-diopsides, 70 % of diopsides in the till and sand&gravel samples contained  $>1.5$  wt.%  $\text{Cr}_2\text{O}_3$ .

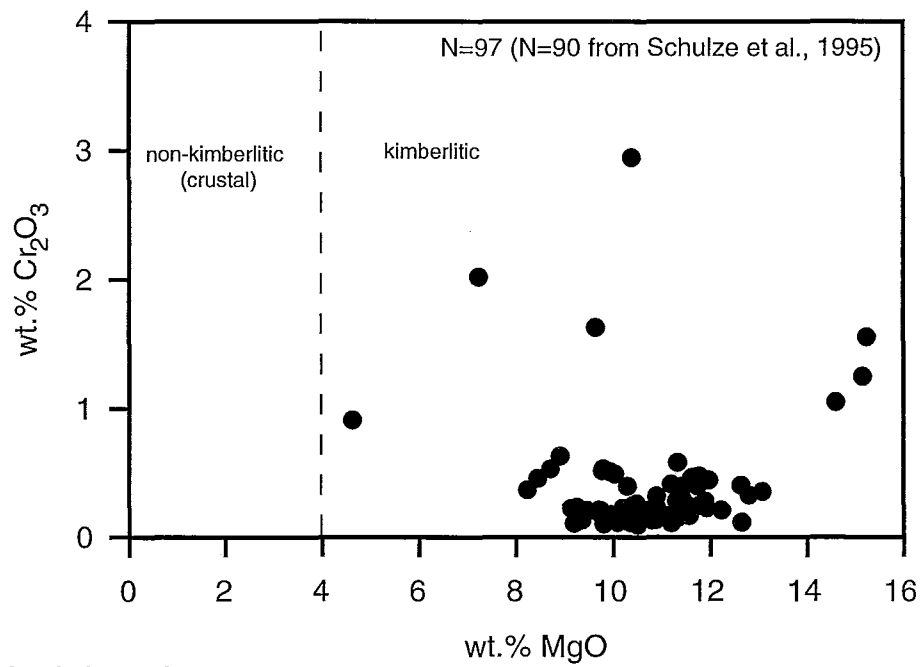
### *Mg-ilmenite*

Chemistry, size and colour for individual ilmenite grains are reported in Appendix C.5. Table 3 summarizes the number and size of Mg-ilmenites and normalized abundances in each sample. Ilmenites from kimberlite contain  $>4$  wt.% MgO and are referred to as Mg-ilmenite (Mitchell, 1973; Haggerty, 1975). Ilmenites in glacial sediments around the C14 kimberlite have two distinct compositions, (1) Mg-ilmenites with  $>4$  wt.% MgO that mimic the composition of ilmenites in the kimberlite and (2) ilmenites with  $<4$  wt.% MgO and very little  $\text{Cr}_2\text{O}_3$  interpreted to be derived from regional bedrock sources such as mafic volcanics, mafic to intermediate intrusives and Temiskaming sediments (Table 6 in Fortescue et al., 1984). Because only six Mg-ilmenite grains were recovered from the C14 kimberlite, their compositional data were combined with published C14 Mg-ilmenite data from Schulze et al. (1995) and plotted in Figure 12. Mg-ilmenites from the C14 kimberlite form a "U"- shaped curve with most grains clustering at the bottom of the U, containing between 6 and 12 wt.% MgO and  $<1$  wt.%  $\text{Cr}_2\text{O}_3$ .

### *Hematite , Leucoxene and Rutile*

A few hematite, leucoxene and rutile grains that were analyzed are accessory minerals or alteration products of ilmenite or perovskite. Leucoxene is a

## A) C14 kimberlite



## B) glacial sediments

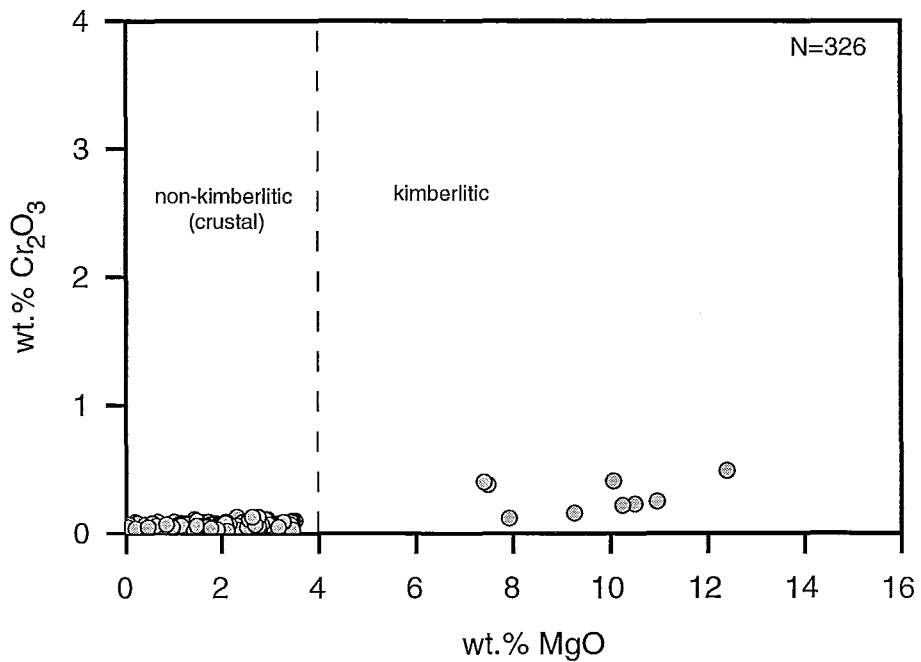


Figure 12.  $\text{Cr}_2\text{O}_3$  versus MgO plot for ilmenite grains from:  
A) C14 kimberlite and B) glacial sediments.

mixture of Fe- and Ti-rich phases (rutile, titanite and hematite). In this study the name leucosene is used for all non-stoichiometric mixtures of  $\text{SiO}_2$ ,  $\text{FeO}$  and  $\text{TiO}_2$  with minor  $\text{Al}_2\text{O}_3$  and  $\text{CaO}$ .

### *Chromite and Cr-spinel*

Size, colour and mineral chemistry for individual chromite grains are reported in Appendix C.6. Chromite abundance and size distribution for each sample is summarized in Table 3. The analyzed chromites have a wide range of  $\text{Cr}_2\text{O}_3$  contents, ranging from Cr-spinels with <25 wt.%  $\text{Cr}_2\text{O}_3$  to chromites with up to 65 wt.%  $\text{Cr}_2\text{O}_3$ . Chromite occurs in a variety of basic and ultrabasic rocks in the region including kimberlite (e.g. Table 6 in Fortescue et al., 1984). Similar to Cr-diopsides, the  $\text{Cr}_2\text{O}_3$  contents of kimberlitic and non-kimberlitic chromites overlap. Very chromium and magnesium rich (>62.5 wt.%  $\text{Cr}_2\text{O}_3$ , 12-17 wt.%  $\text{MgO}$ , < 1 wt.%  $\text{TiO}_2$ ) (magnesio-) chromites in kimberlite have been found as inclusions in diamonds (Fipke et al., 1989; Gurney and Moore, 1993). The  $\text{Cr}_2\text{O}_3$  versus  $\text{MgO}$  plots for chromites from the C14 pipe (Fig. 13a) show that two grains contain sufficient  $\text{MgO}$  and  $\text{Cr}_2\text{O}_3$  to plot in the diamond inclusion field defined by Fipke et al. (1989). Schulze (1996c), however, argues that chromites coexisting with diamond do not have to fall into this field due to possible subsequent re-equilibration in the open system of the upper mantle. Chromites in the glacial sediments (Fig. 13b) show a similar range of  $\text{MgO}$  versus  $\text{Cr}_2\text{O}_3$  compositions to the kimberlite.

### *Other minerals*

Some garnet grains exhibited kelyphitic rims or overgrowths which were analyzed, in some cases, because no fresh garnet was exposed on the grain surface. Kelyphite is a mixture of ortho- and clinopyroxene, phlogopite, Al-rich spinel and serpentine; some kelyphite rims were almost pure phlogopite. Other minerals analyzed in this study were picked because they resembled kimberlite indicator minerals. Black amphibole and tourmaline were picked

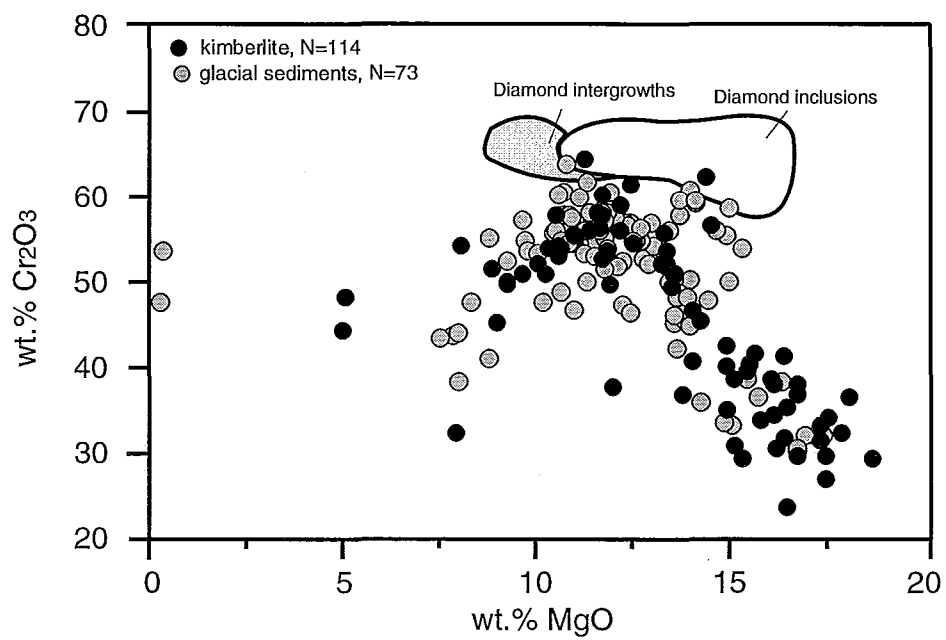


Figure 13.  $\text{Cr}_2\text{O}_3$  versus  $\text{MgO}$  plot for chromite grains from the C14 kimberlite and glacial sediments.

because they look similar to Mg-ilmenite or chromite. Pale green serpentine was picked because it resembled Cr-diopside. Perovskite, a dark brown to black oxide, is a common groundmass phase in kimberlites and has been found in the C14 kimberlite (Armstrong et al., 1997), however, it is not used as an indicator mineral. Perovskite, a dark brown to black oxide, is an accessory mineral in kimberlites, however, it is not used as an indicator mineral because it also occurs in many other undersaturated alkaline rocks. .

### **Kimberlite geochemistry**

Whole rock major and trace element chemistry for five kimberlite samples from various depths within the C14 kimberlite are listed in Appendix F. Two core samples are from drilling performed in the present study; the other three samples are from LAC Minerals drill core donated to D. Schulze at the University of Toronto, and subsequently sampled by B.A. Kjarsgaard. The five C14 kimberlite samples are all broadly similar in their major and trace element concentrations. Furthermore, when compared to archetypal (Gp I) kimberlites from various global localities, the C14 samples plot between the world 'high' values and the world 'low' values, at concentrations slightly lower than the global 'world average' (Fig. 14a and b). In other words, the C14 kimberlite samples are quite typical in terms of their geochemical signature as compared to archetypal (Gp I) kimberlites worldwide, i.e. high concentrations of compatible elements of the first series of transition elements (Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Co; but specifically Ni and Cr), as well as high concentrations of a variety of incompatible elements such as the rare earth elements (REE; especially the light REE) and also Rb, Ba, Sr, Nb, Zr, Hf, Ta, U, Th, Pb.

### **Till geochemistry**

Major and trace element data for the heavy mineral and fine fractions of glacial sediments are listed in Appendixes D and E. The <1.0 mm non-

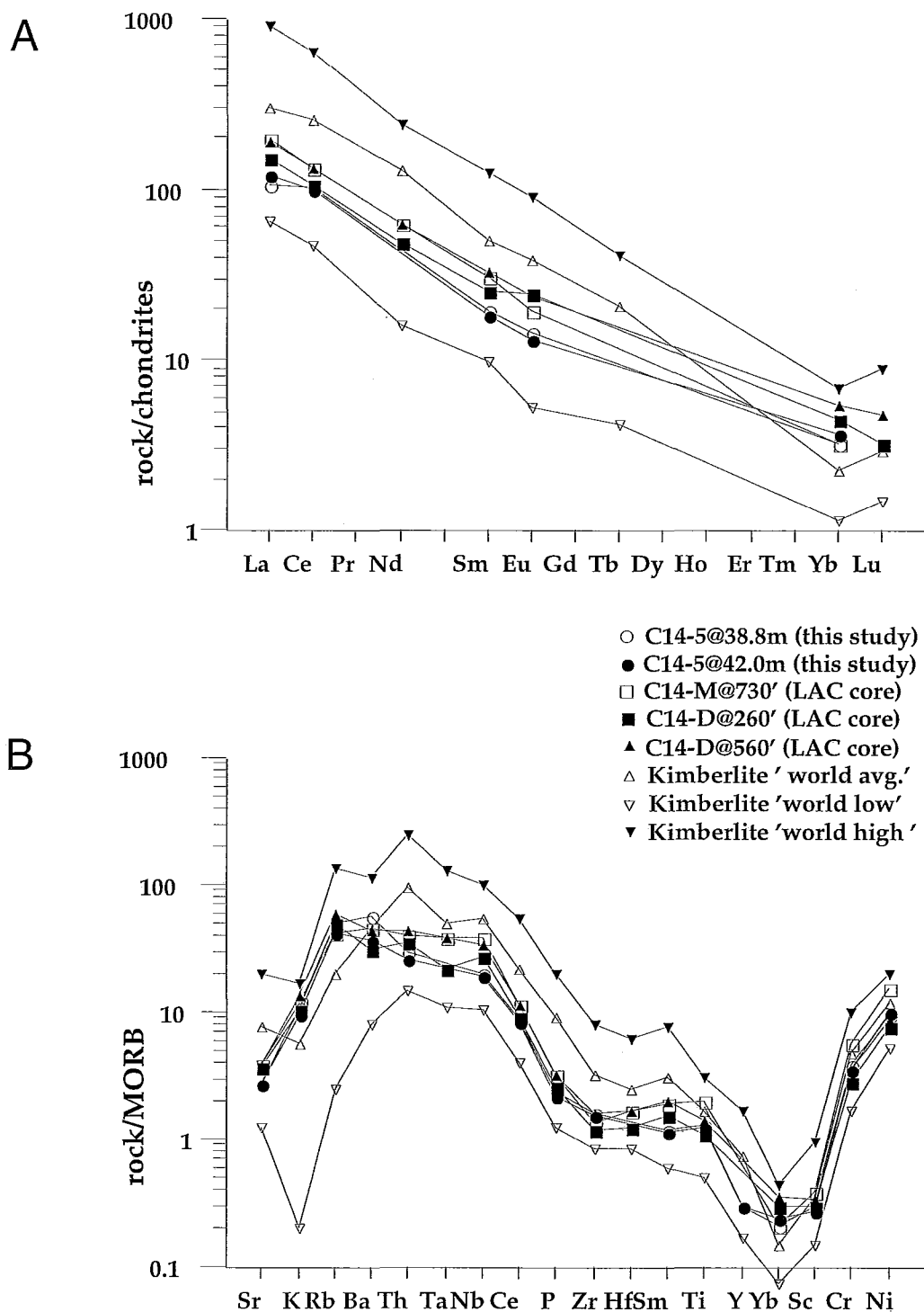


Figure 14. A.) REE plot for two diatreme facies C14 kimberlite samples analysed this study, plus three other C14 samples from LAC drill core. Chondrite normalization values from Nakamura (1974). B.) Pearce plot (samples normalized to MORB) for the five C14 samples. For comparison in figures A and B, world average plus high and low values for archetypal (Gp I) kimberlite are also shown.

ferromagnetic heavy mineral fraction of C14 kimberlite is characterized by high concentrations of Cr, Ta, La, Ce, Nd, Sm and Eu and the <0.063 mm fraction contains high concentrations of Ba, Ca, Co, Cr, K, Mg, Mn, Ni, Sr and Ti. Till sample 93MPB023 sitting directly on kimberlite in hole C14-05 (Fig. 15) has elevated concentrations of Au, Cr, Sr, Ta, La, Ce, and Eu in the heavy mineral fraction and Ba, Co, Cr, Tot Fe, K, Mg, Ni, Sr and Ti in the <0.063 mm fraction which reflect incorporation of the underlying kimberlite bedrock. Fine-grained glaciolacustrine sediments (silt and clay) overlying the till in hole C14-05 display a decreasing abundance of most elements with increasing depth (Fig. 15). This trend may be related to the increasing silt content with depth (see Appendix A.1, grain size analysis for silt samples 93MPB207 to 216).

### **Gold grains and geochemistry**

The number, size and shape of visible gold grains recovered from glacial sediment and kimberlite are reported in Appendix G. Because of the variable weight of the bulk samples (4 to 25 kg), gold grain counts were normalized to 10 kg of <2 mm (-10 mesh) material. Normalized values are reported in Appendix G and these values are discussed below. Till samples contain between zero and 29 visible gold grains, although most samples contain between 5 and 15 gold grains. Over 90% of the gold grains recovered from the glacial sediments are reshaped (well traveled) grains that are <100  $\mu\text{m}$  in size and are considered to be background grains. Although visible gold grains have been recovered from kimberlitic rocks in the Kirkland Lake area (McClenaghan et al., 1995; McClenaghan et al. 1996), none were found in C14 kimberlite samples 93MPB204 and 205. Till sample 93MPB011 resting on bedrock in hole C14-03 is very anomalous, containing 29 visible gold grains and assaying 51,300 ppb Au. Till sample 93MPB023 resting on kimberlite bedrock contained no visible gold grains yet assayed a moderately anomalous 3020 ppb Au.



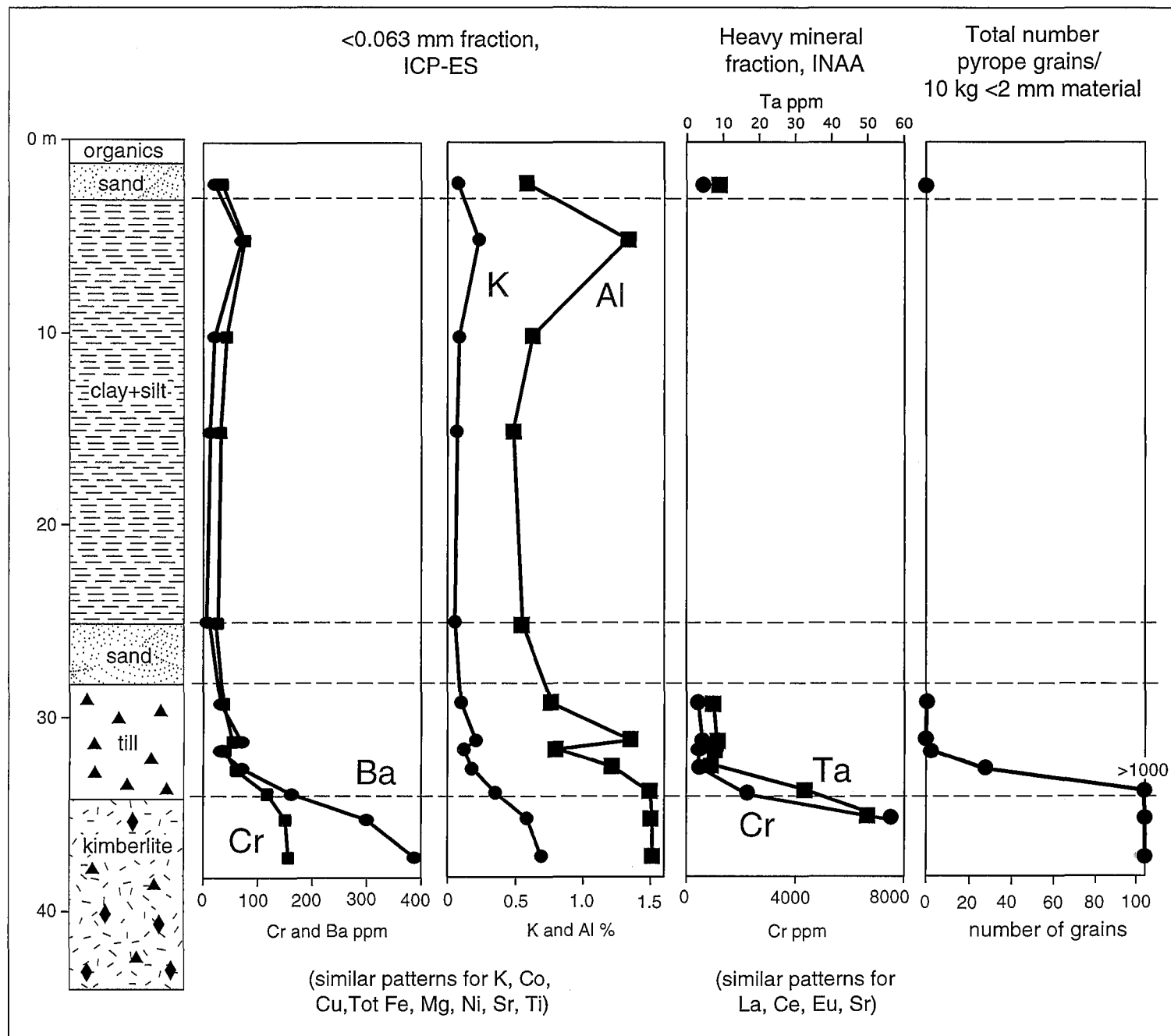


Figure 15. Geochemistry and pyrope abundance in glacial sediments and kimberlite in GSC drill hole C14-05 overlying the C14 kimberlite..

### **Pebble lithology**

The number percent of pebbles (5.6 mm to 6 cm) in nine lithologic categories are listed in Appendix H. The pebble fraction of till around the C14 pipe is dominated by metavolcanic rocks. A few kimberlite pebbles were found in till samples 93MPB009 and 010 in hole C14-02, just west of the kimberlite. Approximately 30% of the pebble fraction in till sample 93MPB023 sitting directly on kimberlite, is composed of kimberlite fragments.

### **Biogeochemical studies**

Geochemical data for black spruce twigs and bark collected along a 400 m north south transect over the C14 kimberlite are reported in McClenaghan and Dunn (1995). Sr, Rb, Ba (Fig. 16), Cr, Na, Cd, Co, Cs, Zn and REE concentrations in black spruce twigs and Sr, Ba and Zn concentrations in black spruce bark are elevated overlying the C14 kimberlite. These patterns overlying the kimberlite indicate the biogeochemical studies may help in delineating kimberlitic bodies (McClenaghan and Dunn, 1995; Dunn and McClenaghan, 1996).

## **DISCUSSION AND CONCLUSIONS**

Cr-pyrope from the C14 kimberlite is overwhelmingly from disaggregated lherzolitic xenoliths. Only a few subcalcic garnets from harzburgite or dunite were observed. A small population of Ti-rich, Cr-poor garnets probably are megacrysts. No eclogitic garnets were found. These findings are in accordance with studies by Schulze (1993a), Meyer et al. (1994), Sage (1996) and Vicker (1997) who found similar garnet compositions and proportions of source rocks for the C14 pipe. Brummer et al. (1992) have reported eclogitic xenoliths from this kimberlite, but mineral chemistry data are not reported.

The high Cr<sub>2</sub>O<sub>3</sub> levels of diopside in glacial sediments (70 % containing >1.5 wt.% Cr<sub>2</sub>O<sub>3</sub>) suggests that they are mainly derived from the C14 kimberlite, of

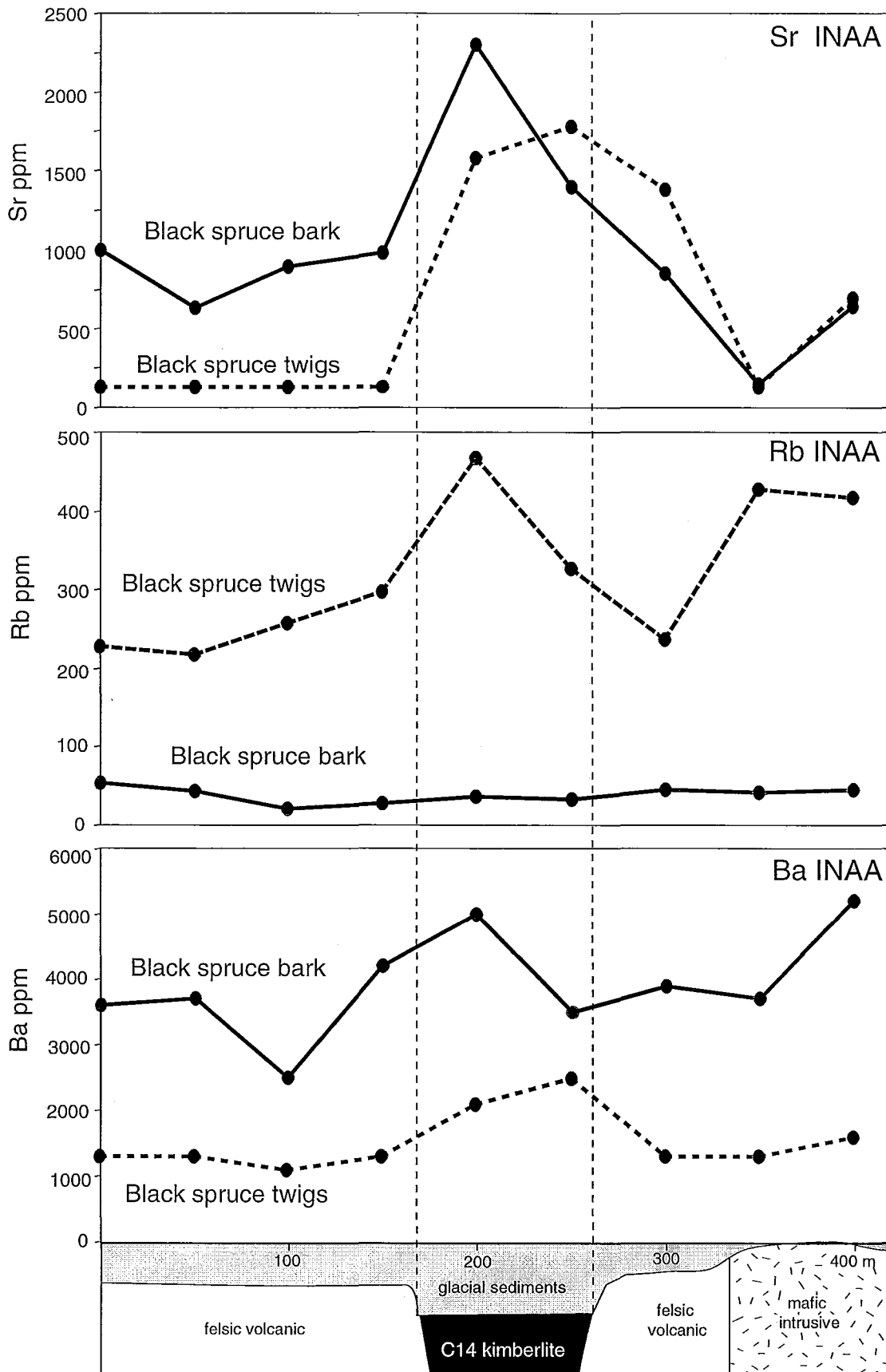


Figure 16. Distribution of Sr, Rb and Ba, determined by INAA analysis, in the ash of black spruce bark and twigs along a north-south transect across the C14 kimberlite (from Dunn and McClenaghan, 1996)

which 100% of the diopsides analyzed contain  $>1.0$  wt.%  $\text{Cr}_2\text{O}_3$ . Cr-diopside in garnet lherzolites from the C14 pipe have  $\text{Cr}_2\text{O}_3$  ranging from 0.8 to 2.5 wt. % (Meyer et al., 1994). It is assumed that Cr-diopsides with higher  $\text{Cr}_2\text{O}_3$  analyzed here are also mantle derived peridotites since diopside from Cr-poor megacrysts or eclogites have considerably lower  $\text{Cr}_2\text{O}_3$  levels (Eggler et al., 1979; Shee and Gurney, 1979).

The compositional range of chromite grains from this study is typical of chromite macrocrysts from kimberlites in general and in accordance with other studies of C14 spinels (Armstrong et al., 1997; Meyer et al. , 1994). Two (magnesio-) chromites out of a total of 187 in this study contain sufficient MgO and  $\text{Cr}_2\text{O}_3$  to plot in the diamond inclusion field, consistent with the low number of subcalcic garnets found in the C14 kimberlite. Brummer et al. (1992b) mention finding several magnesiochromites in C14 kimberlite samples that also yielded diamonds. Sage (1996) found no diamond inclusion field chromites among 47 chromites analyzed from the C14 pipe. Glacial sediments display a similar range of chromite compositions as the kimberlite samples, indicating most are derived from the C14 kimberlite.

Mg-ilmenites are the least abundant indicator mineral in the C14 pipe. The few grains that were recovered in this study and by Schulze et al. (1995) contain between 8 and 14 wt.% MgO and  $<1$  wt. %.  $\text{Cr}_2\text{O}_3$ . Sage (1996) reported a similar compositional range, from 8.8 and 14.3 wt. % MgO.

In summary, the kimberlite indicator minerals of the C14 pipe are dominated by Cr-pyrope and chromite ( $\pm$  Cr-diopside) derived from lherzolithic xenoliths with only a minor proportion from harzburgite and dunite sources. No evidence of eclogitic xenoliths could be found in this study. The low numbers of Cr-poor pyrope, diopside and Mg-ilmenite point to a low contribution from the Cr-poor megacryst suite which can be dominant in other kimberlites in

the Kirkland Lake kimberlite field (Schulze, in press). The presence of subcalcic garnet and Cr-rich and (magnesio-) chromite suggests a moderate diamond potential for the C14 pipe. This is consistent with the recovery of 8 macrodiamonds in a 15.04 ton kimberlite sample from the C14 pipe by LAC Minerals (reported in Brummer et al. 1992b).

The range in glacial sediment sample weights is large, 4 to 25 kg. Therefore indicator mineral counts were normalized to a 10-kg weight of <2 mm (table feed) material for comparison between samples (Table 2). The relative abundance of indicator minerals in the C14 kimberlite, listed in decreasing order of abundance, is: pyrope > Cr-diopside > chromite > Mg-ilmenite. These relative abundances are mimicked in till overlying (hole C14-05) and just down-ice (hole C14-02) of the kimberlite. Indicator mineral chemistry for grains recovered from the glacial sediments around the C14 kimberlite are also similar to that for the kimberlite.

Kimberlite samples from the C14 pipe contain tens of thousands of indicator mineral grains in 10-kg. Unfortunately, hole C14-01 which was drilled north of the pipe to test background indicator mineral concentrations, did not intersect till. Instead, background concentrations for the C14 area were estimated from the upper, more distally derived parts of thick till sequences in the other drill holes: 0 to 3 pyrope, 0 to 2 Cr-diopside, 0 chromite and 0 Mg-ilmenite. KLIP holes northwest and northeast of the C14 kimberlite do not contain kimberlite indicator minerals (Fortescue et al., 1984) supporting the observation from the GSC holes that background concentrations of indicator minerals are very low to none.

Lower till samples collected from directly over the C14 pipe in Hole C14-05 (Fig. 14) and just down-ice, in hole C14-02, contain anomalous concentrations of indicator minerals (tens to thousands of grains), contain elevated Cr, Sr, Ta,

La, Ce, and Eu in the heavy mineral fraction and Ba, Co, Cr, Tot Fe, K, Mg, Ni, Sr and Ti in the <0.063 mm fraction, and contain several kimberlite clasts in the pebble (+10 mesh) fraction. Upper till samples in these two holes and till samples from holes C14-03 and C14-04 contain background concentrations of indicator minerals, no kimberlite clasts and no geochemically anomalous abundances. Till in hole C14-08, 2 km southwest of the kimberlite, contains slightly anomalous concentrations of indicator minerals, 14 pyrope, 6 Cr-diopside and 2 chromite. However, till geochemical abundances in these till samples do reflect kimberlite.

Most glacial sediment samples from the C14 property contain andradite, including the one sand sample from hole C14-01 drilled north of the kimberlite (Appendix C.3). Till sample 93MPB049 from the upper part of till in hole C14-08 contains the most andradite, 15 grains in 25 kg of till. In contrast, till samples that contain kimberlite clasts and anomalous concentrations of kimberlite indicator minerals (93MPB023, 93MPB009 and 010) are devoid of andradite. Andradite is found occasionally in kimberlites (Mitchell, 1986) but its source in the till in southern Clifford Township is unlikely to be the C14 kimberlite as none were found in the two C14 kimberlite samples. Cr-Andradites of very similar composition and paragenesis to the grains analyzed here have been reported from Reaume Township, 80 km northwest by Duke and Bonardi (1982), where they occur in serpentinitized veins in wehrlites as a product of the breakdown of olivine, diopside and Cr-spinel. Andradites in glacial sediments may also be eroded from zones of alkalic metasomatism north of, and associated with, the Destor-Porcupine deformation zone (R. Sage, pers comm, 1998). Averill and McClenaghan (1993) also suggested that andradite in glacial sediments around the C14 and the Diamond Lake pipes was eroded from shear zones. The absence of Cr-andradites in the C14 kimberlite samples and their presence in other glacial sediment samples from the Kirkland Lake area (e.g. Fortescue et

al., 1984; Averill and McClenaghan, 1993; McClenaghan et. al., 1996) indicates that the Cr-andradites reported here are not related to kimberlite.

## **FUTURE WORK**

Results from similar studies around the A4 pipe are in preparation. Olivine from kimberlite is being examined to determine its usefulness as indicator minerals. Additional ilmenites in kimberlite boulders collected from gravel pits in the Munro and Misema River eskers are being analyzed to document kimberlite dispersal in eskers and to determine the boulders' kimberlitic sources. Results for till and kimberlite samples collected from the Peddie kimberlite pipe and adjacent area, near New Liskeard, Ontario, in the fall of 1997 will be released at a later date.

## **ACKNOWLEDGMENTS**

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## **Appendix A.1 Sample descriptions and textural data**

## APPENDIX A.1 Sample locations and descriptions

SAMPLE	DRILL HOLE	NTS SHEET	EASTING	NORTHING	TOWNSHIP	DEPTH FROM (m)	DEPTH TO (m)	MATERIAL TYPE	PEBBLE COUNT	% SAND	% SILT	% CLAY	% TOTAL CARBONATE	MUNSELL COLOUR MOIST	MUNSELL COLOUR MOIST
93MPB001	C14-01	32D/5	588875	5348250	Clifford	17.0	17.5	sand	yes	NA	NA	NA	NA	NA	NA
93MPB002	C14-02	32D/5	588725	5348110	Clifford	25.0	27.5	sand	yes	NA	NA	NA	NA	NA	NA
93MPB003	C14-02	32D/5	588725	5348110	Clifford	27.5	31.0	sand	yes	NA	NA	NA	NA	NA	NA
93MPB004	C14-02	32D/5	588725	5348110	Clifford	31.0	32.5	sand	yes	NA	NA	NA	NA	NA	NA
93MPB005	C14-02	32D/5	588725	5348110	Clifford	32.5	33.0	till	yes	59.0	36.4	4.6	6.0	light olive grey	5Y 6/2
93MPB006	C14-02	32D/5	588725	5348110	Clifford	33.0	34.0	till	yes	57.8	38.1	4.1	7.8	olive grey	5Y 5/2
93MPB007	C14-02	32D/5	588725	5348110	Clifford	34.0	34.7	till	yes	58.0	34.0	8.0	5.4	olive grey	5Y 5/2
93MPB008	C14-02	32D/5	588725	5348110	Clifford	34.7	35.3	till	yes	47.2	40.5	12.3	10.2	olive grey	5Y 5/2
93MPB009	C14-02	32D/5	588725	5348110	Clifford	35.3	36.8	till	yes	37.2	43.0	19.8	11.5	olive grey	5Y 5/2
93MPB010	C14-02	32D/5	588725	5348110	Clifford	36.8	38.0	till	yes	80.5	17.4	2.1	3.4	dary grey	5Y 4/1
93MPB011	C14-03	32D/5	588750	5347800	Clifford	7.0	8.3	till	yes	60.0	27.4	12.6	3.1	pale olive	5Y 6/3
93MPB012	C14-04	32D/5	588700	5347800	Clifford	8.0	10.0	till	yes	NA	NA	NA	NA	NA	NA
93MPB013	C14-04	32D/5	588700	5347800	Clifford	10.0	13.5	till	yes	68.7	27.2	4.1	5.1	light olive grey	5Y 6/2
93MPB014	C14-05	32D/5	588875	5348110	Clifford	1.2	3.0	sand	yes	NA	NA	NA	NA	NA	NA
93MPB015	C14-05	32D/5	588875	5348110	Clifford	3.0	8.0	silt		NA	NA	NA	NA	NA	NA
93MPB016	C14-05	32D/5	588875	5348110	Clifford	8.0	13.0	silt		NA	NA	NA	NA	NA	NA
93MPB017	C14-05	32D/5	588875	5348110	Clifford	13.0	17.0	silt		NA	NA	NA	NA	NA	NA
93MPB018	C14-05	32D/5	588875	5348110	Clifford	23.0	27.8	silt		NA	NA	NA	NA	NA	NA
93MPB019	C14-05	32D/5	588875	5348110	Clifford	27.8	30.8	till	yes	65.7	25.7	8.6	8.3	olive grey	5Y 5/2
93MPB020	C14-05	32D/5	588875	5348110	Clifford	30.8	31.0	till	yes	54.0	29.3	16.6	8.9	olive grey	5Y 5/2
93MPB021	C14-05	32D/5	588875	5348110	Clifford	31.0	31.7	till	yes	NA	NA	NA	NA	NA	NA
93MPB022	C14-05	32D/5	588875	5348110	Clifford	31.7	33.5	till	yes	71.2	19.9	8.8	7.1	olive grey	5Y 5/2
93MPB023	C14-05	32D/5	588875	5348110	Clifford	33.5	34.0	till	yes	52.4	30.6	17.0	7.8	grey	5Y 5/1
93MPB024	C14-06	32D/5	589300	5347375	Arnold	15.5	17.5	sand	yes	NA	NA	NA	NA	NA	NA
93MPB025	C14-06	32D/5	589300	5347375	Arnold	17.5	18.8	sand&gravel	yes	NA	NA	NA	NA	NA	NA
93MPB048	C14-08	32D/5	587150	5347025	Arnold	5.0	7.0	till	yes	71.2	24.7	4.1	7.5	light olive grey	5Y 6/2
93MPB049	C14-08	32D/5	587150	5347025	Arnold	7.0	9.0	till	yes	73.7	24.0	2.3	4.7	light olive grey	5Y 6/2
93MPB050	C14-08	32D/5	587150	5347025	Arnold	9.0	11.0	till	yes	71.7	25.9	2.4	4.2	light olive grey	5Y 6/2
93MPB051	C14-08	32D/5	587150	5347025	Arnold	11.0	13.0	till	yes	64.7	28.9	6.4	4.2	grey	5Y 6/1
93MPB052	C14-08	32D/5	587150	5347025	Arnold	13.0	14.0	till	yes	52.5	42.2	5.2	2.6	light olive grey	5Y 6/2
93MPB204	C14-05	32D/5	588875	5348110	Clifford	34.7	36.2	kimberlite		NA	NA	NA	9.7	dark greenish-grey	5G 4/1
93MPB205	C14-05	32D/5	588875	5348110	Clifford	36.2	37.4	kimberlite		NA	NA	NA	24.2	dark greenish-grey	5G 4/1
93MPB206	C14-05	32D/5	588875	5348110	Clifford	4.0	4.0	silt		16.3	58.4	25.3	7.8	dark grey	5Y 4/1
93MPB207	C14-05	32D/5	588875	5348110	Clifford	6.0	6.0	silt		1.0	41.3	57.6	12.3	olive grey	5Y 5/2
93MPB208	C14-05	32D/5	588875	5348110	Clifford	8.0	8.0	silt		36.3	41.9	21.9	10.8	olive grey	5Y 5/2
93MPB209	C14-05	32D/5	588875	5348110	Clifford	10.0	10.0	silt		1.5	91.4	7.1	11.5	light olive grey	5Y 6/2
93MPB210	C14-05	32D/5	588875	5348110	Clifford	12.0	12.0	silt		2.0	92.6	5.4	8.8	light olive grey	5Y 6/2
93MPB211	C14-05	32D/5	588875	5348110	Clifford	14.0	14.0	silt		1.1	94.1	4.7	10.1	olive grey	5Y 5/2
93MPB212	C14-05	32D/5	588875	5348110	Clifford	16.0	16.0	silt		1.4	94.0	4.6	10.2	olive grey	5Y 5/2
93MPB213	C14-05	32D/5	588875	5348110	Clifford	17.0	17.0	silt		1.7	93.3	5.0	10.0	light olive grey	5Y 6/2
93MPB214	C14-05	32D/5	588875	5348110	Clifford	23.0	23.0	silt		3.2	91.9	4.8	9.8	olive grey	5Y 5/2
93MPB215	C14-05	32D/5	588875	5348110	Clifford	25.0	25.0	silt		11.4	85.3	3.4	8.5	light olive grey	5Y 6/2
93MPB216	C14-05	32D/5	588875	5348110	Clifford	27.0	27.0	silt		54.5	35.6	10.0	4.7	light grey	5Y 6/1
93MPB229	C14-02	32D/5	588725	5348110	Clifford	38.0	38.0	bedrock		NA	NA	NA	NA	dark greenish-grey	5G 4/1
93MPB230	C14-06	32D/5	589300	5347375	Arnold	19.5	19.5	bedrock		NA	NA	NA	NA	dark greenish-grey	5G 4/1

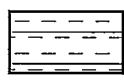
NA = not analyzed, not applicable

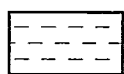
## **Appendix A.2    Overburden drill hole logs and section description**

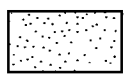
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GSC Drill hole log C14-02  
GSC Drill hole log C14-03  
GSC Drill hole log C14-04  
GSC Drill hole log C14-05  
GSC Drill hole log C14-06  
GSC Drill hole log C14-07  
GSC Drill hole log C14-08


## GRAPHIC LOG LEGEND

 organic material

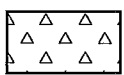
 clay & silt

 silt

 sand


 sand & gravel


 gravel


 till

 bedrock

 kimberlite

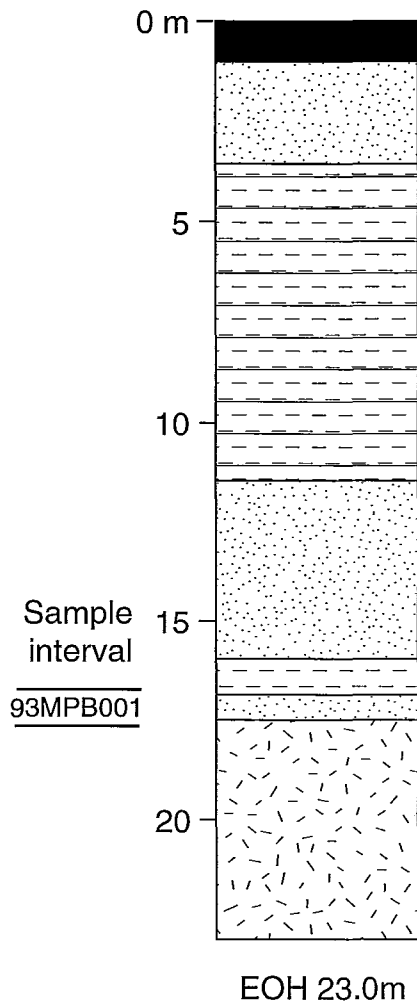
 top of sample interval

 93MPB002 sample number

 bottom of sample interval

- 93MPB217 spot sample for geochemistry/mineralogy

## Hole C14-01



0.0 to 1.7 m Organic material

1.7 to 3.5 m Sand

- very fine sand, moderately sorted, dark grey colour, massive, lower contact is approximate due to core loss

3.5 to 11.5 m Clay

- varved clay and silt, lower contact is approximate

11.5 to 16.5 m Sand

- well sorted, clast free, very fine sand grading down into sandy silt

16.5 to 17.0 m Silt

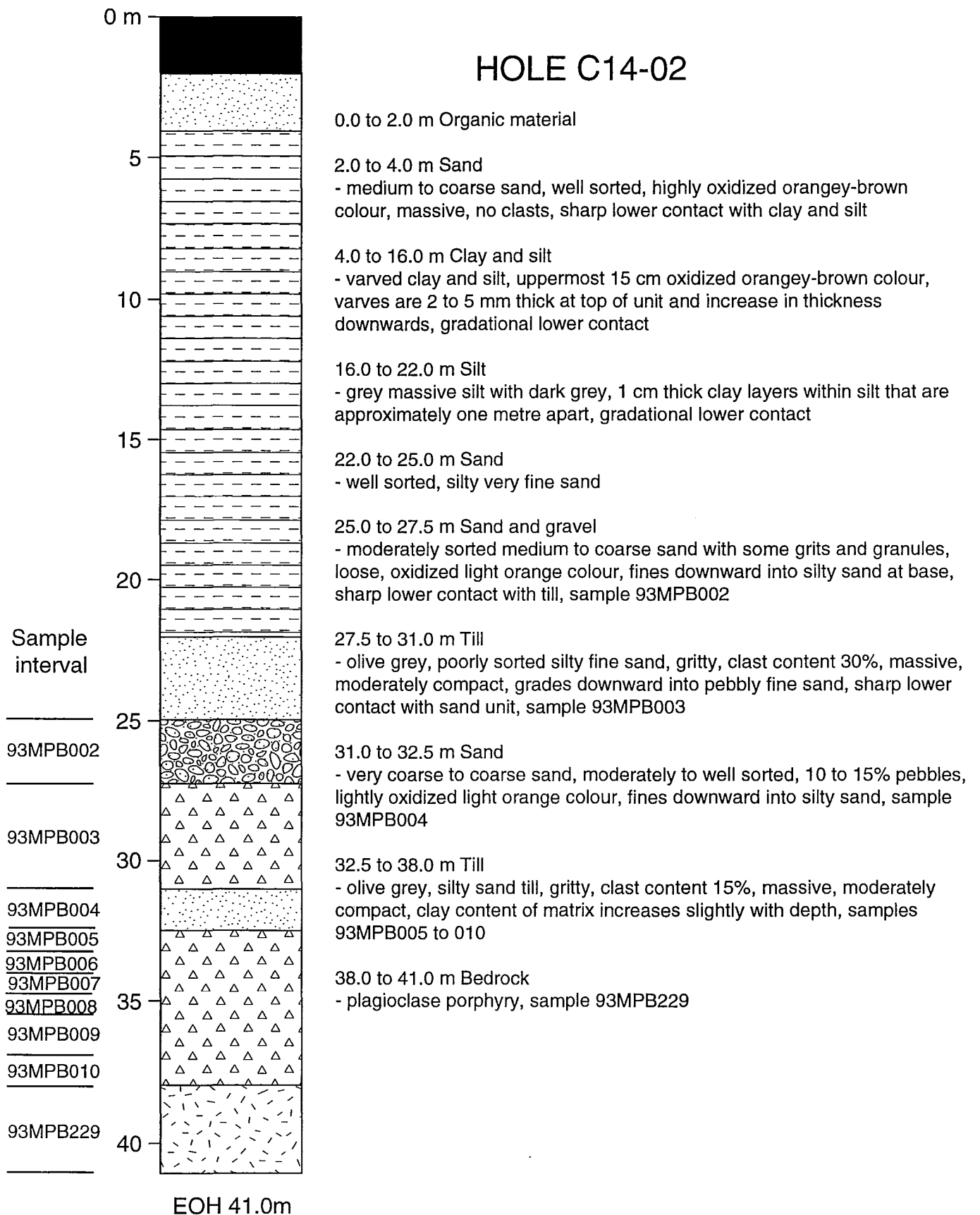
- massive, well sorted grey silt, sharp lower contact

17.0 to 17.5 m Sand

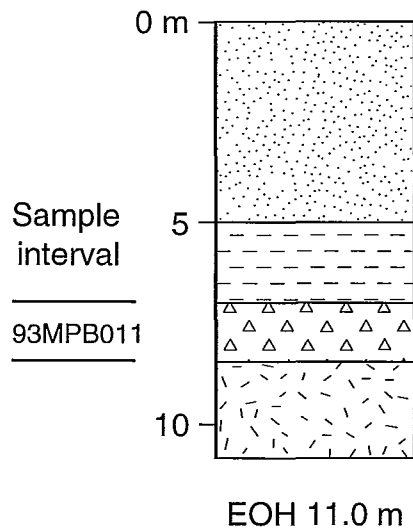
- well sorted, coarse sand with occasional pebbles up to 2 cm in diameter, sorting increases with depth, grades downward into medium sand, sample 93MPB001

17.5 to 23.0 m Bedrock

- basalt



## HOLE C14-03



0.0 to 1.0 m No recovery

1.0 to 5.0 m Sand

- highly oxidized, dark orange sand, well sorted, massive, grades downward into silty sand

5.0 to 7.0 m Silt

- poor core recovery, lower contact approximate

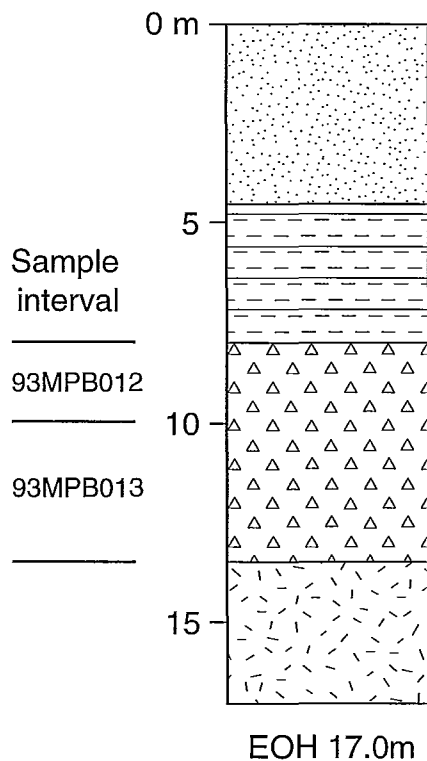
7.0 to 8.3 m Till

- sandy till, clast content 30 to 40%, clast content decreases downward, massive, very loose at top, compaction increases with depth, olive grey at top becoming greenish-grey with depth, two small boulders at 8.0 m, sample 93MPB011

8.3 to 11.0 m Bedrock

- basalt

## HOLE C14-04



0.0 to 4.5 m Sand

- fine to medium sand, upper 1.5 m oxidized orangey-brown colour

4.5 to 8.0 m Clay and silt

- varved clay and silt, varves 0.5 to 1.0 cm thick, sharp lower contact with till

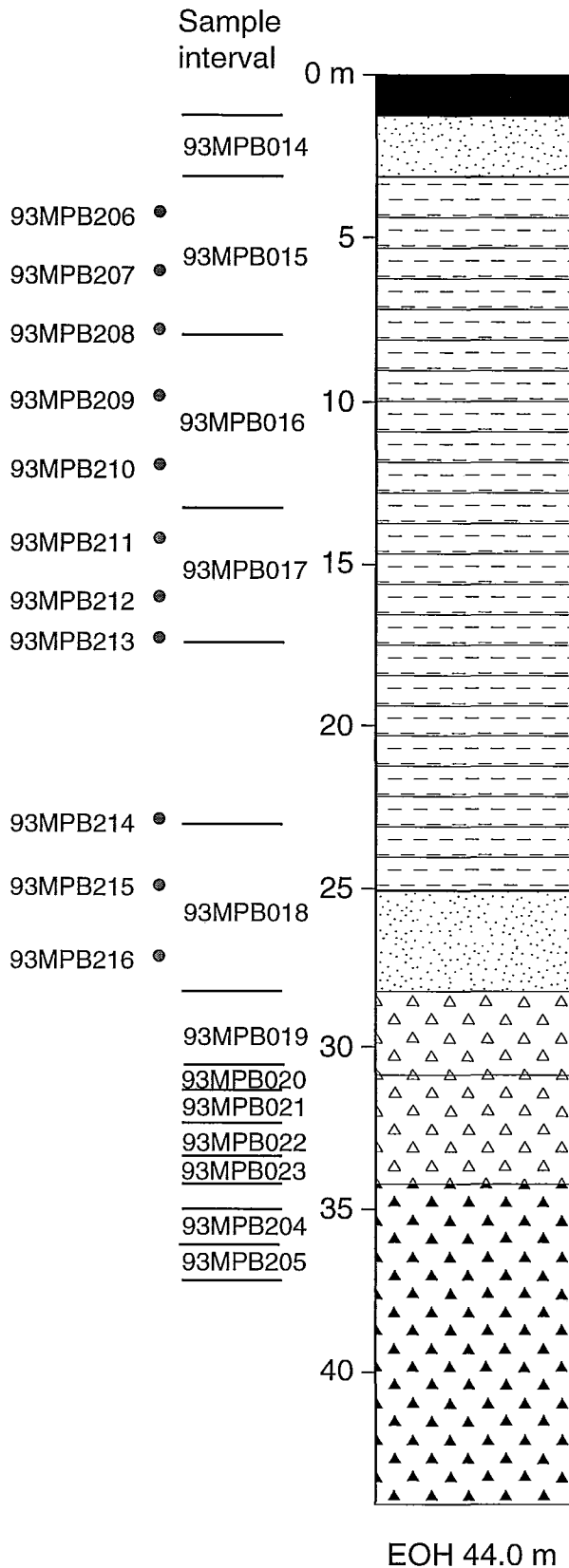
8.0 to 13.6 m Till

- olive grey, sandy till, massive, moderately compact, clast content 20 to 25%, samples 93MPB012 and 013

13.6 to 17.0 m Bedrock

- plagioclase porphyritic basalt





## HOLE C14-05

0.0 to 1.2 m Organic material

1.2 to 3.0 m Sand

- very fine sand grading downward into fine to medium sand, well sorted, oxidized in uppermost 0.4 m, sharp lower contact with clay, sample 93MPB014

3.0 to 25.0 m Clay and silt

- varved clay and silt, grey colour, unoxidized, varves 1 to 2 cm at top of unit with silt:clay ratio of 1:1, varves increase in thickness downward to 10 cm at base with silt:clay ratio of 10:1, sharp lower contact with sand, sample 93MPB015 to 018 and 93MPB206 to 214

25.0 to 27.8 m Sand

- very fine sand, well sorted, grey colour, sharp lower contact with till, sample 93MPB018, 215 and 216

27.8 to 30.8 m Till

- sandy till, olive grey colour, clast content 25%, loose, massive, sharp lower contact, sample 93MPB019

30.8 to 34.0 m Till

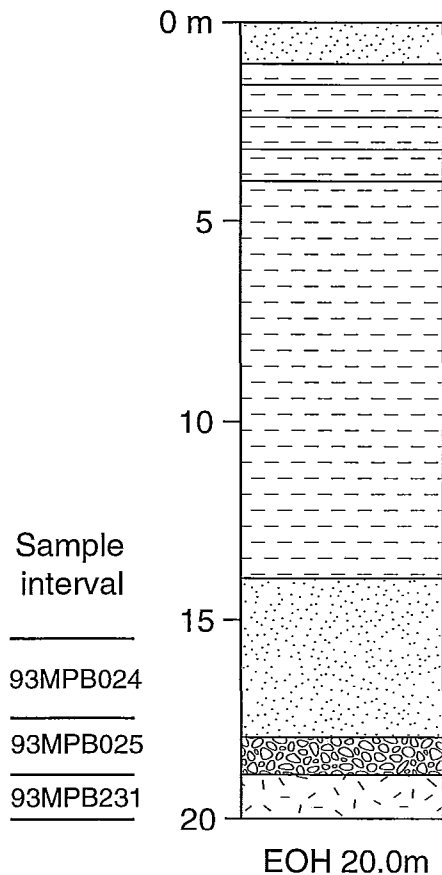
- sandy silt till, higher clay content than till above, dark grey colour changing to greenish-grey with depth, numerous kimberlite pebbles and cobbles in lowermost 0.5 m, samples 93MPB020 to 023

34.0 to 44.0 m Bedrock

- 34.0 to 37.4 m weathered kimberlite, samples 93MPB203 and 204

- 37.4 to 44.0 m, fresh kimberlite

## HOLE C14-06



0.0 to 0.2 m Organic material

0.2 to 1.0 m Sand

- fine grained, well sorted sand, oxidized light brown colour, sharp lower contact

1.0 to 4.0 m Clay

- varved clay and silt, unoxidized, grey colour, varves 1 cm thick, varve thickness increases with depth to 2 cm

4.0 to 14.0 m Silt

- massive silt with occasional clay layer that is 1 to 1.5 cm thick

14.0 to 18.0 m Sand

- fine to medium sand, sand fines upward from very fine/fine sand to medium/coarse sand over two intervals from 15.5 to 17.0 m and from 17.0 to 18.0 m, gradational lower contact with gravel over 0.2 m, samples 93MPB024 and 025

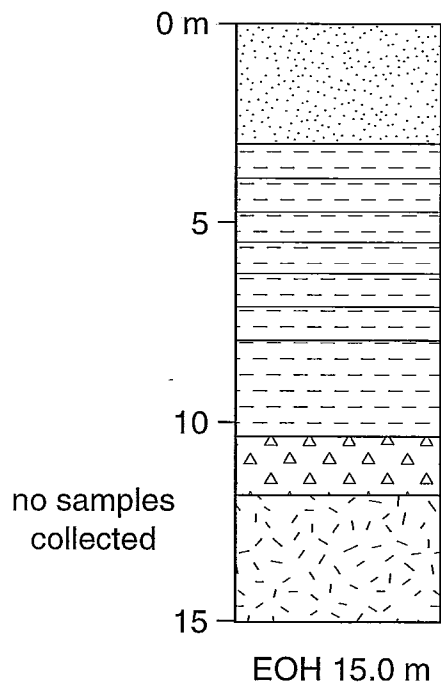
18.0 to 18.7 m Gravel

- very cobbly gravel with coarse to medium sand matrix, grey, loose, clast supported, clasts subangular to subrounded shape, sample 93MPB025

18.7 to 20.0 Bedrock

- mafic volcanic rock, sample 93MPB231

## HOLE C14-07



### 0.0 to 3.0 m Sand

- very fine sand, highly oxidized orangey-brown, grades down into fine to medium sand, sharp lower contact

### 3.0 to 8.0 m Clay and silt

- varved clay and silt, varves 0.5 to 1.0 cm thick

### 8.0 to 10.4 m Silt

- grey silt, massive, occasional 1 cm thick layer of dark grey clay

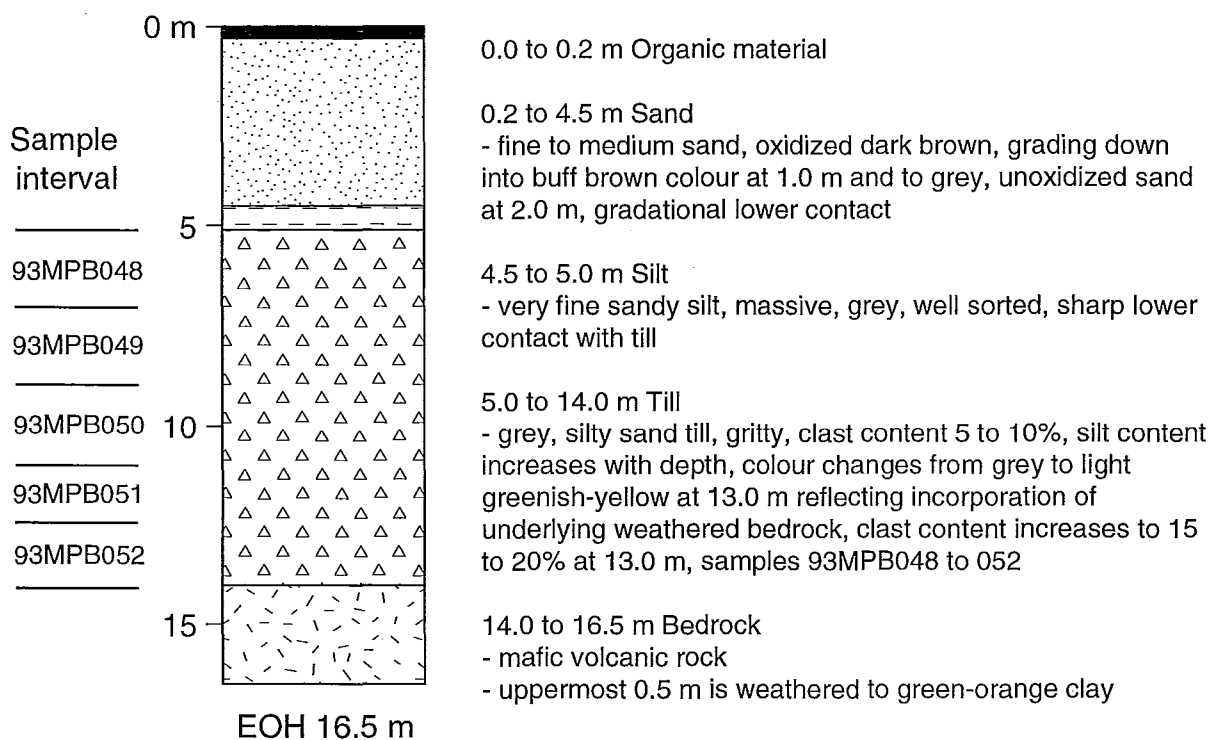
### 10.4 to 11.8 m Till/gravel?

- no core recovered

### 11.8 to 15.0 m Bedrock

- intermediate to mafic volcanic rock

## HOLE C14-08



**Appendix B Total sample and heavy mineral fraction weight data for GSC kimberlite and glacial sediment samples processed by Overburden Drilling Management Ltd.**

**Legend**

**TOTAL SAMPLE WEIGHT:** weight (kg, wet) of entire sample

**WEIGHT >2 mm MATERIAL:** weight (kg, wet) of >2 mm (+10 mesh) fraction, used for pebble counts

**WEIGHT <2 mm MATERIAL:** weight (kg, wet) of <2 mm (-10 mesh) fraction

**1-2 mm FRACTION**

**TOTAL WEIGHT:** weight (g, dry) of the 1.0 to 2.0 mm fraction

**WEIGHT NON-MAG HEAVIES:** weight (g, dry) of the 1.0 to 2.0 mm non-ferromagnetic heavy mineral fraction

**WEIGHT MAG HEAVIES:** weight (g, dry) of the 1.0 to 2.0 mm ferromagnetic heavy mineral fraction

**<1 mm FRACTION**

**TOTAL WEIGHT:** weight (g, dry) of the <1 mm fraction

**WEIGHT NON-MAG HEAVIES:** weight (g, dry) of the <1 mm non-ferromagnetic heavy mineral fraction

**WEIGHT MAG HEAVIES:** weight (g, dry) of the <1 mm ferromagnetic heavy mineral fraction

**TOTAL WEIGHT NON-MAG HEAVIES:** weight of 1.0 to 2.0 mm plus <1 mm non-ferromagnetic heavy mineral fractions

**TOTAL WEIGHT MAG:** weight of 1.0 to 2.0 mm plus <1 mm ferromagnetic heavy mineral fractions

APPENDIX B: Total sample and heavy mineral fraction weight data for kimberlite and glacial sediment samples

SAMPLE	DRILL HOLE	MATERIAL TYPE	TOTAL SAMPLE WEIGHT	WEIGHT >2 mm MATERIAL	WEIGHT <2 mm MATERIAL	1-2 mm FRACTION			<1 mm FRACTION			TOTAL WEIGHT NON-MAG HEAVIES	TOTAL WEIGHT MAG HEAVIES
						TOTAL WEIGHT	WEIGHT NON-MAG HEAVIES	WEIGHT MAG HEAVIES	TOTAL WEIGHT	WEIGHT NON-MAG HEAVIES	WEIGHT MAG HEAVIES		
			(kg, wet)	(kg, wet)	(kg, wet)	(g, dry)	(g, dry)	(g, dry)	(kg, wet)	(g, dry)	(g, dry)	(g, dry)	(g, dry)
93MPB001	C14-01	sand	8.90	1.50	7.40	581.3	2.3	0.7	6.8	62.6	11.5	64.9	12.2
93MPB002	C14-02	sand	29.20	8.45	20.75	2177.2	8.1	3.5	18.6	156.9	33.6	165.0	37.1
93MPB003	C14-02	sand	26.50	2.25	24.25	792.8	2.4	2.0	23.5	147.8	34.0	150.2	36.0
93MPB004	C14-02	sand	23.10	5.30	17.80	1710.8	7.6	1.2	16.1	109.6	21.1	117.2	22.3
93MPB005	C14-02	till	19.25	4.00	15.25	669.5	2.1	0.8	14.6	89.4	14.1	91.5	14.9
93MPB006	C14-02	till	21.50	2.00	19.50	645.7	2.2	0.4	18.9	123.7	15.3	125.9	15.7
93MPB007	C14-02	till	18.45	2.70	15.75	730.6	2.3	0.9	15.0	87.6	12.9	89.9	13.8
93MPB008	C14-02	till	19.45	1.35	18.10	491.1	7.6	0.9	17.6	66.8	12.5	74.4	13.4
93MPB009	C14-02	till	18.10	1.40	16.70	467.3	2.1	0.3	16.2	61.9	11.5	64.0	11.8
93MPB010	C14-02	till	11.60	2.45	9.15	479.2	1.5	1.1	8.7	37.6	8.2	39.1	9.3
93MPB011	C14-03	till	14.00	6.75	7.25	1030.0	3.3	1.0	6.2	50.0	11.9	53.3	12.9
93MPB012	C14-04	till	23.60	6.80	16.80	1786.8	5.2	1.6	15.0	182.2	24.6	187.4	26.2
93MPB013	C14-04	till	25.00	5.15	19.85	1545.0	4.0	1.2	18.3	133.4	22.7	137.4	23.9
93MPB014	C14-05	sand	7.85	0.00	7.85	6.1	0.1	<0.1	7.8	35.7	9.3	35.8	9.3
93MPB019	C14-05	till	17.20	4.00	13.20	928.3	2.8	1.2	12.3	102.8	19.1	105.6	20.3
93MPB020	C14-05	till	4.05	0.40	3.65	120.3	0.6	0.1	3.5	20.3	4.1	20.9	4.2
93MPB021	C14-05	till	6.25	0.30	5.95	339.9	0.6	0.3	5.6	38.7	8.2	39.3	8.5
93MPB022	C14-05	till	23.35	4.80	18.55	588.5	2.7	0.7	18.0	129.3	22.8	132.0	23.5
93MPB023	C14-05	till	11.00	1.50	9.50	411.5	1.3	0.2	9.1	69.5	9.6	70.8	9.8
93MPB024	C14-06	sand	15.25	0.00	15.25	8.9	0.1	0.0	15.2	110.5	17.7	110.6	17.7
93MPB025	C14-06	sand&gravel	12.00	1.75	10.25	525.4	4.7	1.1	9.7	101.8	15.7	106.5	16.8
93MPB048	C14-08	till	20.10	2.20	17.90	779.3	2.2	0.6	17.1	75.9	22.1	78.1	22.7
93MPB049	C14-08	till	27.55	3.15	24.40	1018.7	3.1	0.8	23.4	177.7	35.2	180.8	36.0
93MPB050	C14-08	till	25.30	2.75	22.55	710.5	3.0	0.7	21.8	115.5	28.6	118.5	29.3
93MPB051	C14-08	till	25.55	2.50	23.05	733.2	2.6	0.7	22.3	98.5	25.0	101.1	25.7
93MPB052	C14-08	till	19.40	4.50	14.90	858.4	1.5	0.3	14.0	80.4	13.2	81.9	13.5
93MPB204	C14-05	kimberlite	16.70	6.75	9.95	633.4	2.9	<0.1	9.3	65.4	1.1	68.3	1.1
93MPB205	C14-05	kimberlite	17.30	5.60	11.70	1076.3	4.3	<0.1	10.6	41.9	1.6	46.2	1.6

**Appendix C. Electron microprobe analyses of mineral grains from the  
0.25 to 2.0 mm, non-ferromagnetic heavy mineral (S.G. >3.2) fraction**

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Table C.2 Calculated detection limits and counting times	... 74
C.1 Microprobe data for all minerals in kimberlite and glacial sediment samples	(digital file only)
C.2 Microprobe data for garnets	... 75
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Table C.1. Operating conditions and standards for the major element routine "GARNET".

## SUMMARY OF CONDITIONS IN GARNET.EXP AND GARNET.PHY

Cosecant of the take off angle: 1.556

Total number of elements : 11

Number of analyzed elements :10

## CALIBRATION DATA :

	SPC	XTAL	POS.	+BG. OFFSET	-BG. OFFSET	BG SLOPE	PK-BG C/s/nA	SIGMA	PK TIMs	%REQ. ACCUR	BG TIM ms
Na	1	PC0	26848	2500	-2500	0.00	1517.62	0.7	10	0.1	5000
K	3	PET	42757	1000	0	1.00	294.38	0.6	10	0.5	5000
Fe	4	LIF	48081	1050	0	1.00	333.18	0.3	10	0.1	5000
Mg	2	TAP	38516	1000	0	1.00	1155.93	0.2	10	0.1	5000
Si	2	TAP	27732	1500	0	1.00	1312.58	0.5	10	0.1	5000
Ca	3	PET	38389	2000	0	1.00	370.99	0.4	10	0.1	5000
Mn	4	LIF	52201	1200	0	1.00	435.75	0.2	10	0.5	4627
Ti	3	PET	31426	1000	0	1.00	803.96	0.1	10	0.1	5000
Cr	3	PET	26193	1000	0	1.00	366.95	0.1	10	0.1	5000
Al	2	TAP	32468	1000	0	1.00	1372.19	0.1	10	0.1	5000

## STANDARD DATA:

	STD	WT	LINE	kV	BEAM						
Na	NACL7	0.3930	Ka	20	20						
K	KBR7	0.3290	Ka	20	20						
Fe	MAG1	0.7236	Ka	20	20						
Mg	MGO1	0.6032	Ka	20	20						
Si	QTZ1	0.4674	Ka	20	20						
Ca	WOL1	0.3432	Ka	20	20						
Mn	MN	1.0000	Ka	20	20						
Ti	RUT	0.5895	Ka	20	20						
Cr	CHR1	0.2504	Ka	20	20						
Al	COR1	0.5290	Ka	20	20						
NACL7	Na	0.3930	Cl	0.6070							
KBR7	K	0.3290	Br	0.6710							
MAG1	Fe	0.7236	O	0.2764							
MGO1	Mg	0.6032	O	0.3968							
QTZ1	Si	0.4674	O	0.5326							
WOL1	Ca	0.3432	Fe	0.0030	Mn	0.0012	Si	0.2399	O	0.4127	
MN	Mn	1.0000									
RUT1	Ti	0.5895	Fe	0.0050	Nb	0.0050	O	0.4005			
CHR1	Cr	0.2504	Al	0.0762	Fe	0.2985	Mg	0.0434	Ti	0.0054	V
	Mn	0.0015	Ni	0.0012	Si	0.0011	O	0.3211			0.001
COR1	Al	0.5290	O	0.4710							



Table C.2 Counting times for each grain and calculated minimum detection limits (MDL) for each element

ELEMENT	TIME (s)	MDL	MDL
		(ppm)	(oxide wt %)
Na	10	300	0.04
Si	10	80	0.017
K	10	200	0.024
Fe	10	400	0.051
Al	10	100	0.019
Ca	10	200	0.028
Mn	10	400	0.052
Mg	10	200	0.033
Ti	10	200	0.033
Cr	10	200	0.029

## Appendix C.2 Microprobe data for garnets

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T593	1	93MPB001	C14-01	0.5-1.0	purple	Cr-Pyrope	42.05	0.07	21.63	3.48	7.99	0.51	20.75	4.46	0.01	0.01	100.94	
T593	2	93MPB001	C14-01	0.5-1.0	purple	Cr-Pyrope	41.57	0.05	20.68	4.32	9.56	0.42	18.50	5.23	0.01	0.02	100.35	
T593	3	93MPB002	C14-02	0.5-1.0	purple	Cr-Pyrope	42.07	0.04	21.60	3.37	7.50	0.49	20.77	4.78	0.03	0.00	100.64	
T593	7	93MPB002	C14-02	0.5-1.0	purple	Cr-Pyrope	41.86	0.00	20.94	4.09	7.59	0.42	20.50	4.57	0.00	0.01	99.98	
T593	6	93MPB002	C14-02	0.5-1.0	purple	Cr-Pyrope	41.71	0.03	20.42	4.57	7.60	0.44	20.23	4.98	0.02	0.00	99.99	
T593	5	93MPB002	C14-02	0.5-1.0	purple	Cr-Pyrope	41.89	0.11	20.17	4.88	7.45	0.49	19.32	5.76	0.00	0.00	100.06	
T593	4	93MPB002	C14-02	0.5-1.0	purple	Cr-Pyrope	41.69	0.03	19.63	5.60	7.77	0.48	19.45	5.71	0.03	0.00	100.40	
T593	8	93MPB003	C14-02	0.25-0.5	purple	Cr-Pyrope	42.07	0.05	20.71	4.00	7.29	0.46	20.06	5.48	0.00	0.01	100.12	
T593	10	93MPB003	C14-02	0.25-0.5	purple	Cr-Pyrope	41.57	0.12	20.66	4.20	7.23	0.52	20.20	5.24	0.03	0.00	99.76	
T593	11	93MPB003	C14-02	0.5-1.0	purple	Cr-Pyrope	41.60	0.09	20.15	4.68	7.68	0.44	19.20	5.95	0.00	0.00	99.79	
T593	9	93MPB003	C14-02	0.25-0.5	purple	Cr-Pyrope	41.63	0.12	20.00	4.72	8.27	0.50	18.56	5.89	0.00	0.01	99.70	
T593	13	93MPB004	C14-02	0.25-0.5	purple	Cr-Pyrope	40.62	0.01	19.39	5.60	7.52	0.45	18.46	6.68	0.02	0.01	98.75	
T593	12	93MPB004	C14-02	0.5-1.0	purple	Cr-Pyrope	40.84	0.14	18.54	6.73	7.19	0.42	19.13	5.84	0.01	0.00	98.83	
T593	16	93MPB005	C14-02	0.5-1.0	purple	Cr-Pyrope	41.71	0.10	21.10	3.62	7.48	0.47	20.57	4.83	0.02	0.00	99.91	
T593	14	93MPB005	C14-02	0.5-1.0	purple	Cr-Pyrope	40.44	0.02	20.37	4.22	7.24	0.56	19.91	5.13	0.00	0.02	97.91	low total
T593	17	93MPB005	C14-02	0.5-1.0	purple	Cr-Pyrope	41.55	0.08	20.56	4.22	7.46	0.47	19.87	5.30	0.01	0.01	99.54	
T593	18	93MPB005	C14-02	0.25-0.5	purple	Cr-Pyrope	41.58	0.07	20.54	4.37	7.37	0.49	20.00	5.07	0.02	0.02	99.52	
T593	15	93MPB005	C14-02	0.5-1.0	purple	Cr-Pyrope	40.18	0.25	18.18	6.34	11.07	0.52	16.35	6.51	0.01	0.01	99.41	
T593	19	93MPB006	C14-02	0.5-1.0	purple	Cr-Pyrope	41.85	0.04	20.63	4.62	7.22	0.52	19.81	5.39	0.00	0.02	100.10	
T593	20	93MPB007	C14-02	0.5-1.0	purple	Cr-Pyrope	41.60	0.01	20.90	4.11	7.32	0.50	20.07	5.55	0.00	0.00	100.06	
T593	22	93MPB007	C14-02	0.5-1.0	purple	Cr-Pyrope	42.08	0.08	20.67	4.18	7.50	0.41	19.71	5.40	0.00	0.01	100.04	
T593	21	93MPB007	C14-02	0.5-1.0	purple	Cr-Pyrope	41.98	0.08	20.83	4.30	7.36	0.44	19.59	6.05	0.02	0.02	100.67	
T593	23	93MPB007	C14-02	0.5-1.0	purple	Cr-Pyrope	41.62	0.08	20.77	4.42	7.27	0.53	20.07	5.52	0.03	0.00	100.32	
T619	1	93MPB010	C14-02	0.5-1.0	purple	Cr-Pyrope	41.97	0.24	20.25	4.92	7.77	0.51	20.52	5.49	0.00	0.00	101.67	
T619	3	93MPB010	C14-02	0.25-0.5	purple	Cr-Pyrope	42.44	0.29	20.24	4.97	7.34	0.34	21.48	5.20	0.01	0.00	102.31	
T619	5	93MPB010	C14-02	0.5-1.0	purple	Cr-Pyrope	41.76	0.18	19.98	5.16	7.51	0.43	21.07	5.20	0.00	0.00	101.30	
T619	2	93MPB010	C14-02	0.25-0.5	purple	Cr-Pyrope	42.10	0.19	19.12	6.56	7.07	0.36	20.91	5.49	0.02	0.00	101.82	
T619	8	93MPB010	C14-02	0.5-1.0	purple	Cr-Pyrope	41.87	0.15	18.62	7.07	5.87	0.35	21.82	5.43	0.00	0.00	101.18	
T619	4	93MPB010	C14-02	0.5-1.0	purple	Cr-Pyrope	41.15	0.13	18.37	7.26	7.62	0.45	19.59	6.58	0.00	0.00	101.14	
T619	7	93MPB010	C14-02	0.5-1.0	purple	Cr-Pyrope	41.95	0.34	18.13	7.44	6.27	0.31	21.68	5.37	0.04	0.01	101.52	
T619	6	93MPB010	C14-02	0.25-0.5	purple	Cr-Pyrope	40.73	0.50	15.41	10.50	6.68	0.37	19.69	7.04	0.03	0.01	100.95	
T578	100	93MPB022	C14-05	0.25-0.5	orange	Pyrope	41.59	0.72	21.34	1.31	10.09	0.36	20.52	4.30	0.07	0.02	100.30	
T619	18	93MPB022	C14-05	0.25-0.5	purple	Cr-Pyrope	41.38	0.27	21.50	2.98	7.23	0.45	21.37	4.79	0.05	0.00	100.00	
T619	10	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	41.88	0.20	21.05	3.39	7.13	0.37	21.62	4.87	0.04	0.00	100.55	
T619	12	93MPB022	C14-05	0.25-0.5	purple	Cr-Pyrope	41.75	0.39	20.38	4.07	7.57	0.41	20.91	5.16	0.03	0.00	100.66	
T619	16	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	40.71	0.06	20.22	4.37	8.17	0.45	19.76	5.49	0.00	0.00	99.23	
T619	13	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	42.35	0.22	20.26	4.80	6.75	0.33	21.64	5.08	0.00	0.02	101.43	
T619	15	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	41.23	0.30	19.47	5.22	6.20	0.34	21.58	5.04	0.03	0.01	99.42	
T619	11	93MPB022	C14-05	0.25-0.5	purple	Cr-Pyrope	40.87	0.12	18.71	5.87	8.77	0.43	19.21	5.86	0.00	0.00	99.82	
T619	14	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	41.06	0.19	18.58	6.31	6.03	0.26	21.24	5.62	0.04	0.00	99.33	
T619	17	93MPB022	C14-05	0.25-0.5	purple	Cr-Pyrope	41.67	0.30	18.54	6.33	6.39	0.34	21.13	5.32	0.04	0.01	100.07	
T619	9	93MPB022	C14-05	0.5-1.0	purple	Cr-Pyrope	41.04	0.05	18.18	7.31	7.67	0.46	18.87	6.55	0.00	0.01	100.15	
T579	5	93MPB023	C14-05	0.5-1.0	orange	Pyrope	41.68	0.92	21.81	0.42	10.26	0.38	19.91	4.84	0.05	0.01	100.28	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T579	3	93MPB023	C14-05	0.5-1.0	orange	Pyrope	42.63	0.85	22.52	0.59	11.07	0.40	19.93	4.67	0.08	0.00	102.73	
T579	4	93MPB023	C14-05	1.0-2.0	orange	Pyrope	42.22	0.81	21.77	1.03	10.31	0.42	20.18	4.74	0.04	0.00	101.52	
T579	2	93MPB023	C14-05	0.5-1.0	orange	Pyrope	41.98	0.80	21.87	1.04	10.31	0.37	20.39	4.84	0.04	0.02	101.66	
T579	1	93MPB023	C14-05	0.5-1.0	orange	Pyrope	42.11	0.83	21.75	1.05	10.21	0.44	20.22	4.75	0.09	0.00	101.44	
T619	96	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.36	0.05	21.41	3.00	7.56	0.36	21.20	4.88	0.00	0.04	100.87	
T619	122	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.48	0.30	21.01	3.19	7.42	0.33	21.23	4.98	0.02	0.00	99.95	
T619	145	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	42.32	0.15	21.39	3.43	6.38	0.37	22.11	4.64	0.00	0.00	100.79	
T619	70	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.34	0.20	20.48	3.84	7.69	0.46	20.80	5.04	0.03	0.00	99.87	
T619	34	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.84	0.26	20.31	3.87	7.22	0.28	21.33	5.05	0.05	0.00	100.21	
T619	78	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.24	0.18	20.44	3.88	8.40	0.45	19.74	5.44	0.04	0.01	99.81	
T619	84	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.52	0.20	21.13	3.89	6.00	0.33	22.70	4.85	0.01	0.01	101.63	
T619	131	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.56	0.05	20.17	4.15	8.31	0.53	19.66	5.32	0.01	0.00	98.74	
T619	111	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.18	0.18	20.53	4.30	5.79	0.30	21.99	5.08	0.03	0.00	100.39	
T619	79	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.46	0.18	20.11	4.32	6.93	0.28	21.44	4.91	0.01	0.00	99.64	
T619	91	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.60	0.19	20.40	4.33	6.94	0.35	22.25	5.13	0.06	0.02	101.25	
T619	128	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.49	19.99	4.34	7.16	0.34	21.09	5.14	0.09	0.00	99.93	
T619	103	93MPB023	C14-05	> 2.0	purple	Cr-Pyrope	41.46	0.12	20.16	4.45	6.88	0.42	20.83	5.01	0.04	0.02	99.38	
T619	52	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.18	0.04	20.92	4.47	7.52	0.47	21.02	4.44	0.03	0.00	101.10	low Ca
T619	23	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.53	0.05	20.38	4.66	8.30	0.53	19.48	6.01	0.03	0.01	100.97	
T619	119	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.32	0.25	20.28	4.73	7.59	0.39	21.40	5.14	0.02	0.00	102.13	
T619	21	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.65	0.16	19.98	4.75	7.76	0.47	20.48	5.55	0.03	0.03	100.84	
T619	144	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.68	0.40	19.90	4.75	6.70	0.27	21.79	4.35	0.06	0.00	99.89	
T619	101	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.13	0.21	19.43	4.76	8.26	0.37	19.95	5.70	0.02	0.00	99.84	
T619	146	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.21	0.21	19.98	4.76	6.84	0.25	21.61	5.12	0.00	0.00	100.98	
T619	129	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.75	0.22	19.75	4.81	8.34	0.39	19.88	5.33	0.04	0.00	99.51	
T619	109	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.26	0.18	19.73	4.83	8.29	0.38	20.01	5.41	0.02	0.01	100.12	
T619	98	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.32	0.17	19.62	4.83	8.19	0.48	19.98	5.15	0.02	0.00	99.76	
T619	95	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.24	0.42	20.00	4.84	6.63	0.32	22.24	4.28	0.07	0.00	100.04	
T619	117	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.76	0.17	20.17	4.85	8.25	0.40	20.58	5.32	0.02	0.01	101.54	
T619	139	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.80	0.23	19.58	4.86	8.18	0.41	20.21	5.37	0.01	0.01	99.66	
T619	115	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.21	19.78	4.88	8.39	0.49	19.43	5.96	0.00	0.00	100.61	
T619	104	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.93	0.18	19.52	4.89	8.33	0.42	19.60	5.45	0.03	0.01	99.34	
T619	121	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	42.05	0.19	19.94	4.89	8.38	0.48	19.82	5.90	0.01	0.02	101.68	
T619	110	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.05	0.20	19.68	4.95	8.41	0.41	19.63	5.84	0.01	0.04	100.22	
T619	94	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.36	0.18	19.49	4.99	8.23	0.50	19.51	5.93	0.00	0.00	100.19	
T619	105	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.65	0.28	19.38	5.02	6.26	0.35	21.36	5.06	0.01	0.00	99.39	
T619	108	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.81	0.18	19.27	5.04	8.43	0.49	19.22	5.93	0.00	0.00	99.38	
T619	132	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.39	0.33	19.26	5.07	6.44	0.30	21.94	4.17	0.04	0.00	97.93	low total
T619	59	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	42.19	0.06	20.34	5.40	8.12	0.48	20.57	4.95	0.03	0.00	102.13	
T619	89	93MPB023	C14-05	> 2.0	purple	Cr-Pyrope	41.55	0.05	19.58	5.42	8.28	0.41	19.54	6.26	0.00	0.00	101.09	
T619	102	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.22	0.22	19.22	5.44	7.05	0.36	20.86	5.28	0.03	0.01	99.67	
T619	76	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.63	0.07	19.19	5.47	8.26	0.50	19.11	6.28	0.00	0.00	99.52	
T619	67	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.25	0.24	19.41	5.54	7.22	0.39	20.88	5.38	0.05	0.01	100.38	
T619	99	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.34	0.31	19.18	5.55	7.58	0.40	19.72	5.62	0.02	0.02	99.73	
T619	86	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	42.10	0.28	19.73	5.55	7.37	0.47	20.17	5.43	0.07	0.01	101.19	
T619	24	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.81	0.17	19.65	5.58	7.58	0.46	20.60	5.43	0.02	0.01	101.29	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T619	82	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.26	0.35	19.17	5.60	7.94	0.39	20.29	4.74	0.05	0.53	100.30	
T619	124	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.31	0.22	19.45	5.61	6.50	0.27	21.43	5.27	0.00	0.01	100.07	
T619	57	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.95	0.22	19.89	5.61	7.02	0.36	21.34	5.03	0.05	0.00	101.49	
T619	134	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.93	0.19	19.14	5.64	7.05	0.29	20.83	5.21	0.00	0.03	99.31	
T619	127	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.44	0.26	18.93	5.69	7.11	0.35	21.07	5.45	0.00	0.01	100.31	
T619	68	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.75	0.26	18.89	5.72	6.55	0.34	21.31	5.07	0.04	0.01	99.95	
T619	71	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.25	0.13	18.87	5.81	7.01	0.32	20.47	5.63	0.00	0.01	99.50	
T619	133	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.83	0.25	19.08	5.83	6.52	0.32	21.21	5.19	0.01	0.00	99.22	
T619	69	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.08	0.30	18.79	5.85	6.38	0.30	21.21	5.20	0.00	0.00	99.09	
T619	130	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.22	0.27	19.01	5.87	6.65	0.38	20.87	5.44	0.04	0.01	99.77	
T619	114	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.24	0.42	18.71	5.93	6.46	0.32	21.23	5.50	0.02	0.00	99.83	
T619	137	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.78	0.52	18.32	5.99	6.40	0.32	21.29	5.39	0.06	0.00	99.06	
T619	126	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.83	0.18	18.57	5.99	8.92	0.39	18.96	5.86	0.04	0.03	99.76	
T619	56	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.85	0.16	19.26	6.03	6.04	0.25	21.65	5.33	0.03	0.00	100.59	
T619	93	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.84	0.46	18.94	6.04	6.43	0.32	21.78	4.93	0.07	0.00	100.80	
T619	87b	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.21	0.06	19.22	6.04	8.35	0.46	19.57	6.29	0.03	0.02	101.24	
T619	92	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.27	0.29	18.96	6.04	6.71	0.32	21.02	5.44	0.00	0.00	100.06	
T619	53	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.82	0.09	19.21	6.04	7.14	0.45	20.22	6.25	0.00	0.00	101.22	
T619	88	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.29	0.12	19.05	6.11	7.91	0.42	19.92	5.86	0.00	0.00	100.68	
T619	44	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.09	0.03	18.88	6.12	7.10	0.40	20.01	5.80	0.01	0.00	99.42	
T619	80	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.72	0.34	18.79	6.14	6.30	0.38	21.45	5.43	0.02	0.00	100.57	
T619	85	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.58	0.24	18.92	6.16	6.85	0.38	20.78	5.48	0.01	0.00	100.40	
T619	87	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	42.31	0.04	19.33	6.16	7.98	0.44	19.79	6.38	0.03	0.01	102.46	
T619	60	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.10	19.14	6.17	7.96	0.43	20.11	5.96	0.02	0.02	101.36	
T619	64	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.29	0.17	19.23	6.22	6.19	0.32	21.81	5.17	0.04	0.03	101.48	
T619	83	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.78	0.16	19.28	6.24	8.03	0.42	19.92	5.94	0.01	0.00	101.76	
T619	107	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.71	0.34	18.41	6.27	6.28	0.28	20.96	5.56	0.04	0.00	98.84	
T619	97	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.04	0.50	18.54	6.28	7.27	0.39	20.06	5.41	0.04	0.00	99.52	
T619	136	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.21	0.09	18.93	6.30	7.74	0.41	19.99	5.61	0.02	0.01	100.30	
T619	63	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.86	0.18	18.99	6.31	6.52	0.29	21.40	5.37	0.02	0.00	100.93	
T619	54	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.39	0.23	18.87	6.34	6.09	0.28	21.64	5.72	0.02	0.00	101.59	
T619	120	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.60	0.32	18.89	6.35	7.68	0.48	20.05	5.95	0.03	0.02	101.37	
T619	74	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.12	0.27	18.62	6.35	6.56	0.31	20.93	5.46	0.04	0.00	99.66	
T619	141	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.44	0.27	18.41	6.35	7.39	0.48	20.14	5.95	0.04	0.00	100.46	
T619	113	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.28	0.58	18.30	6.36	6.28	0.31	21.33	5.79	0.03	0.01	100.26	
T619	135	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.47	0.23	18.40	6.39	7.73	0.53	19.13	6.06	0.03	0.01	98.97	
T619	22	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.07	0.15	18.89	6.39	8.14	0.38	19.89	5.85	0.03	0.00	100.79	
T619	140	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.83	0.12	18.33	6.39	7.91	0.44	19.11	6.01	0.00	0.00	99.14	
T619	32	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.30	0.09	18.90	6.44	6.81	0.37	20.77	5.57	0.01	0.01	101.26	
T619	73	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.11	0.43	18.31	6.48	6.09	0.31	20.95	5.50	0.04	0.00	99.22	
T619	116	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.66	0.48	18.65	6.50	5.94	0.30	21.29	5.51	0.03	0.01	100.36	
T619	27	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.64	0.16	18.87	6.51	7.07	0.44	20.89	5.57	0.02	0.01	101.17	
T619	77	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.21	0.25	18.25	6.61	6.26	0.43	21.32	4.78	0.07	0.00	99.19	
T619	90	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.33	0.19	18.93	6.68	7.20	0.51	20.71	5.89	0.03	0.00	102.47	
T619	45	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.27	0.25	18.05	6.72	6.91	0.39	20.29	5.72	0.00	0.00	98.60	
T619	66	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.86	0.23	18.49	6.76	6.23	0.27	21.32	5.40	0.01	0.01	100.58	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T619	123	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.61	0.48	18.11	6.77	6.47	0.39	20.70	5.88	0.04	0.00	100.46	
T619	118	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.15	0.05	18.35	6.78	7.92	0.44	19.22	6.41	0.00	0.00	100.30	
T619	112	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.01	0.49	18.04	6.84	6.71	0.33	20.71	5.76	0.03	0.00	99.92	
T619	51	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.68	0.16	18.73	6.88	6.91	0.48	20.77	5.82	0.02	0.00	101.44	
T619	46	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.17	0.24	18.20	6.90	6.16	0.27	21.32	5.31	0.00	0.01	99.58	
T619	36	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.45	0.05	18.29	6.91	8.13	0.49	19.36	6.56	0.00	0.00	101.23	
T619	30	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.74	0.27	18.86	6.93	6.13	0.33	21.82	5.31	0.02	0.01	102.41	
T619	81	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.06	0.07	18.12	6.94	7.93	0.47	19.32	6.47	0.00	0.00	100.38	
T619	142	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.08	0.04	18.31	6.94	7.96	0.44	19.41	6.50	0.00	0.00	100.68	
T619	26	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.87	0.05	18.52	6.94	7.88	0.47	19.23	6.51	0.03	0.02	101.51	
T619	55	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.43	0.08	18.46	6.94	7.88	0.41	19.59	6.40	0.00	0.01	101.19	
T619	125	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.07	0.49	18.23	6.95	6.67	0.37	20.69	5.92	0.06	0.00	100.45	
T619	35	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.64	0.17	18.31	6.96	6.64	0.40	20.62	5.71	0.02	0.01	100.47	
T619	62	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.15	0.05	18.37	6.99	7.83	0.45	19.52	6.57	0.02	0.03	100.98	
T619	47	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	40.91	0.09	18.13	7.04	5.98	0.36	21.02	5.98	0.00	0.00	99.52	
T619	143	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.88	0.04	18.03	7.05	7.84	0.42	18.96	6.39	0.00	0.00	99.60	
T619	31	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	41.81	0.19	18.25	7.10	6.54	0.37	21.13	5.85	0.01	0.00	101.25	
T619	48	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.47	0.05	18.75	7.10	5.66	0.31	23.05	3.08	0.00	0.01	99.47	low Ca
T619	72	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.83	0.25	17.78	7.13	7.49	0.41	19.30	6.52	0.01	0.00	99.74	
T619	19	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.50	0.19	17.88	7.23	6.79	0.39	20.00	5.76	0.02	0.01	98.75	
T619	65	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.12	0.04	18.21	7.27	6.79	0.33	19.87	6.20	0.01	0.00	100.84	
T619	50	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.43	0.26	18.17	7.31	6.28	0.34	21.02	5.78	0.02	0.00	100.61	
T619	37	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.94	0.06	18.50	7.35	5.81	0.28	23.45	3.12	0.00	0.01	100.52	low Ca
T619	33	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	42.09	0.04	18.65	7.38	5.86	0.29	23.72	3.12	0.00	0.00	101.15	low Ca
T619	58	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.06	0.14	18.04	7.50	8.24	0.45	19.31	6.61	0.02	0.01	101.37	
T619	20	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.42	0.09	17.83	7.86	7.25	0.47	20.10	6.02	0.05	0.02	101.09	
T619	75	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	39.71	0.15	16.85	7.92	8.20	0.54	18.25	6.81	0.04	0.00	98.46	
T619	39	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.90	0.12	17.28	8.01	6.85	0.41	19.71	6.33	0.03	0.02	99.65	
T619	41	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	40.67	0.19	16.76	8.56	7.47	0.53	18.38	7.05	0.00	0.00	99.62	
T619	28	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.36	0.10	17.20	8.66	7.22	0.42	19.28	6.68	0.02	0.00	100.93	
T619	38	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.06	0.09	17.15	8.82	7.25	0.50	19.63	6.19	0.00	0.01	100.69	
T619	61	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.50	0.11	17.28	8.85	7.17	0.41	19.86	6.18	0.01	0.01	101.37	
T619	43	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.12	0.10	16.37	8.86	7.01	0.38	18.67	6.80	0.00	0.00	98.30	low total
T619	29	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.64	0.15	17.17	9.09	6.00	0.28	22.47	4.32	0.00	0.01	101.13	
T619	25	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.20	0.46	16.46	9.49	6.33	0.36	20.37	6.49	0.03	0.01	101.18	
T619	49	93MPB023	C14-05	0.5-1.0	purple	Cr-Pyrope	41.29	0.27	16.17	9.58	5.98	0.35	20.55	6.34	0.00	0.00	100.52	
T619	40	93MPB023	C14-05	0.25-0.5	purple	Cr-Pyrope	41.23	0.26	15.93	10.21	5.90	0.32	21.65	5.13	0.02	0.00	100.64	low Ca
T619	100	93MPB023	C14-05	1.0-2.0	purple	Cr-Pyrope	40.07	0.25	15.28	10.63	6.19	0.35	20.12	6.08	0.02	0.01	98.99	
T593	25	93MPB025	C14-06	0.5-1.0	purple	Cr-Pyrope	41.68	0.02	20.84	4.20	7.45	0.47	20.93	4.81	0.03	0.00	100.41	
T593	24	93MPB025	C14-06	0.5-1.0	purple	Cr-Pyrope	41.80	0.08	20.49	4.55	7.99	0.45	19.82	5.17	0.02	0.01	100.37	
T593	27	93MPB025	C14-06	0.25-0.5	purple	Cr-Pyrope	41.90	0.31	19.34	5.37	6.93	0.37	20.63	5.39	0.02	0.00	100.26	
T593	26	93MPB025	C14-06	0.5-1.0	purple	Cr-Pyrope	41.60	0.32	18.31	6.83	6.32	0.34	21.36	5.30	0.04	0.01	100.41	
T594	118	93MPB048	C14-08	0.5-1.0	purple	Cr-Pyrope	41.47	0.04	20.98	3.90	7.13	0.56	20.77	4.56	0.00	0.00	99.39	
T594	114	93MPB048	C14-08	0.5-1.0	purple	Cr-Pyrope	40.68	0.10	20.33	3.98	8.29	0.42	18.76	5.64	0.00	0.00	98.19	
T594	116	93MPB048	C14-08	0.25-0.5	purple	Cr-Pyrope	40.91	0.03	20.69	4.04	7.80	0.38	19.58	5.21	0.02	0.01	98.67	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T594	119	93MPB048	C14-08	0.25-0.5	purple	Cr-Pyrope	41.19	0.10	20.27	4.51	7.79	0.50	19.22	5.70	0.00	0.03	99.30	
T594	115	93MPB048	C14-08	0.25-0.5	purple	Cr-Pyrope	40.63	0.11	19.86	4.97	7.53	0.50	19.29	5.79	0.00	0.01	98.69	
T594	117	93MPB048	C14-08	0.25-0.5	purple	Cr-Pyrope	40.53	0.11	17.59	7.39	7.44	0.45	18.94	6.29	0.00	0.00	98.74	
T594	126	93MPB049	C14-08	0.25-0.5	purple	Cr-Pyrope	41.46	0.02	20.73	3.83	7.48	0.34	20.58	4.75	0.00	0.00	99.19	
T594	127	93MPB049	C14-08	0.25-0.5	purple	Cr-Pyrope	41.44	0.00	20.98	4.25	7.07	0.42	20.47	5.21	0.00	0.01	99.85	
T594	123	93MPB049	C14-08	0.25-0.5	purple	Cr-Pyrope	41.64	0.02	20.74	4.25	7.11	0.43	20.26	5.14	0.01	0.03	99.64	
T594	124	93MPB049	C14-08	0.5-1.0	purple	Cr-Pyrope	41.22	0.13	20.69	4.45	7.97	0.49	19.37	5.71	0.00	0.03	100.08	
T594	122	93MPB049	C14-08	0.25-0.5	purple	Cr-Pyrope	40.89	0.04	20.15	4.93	7.12	0.49	20.06	5.40	0.04	0.00	99.11	
T594	125	93MPB049	C14-08	0.5-1.0	purple	Cr-Pyrope	40.46	0.07	19.61	4.97	10.71	0.69	16.05	7.21	0.00	0.01	99.78	
T594	120	93MPB049	C14-08	0.5-1.0	purple	Cr-Pyrope	41.13	0.12	19.65	5.47	7.37	0.47	18.97	6.05	0.02	0.02	99.27	
T594	121	93MPB049	C14-08	0.25-0.5	purple	Cr-Pyrope	40.53	0.06	19.34	5.61	9.96	0.54	17.64	6.03	0.00	0.02	99.73	
T618	60	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.23	0.16	22.01	2.11	6.53	0.39	21.35	4.82	0.00	0.01	98.61	
T594	144	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.05	0.07	20.96	3.51	7.55	0.43	20.12	4.92	0.02	0.01	98.62	
T594	131	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.10	0.07	21.15	3.54	8.10	0.48	19.63	5.51	0.00	0.00	99.59	
T594	140	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.88	0.02	20.94	3.54	7.28	0.44	20.20	4.53	0.00	0.00	97.83	
T594	138	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.28	0.06	21.23	3.55	7.60	0.62	20.08	4.77	0.03	0.00	99.22	
T594	151	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.22	0.01	21.21	3.68	7.28	0.52	20.54	4.80	0.00	0.01	99.27	
T594	145	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.28	0.10	20.90	3.72	7.41	0.35	20.06	5.29	0.00	0.00	99.12	
T594	136	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.09	0.01	21.03	3.75	7.29	0.49	20.45	4.60	0.00	0.00	98.70	
T594	152	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.46	0.02	20.87	3.84	7.38	0.47	20.04	5.54	0.00	0.02	99.64	
T594	133	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.34	0.04	21.05	3.87	7.19	0.47	20.77	4.75	0.03	0.01	99.50	
T594	148	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.35	0.03	20.85	3.95	7.65	0.58	19.96	4.92	0.00	0.00	99.28	
T618	59	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.72	0.07	20.39	4.09	7.53	0.51	20.48	4.84	0.00	0.01	98.65	
T594	139	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	40.56	0.11	20.28	4.19	7.34	0.48	19.60	5.52	0.00	0.00	98.08	
T594	132	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.26	0.04	20.29	4.20	9.37	0.37	18.30	5.54	0.02	0.00	99.38	
T594	146	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.23	0.01	20.73	4.25	8.15	0.53	19.28	5.42	0.00	0.02	99.61	
T594	129	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.61	0.23	20.29	4.40	7.67	0.40	20.01	5.38	0.01	0.02	100.04	
T594	150	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	40.92	0.07	20.01	4.56	7.48	0.59	19.04	5.67	0.00	0.00	98.32	
T594	135	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	40.90	0.00	20.20	4.58	7.71	0.52	19.42	5.89	0.00	0.00	99.22	
T594	149	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.12	0.09	20.18	4.64	7.16	0.44	19.91	5.37	0.00	0.01	98.92	
T594	137	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.44	0.04	20.33	4.78	7.50	0.53	19.64	5.25	0.00	0.04	99.54	
T594	147	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.56	0.17	20.04	4.80	7.37	0.50	20.24	5.08	0.02	0.00	99.78	
T594	130	93MPB050	C14-08	0.5-1.0	purple	Cr-Pyrope	41.47	0.12	20.16	4.81	7.60	0.44	19.62	5.73	0.00	0.00	99.94	
T594	153	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	41.08	0.13	20.07	5.05	7.49	0.44	19.63	5.81	0.02	0.01	99.71	
T594	142	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.63	0.02	19.58	5.22	7.45	0.47	19.22	5.68	0.00	0.00	98.27	
T594	128	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.38	0.07	19.37	5.29	10.37	0.61	17.06	6.49	0.00	0.02	99.65	
T594	141	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.53	0.06	19.33	5.47	7.01	0.46	19.07	6.10	0.00	0.01	98.05	
T594	143	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.14	0.08	18.98	5.55	10.22	0.46	16.94	6.27	0.00	0.00	98.63	
T594	134	93MPB050	C14-08	0.25-0.5	purple	Cr-Pyrope	40.54	0.10	18.27	7.22	7.27	0.46	19.29	5.53	0.00	0.00	98.68	
T580	2	93MPB051	C14-08	0.5-1.0	orange	Pyrope	41.15	0.20	22.81	0.14	17.42	0.48	14.66	4.67	0.01	0.02	101.55	
T619	154	93MPB051	C14-08	0.5-1.0	purple	Cr-Pyrope	40.44	0.07	20.12	4.30	7.32	0.48	20.20	5.25	0.00	0.00	98.17	low total
T619	155	93MPB051	C14-08	0.5-1.0	purple	Cr-Pyrope	40.71	0.02	19.58	4.87	9.85	0.71	17.90	5.80	0.00	0.01	99.45	
T619	156	93MPB051	C14-08	0.5-1.0	purple	Cr-Pyrope	41.18	0.39	19.08	5.41	6.98	0.40	20.85	5.37	0.04	0.04	99.72	
T611	33	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.31	0.89	21.35	0.17	11.55	0.43	18.90	4.82	0.07	0.00	98.48	
T586	2	93MPB204	C14-05	1.0-2.0	orange	Pyrope	42.86	0.75	22.76	0.30	10.40	0.40	20.41	4.23	0.04	0.00	102.16	megacryst
T611	31	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.33	1.05	21.02	0.60	10.32	0.32	19.31	4.86	0.07	0.00	97.87	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T586	5	93MPB204	C14-05	1.0-2.0	orange	Pyrope	43.17	0.64	22.65	0.71	8.78	0.29	21.30	4.34	0.05	0.00	101.93	megacryst
T586	1	93MPB204	C14-05	1.0-2.0	orange	Pyrope	43.20	0.87	22.02	0.72	9.58	0.31	20.02	4.71	0.05	0.01	101.48	megacryst
T611	29	93MPB204	C14-05	1.0-2.0	orange	Pyrope	41.23	0.63	21.79	0.74	8.77	0.25	20.47	4.31	0.06	0.01	98.25	
T611	32	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.39	1.03	20.63	1.07	10.44	0.44	19.08	4.80	0.05	0.00	97.94	
T611	34	93MPB204	C14-05	1.0-2.0	orange	Pyrope	39.75	0.83	20.80	1.11	9.58	0.35	19.84	4.58	0.09	0.02	96.93	
T611	26	93MPB204	C14-05	1.0-2.0	orange	Pyrope	41.24	0.22	22.04	1.12	8.85	0.26	20.99	4.11	0.02	0.00	98.84	
T611	27	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.96	0.27	21.90	1.21	8.63	0.31	20.68	4.07	0.04	0.00	98.09	
T611	35	93MPB204	C14-05	1.0-2.0	orange	Pyrope	41.51	0.48	21.73	1.29	9.07	0.42	19.95	4.48	0.03	0.01	98.96	
T586	4	93MPB204	C14-05	1.0-2.0	orange	Pyrope	42.89	1.02	21.27	1.45	10.17	0.37	20.14	4.75	0.05	0.00	102.11	megacryst
T586	3	93MPB204	C14-05	1.0-2.0	orange	Pyrope	42.94	0.42	22.38	1.53	9.01	0.38	20.49	4.61	0.05	0.01	101.83	megacryst
T618	65	93MPB204	C14-05	0.5-1.0	orange	Pyrope	41.16	0.45	21.70	1.57	8.91	0.41	20.15	4.55	0.02	0.01	98.92	
T611	28	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.36	0.31	21.23	1.79	8.86	0.35	19.93	4.63	0.01	0.00	97.47	
T611	30	93MPB204	C14-05	1.0-2.0	orange	Pyrope	40.77	0.32	21.39	1.83	8.92	0.36	20.14	4.52	0.02	0.01	98.27	
T611	9	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.55	0.17	21.31	2.28	6.73	0.31	21.46	4.36	0.00	0.02	97.20	
T618	62	93MPB204	C14-05	0.5-1.0	red	Cr-Pyrope	40.55	0.37	21.24	2.32	6.91	0.32	21.58	4.33	0.06	0.02	97.70	
T618	63	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.71	0.17	21.54	2.46	7.22	0.47	20.97	4.67	0.00	0.02	98.22	
T611	16	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.62	0.15	21.08	2.71	7.80	0.44	21.09	4.63	0.00	0.01	98.52	
T611	12	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.16	0.16	21.26	2.80	8.23	0.42	20.41	4.66	0.00	0.01	98.11	
T610	78	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.01	0.16	21.49	2.93	6.80	0.30	21.74	4.69	0.01	0.02	100.15	
T627	130	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.46	0.12	21.13	3.16	8.35	0.43	20.67	4.74	0.01	0.01	100.08	
T627	132	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.69	0.08	21.16	3.22	8.16	0.44	20.47	5.06	0.00	0.00	100.29	
T610	84	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.77	0.26	20.99	3.52	8.09	0.40	20.43	4.98	0.04	0.03	100.50	
T611	4	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.88	0.22	20.21	3.54	7.02	0.27	20.88	5.20	0.03	0.01	98.25	
T627	114	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.03	0.21	20.71	3.54	8.05	0.42	20.43	5.28	0.01	0.00	99.69	
T611	15	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.42	0.16	20.49	3.69	6.83	0.32	21.46	4.79	0.00	0.02	99.17	
T610	70	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope ??	38.70	0.20	19.65	3.80	6.69	0.31	11.29	4.92	0.00	0.00	85.56	low total
T627	125	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.37	0.13	20.64	3.96	7.88	0.46	20.59	5.22	0.04	0.00	100.30	
T610	63	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.16	0.19	20.72	3.96	6.51	0.33	21.86	4.86	0.02	0.00	100.59	
T627	139	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.56	0.16	20.76	3.99	8.13	0.42	20.64	4.88	0.03	0.01	99.57	
T627	111	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.73	0.10	20.83	4.00	8.33	0.49	20.78	4.75	0.02	0.00	101.02	
T611	23	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.81	0.37	19.85	4.01	6.94	0.35	21.32	4.95	0.05	0.00	98.63	
T611	11	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.57	0.23	20.04	4.04	7.60	0.38	20.51	5.09	0.02	0.01	98.48	
T611	10	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.52	0.25	19.86	4.10	7.75	0.47	20.01	5.52	0.03	0.02	98.53	
T627	124	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.59	0.16	20.46	4.13	8.23	0.33	20.67	4.99	0.03	0.01	100.60	
T627	122	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.12	0.11	20.10	4.17	8.22	0.43	19.88	5.27	0.02	0.00	99.30	
T611	1	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.20	0.27	20.21	4.24	6.43	0.30	21.76	4.74	0.04	0.01	99.21	
T610	62	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.56	0.23	20.13	4.29	7.55	0.51	20.72	4.87	0.00	0.00	99.86	
T611	14	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.17	0.27	20.03	4.30	7.00	0.31	20.86	5.09	0.00	0.00	99.02	
T610	64	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.78	0.32	20.15	4.31	7.35	0.47	20.70	5.13	0.05	0.00	100.25	
T627	53	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.16	0.29	20.50	4.34	6.20	0.30	22.19	4.82	0.03	0.00	100.82	
T610	16	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.35	0.22	20.67	4.40	7.73	0.44	21.05	4.96	0.04	0.00	101.86	
T627	147	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.28	19.77	4.41	6.93	0.31	21.22	5.27	0.03	0.01	99.51	
T611	3	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.60	0.23	19.97	4.46	7.55	0.43	19.85	5.07	0.06	0.00	98.21	
T627	138	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.88	0.14	20.23	4.46	6.76	0.33	21.57	5.07	0.05	0.01	100.50	
T611	18	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.79	0.19	19.59	4.49	8.31	0.45	19.28	5.34	0.00	0.00	98.44	
T627	8	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.65	0.09	20.35	4.59	8.25	0.37	20.27	5.50	0.00	0.01	101.08	



## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T610	17	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.92	0.16	20.28	4.63	8.00	0.43	20.08	5.49	0.02	0.00	101.02	
T627	145	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	43.67	0.24	19.76	4.67	6.79	0.34	20.95	5.14	0.03	0.00	101.58	
T611	5	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.29	0.20	19.81	4.68	7.74	0.41	19.86	5.20	0.01	0.01	99.20	
T610	40	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.53	0.10	20.28	4.68	7.96	0.41	20.01	5.50	0.00	0.00	100.46	
T610	69	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.19	0.19	19.72	4.71	8.46	0.39	19.87	5.37	0.01	0.00	99.90	
T627	9	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.83	0.23	20.08	4.74	6.62	0.32	21.49	5.20	0.01	0.03	100.55	
T627	112	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.89	0.34	19.91	4.83	7.90	0.41	20.42	5.49	0.05	0.00	100.24	
T611	8	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.63	0.65	19.19	4.84	6.71	0.31	20.60	5.42	0.06	0.00	98.41	
T610	43	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.92	0.22	20.01	4.85	6.91	0.36	21.44	5.30	0.00	0.02	101.02	
T611	25	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.82	0.23	19.19	4.86	6.68	0.32	20.79	5.31	0.03	0.01	98.23	
T627	135	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.35	0.21	19.77	4.86	7.04	0.35	21.28	5.22	0.05	0.01	100.13	
T627	142	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.10	0.38	19.85	4.87	6.31	0.32	21.84	5.16	0.03	0.00	99.87	
T610	38	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.37	0.10	20.22	4.88	7.97	0.44	19.74	5.51	0.00	0.00	100.22	
T611	22	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.65	0.19	19.41	4.88	6.94	0.29	20.74	5.19	0.01	0.02	98.33	
T627	27	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.54	0.14	20.03	4.89	7.93	0.42	20.23	5.45	0.02	0.00	100.64	
T610	68	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.11	0.18	19.81	4.89	7.71	0.37	19.97	5.35	0.01	0.02	99.43	
T627	19	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.89	0.19	20.32	4.89	6.38	0.34	22.11	4.95	0.03	0.01	101.11	
T611	22a	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.82	0.17	19.34	4.90	6.84	0.32	20.65	5.22	0.00	0.01	98.27	
T627	4	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.67	0.28	20.03	4.91	7.95	0.45	20.57	5.55	0.04	0.00	101.43	
T627	84	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.37	0.20	19.89	4.91	6.97	0.47	21.21	5.16	0.05	0.00	100.22	
T627	78	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.19	0.24	19.80	4.92	6.78	0.36	21.26	5.03	0.03	0.01	99.61	
T610	26	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.63	0.20	19.94	4.93	6.97	0.42	20.89	5.16	0.02	0.01	100.16	
T610	36	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.12	0.34	20.06	4.94	6.42	0.33	21.78	4.86	0.00	0.01	100.85	
T611	21	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.80	0.28	19.39	4.95	7.18	0.39	20.56	5.00	0.02	0.02	98.59	
T610	85	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.36	0.31	19.46	4.96	6.41	0.31	21.26	4.65	0.05	0.00	98.74	
T627	11	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.11	0.19	19.86	4.97	7.09	0.37	20.88	5.13	0.00	0.00	99.60	
T610	72	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.89	0.21	19.91	4.97	6.91	0.39	21.15	5.04	0.04	0.00	100.52	
T627	41	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.18	19.93	4.98	7.00	0.32	20.94	5.42	0.03	0.00	100.03	
T610	21	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.20	0.22	20.03	4.99	7.00	0.36	21.13	5.03	0.04	0.02	101.02	
T610	57	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.57	0.18	20.25	4.99	6.85	0.32	21.45	5.12	0.04	0.00	100.76	
T610	83	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.48	0.31	19.73	5.00	7.23	0.38	20.80	5.18	0.04	0.02	100.15	
T627	76	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.87	0.19	20.14	5.00	6.87	0.42	21.37	5.18	0.02	0.01	101.05	
T610	22	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.70	0.19	19.82	5.00	6.83	0.44	21.21	5.02	0.02	0.00	100.21	
T610	49	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.87	0.18	19.43	5.02	6.99	0.43	21.05	5.15	0.04	0.00	99.15	
T627	123	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.49	0.20	19.81	5.02	6.10	0.27	22.14	5.35	0.00	0.00	100.37	
T610	13	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.76	0.14	19.91	5.02	7.51	0.46	20.48	5.25	0.06	0.00	100.60	
T610	34	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.63	0.19	20.09	5.02	6.99	0.33	21.07	5.09	0.00	0.00	100.41	
T627	93	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.94	0.17	19.86	5.03	6.69	0.36	21.19	5.09	0.02	0.00	99.34	
T627	99	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.14	0.23	20.10	5.03	7.18	0.42	21.47	5.12	0.02	0.00	100.71	
T627	87	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.21	19.91	5.04	6.88	0.38	21.54	5.18	0.01	0.00	100.37	
T610	24	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.55	0.19	19.90	5.06	6.74	0.37	20.94	5.10	0.04	0.03	99.92	
T627	88	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.35	0.22	19.92	5.06	6.78	0.37	21.02	5.10	0.02	0.01	99.84	
T610	76	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.97	0.18	20.16	5.06	6.85	0.40	21.29	5.03	0.01	0.00	100.97	
T627	40	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.91	0.18	19.82	5.07	6.82	0.43	20.98	5.20	0.02	0.01	99.43	
T610	71	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.00	0.21	19.82	5.09	6.97	0.37	21.21	5.20	0.01	0.00	100.87	
T610	39	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.69	0.18	20.01	5.11	6.94	0.39	21.35	5.08	0.02	0.00	100.77	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T610	14	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.64	0.18	19.82	5.11	6.91	0.36	21.00	5.12	0.00	0.01	100.13	
T610	59	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.53	0.20	20.08	5.11	6.92	0.44	21.42	5.07	0.02	0.01	100.80	
T627	12	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.50	0.24	20.23	5.13	6.92	0.39	21.14	5.30	0.06	0.00	100.90	
T627	60	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.72	0.23	20.14	5.13	6.08	0.31	22.55	5.03	0.05	0.00	101.26	
T627	144	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.38	0.16	19.20	5.13	6.52	0.33	20.80	5.15	0.00	0.02	99.69	
T610	55	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.04	0.21	20.22	5.16	6.86	0.39	21.45	4.99	0.05	0.01	101.37	
T627	3	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.17	20.04	5.16	6.68	0.41	21.33	5.15	0.03	0.00	100.25	
T610	61	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.54	0.24	19.90	5.16	6.68	0.35	21.50	5.28	0.03	0.01	100.70	
T610	54	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.22	0.19	20.02	5.17	6.79	0.43	21.19	5.08	0.04	0.00	101.12	
T611	13	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.52	0.22	19.15	5.18	6.47	0.37	20.68	5.33	0.01	0.02	97.95	
T627	119	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.05	0.21	19.45	5.19	7.57	0.43	20.39	5.43	0.00	0.00	99.72	
T627	68	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.52	0.26	19.60	5.20	6.64	0.35	21.25	5.30	0.01	0.01	100.13	
T627	102	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.38	19.66	5.23	6.71	0.30	21.54	5.38	0.03	0.00	100.68	
T627	23	93MPB204	C14-05	1.0-2.0	dark	Cr-Pyrope	41.35	0.24	19.64	5.24	6.95	0.33	21.40	5.25	0.03	0.03	100.46	
T627	63	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.19	19.87	5.24	6.92	0.39	21.17	5.15	0.04	0.02	100.28	
T627	103	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.59	0.27	19.84	5.25	6.47	0.30	21.93	5.07	0.00	0.00	100.72	
T610	52	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.43	0.19	19.79	5.26	6.77	0.41	21.15	4.97	0.02	0.02	100.01	
T627	116	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.14	0.27	19.53	5.29	6.42	0.33	21.87	4.92	0.00	0.00	99.77	
T610	81	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.96	0.23	19.89	5.30	6.00	0.25	22.11	4.83	0.04	0.01	100.60	
T610	86	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.84	0.21	18.96	5.30	0.01	0.00	19.92	5.33	0.02	0.00	91.59	
T610	73	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.64	0.18	19.62	5.31	6.79	0.41	21.36	5.09	0.00	0.02	100.42	
T627	109	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.16	19.74	5.31	7.44	0.39	20.24	5.67	0.01	0.00	100.40	
T627	121	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.38	19.46	5.32	6.54	0.32	21.50	4.90	0.07	0.00	99.71	
T611	6	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.36	0.13	18.97	5.34	7.55	0.39	19.67	5.79	0.00	0.00	98.21	
T610	53	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.37	0.18	19.73	5.36	6.84	0.37	21.40	5.17	0.06	0.01	100.48	
T611	2	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.36	0.19	19.23	5.39	7.96	0.41	19.73	5.63	0.00	0.01	98.90	
T627	136	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.83	0.61	19.25	5.41	6.26	0.35	21.68	5.46	0.04	0.00	100.87	
T627	137	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.75	0.23	19.56	5.43	6.36	0.31	21.60	5.23	0.02	0.02	100.51	
T627	89	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.24	0.26	19.39	5.44	6.78	0.35	21.24	5.33	0.00	0.00	100.03	
T610	44	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.17	0.15	19.66	5.44	7.87	0.48	19.94	5.82	0.02	0.00	100.55	
T610	19	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.82	0.22	19.69	5.45	6.32	0.30	22.19	4.83	0.00	0.00	100.81	
T627	37	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.23	0.18	19.48	5.45	6.87	0.29	21.19	5.14	0.02	0.00	99.85	
T627	72	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.27	0.15	19.66	5.48	6.71	0.34	21.32	5.47	0.01	0.00	100.40	
T627	148	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.60	0.31	19.07	5.48	6.07	0.31	21.70	5.11	0.01	0.00	99.66	
T627	16	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.21	19.71	5.51	6.50	0.37	21.31	5.26	0.03	0.00	100.12	
T627	95	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.88	0.14	19.66	5.51	6.93	0.36	21.19	5.23	0.01	0.00	99.91	
T611	20	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.34	0.84	18.06	5.51	7.04	0.28	20.20	5.52	0.05	0.01	97.86	
T627	21	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.66	0.21	19.79	5.52	6.56	0.36	21.56	5.23	0.02	0.00	100.91	
T610	45	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.82	0.24	19.66	5.54	6.36	0.35	21.41	5.16	0.00	0.01	100.56	
T610	80	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.72	0.27	19.69	5.54	6.59	0.32	21.21	4.96	0.04	0.01	100.34	
T627	39	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.78	0.18	19.27	5.54	6.71	0.36	21.16	5.17	0.01	0.02	99.19	
T627	129	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.52	0.17	19.61	5.55	6.70	0.35	21.26	5.36	0.00	0.03	100.54	
T627	85	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.69	0.23	19.76	5.56	6.40	0.31	21.88	5.21	0.05	0.00	101.09	
T627	44	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.21	0.04	19.48	5.56	8.41	0.49	19.61	5.88	0.00	0.00	100.66	
T611	17	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.31	0.29	18.94	5.57	6.76	0.35	20.36	5.60	0.03	0.01	99.22	
T610	15	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.08	0.21	19.56	5.57	6.63	0.31	21.41	5.20	0.05	0.00	101.02	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T610	60	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.70	0.20	19.45	5.58	6.59	0.37	21.15	5.26	0.00	0.01	100.31	
T610	25	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.89	0.19	19.48	5.60	6.35	0.28	21.21	5.22	0.03	0.00	100.24	
T611	19	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.25	0.18	18.94	5.60	6.64	0.28	20.65	5.36	0.02	0.00	98.90	
T627	65	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.04	0.23	19.41	5.61	6.42	0.33	21.50	5.08	0.03	0.00	99.65	
T610	37	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.19	0.26	19.54	5.62	6.58	0.30	21.59	5.28	0.04	0.00	101.37	
T610	47	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.35	0.21	19.22	5.67	6.58	0.31	21.30	5.20	0.04	0.01	99.88	
T627	2	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.10	0.07	19.75	5.67	7.32	0.44	20.25	5.72	0.00	0.01	101.32	
T627	18	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.69	0.31	19.52	5.70	6.31	0.37	21.85	5.05	0.04	0.00	100.84	
T627	134	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.83	0.19	19.58	5.71	6.84	0.31	21.13	5.25	0.01	0.01	100.86	
T610	51	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.45	0.28	19.05	5.74	6.09	0.35	21.36	5.34	0.02	0.01	99.69	
T627	94	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.05	0.06	19.12	5.76	7.55	0.43	20.44	5.56	0.01	0.02	98.99	
T627	73	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.53	0.21	19.42	5.77	6.33	0.30	21.60	5.36	0.02	0.01	100.54	
T610	30	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.58	0.08	19.38	5.80	7.51	0.42	19.97	5.59	0.00	0.00	100.34	
T627	17	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.45	0.23	19.07	5.81	6.32	0.32	21.32	5.44	0.03	0.01	99.98	
T610	41	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.69	0.24	19.49	5.82	6.29	0.27	21.78	5.29	0.01	0.01	100.89	
T627	86	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.53	0.05	19.48	5.84	7.58	0.37	20.41	5.48	0.01	0.01	100.75	
T627	67	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.84	0.20	18.94	5.87	6.94	0.38	21.04	5.19	0.03	0.01	99.45	
T627	104	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.89	0.62	18.62	5.91	6.44	0.23	21.53	5.63	0.03	0.01	99.90	
T627	110	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.00	0.23	19.59	5.91	6.34	0.37	21.96	5.33	0.06	0.00	100.79	
T610	32	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.46	0.20	19.04	5.91	6.23	0.30	21.11	5.30	0.02	0.00	99.57	
T610	75	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.96	0.26	19.31	5.92	6.19	0.31	21.43	5.35	0.01	0.01	100.74	
T627	140	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	40.18	0.41	18.42	5.95	8.30	0.33	18.97	5.91	0.05	0.00	98.52	
T627	75	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.76	0.29	19.30	5.95	6.16	0.27	21.62	5.22	0.03	0.01	100.61	
T611	24	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.29	0.42	18.50	5.99	6.95	0.38	19.95	5.40	0.04	0.01	97.93	
T627	106	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.69	0.26	19.25	6.01	6.10	0.36	21.88	5.34	0.04	0.01	101.93	
T627	133	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.33	18.63	6.03	7.76	0.45	19.55	5.92	0.04	0.00	99.92	
T627	143	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.88	0.33	18.58	6.04	6.03	0.29	20.97	5.35	0.04	0.00	99.49	
T610	77	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.04	0.54	18.62	6.04	8.35	0.36	19.88	5.48	0.04	0.01	100.36	
T610	65	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.23	0.33	18.82	6.10	5.97	0.33	21.46	5.35	0.01	0.00	99.59	
T610	28	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.49	0.07	18.94	6.10	7.27	0.40	19.82	5.62	0.01	0.03	99.75	
T627	46	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.41	0.30	18.96	6.11	7.14	0.37	20.92	5.55	0.03	0.03	100.82	
T618	61	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	40.17	0.22	18.45	6.13	7.11	0.42	20.20	5.37	0.01	0.02	98.08	
T610	82	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.47	0.29	18.88	6.13	6.23	0.35	20.85	5.56	0.01	0.01	99.79	
T627	24	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.27	0.04	19.28	6.16	7.33	0.41	20.71	5.74	0.01	0.01	100.97	
T627	101	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.75	0.20	18.60	6.16	6.86	0.35	20.57	5.29	0.02	0.01	98.79	
T627	58	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.32	0.07	19.28	6.16	7.19	0.37	20.43	5.70	0.02	0.02	100.57	
T627	1	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.69	0.26	19.12	6.18	6.96	0.35	21.10	5.41	0.04	0.02	101.12	
T627	59	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.27	0.04	19.22	6.18	7.44	0.47	20.54	5.77	0.00	0.01	100.93	
T627	79	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.37	0.25	18.98	6.18	6.98	0.43	20.76	5.41	0.02	0.01	100.38	
T618	64	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	39.92	0.24	18.43	6.20	6.89	0.38	20.10	5.41	0.02	0.00	97.60	
T627	90	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.39	0.44	18.94	6.20	5.95	0.28	21.86	4.85	0.03	0.02	99.94	
T627	62	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.10	0.31	18.76	6.22	6.42	0.37	21.31	5.36	0.06	0.01	99.92	
T627	146	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.26	0.45	18.51	6.26	6.13	0.34	21.89	4.98	0.06	0.01	99.90	
T627	69	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.62	0.05	18.76	6.27	7.09	0.44	20.25	5.84	0.00	0.00	100.33	
T627	117	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.92	0.23	18.92	6.27	6.92	0.34	20.55	5.42	0.01	0.01	99.59	
T627	70	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.67	0.26	18.83	6.30	5.95	0.26	21.64	5.52	0.01	0.00	100.44	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T627	126	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.55	0.26	18.81	6.32	7.05	0.41	20.74	5.48	0.03	0.01	100.67	
T627	34	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.75	0.25	18.93	6.34	7.24	0.42	20.69	5.40	0.00	0.00	101.02	
T627	42	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.07	18.79	6.35	7.08	0.38	20.18	5.87	0.00	0.00	100.02	
T627	107	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.83	0.24	18.77	6.35	7.07	0.42	20.74	5.47	0.01	0.00	100.90	
T627	25	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.41	0.24	18.85	6.38	7.03	0.45	20.51	5.39	0.04	0.00	100.30	
T627	91	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.91	0.25	18.54	6.38	7.32	0.37	20.28	5.44	0.02	0.02	99.52	
T627	66	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	40.66	0.13	18.64	6.44	7.46	0.45	20.34	4.97	0.00	0.00	99.09	
T627	20	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.03	0.22	19.10	6.45	7.20	0.41	20.73	5.45	0.06	0.00	101.66	
T627	47	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.18	0.23	18.87	6.46	7.25	0.40	20.46	5.46	0.05	0.02	100.36	
T627	45	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.50	0.23	19.10	6.46	7.11	0.33	20.66	5.56	0.03	0.00	101.00	
T627	28	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.37	0.33	18.69	6.46	7.61	0.41	19.82	6.08	0.02	0.02	100.82	
T627	141	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.74	0.49	18.25	6.48	6.33	0.25	20.89	5.80	0.02	0.01	99.25	
T627	127	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.95	0.60	18.33	6.48	6.10	0.23	21.26	5.69	0.08	0.00	99.71	
T610	27	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.96	0.33	18.38	6.49	7.49	0.35	19.97	5.34	0.03	0.00	99.33	
T610	31	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.37	0.23	18.57	6.49	6.64	0.39	21.68	4.66	0.02	0.00	100.04	
T627	56	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	41.38	0.09	19.05	6.49	7.93	0.45	19.16	6.52	0.00	0.01	101.08	
T627	115	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.93	0.33	18.49	6.49	6.09	0.37	21.23	5.56	0.01	0.00	99.49	
T610	35	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.24	0.25	18.71	6.50	7.07	0.43	20.20	5.45	0.01	0.01	99.86	
T627	52	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.22	0.31	18.64	6.51	6.48	0.33	21.58	4.85	0.00	0.00	99.91	
T627	43	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.13	0.23	18.81	6.56	7.14	0.41	20.36	5.54	0.07	0.00	100.24	
T627	108	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.29	0.27	18.52	6.56	7.28	0.36	20.86	5.47	0.03	0.03	100.67	
T627	55	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.68	0.38	18.45	6.57	5.54	0.25	21.55	5.40	0.04	0.01	99.86	
T610	12	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.93	0.35	18.59	6.58	6.22	0.26	21.28	4.90	0.06	0.00	100.16	
T610	67	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.94	0.33	18.41	6.60	6.27	0.32	21.40	4.87	0.05	0.00	99.19	
T610	29	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.47	0.33	18.60	6.63	6.51	0.33	21.72	4.19	0.04	0.00	99.82	
T610	79	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.77	0.22	18.58	6.65	7.20	0.39	20.34	5.42	0.04	0.00	99.62	
T627	51	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.26	0.23	18.60	6.70	6.30	0.29	21.68	4.91	0.00	0.00	99.97	
T627	29	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	41.15	0.03	18.96	6.70	7.74	0.51	19.35	6.36	0.00	0.00	100.79	
T627	13	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.01	0.02	18.32	6.80	8.00	0.53	18.90	6.39	0.02	0.01	98.99	
T627	98	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	40.86	0.02	18.59	6.83	7.91	0.58	19.24	6.20	0.01	0.00	100.23	
T627	80	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.34	0.26	18.49	6.87	6.16	0.33	21.59	5.16	0.00	0.01	100.20	
T627	131	93MPB204	C14-05	0.5-1.0	purple	Cr-Pyrope	41.53	0.26	18.52	6.87	7.32	0.42	20.02	5.64	0.02	0.00	100.58	
T627	33	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.45	0.22	18.67	6.87	7.20	0.34	20.93	5.61	0.03	0.01	101.32	
T627	120	93MPB204	C14-05	0.5-1.0	dark	Cr-Pyrope	40.71	0.20	18.57	6.88	6.95	0.35	20.27	5.73	0.00	0.00	99.67	
T627	64	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.17	0.26	18.25	6.88	6.32	0.29	21.44	5.64	0.04	0.01	100.30	
T627	92	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.81	0.29	18.29	6.88	7.45	0.40	20.17	5.67	0.04	0.01	99.49	
T627	22	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.02	0.02	19.09	6.92	7.98	0.54	19.51	6.34	0.02	0.01	101.43	
T627	128	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.31	0.59	18.12	6.94	6.28	0.28	21.77	5.27	0.07	0.02	100.63	
T627	57	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.17	0.13	18.48	7.01	6.65	0.35	20.51	5.46	0.01	0.00	99.77	
T627	83	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.65	0.45	17.92	7.08	6.27	0.31	21.27	5.68	0.04	0.01	100.66	
T627	105	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	42.42	0.45	18.23	7.14	6.06	0.40	21.42	5.53	0.02	0.00	101.67	
T627	113	93MPB204	C14-05	1.0-2.0	dark	Cr-Pyrope	41.32	0.60	18.10	7.16	6.29	0.32	21.03	5.63	0.03	0.00	100.48	
T627	118	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.71	0.41	17.86	7.24	6.16	0.27	21.23	5.73	0.06	0.01	99.69	
T627	97	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.00	0.39	17.71	7.26	6.27	0.30	20.95	5.56	0.06	0.00	99.49	
T627	82	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.21	0.14	18.06	7.26	6.58	0.35	20.69	5.74	0.01	0.02	100.06	
T627	35	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.34	0.10	18.37	7.27	7.25	0.35	19.90	6.26	0.00	0.00	100.84	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T610	18	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.61	0.18	18.21	7.30	6.59	0.36	20.69	5.73	0.02	0.01	100.69	
T610	48	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.61	0.20	17.65	7.39	6.55	0.34	20.17	5.92	0.03	0.03	98.89	
T627	81	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.37	0.14	18.07	7.40	6.44	0.31	20.65	5.83	0.00	0.02	100.23	
T610	46	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.06	0.17	17.97	7.40	6.50	0.30	20.36	5.82	0.01	0.02	99.62	
T610	33	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.01	0.10	18.25	7.42	5.75	0.29	22.51	4.03	0.01	0.00	100.37	
T627	61	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.57	0.15	18.14	7.48	6.72	0.38	20.76	5.82	0.01	0.00	101.02	
T627	30	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.16	0.13	17.96	7.49	6.98	0.43	20.23	6.40	0.00	0.01	100.77	
T610	66	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.81	0.61	17.24	7.55	6.56	0.29	20.60	5.76	0.01	0.00	99.42	
T627	100	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.28	0.26	17.76	7.63	6.03	0.32	20.95	5.76	0.03	0.00	100.02	
T627	15	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	43.73	0.16	18.51	7.65	6.39	0.42	21.48	6.05	0.01	0.01	104.41	
T627	31	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.18	0.41	17.73	7.70	6.45	0.41	20.84	5.92	0.05	0.00	100.69	
T610	56	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.87	0.10	17.95	7.70	6.85	0.34	20.03	6.39	0.01	0.01	101.24	
T627	5	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.84	0.08	18.05	7.72	6.83	0.40	20.00	6.38	0.04	0.00	101.33	
T627	6	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.07	0.22	17.56	7.78	6.60	0.29	21.07	5.64	0.02	0.01	100.26	
T627	36	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.80	0.17	17.72	7.83	6.71	0.40	20.16	6.24	0.00	0.00	100.02	
T610	20	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.55	0.16	17.83	7.85	6.23	0.32	21.35	5.26	0.03	0.02	100.59	
T610	58	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.82	0.20	17.58	7.88	6.40	0.34	21.13	5.56	0.00	0.01	100.92	
T627	48	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.14	0.19	17.77	7.91	6.39	0.32	21.23	5.52	0.00	0.00	100.46	
T610	50	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.15	0.29	17.13	7.92	8.02	0.42	18.39	6.44	0.02	0.00	99.77	
T610	74	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	42.29	0.22	17.56	7.93	6.40	0.30	20.88	5.49	0.00	0.01	101.07	
T627	77	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.12	0.38	17.39	7.96	6.12	0.34	20.79	6.13	0.03	0.00	100.26	
T627	7	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.23	0.24	17.74	7.97	6.50	0.30	21.37	5.68	0.02	0.02	101.06	
T627	14	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.64	0.30	17.15	7.98	6.37	0.31	21.16	5.46	0.00	0.01	99.38	
T627	49	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.21	17.64	7.99	6.64	0.30	20.96	5.66	0.02	0.00	100.87	
T627	10	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.66	0.17	17.20	8.19	7.63	0.41	18.62	7.46	0.02	0.01	100.37	
T627	71	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.22	0.11	17.13	8.26	7.03	0.33	19.91	6.43	0.05	0.00	99.47	
T627	50	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.36	0.17	17.14	8.27	7.35	0.47	19.03	7.10	0.02	0.00	99.90	
T627	96	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.32	0.19	17.28	8.27	6.85	0.31	19.81	6.43	0.03	0.02	100.51	
T627	74	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.74	0.26	16.99	8.32	6.31	0.27	20.61	5.81	0.00	0.00	100.30	
T627	32	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.59	0.17	17.35	8.37	7.80	0.44	18.65	6.93	0.01	0.00	100.31	
T627	38	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	40.57	0.18	16.88	8.38	7.57	0.42	18.29	7.15	0.00	0.01	99.44	
T610	42	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	40.71	0.22	16.91	8.41	7.76	0.42	18.67	6.95	0.02	0.00	100.07	
T627	54	93MPB204	C14-05	1.0-2.0	purple	Cr-Pyrope	41.18	0.18	17.12	8.48	7.55	0.42	18.70	7.00	0.00	0.02	100.63	
T610	23	93MPB204	C14-05	1.0-2.0	red	Cr-Pyrope	41.16	0.33	17.02	8.55	6.29	0.34	20.66	6.14	0.01	0.01	100.50	
T607	14	93MPB205	C14-05	1.0-2.0	purple	Pyrope ?	42.99	0.00	19.38	0.00	6.49	0.30	20.05	0.00	0.06	0.00	89.27	out of range
T496	2	93MPB205	C14-05	0.5-1.0	red	Pyrope	41.12	0.89	21.58	0.08	11.67	0.41	18.89	4.62	0.06	0.00	99.32	
T496	6	93MPB205	C14-05	0.5-1.0	red	Pyrope	40.84	0.85	22.04	0.16	11.29	0.39	18.86	4.62	0.00	0.01	99.06	
T496	10	93MPB205	C14-05	0.5-1.0	red	Pyrope	40.81	0.32	22.83	0.21	11.55	0.33	18.39	4.53	0.00	0.02	98.98	
T496	4	93MPB205	C14-05	0.25-0.5	red	Pyrope	41.21	0.85	21.90	0.29	10.92	0.42	19.37	4.81	0.00	0.01	99.78	
T496	5	93MPB205	C14-05	0.5-1.0	red	Pyrope	40.79	1.01	21.51	0.52	10.42	0.38	19.29	4.80	0.00	0.01	98.74	
T496	9	93MPB205	C14-05	1.0-2.0	red	Pyrope	40.88	0.95	21.59	0.52	10.39	0.34	19.48	4.91	0.00	0.01	99.07	
T496	3	93MPB205	C14-05	1.0-2.0	red	Pyrope	41.49	0.37	22.42	1.47	8.16	0.36	20.63	4.57	0.00	0.01	99.48	
T496	7	93MPB205	C14-05	1.0-2.0	red	Pyrope	40.82	0.71	21.07	1.60	9.39	0.31	19.81	4.79	0.00	0.00	98.50	
T607	164	93MPB205	C14-05	1.0-2.0	red	Pyrope	42.35	0.24	22.54	1.75	7.76	0.40	21.48	4.53	0.06	0.00	101.10	
T607	111	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.14	0.11	22.03	2.18	8.13	0.37	21.22	4.28	0.00	0.01	100.48	
T607	128	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.63	0.39	21.98	2.20	6.87	0.31	22.09	4.12	0.08	0.00	100.67	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T607	103	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.56	0.11	22.06	2.25	8.12	0.44	21.30	4.28	0.02	0.00	101.12	
T607	200	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.75	0.26	21.41	2.31	7.91	0.34	20.78	4.62	0.05	0.01	99.43	
T607	173	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.25	0.29	21.75	2.41	7.14	0.34	21.65	4.57	0.04	0.00	100.43	
T607	196	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.95	0.26	21.97	2.41	8.09	0.42	20.84	4.46	0.03	0.00	100.43	
T607	157	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.60	0.17	22.12	2.41	6.58	0.35	22.46	4.39	0.01	0.01	101.11	
T607	178	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.43	0.19	22.08	2.41	7.68	0.41	21.38	4.54	0.01	0.00	101.12	
T607	159	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.39	0.14	22.10	2.43	7.68	0.41	21.92	4.32	0.02	0.02	101.43	
T607	120	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.38	0.15	22.10	2.45	7.72	0.41	21.39	4.29	0.03	0.00	100.94	
T607	134	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.37	0.18	21.93	2.49	7.59	0.40	21.28	4.44	0.05	0.00	100.74	
T607	105	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.24	0.32	21.87	2.50	8.24	0.40	20.78	4.46	0.00	0.00	100.79	
T607	138	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.62	0.19	21.52	2.52	8.92	0.39	20.64	4.56	0.02	0.00	100.37	
T607	186	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.36	0.16	22.05	2.57	7.86	0.38	21.68	4.37	0.03	0.00	101.46	
T607	102	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.33	0.17	21.79	2.62	8.42	0.40	20.60	4.63	0.04	0.01	101.01	
T607	143	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.68	0.22	21.64	2.64	7.78	0.40	21.04	4.81	0.01	0.01	100.23	
T607	132	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.51	0.11	22.15	2.64	7.60	0.37	21.37	4.38	0.02	0.00	101.15	
T607	121	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.14	0.49	21.41	2.70	7.18	0.35	22.02	4.51	0.03	0.00	100.83	
T607	141	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.08	0.17	21.41	2.73	8.08	0.44	21.16	4.73	0.03	0.00	100.82	
T607	140	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.98	0.20	21.44	2.79	7.55	0.38	20.98	4.71	0.00	0.00	100.03	
T607	187	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.10	0.38	21.31	2.79	8.59	0.36	20.43	5.01	0.05	0.00	101.03	
T607	195	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.11	0.25	21.62	2.81	6.39	0.29	22.97	4.01	0.04	0.02	100.51	
T607	153	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.64	0.34	21.66	2.82	7.92	0.38	21.00	4.94	0.02	0.02	101.73	
T607	201	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.55	0.21	21.19	2.83	7.46	0.40	21.49	4.59	0.02	0.01	99.74	
T607	127	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.16	0.21	21.77	2.84	7.25	0.42	21.82	4.66	0.04	0.02	101.18	
T607	135	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.41	0.58	21.38	2.85	7.27	0.35	21.77	4.62	0.05	0.02	101.29	
T607	151	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.32	0.20	21.68	2.93	7.55	0.33	21.06	4.73	0.04	0.01	100.84	
T607	152	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.06	0.17	21.38	2.93	8.58	0.39	20.56	4.74	0.00	0.00	100.81	
T607	150	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.01	0.29	21.18	2.96	7.32	0.37	22.03	4.67	0.02	0.02	100.86	
T607	199	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.05	0.28	21.26	2.97	7.04	0.30	21.65	4.65	0.01	0.01	100.22	
T607	161	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.35	0.32	21.36	2.99	7.21	0.31	21.71	4.70	0.03	0.04	100.99	
T607	180	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.52	0.16	21.73	3.08	7.45	0.44	21.37	4.92	0.00	0.00	101.66	
T607	118	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.61	0.26	21.13	3.13	7.24	0.30	21.85	4.53	0.02	0.01	100.07	
T607	104	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.18	0.13	21.38	3.15	8.20	0.39	20.74	4.78	0.02	0.00	100.97	
T607	175	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.75	0.43	20.90	3.17	7.17	0.32	21.37	4.61	0.03	0.00	99.75	
T607	130	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.69	0.25	21.51	3.17	7.83	0.32	21.16	4.60	0.02	0.00	101.55	
T607	193	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.86	0.19	21.46	3.17	7.36	0.38	21.17	4.83	0.00	0.00	100.43	
T607	163	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.67	0.39	20.81	3.20	7.29	0.33	21.32	4.77	0.00	0.02	99.79	
T607	145	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.33	0.09	20.92	3.23	8.50	0.43	20.34	5.06	0.00	0.00	99.89	
T607	177	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.46	0.29	21.02	3.34	6.94	0.38	21.68	4.76	0.00	0.00	100.86	
T607	169	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.80	0.11	21.31	3.37	8.27	0.45	20.14	5.02	0.01	0.00	100.48	
T607	148	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.88	0.40	21.01	3.42	8.26	0.38	20.44	4.89	0.03	0.01	100.72	
T607	142	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.86	0.27	20.92	3.51	7.09	0.37	21.46	4.89	0.01	0.00	100.38	
T607	155	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.77	0.50	21.00	3.56	7.14	0.30	21.82	4.82	0.05	0.00	101.95	
T607	126	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.38	0.55	20.74	3.56	6.39	0.32	22.01	4.76	0.09	0.00	100.79	
T607	198	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.98	0.27	20.63	3.62	6.59	0.29	21.82	4.94	0.03	0.00	100.15	
T607	113	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.94	0.33	20.91	3.63	7.90	0.39	20.88	4.85	0.06	0.00	100.88	
T607	124	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.43	0.40	21.05	3.63	6.72	0.30	22.02	4.78	0.02	0.02	101.36	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T607	181	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.28	0.34	20.99	3.64	6.99	0.27	21.83	4.66	0.01	0.02	101.03	
T607	3	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.14	0.29	20.70	3.67	6.74	0.31	21.52	4.76	0.01	0.01	100.14	
T607	117	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.69	0.59	20.30	3.71	7.17	0.35	21.28	4.76	0.05	0.00	99.92	
T607	80	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.41	0.19	21.16	3.74	7.48	0.40	20.86	5.07	0.01	0.01	101.33	
T496	1	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	40.81	0.90	19.86	3.74	8.73	0.28	20.02	4.75	0.00	0.00	99.09	
T607	168	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.22	0.68	20.39	3.75	6.38	0.30	22.08	5.04	0.02	0.00	100.87	
T607	25	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.41	0.11	20.94	3.78	8.16	0.42	20.16	5.18	0.00	0.02	100.19	
T607	115	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.81	0.53	20.20	3.83	6.86	0.30	21.71	5.08	0.01	0.02	100.33	
T607	108	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.09	0.65	20.39	3.84	6.30	0.29	22.15	4.96	0.03	0.03	100.73	
T607	112	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.48	0.35	20.36	3.85	7.00	0.26	21.49	4.93	0.01	0.00	99.72	
T607	131	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.16	0.18	20.70	3.85	8.44	0.41	20.30	4.97	0.04	0.03	101.09	
T607	171	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.59	0.33	20.78	3.85	7.19	0.36	21.72	4.71	0.05	0.00	101.58	
T607	139	93MPB205	C14-05	0.25-0.5	red	Cr-Pyrope	41.83	0.20	20.62	3.88	8.20	0.47	20.07	5.03	0.04	0.00	100.34	
T607	166	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.94	0.29	20.65	3.89	6.54	0.31	21.69	4.84	0.04	0.01	100.21	
T607	147	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.94	0.26	20.69	3.90	7.02	0.38	21.77	4.97	0.00	0.02	100.95	
T607	133	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.12	0.65	20.51	3.91	7.10	0.22	21.41	4.94	0.06	0.01	100.94	
T607	197	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.19	0.32	20.59	3.99	6.89	0.34	21.34	4.86	0.04	0.01	100.55	
T607	154	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.15	0.36	20.41	4.00	6.37	0.27	21.98	4.96	0.05	0.01	100.55	
T607	122	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.20	0.29	20.64	4.04	6.60	0.32	21.87	4.73	0.02	0.01	100.71	
T607	158	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.51	0.24	20.69	4.08	6.95	0.28	21.68	4.88	0.03	0.00	101.32	
T607	189	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.37	0.57	20.60	4.13	6.46	0.35	21.89	4.86	0.00	0.02	101.25	
T607	144	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.12	0.25	20.43	4.13	6.85	0.39	21.45	4.82	0.00	0.00	100.45	
T607	182	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.26	0.34	20.33	4.13	6.96	0.38	21.51	5.11	0.02	0.01	101.05	
T607	52	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.51	0.17	20.46	4.19	7.24	0.37	20.80	5.21	0.02	0.02	99.99	
T607	176	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.53	0.28	20.18	4.27	8.48	0.50	20.12	5.22	0.07	0.01	100.66	
T607	137	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.96	0.31	20.23	4.28	6.09	0.32	22.00	4.81	0.04	0.00	100.03	
T607	165	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.75	0.55	20.26	4.30	6.63	0.31	21.35	5.07	0.05	0.00	101.27	
T607	149	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.62	0.41	20.59	4.31	6.48	0.35	21.71	4.91	0.04	0.00	101.41	
T607	77	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	42.61	0.26	20.77	4.33	7.17	0.39	21.16	5.05	0.02	0.00	101.77	
T607	107	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.64	0.37	20.39	4.36	6.52	0.35	21.88	4.83	0.06	0.02	101.42	
T607	125	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.58	0.94	19.87	4.37	6.97	0.35	21.51	5.35	0.08	0.02	102.02	
T607	192	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.05	0.29	20.56	4.37	6.77	0.45	21.67	4.86	0.05	0.01	101.08	
T607	194	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.28	0.60	20.07	4.40	6.84	0.33	21.49	4.99	0.05	0.01	101.05	
T607	76	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.29	0.18	20.56	4.40	6.57	0.38	21.42	5.13	0.02	0.01	100.95	
T607	114	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.52	0.33	20.13	4.41	7.00	0.37	21.10	4.99	0.02	0.01	99.86	
T607	79	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.97	0.23	20.48	4.43	8.00	0.42	20.14	5.36	0.03	0.00	101.05	
T607	74	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.15	0.21	20.66	4.47	7.04	0.38	21.30	5.00	0.04	0.02	101.27	
T607	6	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.78	0.42	20.20	4.55	7.19	0.40	20.92	5.07	0.03	0.02	100.58	
T607	71	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.75	0.15	20.25	4.57	7.68	0.36	20.87	5.29	0.00	0.00	100.90	
T607	123	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.39	0.71	19.63	4.60	7.02	0.33	21.22	5.14	0.03	0.00	101.06	
T607	50	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.78	0.21	20.19	4.61	5.99	0.27	22.22	4.91	0.01	0.00	100.19	
T607	27	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.35	0.23	20.35	4.62	6.83	0.34	21.51	5.09	0.00	0.00	101.31	
T607	129	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.63	0.42	20.06	4.64	7.07	0.40	20.89	5.15	0.06	0.00	101.31	
T607	94	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	42.45	0.18	20.15	4.64	6.02	0.27	21.88	4.90	0.00	0.02	100.51	
T607	191	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.18	0.20	20.54	4.65	7.53	0.47	20.81	4.95	0.04	0.00	101.36	
T607	106	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.38	0.36	20.35	4.69	7.06	0.47	21.15	5.13	0.05	0.00	101.64	

## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T607	68	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.25	0.29	20.18	4.70	7.28	0.32	21.35	5.08	0.10	0.02	101.56	
T607	5	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.42	0.18	20.28	4.70	8.13	0.51	20.18	5.10	0.03	0.00	101.52	
T607	13	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	42.03	0.21	20.38	4.74	5.97	0.33	22.05	4.90	0.01	0.02	100.65	
T607	70	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.43	0.31	20.07	4.75	6.33	0.23	21.90	5.16	0.02	0.01	101.21	
T607	75	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.14	0.16	20.26	4.78	6.44	0.30	21.47	5.04	0.02	0.01	100.62	
T607	160	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.73	0.33	19.83	4.78	7.59	0.38	20.66	5.34	0.04	0.00	100.68	
T607	110	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.88	0.66	19.64	4.80	7.08	0.30	20.75	5.32	0.03	0.01	100.46	
T607	116	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.88	0.36	19.33	4.81	6.93	0.27	20.80	5.39	0.00	0.01	99.78	
T607	36	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.92	0.35	20.10	4.85	6.08	0.29	22.20	4.95	0.00	0.00	100.73	
T607	9	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.41	0.28	20.11	4.91	6.29	0.33	21.78	4.87	0.03	0.01	101.01	
T607	170	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.92	0.25	19.84	4.92	8.03	0.46	19.44	5.43	0.05	0.01	100.35	
T607	65	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.21	19.74	4.97	8.34	0.47	19.70	5.79	0.01	0.01	100.70	
T607	32	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.10	0.39	19.71	4.97	7.12	0.28	21.06	5.48	0.00	0.00	101.12	
T607	56	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.33	0.29	19.94	5.00	6.77	0.33	21.61	5.27	0.04	0.01	101.58	
T607	40	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.23	0.20	20.18	5.02	5.70	0.34	21.69	5.05	0.00	0.01	100.41	
T607	109	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.28	0.46	19.89	5.03	6.37	0.21	21.82	4.99	0.05	0.00	101.10	
T607	58	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.83	0.30	19.64	5.14	6.20	0.28	21.72	5.05	0.00	0.00	100.16	
T607	119	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.02	0.16	19.69	5.19	8.32	0.45	19.05	6.00	0.06	0.01	100.94	
T607	185	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.87	0.26	19.88	5.23	6.79	0.37	21.35	5.31	0.03	0.00	101.09	
T607	66	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.17	0.38	19.47	5.24	6.04	0.29	21.49	5.13	0.06	0.00	100.28	
T607	38	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.05	0.10	19.40	5.29	8.19	0.50	19.38	5.47	0.01	0.01	99.41	
T607	20	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.99	0.30	19.76	5.31	6.53	0.37	21.39	5.10	0.05	0.00	100.78	
T607	82	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.13	0.25	19.73	5.31	6.38	0.36	20.89	5.55	0.02	0.00	100.61	
T607	172	93MPB205	C14-05	0.25-0.5	red	Cr-Pyrope	41.79	0.33	19.39	5.36	7.70	0.43	19.84	5.45	0.02	0.02	100.31	
T607	92	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.83	0.18	19.19	5.40	6.54	0.33	20.67	5.44	0.00	0.00	99.59	
T607	85	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.84	0.11	19.53	5.44	6.30	0.30	21.39	5.36	0.03	0.00	100.29	
T607	167	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.68	0.22	19.40	5.51	7.00	0.33	21.00	5.16	0.03	0.01	100.33	
T607	46	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.12	0.44	19.58	5.62	6.42	0.33	21.41	5.26	0.05	0.02	101.24	
T607	49	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.81	0.29	19.26	5.64	6.78	0.34	21.04	5.44	0.03	0.01	100.62	
T607	83	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.13	0.22	19.49	5.64	6.18	0.28	21.58	5.08	0.00	0.00	100.59	
T607	190	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.63	0.17	19.64	5.66	6.92	0.45	20.93	5.44	0.01	0.01	101.84	
T607	11	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.98	0.23	19.06	5.68	6.82	0.37	20.34	5.36	0.04	0.00	99.89	
T607	162	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	42.13	0.71	18.78	5.69	6.37	0.35	21.25	5.62	0.03	0.00	100.93	
T607	73	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.90	0.29	19.42	5.70	7.13	0.37	21.13	5.21	0.00	0.01	101.16	
T607	44	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.75	0.24	19.36	5.70	5.98	0.28	21.66	5.25	0.00	0.01	100.22	
T607	184	93MPB205	C14-05	0.25-0.5	red	Cr-Pyrope	42.13	1.00	18.28	5.71	6.55	0.26	20.78	5.90	0.04	0.01	100.66	
T607	188	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	42.79	0.54	19.15	5.72	6.60	0.36	21.16	5.52	0.02	0.00	101.87	
T607	55	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.81	0.20	19.51	5.73	7.02	0.34	20.96	5.29	0.01	0.02	100.89	
T607	179	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.80	0.56	19.02	5.77	6.43	0.39	21.17	5.58	0.02	0.00	100.73	
T607	2	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	42.07	0.62	18.95	5.78	6.38	0.34	21.15	5.53	0.01	0.02	100.84	
T607	22	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.86	0.17	19.44	5.78	6.66	0.43	20.71	5.31	0.03	0.01	100.39	
T607	30	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.45	0.05	19.57	5.80	7.12	0.49	20.90	4.82	0.01	0.00	100.21	
T607	57	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.54	0.18	19.42	5.82	7.53	0.46	19.81	5.40	0.00	0.02	100.16	
T607	45	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.61	0.25	19.54	5.82	6.09	0.27	21.74	5.41	0.01	0.01	101.75	
T607	97	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.94	0.40	19.16	5.83	6.12	0.30	21.55	5.28	0.00	0.00	100.58	
T607	96	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.98	0.22	19.48	5.84	6.89	0.43	20.94	5.32	0.00	0.02	101.11	



## APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T607	37	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.27	0.21	19.30	5.84	7.06	0.34	20.82	5.29	0.02	0.01	100.15	
T607	69	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.79	0.16	19.33	5.85	6.93	0.36	21.01	5.31	0.00	0.01	100.75	
T607	84	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.97	0.27	19.23	5.88	6.15	0.36	21.19	5.27	0.01	0.03	100.36	
T607	15	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.89	0.21	19.17	5.90	7.11	0.44	20.37	5.35	0.03	0.00	100.46	
T607	54	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.97	0.20	19.28	5.92	6.76	0.35	20.67	5.50	0.00	0.04	100.69	
T607	67	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.76	0.05	19.16	5.95	7.98	0.50	19.75	5.67	0.01	0.02	100.84	
T607	41	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.85	0.25	19.25	5.98	6.30	0.34	21.23	5.34	0.00	0.00	100.53	
T607	86	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.61	0.25	19.11	5.99	5.87	0.34	21.43	5.40	0.01	0.02	101.04	
T607	87	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.93	0.20	18.76	5.99	6.81	0.33	20.43	5.68	0.00	0.01	100.14	
T607	43	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.11	0.25	19.02	6.02	5.90	0.25	21.50	5.33	0.00	0.01	100.39	
T607	91	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.52	0.40	18.63	6.04	6.79	0.26	20.95	5.49	0.04	0.03	100.14	
T607	78	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.14	0.36	19.00	6.07	6.33	0.30	21.30	5.46	0.04	0.00	101.00	
T607	53	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.77	0.11	19.19	6.12	7.90	0.52	19.43	5.81	0.00	0.01	100.87	
T607	47	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.42	0.23	19.14	6.13	8.05	0.37	19.66	5.61	0.01	0.00	100.61	
T607	33	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.69	0.19	19.25	6.13	6.43	0.35	21.53	5.08	0.01	0.00	100.65	
T607	90	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.97	0.44	18.98	6.13	6.27	0.39	21.25	5.43	0.03	0.00	100.89	
T607	64	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.12	0.09	19.10	6.19	7.57	0.33	19.92	5.56	0.01	0.00	99.86	
T607	156	93MPB205	C14-05	0.25-0.5	red	Cr-Pyrope	41.94	0.69	18.76	6.20	6.35	0.31	21.24	5.68	0.09	0.00	101.25	
T607	17	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.91	0.22	18.91	6.24	6.00	0.36	21.30	5.43	0.04	0.00	100.40	
T607	93	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.92	0.22	19.03	6.25	5.97	0.27	21.62	5.54	0.03	0.00	100.85	
T607	29	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope ?	37.00	0.12	17.28	6.26	4.54	0.21	18.04	4.83	1.46	2.77	92.51	Kelyphite '
T607	21	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.72	0.69	18.70	6.33	6.35	0.35	21.08	5.73	0.05	0.02	101.01	
T607	23	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.32	0.36	18.65	6.43	6.78	0.38	20.78	5.61	0.03	0.01	100.34	
T607	8	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.07	0.08	18.81	6.44	7.68	0.44	19.42	5.91	0.02	0.00	99.87	
T607	26	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.93	0.26	18.66	6.52	7.09	0.31	20.76	5.55	0.00	0.01	101.09	
T607	12	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	40.92	0.43	18.53	6.55	7.11	0.43	19.99	5.68	0.05	0.00	99.69	
T607	4	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.54	0.22	18.47	6.57	7.28	0.36	20.08	5.70	0.00	0.01	100.22	
T607	48	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.53	0.22	18.87	6.59	5.86	0.35	21.91	5.46	0.00	0.01	101.80	
T607	10	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.67	0.25	18.52	6.61	6.86	0.27	20.69	5.44	0.02	0.01	100.33	
T607	81	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.46	0.07	18.74	6.72	7.28	0.41	19.89	5.92	0.00	0.00	100.49	
T607	7	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.53	0.08	18.66	6.72	8.07	0.45	19.26	6.12	0.00	0.00	100.89	
T607	98	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.53	0.15	18.74	6.78	7.52	0.50	20.00	5.91	0.00	0.00	101.14	
T607	146	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	41.51	0.20	18.32	6.78	5.91	0.27	21.10	5.59	0.04	0.01	99.72	
T607	28	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.63	0.19	18.35	6.90	7.58	0.45	19.73	5.59	0.02	0.01	100.45	
T607	35	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.41	0.47	17.87	7.12	5.97	0.30	20.67	6.14	0.00	0.01	99.96	
T607	16	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	40.97	0.39	17.47	7.28	6.33	0.37	20.59	5.74	0.04	0.00	99.18	
T607	24	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.22	0.16	18.36	7.29	6.57	0.29	20.64	5.76	0.01	0.01	101.30	
T607	51	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.57	0.17	18.02	7.34	7.31	0.40	18.86	6.49	0.00	0.01	100.16	
T607	174	93MPB205	C14-05	1.0-2.0	red	Cr-Pyrope	41.92	0.63	17.70	7.37	6.73	0.36	20.74	6.03	0.02	0.01	101.51	
T607	62	93MPB205	C14-05	0.5-1.0	purple	Cr-Pyrope	41.07	0.37	17.73	7.39	6.36	0.32	20.67	5.54	0.01	0.02	99.47	
T607	59	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.45	0.43	17.61	7.40	6.49	0.33	20.56	5.76	0.06	0.00	100.09	
T607	61	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.24	0.30	17.52	7.40	6.32	0.42	20.47	5.78	0.01	0.01	99.46	
T607	34	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.64	0.12	18.10	7.43	6.55	0.34	21.04	5.17	0.00	0.02	100.40	
T607	63	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.10	0.19	17.86	7.45	7.14	0.45	19.16	6.59	0.02	0.02	99.99	
T607	18	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	40.49	0.39	17.48	7.57	6.57	0.40	20.42	5.92	0.00	0.01	99.24	
T607	60	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.49	0.69	17.37	7.63	5.88	0.38	20.99	5.74	0.04	0.00	100.21	

APPENDIX C.2: Microprobe data for pyrope garnet

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T607	100	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.50	0.39	17.71	7.63	6.34	0.31	20.61	5.66	0.02	0.01	100.17	
T607	19	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.06	0.75	17.13	7.69	6.39	0.35	21.03	5.57	0.05	0.01	100.02	
T607	99	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.56	0.32	17.88	7.73	7.41	0.48	19.75	5.95	0.03	0.00	101.10	
T607	72	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.65	0.16	17.74	7.74	7.85	0.38	19.56	5.90	0.00	0.00	100.97	
T607	101	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	42.19	0.72	17.56	7.75	6.18	0.32	21.50	5.89	0.08	0.01	102.20	
T607	42	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.36	0.50	16.93	8.04	6.00	0.35	20.73	5.84	0.01	0.00	99.77	
T607	88	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.39	0.22	17.14	8.21	6.69	0.35	20.38	5.60	0.00	0.00	99.98	
T607	89	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.11	0.39	16.88	8.47	7.25	0.42	19.34	6.21	0.06	0.00	100.13	
T607	31	93MPB205	C14-05	1.0-2.0	purple	Cr-Pyrope	41.30	0.58	16.59	8.82	6.20	0.30	20.53	5.87	0.05	0.00	100.24	
T607	183	93MPB205	C14-05	0.5-1.0	red	Cr-Pyrope	40.35	1.16	15.17	9.47	7.39	0.33	19.44	6.48	0.08	0.00	99.87	

### **Appendix C.3 Microprobe data for andradites**

## APPENDIX C.3 Microprobe data for andradites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T453	6	93MPB001	C14-01	0.25-0.5	pale green	Andrad./Serp.	39.35	0.09	1.38	1.40	7.42	0.13	33.70	10.23	0.00	0.01	93.71	altered
T453	7	93MPB001	C14-01	0.5-1.0	pale green	Cr-Andradite	33.88	1.34	1.05	2.31	23.71	0.03	0.26	33.43	0.01	0.01	96.01	altered
T453	8	93MPB001	C14-01	0.5-1.0	pale green	Cr-Andradite	33.93	0.54	0.97	2.32	23.86	0.03	1.74	32.92	0.00	0.00	96.30	altered
T453	9	93MPB001	C14-01	0.5-1.0	pale green	Cr-Andradite	33.05	0.52	1.05	4.61	21.61	0.08	0.81	32.54	0.00	0.01	94.28	altered
T453	24	93MPB002	C14-02	0.5-1.0	pale green	Andradite	34.16	0.08	0.80	0.69	25.27	0.05	1.64	31.61	0.00	0.02	94.31	altered
T453	48	93MPB003	C14-02	0.25-0.5	pale green	Cr-Andradite	32.77	0.49	1.36	0.54	25.00	0.03	0.10	33.78	0.01	0.00	94.09	
T453	52	93MPB003	C14-02	0.5-1.0	pale yellow	Andradite	33.49	0.06	0.94	0.68	25.86	0.06	0.09	33.65	0.01	0.00	94.83	altered
T453	50	93MPB003	C14-02	1.0-2.0	pale green	Andradite	33.85	0.17	0.71	1.01	26.05	0.04	0.08	33.69	0.02	0.01	95.64	
T453	45	93MPB003	C14-02	0.5-1.0	pale green	Andradite	34.26	0.17	1.23	1.75	24.01	0.01	1.86	31.92	0.00	0.00	95.20	
T453	55	93MPB003	C14-02	0.25-0.5	pale yellow	Andradite	34.98	0.07	1.19	1.82	23.40	0.07	3.38	30.94	0.01	0.00	95.86	
T453	46	93MPB003	C14-02	0.5-1.0	pale green	Cr-Andradite	33.86	0.12	1.02	2.42	23.77	0.04	1.41	32.50	0.02	0.01	95.16	altered
T453	56	93MPB003	C14-02	0.5-1.0	pale green	Cr-Andradite	33.29	2.04	1.67	3.29	20.76	0.05	0.26	34.01	0.00	0.01	95.37	
T453	51	93MPB003	C14-02	0.25-0.5	pale green	Cr-Andradite	33.97	0.85	0.90	5.06	20.71	0.10	0.43	33.09	0.00	0.00	95.11	
T453	42	93MPB003	C14-02	0.25-0.5	pale green	Cr-Andradite	33.86	0.52	1.20	5.93	17.71	0.05	2.99	30.52	0.00	0.00	92.78	altered
T453	79	93MPB004	C14-02	0.25-0.5	pale green	Andradite	36.20	0.55	6.01	0.85	19.62	0.04	0.12	34.49	0.00	0.02	97.89	
T453	76	93MPB004	C14-02	0.25-0.5	pale green	Andradite	33.84	0.04	1.79	1.08	24.67	0.00	0.12	33.75	0.01	0.00	95.30	
T453	72	93MPB004	C14-02	0.25-0.5	pale green	Andradite	34.63	0.09	1.89	1.36	23.44	0.02	1.07	32.89	0.00	0.00	95.39	altered
T453	73	93MPB004	C14-02	0.5-1.0	pale green	Andradite	34.71	0.11	0.78	1.54	25.13	0.02	1.13	32.34	0.00	0.00	95.75	
T453	74	93MPB004	C14-02	0.5-1.0	pale green	Cr-Andradite	33.75	0.80	1.22	3.11	21.85	0.00	2.36	32.30	0.01	0.01	95.41	altered
T454	6	93MPB005	C14-02	0.25-0.5	green	Cr-Andradite	34.03	0.18	1.00	2.57	23.99	0.05	0.11	33.36	0.00	0.00	95.29	
T454	9	93MPB005	C14-02	0.5-1.0	green	Cr-Andradite	34.15	0.26	1.41	4.04	20.01	0.09	2.82	29.76	0.00	0.03	92.57	altered
T454	25	93MPB006	C14-02	0.5-1.0	green	Cr-Andradite	34.64	0.55	1.45	2.08	20.82	0.03	4.86	28.74	0.00	0.00	93.16	altered
T454	26	93MPB006	C14-02	0.5-1.0	green	Cr-Andradite	34.18	0.44	1.89	2.25	20.15	0.06	8.52	26.38	0.05	0.01	93.92	altered
T454	27	93MPB006	C14-02	0.5-1.0	green	Cr-Andradite	33.18	0.73	1.22	5.62	19.73	0.07	0.18	33.42	0.03	0.00	94.16	
T454	46	93MPB007	C14-02	0.25-0.5	pale yellow	Andradite	34.55	0.08	0.53	1.59	25.57	0.00	0.15	33.16	0.00	0.01	95.62	altered
T454	45	93MPB007	C14-02	0.25-0.5	pale green	Cr-Andradite	34.19	0.10	0.75	2.76	24.00	0.00	0.79	32.69	0.00	0.01	95.28	altered
T454	47	93MPB007	C14-02	0.5-1.0	green	Cr-Andradite	34.21	0.72	1.31	2.97	22.46	0.04	0.23	33.58	0.00	0.01	95.54	
T454	44	93MPB007	C14-02	0.5-1.0	green	Cr-Andradite	34.27	0.62	2.21	6.21	16.27	0.05	7.29	28.21	0.00	0.01	95.11	altered
T454	43	93MPB007	C14-02	0.25-0.5	green	Cr-Andradite	33.56	1.19	1.14	6.76	18.65	0.07	1.49	33.34	0.02	0.01	96.21	altered
T577	7	93MPB008	C14-02	0.5-1.0	pale green	Cr-Andradite	34.32	0.27	1.09	2.55	22.27	0.04	2.70	30.29	0.01	0.00	93.53	altered
T577	6	93MPB008	C14-02	0.5-1.0	pale green	Cr-Andradite	35.97	0.34	1.22	3.38	22.95	0.10	0.14	33.96	0.00	0.02	98.07	altered
T577	8	93MPB008	C14-02	0.5-1.0	pale green	Cr-Andradite	34.08	2.55	0.76	9.28	14.55	0.09	0.76	32.82	0.02	0.03	94.94	altered
T577	91	93MPB011	C14-03	0.25-0.5	pale green	Andradite	35.18	0.18	1.38	1.53	23.31	0.06	1.49	32.23	0.00	0.00	95.35	altered
T577	93	93MPB011	C14-03	0.25-0.5	pale green	Cr-Andradite	35.13	0.73	1.07	2.40	22.02	0.05	0.60	32.92	0.04	0.00	94.95	altered
T577	92	93MPB011	C14-03	0.25-0.5	pale green	Cr-Andradite	34.73	0.61	0.97	6.92	18.81	0.04	0.68	32.88	0.00	0.01	95.65	altered
T577	90	93MPB011	C14-03	0.25-0.5	pale green	Cr-Andradite	33.46	1.76	1.19	8.33	16.88	0.01	0.25	34.06	0.00	0.00	95.94	altered
T578	11	93MPB012	C14-04	0.25-0.5	pale green	Andradite	35.87	0.17	1.19	0.34	25.93	0.01	0.12	33.94	0.00	0.00	97.57	altered
T578	5	93MPB012	C14-04	0.25-0.5	pale green	Andradite	33.87	1.65	1.21	1.29	24.57	0.01	0.13	33.61	0.00	0.00	96.34	altered
T578	3	93MPB012	C14-04	0.25-0.5	pale green	Andradite (alt.)	34.93	0.20	1.46	1.51	19.99	0.07	8.47	26.29	0.00	0.00	92.93	altered
T578	2	93MPB012	C14-04	0.5-1.0	pale green	Andradite	32.80	0.13	0.65	1.79	24.62	0.03	1.38	31.94	0.00	0.00	93.34	altered
T578	1	93MPB012	C14-04	0.5-1.0	pale green	Cr-Andradite	34.65	0.18	0.75	3.20	23.83	0.03	0.12	33.11	0.01	0.03	95.90	altered
T578	7	93MPB012	C14-04	0.5-1.0	pale green	Cr-Andradite	36.13	0.73	1.22	5.05	21.01	0.09	0.98	32.59	0.00	0.01	97.80	altered
T578	48	93MPB013	C14-04	0.5-1.0	pale green	Andradite	34.52	0.23	1.36	0.84	24.27	0.02	0.35	32.64	0.00	0.00	94.23	altered
T578	43	93MPB013	C14-04	0.25-0.5	pale green	Andradite	34.92	0.54	0.78	1.29	22.83	0.06	0.54	30.98	0.00	0.00	91.93	altered
T578	38	93MPB013	C14-04	1.0-2.0	pale green	Andradite	37.17	0.45	1.18	2.25	22.40	0.05	4.08	29.89	0.00	0.01	97.47	altered
T578	46	93MPB013	C14-04	0.5-1.0	pale green	Andradite (alt.)	35.81	0.26	1.45	2.26	18.59	0.13	17.02	15.96	0.00	0.02	91.49	altered

## APPENDIX C.3 Microprobe data for andradites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T578	45	93MPB013	C14-04	0.25-0.5	pale green	Cr-Andradite	35.76	0.49	1.61	4.05	17.29	0.05	6.53	26.29	0.00	0.01	92.08	altered
T578	36	93MPB013	C14-04	0.5-1.0	pale green	Cr-Andradite	36.09	0.68	0.92	4.10	21.27	0.05	2.52	31.79	0.00	0.00	97.41	altered
T578	42	93MPB013	C14-04	0.25-0.5	pale green	Cr-Andradite	36.15	0.65	1.35	4.30	19.58	0.07	4.38	30.17	0.04	0.00	96.68	altered
T578	39	93MPB013	C14-04	0.5-1.0	pale green	Cr-Andradite	34.65	1.70	0.77	5.53	19.43	0.04	0.27	32.97	0.00	0.00	95.36	altered
T578	41	93MPB013	C14-04	0.5-1.0	pale green	Cr-Andradite	34.33	0.68	1.06	6.18	18.42	0.11	2.32	31.12	0.00	0.00	94.22	altered
T578	35	93MPB013	C14-04	0.5-1.0	pale green	Cr-Andradite	35.10	0.20	0.88	6.20	20.40	0.10	0.16	33.46	0.00	0.00	96.50	altered
T578	40	93MPB013	C14-04	0.25-0.5	pale green	Cr-Andradite	34.48	0.45	1.38	7.83	16.23	0.05	2.46	31.09	0.00	0.01	93.97	altered
T454	70	93MPB019	C14-05	0.5-1.0	green	Cr-Andradite	33.83	0.31	1.12	3.13	22.96	0.05	0.32	33.43	0.00	0.02	95.17	
T454	80	93MPB020	C14-05	0.5-1.0	green	Andrad./Serp.	35.76	0.42	1.66	3.40	10.22	0.06	20.09	13.67	0.02	0.00	85.29	altered
T578	75	93MPB021	C14-05	0.25-0.5	pale green	Cr-Andradite	34.50	0.47	1.03	3.46	16.95	0.04	8.05	26.95	0.02	0.01	91.46	altered
T578	74	93MPB021	C14-05	0.25-0.5	pale green	Cr-Andradite	35.60	1.27	1.00	4.12	18.70	0.05	5.51	29.65	0.00	0.01	95.91	altered
T578	107	93MPB022	C14-05	0.25-0.5	pale green	Andradite	35.90	0.14	1.42	0.95	24.26	0.00	0.62	32.22	0.03	0.00	95.53	altered
T578	110	93MPB022	C14-05	0.5-1.0	pale green	Andradite	34.88	0.19	1.13	2.07	22.16	0.04	1.47	30.72	0.02	0.00	92.68	altered
T578	109	93MPB022	C14-05	0.5-1.0	pale green	Cr-Andradite	36.21	0.20	1.13	3.11	22.99	0.00	0.11	33.70	0.00	0.01	97.45	altered
T578	105	93MPB022	C14-05	0.25-0.5	pale green	Cr-Andradite	33.96	0.76	1.12	3.25	22.73	0.00	0.18	34.07	0.00	0.00	96.08	altered
T578	106	93MPB022	C14-05	0.5-1.0	pale green	Cr-Andradite	33.14	0.43	1.12	3.52	21.91	0.03	0.23	34.27	0.00	0.00	94.64	altered
T578	108	93MPB022	C14-05	0.25-0.5	pale green	Cr-Andradite	34.86	0.58	1.68	5.21	20.60	0.07	0.62	33.42	0.01	0.02	97.07	altered
T578	103	93MPB022	C14-05	1.0-2.0	pale green	Cr-Andradite	34.36	1.26	1.47	7.36	15.30	0.03	3.23	29.91	0.02	0.02	92.96	altered
T454	85	93MPB024	C14-06	0.5-1.0	green	Cr-Andradite	34.19	0.30	1.49	4.14	21.26	0.00	1.21	32.00	0.01	0.01	94.60	
T455	5	93MPB025	C14-06	1.0-2.0	green	Cr-Andradite	33.77	0.78	1.18	2.34	22.74	0.01	1.37	32.47	0.00	0.01	94.68	altered
T455	6	93MPB025	C14-06	0.5-1.0	green	Cr-Andradite	34.04	0.61	1.11	2.41	22.92	0.00	0.59	32.76	0.00	0.01	94.44	altered
T463	21	93MPB048	C14-08	0.5-1.0	pale green	Cr-Andradite	34.95	0.25	0.64	2.18	24.43	0.04	0.51	32.98	0.00	0.01	95.99	altered
T463	18	93MPB048	C14-08	0.5-1.0	pale green	Cr-Andr./Serp.	33.09	0.41	1.51	2.85	20.16	0.11	5.72	26.86	0.08	0.00	90.80	altered
T463	22	93MPB048	C14-08	0.25-0.5	pale green	Cr-Andradite	31.78	0.67	0.72	5.22	20.09	0.00	1.06	32.52	0.00	0.01	92.07	altered
T463	20	93MPB048	C14-08	0.5-1.0	pale green	Cr-Andradite	34.35	0.57	1.23	7.52	19.13	0.04	0.12	33.85	0.00	0.02	96.81	
T463	53	93MPB049	C14-08	0.5-1.0	pale green	Andradite	33.98	0.23	0.54	1.27	25.67	0.04	0.10	33.36	0.00	0.00	95.20	altered
T463	57	93MPB049	C14-08	0.5-1.0	pale green	Andradite	34.72	0.17	1.20	1.52	24.57	0.05	0.77	32.97	0.00	0.01	95.98	altered
T463	58	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	34.39	0.29	1.52	2.04	23.79	0.09	0.15	34.00	0.00	0.00	96.27	
T463	50	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	37.23	0.30	1.57	2.29	20.66	0.06	4.64	29.32	0.00	0.03	96.10	altered
T463	41	93MPB049	C14-08	0.25-0.5	pale green	Cr-Andradite	33.41	0.17	1.51	2.31	22.50	0.06	2.67	31.23	0.00	0.00	93.86	altered
T463	60	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	35.37	0.11	1.28	2.41	22.26	0.00	2.50	30.57	0.00	0.01	94.51	altered
T463	55	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	34.45	0.21	1.41	2.85	23.12	0.01	0.24	33.65	0.00	0.02	95.95	
T463	45	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	34.88	0.27	0.72	3.41	23.08	0.02	0.21	33.27	0.00	0.00	95.86	altered
T463	48	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andr./Serp.	36.79	0.29	1.16	3.94	17.45	0.13	10.12	27.31	0.01	0.00	97.19	altered
T463	42	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	33.72	0.51	0.61	4.05	22.43	0.06	0.67	32.93	0.00	0.03	95.02	altered
T463	54	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	34.17	1.95	1.03	4.34	20.26	0.12	1.12	33.36	0.00	0.01	96.36	altered
T463	62	93MPB049	C14-08	0.5-1.0	green	Andr./Serp.	35.31	0.39	2.39	4.41	9.32	0.07	21.76	15.13	0.04	0.00	88.81	altered
T463	61	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andr./Serp.	33.88	0.31	1.48	4.74	18.53	0.07	5.41	28.97	0.00	0.01	93.38	
T463	56	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	34.01	0.94	1.18	5.02	20.65	0.07	0.50	33.16	0.04	0.01	95.58	
T463	40	93MPB049	C14-08	0.5-1.0	pale green	Cr-Andradite	35.56	1.49	1.13	5.76	17.33	0.06	4.68	29.25	0.00	0.01	95.28	altered
T579	86	93MPB050	C14-08	0.5-1.0	pale green	Cr-Andradite	35.61	0.09	0.92	3.11	23.67	0.07	0.08	33.47	0.02	0.02	97.05	altered
T579	88	93MPB050	C14-08	0.5-1.0	pale green	Cr-Andradite	35.76	0.18	0.79	3.19	23.69	0.05	0.15	32.75	0.01	0.00	96.56	altered
T579	90	93MPB050	C14-08	0.25-0.5	pale green	Cr-Andradite	33.34	0.37	1.05	5.65	19.80	0.03	1.03	33.26	0.01	0.01	94.55	altered
T579	89	93MPB050	C14-08	0.25-0.5	pale green	Cr-Andradite	34.61	1.57	1.01	6.79	17.02	0.05	2.25	30.19	0.01	0.00	93.50	altered
T580	11	93MPB051	C14-08	0.25-0.5	pale green	Andradite	33.80	0.20	1.39	1.18	22.90	0.00	0.52	32.28	0.03	0.02	92.31	altered

APPENDIX C.3 Microprobe data for andradites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T580	9	93MPB051	C14-08	0.5-1.0	pale green	Andradite	33.26	0.41	1.82	1.54	22.74	0.25	0.53	33.62	0.00	0.01	94.18	altered
T580	7	93MPB051	C14-08	0.5-1.0	pale green	Andradite	34.78	0.38	0.99	1.56	24.26	0.09	0.13	33.57	0.00	0.00	95.75	altered
T580	8	93MPB051	C14-08	0.25-0.5	pale green	Cr-Andradite	35.69	0.08	1.19	3.32	22.52	0.07	1.46	31.64	0.00	0.00	95.95	altered
T580	10	93MPB051	C14-08	0.25-0.5	pale green	Cr-Andradite	34.74	1.22	0.82	4.03	21.40	0.01	0.31	33.41	0.00	0.00	95.93	altered
T580	6	93MPB051	C14-08	0.5-1.0	pale green	Cr-Andradite	35.55	0.28	0.96	5.69	20.93	0.02	0.47	33.51	0.00	0.00	97.41	altered

## **Appendix C.4 Microprobe data for diopsides**

## APPENDIX C.4: Microprobe data for diopsides

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T453	27	93MPB002	C14-02	0.5-1.0	green	Cr-Diopside	51.23	0.14	2.76	1.14	2.68	0.08	17.49	22.07	0.59	0.02	98.20
T453	25	93MPB002	C14-02	0.5-1.0	green	HiCr-Diopside	52.98	0.17	1.55	2.50	1.93	0.09	16.04	21.00	2.03	0.00	98.29
T453	26	93MPB002	C14-02	0.5-1.0	emerald	HiCr-Diopside	52.84	0.23	2.59	2.56	1.43	0.11	15.80	20.42	2.18	0.00	98.14
T453	57	93MPB003	C14-02	0.25-0.5	emerald	HiCr-Diopside	52.24	0.58	0.49	1.81	3.76	0.13	17.27	20.68	1.16	0.01	98.14
T453	43	93MPB003	C14-02	0.25-0.5	pale green	HiCr-Diopside	53.15	0.28	0.48	1.91	3.76	0.10	16.81	20.68	1.55	0.04	98.76
T453	44	93MPB003	C14-02	0.5-1.0	emerald	HiCr-Diopside	53.18	0.08	2.34	1.77	1.23	0.04	16.35	21.76	1.78	0.02	98.54
T453	49	93MPB003	C14-02	0.5-1.0	emerald	HiCr-Diopside	53.44	0.12	3.15	2.52	1.34	0.08	15.41	20.15	2.45	0.02	98.67
T453	47	93MPB003	C14-02	0.5-1.0	pale green	HiCr-Diopside	53.40	0.17	3.18	2.54	1.33	0.10	15.47	20.12	2.54	0.02	98.86
T453	77	93MPB004	C14-02	0.25-0.5	pale green	HiCr-Diopside	53.55	0.26	2.28	1.81	2.86	0.10	16.64	19.66	1.87	0.02	99.05
T453	78	93MPB004	C14-02	0.25-0.5	pale green	HiCr-Diopside	52.57	0.21	2.71	2.12	1.62	0.11	15.51	20.73	2.15	0.00	97.73
T453	75	93MPB004	C14-02	0.5-1.0	emerald	HiCr-Diopside	52.82	0.18	2.97	2.27	1.36	0.07	15.61	20.30	2.26	0.02	97.87
T454	8	93MPB005	C14-02	0.25-0.5	emerald	HiCr-Diopside	53.32	0.12	0.72	1.81	2.75	0.12	16.22	21.62	1.76	0.01	98.44
T454	10	93MPB005	C14-02	0.5-1.0	emerald	HiCr-Diopside	53.99	0.00	0.73	1.86	5.06	0.18	14.98	22.38	1.42	0.03	100.61
T454	7	93MPB005	C14-02	0.5-1.0	emerald	HiCr-Diopside	53.27	0.19	2.25	2.43	3.05	0.10	15.38	19.28	2.36	0.00	98.30
T577	9	93MPB008	C14-02	0.25-0.5	pale green	Cr-Diopside	54.25	0.31	0.68	1.06	5.10	0.15	18.77	19.93	0.47	0.00	100.71
T577	36	93MPB009	C14-02	0.25-0.5	pale green	Cr-Diopside	52.22	0.39	1.39	1.35	5.15	0.15	17.09	20.78	0.56	0.00	99.07
T577	67	93MPB010	C14-02	0.25-0.5	green	Cr-Diopside	53.34	0.26	1.00	1.16	4.72	0.16	18.07	20.82	0.46	0.01	99.99
T577	68	93MPB010	C14-02	0.5-1.0	green	HiCr-Diopside	53.96	0.24	3.35	1.70	2.57	0.07	15.79	19.32	2.61	0.14	99.75
T577	66	93MPB010	C14-02	0.5-1.0	green	HiCr-Diopside	53.72	0.35	1.09	2.33	2.66	0.07	17.41	20.87	1.31	0.00	99.80
T578	8	93MPB012	C14-04	0.25-0.5	green	Cr-Diopside	52.87	0.32	0.92	1.14	4.84	0.21	17.50	20.49	0.51	0.00	98.81
T578	6	93MPB012	C14-04	0.25-0.5	green	Cr-Diopside	53.08	0.29	1.12	1.23	4.89	0.20	17.64	20.87	0.56	0.01	99.88
T578	9	93MPB012	C14-04	0.25-0.5	green	Cr-Diopside	52.84	0.23	0.84	1.24	5.10	0.19	18.70	19.47	0.46	0.00	99.06
T578	44	93MPB013	C14-04	0.25-0.5	pale green	Cr-Diopside	54.25	0.06	0.91	0.73	3.63	0.19	16.81	22.97	0.50	0.02	100.05
T578	47	93MPB013	C14-04	0.25-0.5	emerald	Cr-Diopside	55.57	0.28	2.31	1.22	2.73	0.11	17.59	19.50	1.72	0.03	101.06
T578	37	93MPB013	C14-04	0.5-1.0	green	HiCr-Diopside	54.39	0.09	0.57	2.48	2.07	0.05	16.24	22.11	1.72	0.00	99.72
T454	69	93MPB019	C14-05	0.25-0.5	green	Cr-Diopside	53.06	0.06	2.01	1.32	1.89	0.08	16.67	21.84	1.53	0.03	98.49
T454	71	93MPB019	C14-05	0.25-0.5	emerald	HiCr-Diopside	52.76	0.19	3.00	2.58	1.40	0.09	15.35	19.97	2.35	0.00	97.68
T454	79	93MPB020	C14-05	0.5-1.0	green	HiCr-Diopside	53.14	0.10	0.75	2.50	2.18	0.11	16.01	21.83	1.88	0.00	98.49
T454	81	93MPB020	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.02	0.03	3.59	3.28	1.67	0.08	14.66	18.49	3.22	0.00	99.04
T578	104	93MPB022	C14-05	1.0-2.0	green	Cr-Diopside	52.90	0.36	0.88	1.17	5.38	0.16	18.40	19.42	0.46	0.01	99.15
T579	44	93MPB023	C14-05	0.25-0.5	pale green	Cr-Diopside	54.39	0.39	2.78	1.35	3.69	0.17	16.85	17.94	2.34	0.01	99.90
T579	42	93MPB023	C14-05	0.25-0.5	emerald	Cr-Diopside	55.19	0.11	1.84	1.38	2.18	0.06	17.09	21.37	1.53	0.02	100.76
T579	37	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	53.14	0.37	1.29	1.55	2.59	0.05	16.93	22.42	1.10	0.02	99.46
T579	26	93MPB023	C14-05	0.25-0.5	green	HiCr-Diopside	54.53	0.43	2.69	1.62	3.63	0.14	16.57	18.00	2.37	0.02	99.99
T579	43	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	54.89	0.16	2.21	1.74	2.83	0.07	17.43	19.37	1.88	0.02	100.58
T579	11	93MPB023	C14-05	0.25-0.5	green	HiCr-Diopside	53.86	0.23	2.08	1.83	2.56	0.09	16.93	19.68	1.83	0.02	99.10
T579	17	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	54.03	0.36	0.86	1.94	3.13	0.10	17.54	21.05	1.08	0.05	100.13
T579	41	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	54.97	0.22	2.22	2.00	2.50	0.12	16.56	19.70	2.20	0.00	100.49
T579	24	93MPB023	C14-05	0.25-0.5	pale green	HiCr-Diopside	55.10	0.23	2.21	2.09	2.56	0.12	18.58	18.28	1.83	0.05	101.03
T579	10	93MPB023	C14-05	0.25-0.5	green	HiCr-Diopside	53.50	0.22	2.26	2.10	2.25	0.10	16.38	19.52	1.97	0.01	98.31
T579	39	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	54.48	0.14	2.16	2.12	2.65	0.09	16.57	20.02	2.01	0.00	100.23
T579	34	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	53.97	0.20	1.67	2.31	2.51	0.05	16.25	19.89	2.07	0.01	98.92
T579	36	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	53.84	0.24	2.08	2.38	2.23	0.11	16.53	20.26	2.12	0.02	99.82
T579	27	93MPB023	C14-05	0.25-0.5	green	HiCr-Diopside	54.31	0.13	2.17	2.68	2.34	0.13	16.43	19.62	2.21	0.02	100.04
T579	35	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	53.82	0.23	2.26	2.87	2.63	0.13	17.46	17.32	2.17	0.04	98.93



## APPENDIX C.4: Microprobe data for diopsides

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T579	40	93MPB023	C14-05	0.25-0.5	emerald	HiCr-Diopside	54.10	0.35	2.17	3.10	2.24	0.07	16.57	18.21	2.30	0.03	99.14
T579	12	93MPB023	C14-05	0.5-1.0	emerald	Cr-Diopside	52.98	0.05	1.00	0.71	2.48	0.12	20.20	19.16	0.47	0.05	97.21
T579	12	93MPB023	C14-05	0.5-1.0	emerald	Cr-Diopside	52.98	0.05	1.00	0.71	2.48	0.12	20.20	19.16	0.47	0.05	97.21
T579	7	93MPB023	C14-05	0.5-1.0	emerald	Cr-Diopside	54.53	0.25	2.81	1.06	3.05	0.10	18.31	17.94	1.95	0.05	100.04
T579	20	93MPB023	C14-05	0.5-1.0	pale green	Cr-Diopside	55.45	0.17	1.65	1.11	2.23	0.07	18.28	21.14	1.26	0.03	101.38
T579	30	93MPB023	C14-05	0.5-1.0	emerald	Cr-Diopside	54.65	0.14	1.90	1.12	2.79	0.07	19.01	19.16	1.34	0.05	100.23
T579	22	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	55.19	0.49	2.38	1.75	2.91	0.13	18.49	17.78	1.95	0.05	101.10
T579	23	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	55.03	0.08	1.48	1.78	2.23	0.13	17.87	20.45	1.45	0.04	100.53
T579	33	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.65	0.08	1.59	1.86	2.62	0.11	18.90	19.01	1.32	0.07	100.22
T579	15	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	53.98	0.61	1.28	2.01	2.47	0.09	18.59	19.93	1.27	0.01	100.24
T579	45	93MPB023	C14-05	0.5-1.0	green	HiCr-Diopside	53.66	0.25	2.22	2.17	2.35	0.07	16.50	18.42	2.29	0.03	97.96
T579	6	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.82	0.21	1.99	2.24	2.78	0.06	16.65	19.79	2.18	0.03	100.75
T579	8	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	56.08	0.47	4.56	2.25	3.03	0.15	16.22	14.01	3.59	0.05	100.41
T579	14	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	53.96	0.27	2.35	2.29	2.53	0.05	16.44	19.03	2.15	0.02	99.09
T579	38	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.20	0.20	2.21	2.30	2.52	0.08	16.74	19.17	2.18	0.04	99.63
T579	9	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.20	0.41	2.19	2.45	2.49	0.10	17.52	17.95	2.14	0.06	99.50
T579	19	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.15	0.06	2.20	2.48	2.49	0.06	16.44	19.23	2.24	0.00	99.34
T579	28	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.78	0.18	2.03	2.56	2.11	0.07	17.11	19.56	2.01	0.04	100.44
T579	31	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.29	0.08	2.09	2.65	2.35	0.07	16.20	19.45	2.18	0.00	99.35
T579	21	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.76	0.26	3.08	3.22	1.87	0.12	15.40	17.62	3.05	0.01	99.36
T579	32	93MPB023	C14-05	0.5-1.0	emerald	HiCr-Diopside	54.51	0.38	2.68	3.32	2.63	0.12	17.23	16.31	2.78	0.09	100.03
T579	16	93MPB023	C14-05	1.0-2.0	emerald	Cr-Diopside	54.90	0.34	2.82	1.14	3.06	0.09	18.40	17.93	1.95	0.06	100.69
T579	18	93MPB023	C14-05	1.0-2.0	emerald	Cr-Diopside	54.78	0.43	2.14	1.28	2.93	0.13	18.66	18.89	1.57	0.04	100.84
T579	25	93MPB023	C14-05	1.0-2.0	emerald	HiCr-Diopside	54.64	0.35	1.83	1.68	2.90	0.12	19.21	18.02	1.51	0.02	100.27
T579	13	93MPB023	C14-05	1.0-2.0	emerald	HiCr-Diopside	54.77	0.14	1.69	2.25	2.53	0.11	16.63	19.96	1.86	0.00	99.94
T455	7	93MPB025	C14-06	0.25-0.5	green	Cr-Diopside	52.40	0.37	0.88	0.90	5.72	0.19	18.12	19.52	0.39	0.00	98.48
T455	7	93MPB025	C14-06	0.25-0.5	green	Cr-Diopside	52.40	0.37	0.88	0.90	5.72	0.19	18.12	19.52	0.39	0.00	98.48
T463	19	93MPB048	C14-08	0.25-0.5	green	HiCr-Diopside	54.64	0.15	0.48	1.74	2.27	0.07	17.17	22.21	1.45	0.02	100.20
T463	17	93MPB048	C14-08	0.25-0.5	green	HiCr-Diopside	54.21	0.09	0.36	2.14	1.86	0.04	17.28	22.63	1.43	0.01	100.05
T463	23	93MPB048	C14-08	0.25-0.5	green	HiCr-Diopside	53.54	0.09	3.45	2.78	1.54	0.10	15.07	19.43	2.84	0.01	98.85
T463	16	93MPB048	C14-08	0.5-1.0	green	HiCr-Diopside	53.76	0.22	3.00	2.53	1.59	0.06	15.73	20.67	2.42	0.00	99.96
T463	52	93MPB049	C14-08	0.5-1.0	green	Cr-Diopside	53.80	0.11	1.28	0.98	2.43	0.06	16.63	22.43	1.22	0.01	98.94
T463	52	93MPB049	C14-08	0.5-1.0	green	Cr-Diopside	53.80	0.11	1.28	0.98	2.43	0.06	16.63	22.43	1.22	0.01	98.94
T463	49	93MPB049	C14-08	0.5-1.0	green	Cr-Diopside	52.40	0.37	1.24	1.30	5.53	0.10	17.84	19.89	0.52	0.00	99.20
T463	46	93MPB049	C14-08	0.5-1.0	green	HiCr-Diopside	53.35	0.17	2.46	2.01	1.27	0.03	16.64	21.94	2.00	0.01	99.87
T463	44	93MPB049	C14-08	0.5-1.0	green	HiCr-Diopside	53.67	0.10	0.36	2.45	1.71	0.12	16.76	22.33	1.57	0.01	99.07
T463	43	93MPB049	C14-08	0.5-1.0	green	HiCr-Diopside	53.50	0.06	1.70	2.46	1.90	0.10	15.65	20.80	2.20	0.01	98.39
T463	47	93MPB049	C14-08	0.5-1.0	green	HiCr-Diopside	54.30	0.14	0.36	2.50	2.34	0.08	16.23	21.82	1.77	0.02	99.56
T463	51	93MPB049	C14-08	0.5-1.0	green	HiCr-Diopside	54.91	0.12	0.53	2.96	1.95	0.07	16.49	21.46	1.92	0.03	100.44
T579	87	93MPB050	C14-08	0.5-1.0	green	Cr-Diopside	53.83	0.31	0.85	1.08	5.50	0.15	19.83	18.42	0.46	0.00	100.43
T580	12	93MPB051	C14-08	0.5-1.0	green	Cr-Diopside	54.21	0.42	2.77	1.37	3.70	0.16	16.84	18.15	2.32	0.00	99.95
T586	16	93MPB204	C14-05	0.25-0.5	green	Cr-Diopside	56.85	0.22	1.91	1.38	3.21	0.15	19.99	18.03	1.31	0.06	103.11
T586	20	93MPB204	C14-05	0.25-0.5	green	HiCr-Diopside	55.05	0.23	2.32	2.78	2.26	0.11	16.80	18.65	2.35	0.04	100.58
T586	6	93MPB204	C14-05	0.25-0.5	green	HiCr-Diopside	55.16	0.41	2.41	3.29	2.61	0.13	16.21	17.85	2.65	0.01	100.73
T586	44	93MPB204	C14-05	0.5-1.0	green	Cr-Diopside	56.28	0.02	1.10	1.20	1.90	0.06	18.45	22.34	0.87	0.01	102.21

## APPENDIX C.4: Microprobe data for diopsides

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T586	35	93MPB204	C14-05	0.5-1.0	green	Cr-Diopside	54.88	0.27	2.01	1.42	2.73	0.14	18.63	18.60	1.44	0.04	100.16
T586	43	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.31	0.23	2.26	1.61	2.66	0.13	17.26	19.90	1.99	0.02	101.37
T586	21	93MPB204	C14-05	0.5-1.0	emerald	HiCr-Diopside	56.04	0.18	2.26	1.66	2.43	0.07	17.51	19.75	1.97	0.00	101.87
T586	10	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.11	0.26	1.95	1.71	2.33	0.08	17.27	20.33	1.65	0.01	100.71
T586	12	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.14	0.02	2.40	1.71	2.08	0.09	16.54	20.60	1.89	0.00	100.48
T586	11	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.87	0.19	2.25	1.79	2.48	0.07	16.45	19.86	2.09	0.02	100.07
T586	27	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.42	0.05	1.28	1.84	1.99	0.11	18.07	21.20	1.16	0.05	101.17
T586	18	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.04	0.14	2.03	1.95	2.30	0.07	16.78	20.24	1.80	0.00	100.35
T586	17	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.65	0.44	2.12	2.10	2.82	0.08	18.15	17.87	1.79	0.04	100.07
T586	22	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.05	0.11	1.71	2.21	2.60	0.10	18.25	18.64	1.59	0.05	100.31
T586	13	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.24	0.07	1.88	2.59	2.13	0.09	16.88	19.95	1.86	0.01	100.69
T586	36	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.72	0.10	2.09	2.60	2.15	0.10	16.50	19.81	2.07	0.00	101.14
T586	14	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.83	0.33	2.41	2.62	2.33	0.16	17.03	18.51	2.19	0.04	100.44
T586	32	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.33	0.27	2.34	2.66	2.37	0.11	16.44	18.86	2.26	0.01	99.64
T586	25	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.97	0.22	2.31	2.68	2.18	0.10	16.35	18.86	2.27	0.04	99.97
T586	24	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.89	0.23	2.37	2.70	2.24	0.13	17.02	18.62	2.35	0.03	101.58
T586	23	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	56.07	0.23	2.41	2.71	2.13	0.11	17.04	18.76	2.25	0.02	101.72
T586	28	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.83	0.23	2.43	2.73	2.34	0.11	17.00	18.74	2.30	0.04	101.73
T586	41	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.55	0.30	2.43	2.75	2.48	0.10	17.14	18.55	2.29	0.00	101.59
T586	26	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	56.93	0.26	2.52	2.77	2.31	0.10	17.28	18.45	2.38	0.01	103.00
T586	42	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.62	0.18	2.32	2.78	2.27	0.07	16.94	18.81	2.31	0.03	101.34
T586	39	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.91	0.18	2.30	2.79	2.24	0.06	17.39	18.89	2.29	0.03	102.06
T586	19	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.89	0.22	2.39	2.81	2.29	0.06	16.57	18.69	2.31	0.04	101.27
T586	37	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.00	0.29	2.39	2.81	2.29	0.04	16.60	18.61	2.29	0.01	100.32
T586	7	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.29	0.22	2.36	2.83	2.30	0.11	16.55	18.76	2.26	0.01	100.69
T586	15	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.98	0.24	2.31	2.90	2.28	0.07	16.59	18.53	2.31	0.02	101.24
T586	8	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	54.81	0.49	3.32	3.06	2.85	0.11	16.84	15.30	2.93	0.03	99.73
T586	29	93MPB204	C14-05	0.5-1.0	green	HiCr-Diopside	55.42	0.24	2.45	3.17	2.23	0.15	16.44	18.52	2.48	0.03	101.12
T586	9	93MPB204	C14-05	0.5-1.0	emerald	HiCr-Diopside	55.08	0.29	2.52	3.32	2.46	0.09	17.83	16.84	2.34	0.03	100.79
T586	40	93MPB204	C14-05	1.0-2.0	green	HiCr-Diopside	55.75	0.27	2.42	2.18	2.40	0.08	16.50	19.63	2.17	0.00	101.40
T586	38	93MPB204	C14-05	1.0-2.0	green	HiCr-Diopside	56.56	0.22	2.41	2.78	2.18	0.12	17.46	18.77	2.29	0.06	102.84
T586	33	93MPB204	C14-05	1.0-2.0	green	HiCr-Diopside	54.95	0.21	2.22	2.81	2.30	0.09	16.46	18.75	2.35	0.03	100.17
T586	31	93MPB204	C14-05	1.0-2.0	emerald	HiCr-Diopside	55.50	0.19	2.35	2.87	2.34	0.10	16.85	18.71	2.24	0.05	101.17
T496	13	93MPB205	C14-05	0.25-0.5	green	Cr-Diopside	53.63	0.06	2.05	1.19	2.65	0.06	18.13	18.59	1.39	0.06	97.81
T496	40	93MPB205	C14-05	0.25-0.5	green	Cr-Diopside	53.42	0.28	2.13	1.33	2.86	0.13	18.30	18.41	1.49	0.06	98.40
T496	42	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.95	0.25	1.93	1.54	2.71	0.13	18.42	18.64	1.40	0.06	99.03
T496	32	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.61	0.13	1.85	1.57	2.57	0.06	18.07	18.84	1.28	0.06	98.04
T496	49	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.78	0.12	1.87	1.57	2.42	0.11	16.60	20.48	1.59	0.02	98.54
T496	18	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.42	0.29	2.22	1.69	2.55	0.09	16.89	19.31	1.87	0.02	98.35
T496	24	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	52.97	0.17	2.85	1.77	2.96	0.07	16.56	18.40	2.13	0.48	98.36
T496	38	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.14	0.35	2.10	1.92	2.48	0.10	17.68	18.08	1.81	0.02	97.67
T496	44	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.66	0.34	2.05	2.00	2.55	0.15	17.77	18.14	1.81	0.07	98.53
T496	46	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.88	0.31	2.13	2.01	2.43	0.15	17.83	18.32	1.75	0.04	98.85
T496	26	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.29	0.34	2.13	2.06	2.56	0.08	17.49	18.04	1.81	0.05	97.83
T496	30	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.30	0.30	2.13	2.06	2.54	0.11	17.55	18.03	1.70	0.07	97.79

## APPENDIX C.4: Microprobe data for diopsides

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T496	14	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.18	0.33	2.01	2.10	2.34	0.11	17.35	18.10	1.81	0.05	97.37
T496	22	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.51	0.32	2.09	2.26	2.37	0.09	17.81	18.25	1.78	0.05	98.52
T496	28	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.23	0.33	2.05	2.32	2.49	0.10	17.64	18.10	1.83	0.04	98.14
T496	34	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.63	0.26	2.26	2.33	2.60	0.09	16.16	18.76	2.08	0.02	98.20
T496	16	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.10	0.20	1.93	2.36	2.13	0.10	16.50	19.83	1.84	0.03	98.01
T496	36	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.71	0.12	2.59	2.55	2.49	0.06	15.20	19.13	2.42	0.00	98.26
T496	50	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.31	0.31	2.22	2.67	3.39	0.11	15.75	18.40	2.18	0.00	98.35
T496	48	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.60	0.52	2.45	2.98	2.62	0.12	16.88	16.99	2.43	0.04	98.62
T496	20	93MPB205	C14-05	0.25-0.5	green	HiCr-Diopside	53.36	0.42	2.74	4.15	2.55	0.12	16.29	15.69	2.89	0.05	98.25
T496	29	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.06	0.22	0.76	1.02	2.79	0.07	18.18	21.26	0.57	0.01	97.93
T496	21	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.96	0.23	2.18	1.08	2.88	0.09	18.62	17.99	1.39	0.10	98.51
T496	41	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.83	0.15	0.95	1.40	2.56	0.13	18.62	20.80	0.70	0.02	99.17
T496	11	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.10	0.08	1.83	1.42	2.57	0.11	16.75	20.38	1.50	0.01	97.74
T496	35	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	52.98	0.16	2.18	1.47	2.55	0.10	16.26	19.94	1.78	0.00	97.42
T496	43	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.75	0.48	2.56	1.48	2.98	0.11	17.92	17.60	1.88	0.05	98.79
T496	31	93MPB205	C14-05	0.5-1.0	green	Cr-Diopside	53.76	0.21	1.99	1.48	2.80	0.07	18.15	18.63	1.39	0.09	98.54
T496	19	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	53.46	0.09	1.84	1.50	2.52	0.08	17.04	20.17	1.40	0.04	98.13
T496	23	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	54.46	0.06	2.29	1.58	2.29	0.11	16.81	19.59	1.80	0.02	99.01
T496	45	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	53.95	0.27	3.09	1.63	2.57	0.10	16.01	18.32	2.40	0.03	98.37
T496	17	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	54.06	0.11	1.59	1.70	2.70	0.12	18.44	18.76	1.20	0.05	98.72
T496	25	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	52.39	0.43	0.99	2.00	2.50	0.11	17.15	22.08	0.73	0.00	98.37
T496	12	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	56.17	0.12	2.00	2.15	2.21	0.15	16.27	19.42	2.01	0.01	100.50
T496	33	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	52.07	0.26	0.99	2.31	2.38	0.10	16.70	22.07	0.93	0.02	97.83
T496	27	93MPB205	C14-05	0.5-1.0	green	HiCr-Diopside	52.94	0.17	1.43	2.34	2.27	0.10	16.72	21.47	1.24	0.01	98.68

## Appendix C.4 Microprobe data for ilmenites

## APPENDIX C.5: Microprobe data for Ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T453	15	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.10	50.95	0.06	0.06	46.76	0.67	0.55	0.02	0.00	0.01	99.18
T453	14	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.32	51.71	0.07	0.03	45.22	0.73	1.03	0.00	0.00	0.00	99.11
T453	19	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.00	50.52	0.08	0.02	46.27	0.62	1.28	0.00	0.02	0.00	98.81
T453	12	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.00	51.93	0.05	0.03	44.45	0.70	1.69	0.00	0.00	0.02	98.87
T453	16	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.45	51.12	0.13	0.00	44.06	0.50	2.20	0.00	0.00	0.01	98.47
T453	11	93MPB001	C14-01	0.5-1.0	black	Ilmenite	0.02	51.85	0.14	0.11	43.77	0.62	2.72	0.01	0.02	0.02	99.28
T453	17	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.00	52.43	0.10	0.05	43.08	0.55	2.73	0.03	0.00	0.00	98.97
T453	10	93MPB001	C14-01	0.25-0.5	black	Ilmenite	0.03	51.29	0.13	0.11	43.75	0.54	2.95	0.03	0.00	0.01	98.82
T453	35	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.01	50.01	0.04	0.01	46.41	2.07	0.10	0.01	0.00	0.00	98.66
T453	31	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.08	50.77	0.04	0.05	45.69	0.66	1.01	0.00	0.00	0.01	98.30
T453	32	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.00	50.20	0.08	0.11	43.67	0.63	1.43	0.00	0.01	0.01	96.13
T453	30	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.14	50.93	0.16	0.09	45.24	0.57	2.10	0.01	0.08	0.01	99.32
T453	29	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.00	52.14	0.13	0.04	43.68	0.62	2.29	0.04	0.00	0.01	98.96
T453	34	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.01	51.82	0.12	0.03	43.35	0.55	2.93	0.03	0.00	0.01	98.84
T453	28	93MPB002	C14-02	0.25-0.5	black	Ilmenite	0.04	51.40	0.15	0.10	43.35	0.55	3.52	0.01	0.03	0.00	99.14
T453	62	93MPB003	C14-02	0.25-0.5	black	Ilmenite	0.01	51.54	0.06	0.04	45.86	0.88	0.57	0.02	0.00	0.00	98.97
T453	58	93MPB003	C14-02	0.5-1.0	black	Ilmenite	0.00	51.80	0.06	0.04	46.06	0.85	0.90	0.01	0.00	0.00	99.72
T453	65	93MPB003	C14-02	0.25-0.5	black	Ilmenite	0.00	51.86	0.02	0.05	45.43	0.77	1.22	0.01	0.00	0.01	99.37
T453	63	93MPB003	C14-02	0.25-0.5	black	Ilmenite	0.02	51.83	0.13	0.06	44.34	0.63	2.45	0.02	0.00	0.00	99.47
T453	59	93MPB003	C14-02	0.25-0.5	black	Ilmenite	0.00	52.43	0.12	0.06	43.59	0.56	2.64	0.01	0.01	0.00	99.41
T453	66	93MPB003	C14-02	0.5-1.0	black	Mg-Ilmenite	0.02	50.52	0.52	0.16	37.43	0.35	9.27	0.06	0.11	0.00	98.42
T453	80	93MPB004	C14-02	0.5-1.0	black	Ilmenite	0.01	51.38	0.06	0.02	45.95	0.89	0.54	0.03	0.00	0.01	98.87
T453	83	93MPB004	C14-02	0.5-1.0	black	Ilmenite	0.02	52.09	0.03	0.05	45.09	0.74	1.47	0.03	0.00	0.00	99.51
T453	85	93MPB004	C14-02	0.25-0.5	black	Ilmenite	0.00	51.50	0.10	0.08	44.06	0.66	2.23	0.01	0.05	0.00	98.68
T453	84	93MPB004	C14-02	0.25-0.5	black	Ilmenite	0.00	49.42	0.14	0.10	45.63	0.55	2.25	0.01	0.02	0.02	98.14
T453	88	93MPB004	C14-02	0.25-0.5	black	Ilmenite	0.00	51.77	0.10	0.05	43.90	0.65	2.27	0.02	0.00	0.01	98.76
T454	14	93MPB005	C14-02	0.25-0.5	black	Ilmenite	0.06	50.16	0.10	0.06	46.01	0.66	1.44	0.04	0.01	0.02	98.54
T454	20	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.05	52.03	0.05	0.08	44.43	0.67	1.65	0.00	0.00	0.00	98.95
T454	13	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.07	50.41	0.09	0.05	45.28	0.67	1.70	0.01	0.00	0.00	98.28
T454	19	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.05	51.06	0.10	0.06	45.08	0.59	1.72	0.02	0.02	0.01	98.72
T454	15	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.04	52.04	0.06	0.06	43.86	0.65	2.21	0.02	0.01	0.03	98.98
T454	18	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.00	51.18	0.12	0.05	44.57	0.46	2.25	0.03	0.01	0.02	98.70
T454	11	93MPB005	C14-02	0.5-1.0	black	Ilmenite	0.00	52.13	0.09	0.07	42.99	0.53	2.58	0.04	0.00	0.00	98.43
T454	16	93MPB005	C14-02	0.25-0.5	black	Ilmenite	0.04	52.11	0.13	0.06	43.45	0.52	2.86	0.01	0.03	0.00	99.22
T454	17	93MPB005	C14-02	0.5-1.0	black	Mg-Ilmenite	0.07	48.48	0.46	0.12	39.95	0.26	7.93	0.03	0.04	0.01	97.33
T454	34	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.20	50.77	0.02	0.00	45.69	0.89	0.25	0.01	0.01	0.02	97.85
T454	31	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.09	51.67	0.08	0.01	45.78	0.75	0.77	0.00	0.00	0.00	99.14
T454	37	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.14	50.09	0.08	0.01	46.81	0.84	1.14	0.00	0.00	0.00	99.10
T454	32	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.00	51.63	0.13	0.08	44.28	0.64	2.05	0.04	0.00	0.01	98.84
T454	33	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.04	50.62	0.11	0.07	44.79	0.56	2.11	0.00	0.00	0.00	98.30
T454	35	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.16	51.28	0.09	0.09	43.98	0.61	2.17	0.01	0.00	0.00	98.38
T454	30	93MPB006	C14-02	0.25-0.5	black	Ilmenite	0.12	51.64	0.12	0.06	44.09	0.49	2.31	0.02	0.02	0.00	98.87
T454	29	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.06	51.76	0.11	0.05	44.05	0.59	2.40	0.01	0.00	0.01	99.04
T454	28	93MPB006	C14-02	0.5-1.0	black	Ilmenite	0.03	52.36	0.03	0.06	43.37	0.56	2.82	0.03	0.00	0.00	99.25
T454	51	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.08	52.14	0.06	0.03	45.14	0.72	1.09	0.06	0.01	0.01	99.34

## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T454	55	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.06	51.82	0.06	0.01	44.88	0.77	1.12	0.03	0.00	0.00	98.74
T454	50	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.06	51.48	0.12	0.03	45.24	0.64	1.39	0.02	0.05	0.01	99.02
T454	54	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.05	51.52	0.06	0.06	44.54	0.73	1.50	0.01	0.01	0.01	98.51
T454	49	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.14	51.66	0.06	0.04	44.38	0.64	1.83	0.01	0.01	0.00	98.76
T454	52	93MPB007	C14-02	0.25-0.5	black	Ilmenite	0.14	50.61	0.07	0.06	43.45	0.57	2.11	0.01	0.00	0.03	97.04
T454	56	93MPB007	C14-02	0.25-0.5	black	Ilmenite	0.10	51.31	0.09	0.04	43.48	0.65	2.28	0.00	0.00	0.01	97.95
T454	53	93MPB007	C14-02	0.5-1.0	black	Ilmenite	0.02	51.68	0.13	0.08	43.91	0.58	2.32	0.02	0.00	0.01	98.75
T577	20	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	50.79	0.06	0.09	47.18	0.68	0.20	0.00	0.00	0.01	99.02
T577	24	93MPB008	C14-02	0.25-0.5	black	Ilmenite	0.00	50.70	0.05	0.06	45.70	0.71	0.81	0.02	0.03	0.02	98.09
T577	16	93MPB008	C14-02	0.25-0.5	black	Ilmenite	0.08	51.60	0.06	0.06	45.16	0.72	1.24	0.00	0.00	0.01	98.91
T577	25	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.01	51.82	0.08	0.08	44.72	0.78	1.40	0.00	0.06	0.01	98.94
T577	28	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.03	50.76	0.07	0.04	44.65	0.67	1.65	0.00	0.07	0.01	97.94
T577	19	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.74	0.08	0.05	44.72	0.64	1.67	0.01	0.04	0.00	98.94
T577	11	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.74	0.05	0.06	44.17	0.62	1.95	0.00	0.00	0.00	98.58
T577	29	93MPB008	C14-02	0.25-0.5	black	Ilmenite	0.00	51.25	0.15	0.06	44.80	0.58	2.08	0.00	0.00	0.01	98.93
T577	13	93MPB008	C14-02	0.25-0.5	black	Ilmenite	0.01	50.87	0.13	0.06	44.78	0.56	2.13	0.02	0.01	0.00	98.55
T577	22	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	52.06	0.05	0.06	43.88	0.65	2.13	0.02	0.05	0.00	98.90
T577	21	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.56	0.04	0.04	44.33	0.65	2.19	0.04	0.03	0.00	98.88
T577	10	93MPB008	C14-02	0.25-0.5	black	Ilmenite	0.03	50.93	0.10	0.08	44.98	0.58	2.26	0.00	0.00	0.00	98.96
T577	23	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.79	0.12	0.06	44.02	0.63	2.32	0.00	0.02	0.01	98.96
T577	12	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.64	0.09	0.05	43.43	0.63	2.51	0.00	0.00	0.00	98.34
T577	27	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.57	0.13	0.06	43.85	0.58	2.58	0.01	0.00	0.02	98.80
T577	17	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.02	51.20	0.11	0.03	43.43	0.58	2.64	0.00	0.00	0.00	98.01
T577	14	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.02	51.21	0.10	0.02	43.66	0.57	2.78	0.02	0.00	0.00	98.37
T577	26	93MPB008	C14-02	0.5-1.0	black	Ilmenite	0.00	51.38	0.12	0.09	43.71	0.55	2.98	0.02	0.00	0.00	98.86
T577	53	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	49.93	0.05	0.03	47.50	1.13	0.15	0.01	0.00	0.00	98.80
T577	45	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	48.91	0.05	0.05	47.95	0.66	0.23	0.01	0.00	0.01	97.87
T577	55	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.03	51.18	0.07	0.03	46.53	0.86	0.56	0.00	0.00	0.02	99.28
T577	56	93MPB009	C14-02	0.25-0.5	black	Ilmenite	0.00	51.85	0.08	0.05	45.48	0.87	0.73	0.03	0.00	0.00	99.09
T577	44	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.77	0.05	0.06	45.63	0.84	0.74	0.02	0.02	0.00	99.13
T577	38	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	50.12	0.09	0.07	46.39	0.69	0.86	0.02	0.00	0.01	98.27
T577	46	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.87	0.04	0.06	45.30	0.80	1.14	0.00	0.00	0.00	99.21
T577	41	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.89	0.06	0.00	44.41	0.66	1.48	0.04	0.00	0.00	98.54
T577	43	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.53	0.04	0.06	44.96	0.60	1.48	0.00	0.00	0.01	98.68
T577	40	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.38	0.06	0.04	44.80	0.67	1.59	0.02	0.00	0.02	98.58
T577	52	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.29	0.09	0.02	44.52	0.66	1.81	0.01	0.00	0.01	98.41
T577	50	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	50.06	0.12	0.07	45.99	0.66	1.82	0.04	0.04	0.02	98.82
T577	48	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.02	51.51	0.05	0.05	44.83	0.70	1.86	0.02	0.00	0.01	99.06
T577	51	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.43	0.13	0.07	44.24	0.63	2.16	0.03	0.00	0.02	98.70
T577	39	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.14	51.62	0.10	0.09	43.72	0.59	2.72	0.00	0.02	0.03	99.02
T577	42	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.55	0.11	0.07	43.73	0.64	2.82	0.02	0.00	0.00	98.93
T577	57	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.28	0.09	0.06	44.08	0.49	2.83	0.04	0.02	0.00	98.88
T577	47	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	51.17	0.11	0.07	44.01	0.52	2.86	0.01	0.00	0.02	98.78
T577	37	93MPB009	C14-02	0.25-0.5	black	Ilmenite	0.02	51.41	0.13	0.03	43.39	0.62	3.14	0.03	0.00	0.00	98.76
T577	54	93MPB009	C14-02	0.5-1.0	black	Ilmenite	0.00	49.66	0.10	0.10	44.28	0.47	3.47	0.00	0.01	0.00	98.11

## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T577	49	93MPB009	C14-02	0.5-1.0	black	Mg-ilmenite	0.00	52.12	0.19	0.41	34.74	0.36	10.07	0.02	0.02	0.00	97.92
T577	76	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	50.28	0.09	0.08	45.99	1.08	0.25	0.02	0.00	0.01	97.79
T577	74	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	50.84	0.03	0.05	46.35	0.82	0.53	0.02	0.02	0.01	98.66
T577	83	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	51.37	0.09	0.09	46.26	0.73	0.66	0.00	0.05	0.00	99.24
T577	82	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.06	51.41	0.04	0.06	44.97	0.85	0.77	0.02	0.00	0.00	98.17
T577	69	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	50.72	0.07	0.00	46.15	0.78	0.81	0.02	0.00	0.00	98.54
T577	87	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	50.96	0.10	0.07	45.41	0.67	1.14	0.00	0.00	0.00	98.35
T577	78	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	51.53	0.07	0.07	45.20	0.63	1.18	0.00	0.00	0.00	98.67
T577	85	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	51.05	0.09	0.05	45.47	0.69	1.38	0.00	0.04	0.01	98.76
T577	72	93MPB010	C14-02	1.0-2.0	black	Ilmenite	0.00	51.50	0.12	0.09	45.00	0.56	1.54	0.01	0.01	0.00	98.82
T577	79	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.02	51.19	0.07	0.05	43.82	0.75	1.54	0.02	0.00	0.02	97.47
T577	84	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	50.55	0.14	0.04	45.86	0.58	1.67	0.00	0.03	0.00	98.86
T577	73	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	50.47	0.12	0.08	45.30	0.58	1.89	0.00	0.00	0.00	98.44
T577	70	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	50.95	0.06	0.04	44.77	0.60	2.01	0.00	0.00	0.03	98.45
T577	88	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	51.97	0.07	0.02	44.47	0.58	2.03	0.00	0.00	0.03	99.16
T577	77	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	51.54	0.08	0.06	44.56	0.64	2.07	0.00	0.00	0.00	98.97
T577	86	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	52.00	0.04	0.05	44.81	0.67	2.09	0.00	0.02	0.00	99.68
T577	80	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.03	51.56	0.07	0.06	43.77	0.61	2.19	0.01	0.00	0.00	98.31
T577	81	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	50.96	0.13	0.05	44.37	0.50	2.25	0.00	0.00	0.01	98.26
T577	71	93MPB010	C14-02	0.5-1.0	black	Ilmenite	0.00	51.70	0.16	0.08	43.69	0.50	3.07	0.03	0.00	0.01	99.23
T577	75	93MPB010	C14-02	0.25-0.5	black	Ilmenite	0.00	51.28	0.15	0.09	43.37	0.51	3.44	0.00	0.00	0.03	98.87
T577	110	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.48	0.08	0.07	45.95	1.63	0.07	0.01	0.02	0.00	99.29
T577	97	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.52	0.06	0.01	46.59	0.94	0.27	0.02	0.03	0.02	99.44
T577	103	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.38	0.03	0.01	46.57	0.88	0.46	0.00	0.00	0.01	99.34
T577	112	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.01	51.19	0.04	0.00	46.06	0.92	0.57	0.01	0.02	0.00	98.82
T577	98	93MPB011	C14-03	1.0-2.0	black	Ilmenite	0.00	52.12	0.05	0.04	46.00	0.83	0.61	0.03	0.00	0.01	99.70
T577	102	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.02	51.86	0.05	0.08	45.02	0.72	1.15	0.00	0.01	0.00	98.90
T577	101	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.41	0.07	0.04	45.63	0.69	1.31	0.01	0.03	0.00	99.19
T577	122	93MPB011	C14-03	0.25-0.5	black	Ilmenite	0.03	50.99	0.12	0.06	44.94	0.65	1.61	0.04	0.00	0.02	98.45
T577	104	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.26	0.05	0.02	45.01	0.67	1.65	0.00	0.00	0.03	98.70
T577	111	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	52.09	0.06	0.06	44.46	0.79	1.68	0.02	0.01	0.01	99.18
T577	106	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.39	0.10	0.07	44.41	0.57	2.00	0.00	0.00	0.02	98.55
T577	105	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.17	0.12	0.04	44.31	0.60	2.14	0.04	0.00	0.02	98.43
T577	107	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.05	51.38	0.13	0.07	44.85	0.64	2.18	0.00	0.00	0.00	99.30
T577	96	93MPB011	C14-03	0.25-0.5	black	Ilmenite	0.00	51.23	0.10	0.05	44.82	0.57	2.24	0.01	0.00	0.00	99.02
T577	99	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.44	0.15	0.06	44.16	0.54	2.39	0.02	0.00	0.01	98.76
T577	94	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	51.39	0.13	0.07	44.61	0.58	2.41	0.03	0.00	0.00	99.21
T577	100	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.00	50.86	0.15	0.05	44.46	0.58	2.61	0.02	0.00	0.00	98.73
T577	113	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.01	51.50	0.10	0.09	43.91	0.44	2.78	0.01	0.01	0.01	98.85
T577	108	93MPB011	C14-03	0.25-0.5	black	Ilmenite	0.00	51.45	0.10	0.07	43.90	0.58	2.84	0.02	0.00	0.00	98.95
T577	109	93MPB011	C14-03	0.5-1.0	black	Ilmenite	0.05	50.92	0.16	0.06	43.21	0.52	2.89	0.04	0.00	0.03	97.89
T578	17	93MPB012	C14-04	1.0-2.0	black	Ilmenite	0.05	49.37	0.04	0.05	47.14	1.51	0.05	0.01	0.00	0.00	98.22
T578	28	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.04	50.59	0.02	0.03	46.39	0.92	0.31	0.01	0.00	0.03	98.35
T578	21	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.33	0.06	0.05	46.02	0.92	0.76	0.03	0.00	0.01	99.18
T578	16	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.01	50.07	0.06	0.05	45.48	0.72	0.86	0.01	0.01	0.00	97.27

## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T578	20	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.82	0.09	0.01	45.96	0.84	0.88	0.03	0.00	0.00	99.63
T578	31	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.43	0.08	0.01	45.88	0.72	1.06	0.02	0.00	0.00	99.20
T578	23	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.48	0.08	0.03	45.76	0.75	1.13	0.03	0.00	0.01	99.26
T578	29	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.62	0.09	0.06	44.81	0.70	1.34	0.01	0.05	0.01	98.68
T578	15	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.46	0.08	0.06	45.62	0.62	1.51	0.03	0.02	0.00	99.40
T578	25	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.74	0.09	0.02	44.63	0.67	1.70	0.02	0.00	0.00	98.87
T578	27	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	52.00	0.08	0.00	44.60	0.62	1.89	0.02	0.00	0.00	99.22
T578	24	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.87	0.08	0.06	44.59	0.58	1.90	0.02	0.02	0.01	99.12
T578	26	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.95	0.03	0.07	44.84	0.65	1.92	0.00	0.01	0.00	99.47
T578	13	93MPB012	C14-04	0.25-0.5	black	Ilmenite	0.01	50.69	0.09	0.05	44.59	0.65	2.02	0.00	0.00	0.00	98.10
T578	14	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.09	0.08	0.03	44.18	0.70	2.09	0.02	0.01	0.00	98.20
T578	19	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.95	0.05	0.03	43.56	0.70	2.24	0.03	0.00	0.01	98.56
T578	30	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	50.72	0.09	0.03	44.46	0.64	2.30	0.04	0.00	0.01	98.29
T578	12	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.01	51.68	0.17	0.06	43.88	0.49	2.50	0.02	0.00	0.02	98.83
T578	18	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.05	49.97	0.10	0.06	43.32	0.61	2.50	0.04	0.01	0.02	96.67
T578	22	93MPB012	C14-04	0.5-1.0	black	Ilmenite	0.00	51.38	0.12	0.11	42.94	0.58	2.91	0.01	0.01	0.02	98.08
T578	61	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.00	51.41	0.06	0.00	46.47	0.95	0.52	0.00	0.00	0.00	99.41
T578	58	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.02	51.31	0.01	0.02	45.42	0.86	1.01	0.05	0.00	0.01	98.71
T578	62	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.00	51.29	0.08	0.03	45.28	0.70	1.34	0.04	0.00	0.01	98.76
T578	56	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	51.88	0.05	0.03	44.70	0.75	1.40	0.01	0.00	0.00	98.82
T578	49	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.00	51.71	0.07	0.08	45.26	0.70	1.50	0.03	0.00	0.01	99.35
T578	53	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.11	51.44	0.11	0.02	45.16	0.61	1.62	0.01	0.01	0.00	99.08
T578	50	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.01	51.23	0.04	0.06	44.89	0.73	1.68	0.02	0.03	0.00	98.69
T578	60	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	50.94	0.12	0.03	45.08	0.57	1.74	0.00	0.01	0.00	98.48
T578	59	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	52.39	0.08	0.04	44.53	0.61	1.91	0.03	0.01	0.01	99.60
T578	63	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	51.68	0.03	0.07	43.62	0.74	2.04	0.02	0.04	0.03	98.26
T578	67	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.02	51.35	0.09	0.00	44.57	0.63	2.05	0.05	0.00	0.01	98.76
T578	54	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.02	51.84	0.11	0.06	43.03	0.64	2.12	0.02	0.01	0.00	97.85
T578	52	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	51.31	0.12	0.06	44.98	0.56	2.27	0.00	0.02	0.02	99.34
T578	66	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.00	51.18	0.12	0.04	43.39	0.63	2.45	0.02	0.02	0.00	97.84
T578	68	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.02	51.50	0.09	0.04	44.14	0.62	2.47	0.03	0.00	0.00	98.92
T578	64	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.02	52.73	0.09	0.05	43.39	0.58	2.54	0.02	0.05	0.01	99.48
T578	55	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	50.92	0.11	0.05	44.35	0.63	2.65	0.02	0.00	0.01	98.72
T578	57	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.08	51.15	0.11	0.05	43.88	0.48	2.70	0.02	0.03	0.02	98.51
T578	72	93MPB013	C14-04	0.25-0.5	black	Ilmenite	0.00	50.60	0.15	0.03	44.36	0.50	2.70	0.00	0.02	0.00	98.36
T578	65	93MPB013	C14-04	0.5-1.0	black	Ilmenite	0.00	51.22	0.13	0.08	42.69	0.51	3.20	0.01	0.01	0.03	97.87
T454	58	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.12	50.18	0.04	0.04	47.47	0.67	0.46	0.01	0.00	0.01	99.00
T454	59	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.09	51.40	0.03	0.05	45.63	0.85	0.70	0.02	0.00	0.01	98.77
T454	65	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.00	50.53	0.06	0.04	46.56	0.89	0.89	0.01	0.00	0.01	98.99
T454	57	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.08	51.43	0.09	0.02	45.71	0.72	1.05	0.03	0.00	0.03	99.15
T454	60	93MPB014	C14-05	0.5-1.0	black	Ilmenite	0.08	51.19	0.08	0.08	45.21	0.74	1.64	0.02	0.00	0.00	99.03
T454	63	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.01	51.63	0.08	0.04	45.14	0.63	1.66	0.00	0.00	0.00	99.20
T454	66	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.02	50.79	0.12	0.05	45.26	0.67	1.96	0.00	0.00	0.01	98.87
T454	61	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.05	50.80	0.07	0.13	44.64	0.51	2.32	0.03	0.02	0.00	98.57
T454	62	93MPB014	C14-05	0.25-0.5	black	Ilmenite	0.06	51.66	0.14	0.07	43.97	0.55	2.98	0.02	0.00	0.01	99.44



## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T454	72	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.05	50.90	0.03	0.02	46.56	1.03	0.29	0.02	0.00	0.02	98.92
T454	74	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.07	51.63	0.07	0.08	45.30	0.72	1.30	0.03	0.00	0.01	99.21
T454	76	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.04	51.93	0.08	0.01	44.37	0.57	1.62	0.03	0.04	0.01	98.68
T454	75	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.04	51.70	0.06	0.03	44.34	0.70	1.76	0.00	0.00	0.01	98.63
T454	77	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.04	49.11	0.15	0.05	46.53	0.54	1.78	0.02	0.00	0.00	98.21
T454	73	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.01	52.02	0.06	0.03	44.37	0.70	1.89	0.00	0.00	0.00	99.08
T454	78	93MPB019	C14-05	0.5-1.0	black	Ilmenite	0.00	51.33	0.12	0.07	44.04	0.58	2.74	0.00	0.00	0.02	98.91
T454	83	93MPB020	C14-05	0.25-0.5	black	Ilmenite	0.00	51.79	0.06	0.04	44.19	0.58	2.28	0.00	0.00	0.00	98.93
T454	84	93MPB020	C14-05	0.5-1.0	black	Ilmenite	0.00	51.79	0.12	0.08	43.64	0.53	2.66	0.02	0.00	0.00	98.84
T578	90	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.00	50.93	0.09	0.07	46.23	0.86	0.41	0.05	0.00	0.00	98.62
T578	87	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.00	50.47	0.07	0.00	45.56	0.93	0.64	0.03	0.00	0.02	97.72
T578	95	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	51.19	0.10	0.09	46.46	0.74	1.01	0.01	0.01	0.02	99.61
T578	96	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.02	51.39	0.06	0.03	44.05	0.69	1.32	0.01	0.00	0.00	97.56
T578	82	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.02	51.84	0.09	0.08	45.34	0.71	1.45	0.00	0.00	0.02	99.54
T578	91	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.32	51.32	0.06	0.04	45.04	0.83	1.49	0.03	0.00	0.01	99.13
T578	83	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.12	51.23	0.08	0.08	45.39	0.65	1.66	0.03	0.04	0.00	99.29
T578	93	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.05	51.27	0.03	0.06	45.06	0.67	1.77	0.00	0.04	0.01	98.95
T578	89	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.16	51.90	0.11	0.05	44.71	0.66	1.93	0.02	0.00	0.02	99.56
T578	92	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	51.77	0.09	0.02	44.50	0.76	1.98	0.04	0.00	0.03	99.19
T578	78	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.14	48.76	0.11	0.06	46.25	0.48	1.99	0.02	0.00	0.00	97.81
T578	86	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.01	51.97	0.07	0.03	44.10	0.68	2.05	0.04	0.00	0.02	98.97
T578	88	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	51.53	0.08	0.07	44.67	0.51	2.05	0.03	0.00	0.01	98.95
T578	81	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.02	51.39	0.10	0.05	44.22	0.57	2.05	0.01	0.00	0.01	98.41
T578	85	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	51.61	0.06	0.09	43.99	0.63	2.09	0.03	0.00	0.00	98.51
T578	79	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.08	49.72	0.12	0.05	44.46	0.59	2.27	0.02	0.00	0.00	97.31
T578	80	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.05	51.06	0.11	0.04	44.37	0.54	2.52	0.02	0.00	0.03	98.74
T578	84	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.02	52.00	0.08	0.08	43.64	0.63	2.58	0.02	0.00	0.00	99.05
T578	77	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	51.63	0.10	0.07	43.88	0.48	2.74	0.00	0.00	0.00	98.90
T578	94	93MPB021	C14-05	0.25-0.5	black	Ilmenite	0.00	52.37	0.07	0.06	43.26	0.67	2.78	0.02	0.00	0.00	99.23
T578	76	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.03	51.17	0.08	0.07	43.98	0.54	2.78	0.00	0.03	0.00	98.68
T578	97	93MPB021	C14-05	0.5-1.0	black	Ilmenite	0.05	50.75	0.10	0.07	43.68	0.53	2.83	0.02	0.00	0.01	98.04
T578	124	93MPB022	C14-05	0.25-0.5	black	Ilmenite	0.02	50.95	0.03	0.04	46.63	0.75	0.46	0.00	0.00	0.00	98.88
T578	120	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	50.68	0.04	0.04	45.52	0.69	0.78	0.00	0.00	0.02	97.77
T578	112	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.03	51.91	0.09	0.05	45.40	0.67	1.06	0.00	0.00	0.01	99.19
T578	117	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.03	51.39	0.07	0.07	45.56	0.73	1.10	0.02	0.00	0.00	98.96
T578	118	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.04	48.82	0.10	0.07	47.48	0.50	1.26	0.01	0.00	0.00	98.27
T578	114	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	52.07	0.03	0.04	45.28	0.73	1.49	0.00	0.00	0.02	99.65
T578	111	93MPB022	C14-05	0.25-0.5	black	Ilmenite	0.00	51.70	0.09	0.03	44.51	0.75	1.52	0.01	0.00	0.00	98.62
T578	119	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	50.94	0.10	0.09	44.32	0.59	1.62	0.05	0.01	0.01	97.73
T578	123	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	50.87	0.05	0.07	43.22	0.80	1.84	0.03	0.02	0.00	96.91
T578	113	93MPB022	C14-05	1.0-2.0	black	Ilmenite	0.01	51.21	0.13	0.06	44.82	0.61	1.97	0.00	0.00	0.02	98.83
T578	127	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.03	50.95	0.09	0.09	42.61	0.57	2.10	0.00	0.00	0.01	96.45
T578	115	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.02	51.01	0.10	0.05	44.97	0.58	2.20	0.02	0.00	0.01	98.95
T578	116	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	52.06	0.05	0.06	43.91	0.64	2.41	0.01	0.00	0.00	99.14
T578	126	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.01	51.80	0.10	0.09	43.44	0.54	2.45	0.00	0.00	0.01	98.44

## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T578	130	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	51.40	0.13	0.05	43.31	0.63	2.55	0.02	0.00	0.02	98.09
T578	129	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.01	51.55	0.06	0.08	44.02	0.57	2.60	0.04	0.00	0.00	98.92
T578	121	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.02	51.05	0.09	0.08	43.77	0.56	2.60	0.00	0.00	0.02	98.20
T578	125	93MPB022	C14-05	0.25-0.5	black	Ilmenite	0.44	49.96	0.36	0.05	43.84	0.58	2.61	0.01	0.00	0.09	97.93
T578	122	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	51.94	0.07	0.09	43.09	0.64	2.65	0.04	0.01	0.02	98.53
T578	128	93MPB022	C14-05	0.5-1.0	black	Ilmenite	0.00	50.54	0.12	0.07	42.91	0.53	3.43	0.03	0.01	0.00	97.64
T579	46	93MPB023	C14-05	0.25-0.5	black	Ilmenite	0.03	51.29	0.05	0.01	46.49	0.99	0.25	0.02	0.00	0.02	99.15
T579	51	93MPB023	C14-05	0.5-1.0	black	Ilmenite	0.00	51.58	0.10	0.00	45.44	0.82	0.91	0.00	0.00	0.01	98.87
T579	58	93MPB023	C14-05	0.25-0.5	black	Ilmenite	0.02	51.22	0.05	0.02	45.25	0.72	1.41	0.00	0.03	0.00	98.70
T579	49	93MPB023	C14-05	0.5-1.0	black	Ilmenite	0.06	51.47	0.08	0.06	45.16	0.70	1.68	0.01	0.00	0.03	99.24
T579	57	93MPB023	C14-05	1.0-2.0	black	Ilmenite	0.00	52.24	0.07	0.01	43.84	0.64	2.15	0.04	0.00	0.00	98.98
T579	56	93MPB023	C14-05	0.5-1.0	black	Ilmenite	0.01	51.29	0.11	0.06	44.59	0.58	2.27	0.03	0.00	0.00	98.94
T579	61	93MPB023	C14-05	0.5-1.0	black	Ilmenite	0.00	52.16	0.16	0.04	43.64	0.59	2.36	0.00	0.00	0.01	98.96
T579	63	93MPB023	C14-05	0.5-1.0	black	Mg-Ilmenite	0.00	47.44	0.23	0.40	41.63	0.30	7.41	0.03	0.00	0.00	97.43
T579	50	93MPB023	C14-05	0.5-1.0	black	Mg-Ilmenite	0.02	47.42	0.20	0.38	41.51	0.29	7.49	0.02	0.03	0.00	97.35
T579	74	93MPB023	C14-05	0.25-0.5	black	Mg-Ilmenite	0.02	51.48	0.60	0.22	35.33	0.21	10.26	0.02	0.04	0.00	98.16
T579	62	93MPB023	C14-05	0.25-0.5	black	Mg-Ilmenite	0.00	51.95	0.61	0.23	34.62	0.30	10.51	0.02	0.00	0.03	98.28
T579	60	93MPB023	C14-05	0.25-0.5	black	Mg-Ilmenite	0.03	51.79	0.64	0.25	34.41	0.29	10.97	0.04	0.02	0.02	98.45
T579	78	93MPB023	C14-05	0.25-0.5	black	Mg-Ilmenite	0.00	53.26	0.64	0.49	30.96	0.32	12.40	0.06	0.01	0.00	98.14
T454	88	93MPB024	C14-06	0.5-1.0	black	Ilmenite	0.05	51.50	0.10	0.07	45.30	0.70	1.12	0.02	0.00	0.01	98.87
T454	87	93MPB024	C14-06	0.25-0.5	black	Ilmenite	0.01	52.50	0.12	0.03	42.31	0.52	3.47	0.02	0.00	0.00	98.98
T455	9	93MPB025	C14-06	0.5-1.0	black	Ilmenite	0.04	52.06	0.08	0.02	45.24	0.68	1.04	0.04	0.00	0.00	99.21
T455	8	93MPB025	C14-06	0.5-1.0	black	Ilmenite	0.05	51.55	0.11	0.09	44.75	0.63	2.48	0.01	0.00	0.00	99.67
T463	25	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	50.56	0.10	0.03	45.61	0.67	1.33	0.00	0.03	0.00	98.32
T463	28	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	51.97	0.05	0.05	44.38	0.71	1.85	0.01	0.01	0.01	99.03
T463	30	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	51.19	0.11	0.07	44.90	0.56	1.89	0.00	0.00	0.00	98.72
T463	31	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	48.80	0.09	0.07	46.55	0.52	2.03	0.01	0.02	0.01	98.10
T463	24	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	52.95	0.06	0.04	43.62	0.60	2.20	0.01	0.00	0.04	99.52
T463	32	93MPB048	C14-08	0.5-1.0	black	Ilmenite	0.00	51.56	0.11	0.06	44.21	0.66	2.28	0.01	0.00	0.00	98.89
T463	29	93MPB048	C14-08	0.5-1.0	black	Ilmenite	0.00	51.86	0.05	0.07	43.84	0.65	2.36	0.01	0.00	0.00	98.84
T463	27	93MPB048	C14-08	0.25-0.5	black	Ilmenite	0.00	49.16	0.12	0.09	46.02	0.55	2.58	0.00	0.00	0.01	98.52
T463	26	93MPB048	C14-08	0.5-1.0	black	Ilmenite	0.00	51.99	0.19	0.04	44.01	0.62	2.68	0.01	0.02	0.03	99.59
T463	67	93MPB049	C14-08	0.5-1.0	black	Ilmenite	0.24	50.83	0.06	0.04	45.82	0.82	0.84	0.05	0.01	0.01	98.72
T463	64	93MPB049	C14-08	0.5-1.0	black	Ilmenite	0.00	51.72	0.08	0.06	45.19	0.60	1.53	0.03	0.01	0.01	99.23
T463	63	93MPB049	C14-08	0.5-1.0	black	Ilmenite	0.00	51.57	0.13	0.07	44.36	0.63	2.38	0.04	0.00	0.01	99.18
T463	66	93MPB049	C14-08	0.5-1.0	black	Ilmenite	0.00	52.44	0.09	0.09	43.65	0.60	2.45	0.04	0.00	0.02	99.37
T579	104	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.00	51.50	0.00	0.02	45.71	0.79	0.81	0.02	0.00	0.01	98.85
T579	93	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.01	51.40	0.04	0.00	46.20	0.78	0.82	0.01	0.00	0.00	99.24
T579	92	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.01	51.44	0.07	0.04	46.24	0.68	1.09	0.01	0.00	0.00	99.59
T579	111	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.05	51.65	0.06	0.03	44.82	0.81	1.29	0.00	0.00	0.00	98.69
T579	91	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.00	51.27	0.08	0.01	44.94	0.75	1.38	0.02	0.00	0.02	98.46
T579	99	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.02	49.93	0.08	0.07	45.70	0.63	1.55	0.01	0.00	0.00	97.98
T579	110	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.03	50.73	0.10	0.09	45.78	0.63	1.73	0.01	0.00	0.00	99.11
T579	102	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.04	50.90	0.20	0.07	44.74	0.58	1.89	0.04	0.00	0.01	98.47
T579	101	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.00	51.65	0.13	0.01	44.53	0.59	1.91	0.00	0.00	0.00	98.82

## APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T579	107	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.22	51.32	0.32	0.05	43.82	0.62	2.00	0.06	0.00	0.00	98.40
T579	109	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.00	51.55	0.08	0.03	44.66	0.63	2.07	0.03	0.00	0.01	99.05
T579	94	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.00	51.98	0.10	0.07	43.93	0.64	2.14	0.04	0.01	0.00	98.92
T579	106	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.01	52.05	0.05	0.05	43.40	0.64	2.14	0.00	0.02	0.01	98.37
T579	98	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.04	51.66	0.11	0.04	44.63	0.60	2.22	0.02	0.00	0.01	99.34
T579	103	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.03	51.54	0.12	0.03	43.19	0.62	2.29	0.01	0.00	0.01	97.83
T579	97	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.00	51.84	0.10	0.06	44.16	0.56	2.33	0.01	0.00	0.00	99.06
T579	108	93MPB050	C14-08	0.25-0.5	black	Ilmenite	0.01	51.33	0.12	0.04	44.35	0.55	2.51	0.04	0.00	0.00	98.96
T579	96	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.01	51.07	0.11	0.07	44.13	0.56	2.65	0.02	0.00	0.00	98.63
T579	105	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.03	51.99	0.06	0.06	43.19	0.53	2.67	0.01	0.00	0.01	98.55
T579	95	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.02	51.67	0.18	0.06	43.97	0.63	2.77	0.00	0.03	0.00	99.32
T579	100	93MPB050	C14-08	0.5-1.0	black	Ilmenite	0.05	50.08	0.10	0.09	41.90	0.56	3.28	0.00	0.00	0.01	96.06
T580	20	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	50.26	0.06	0.04	47.27	1.50	0.21	0.03	0.00	0.03	99.39
T580	41	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	51.86	0.03	0.05	45.58	1.06	0.47	0.03	0.01	0.00	99.09
T580	22	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.00	51.62	0.05	0.08	46.15	0.75	0.55	0.00	0.00	0.01	99.19
T580	40	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	49.58	0.05	0.06	47.48	0.87	0.63	0.02	0.00	0.00	98.70
T580	25	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.03	51.64	0.06	0.00	45.27	0.84	0.93	0.01	0.00	0.00	98.78
T580	30	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.06	51.71	0.05	0.05	45.79	0.84	0.97	0.02	0.00	0.00	99.49
T580	18	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	51.47	0.03	0.06	45.26	0.73	1.15	0.02	0.00	0.03	98.73
T580	14	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	51.81	0.08	0.04	45.14	0.74	1.20	0.00	0.02	0.01	99.04
T580	17	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	51.51	0.08	0.02	44.94	0.70	1.20	0.02	0.04	0.00	98.51
T580	32	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.07	50.64	0.13	0.05	45.78	0.56	1.47	0.00	0.00	0.02	98.72
T580	24	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.03	51.77	0.07	0.10	45.02	0.68	1.48	0.04	0.01	0.00	99.19
T580	28	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.05	50.59	0.10	0.06	46.01	0.52	1.69	0.01	0.00	0.00	99.03
T580	15	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.03	51.40	0.11	0.07	44.81	0.66	1.76	0.04	0.01	0.00	98.90
T580	26	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.07	51.56	0.13	0.07	45.13	0.53	1.94	0.01	0.00	0.01	99.43
T580	29	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.01	51.06	0.10	0.07	43.48	0.64	2.16	0.02	0.01	0.00	97.54
T580	21	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.02	51.69	0.11	0.03	44.56	0.70	2.41	0.02	0.00	0.01	99.55
T580	23	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.03	52.31	0.10	0.05	43.38	0.64	2.54	0.00	0.00	0.01	99.05
T580	27	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.05	51.78	0.12	0.11	43.86	0.64	2.58	0.03	0.00	0.00	99.18
T580	31	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.01	51.41	0.11	0.07	44.39	0.57	2.70	0.03	0.03	0.05	99.37
T580	19	93MPB051	C14-08	0.25-0.5	black	Ilmenite	0.00	51.92	0.12	0.13	43.87	0.57	2.76	0.02	0.00	0.04	99.42
T580	16	93MPB051	C14-08	0.5-1.0	black	Ilmenite	0.00	51.82	0.10	0.05	43.38	0.52	3.18	0.04	0.02	0.01	99.11
T580	51	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.02	51.08	0.06	0.07	45.28	0.79	0.85	0.04	0.02	0.00	98.22
T580	60	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.02	51.70	0.12	0.02	45.29	0.67	1.42	0.03	0.01	0.02	99.30
T580	64	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	51.78	0.03	0.06	45.26	0.67	1.48	0.03	0.02	0.02	99.35
T580	44	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.00	51.40	0.07	0.06	44.85	0.57	1.54	0.03	0.00	0.03	98.54
T580	57	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.12	51.67	0.07	0.03	45.07	0.65	1.64	0.00	0.02	0.02	99.28
T580	49	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.00	52.65	0.05	0.05	44.85	0.60	1.68	0.02	0.00	0.00	99.90
T580	59	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	51.49	0.07	0.05	45.10	0.67	1.71	0.03	0.00	0.02	99.13
T580	67	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.20	51.42	0.05	0.04	44.32	0.68	1.78	0.03	0.01	0.02	98.56
T580	65	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	52.46	0.09	0.03	44.10	0.65	1.92	0.00	0.05	0.00	99.29
T580	48	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	52.02	0.09	0.01	44.56	0.60	1.97	0.04	0.00	0.03	99.32
T580	53	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.04	51.61	0.06	0.06	43.83	0.74	1.98	0.16	0.01	0.01	98.50
T580	47	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.00	52.16	0.05	0.03	44.25	0.73	1.99	0.02	0.00	0.00	99.22

APPENDIX C.5: Microprobe data for ilmenites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	CR2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL
T580	46	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.00	52.06	0.05	0.01	44.21	0.62	1.99	0.03	0.01	0.02	98.99
T580	50	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.05	52.26	0.07	0.02	43.20	0.69	2.03	0.00	0.00	0.00	98.31
T580	43	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	52.79	0.03	0.00	43.69	0.69	2.04	0.05	0.00	0.01	99.29
T580	52	93MPB052	C14-08	0.25-0.5	black	Ilmenite	0.00	51.69	0.06	0.04	44.52	0.69	2.04	0.03	0.00	0.01	99.07
T580	56	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.10	51.86	0.08	0.07	43.75	0.64	2.04	0.00	0.01	0.00	98.55
T580	61	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.04	52.14	0.03	0.08	43.76	0.64	2.08	0.01	0.00	0.00	98.77
T580	54	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.01	52.42	0.07	0.05	43.92	0.67	2.09	0.04	0.00	0.01	99.27
T580	55	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.04	52.36	0.08	0.06	43.63	0.65	2.10	0.04	0.02	0.01	98.99
T580	58	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.01	51.92	0.05	0.03	44.23	0.73	2.12	0.03	0.00	0.02	99.14
T580	62	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.02	51.99	0.05	0.02	43.64	0.68	2.12	0.01	0.01	0.01	98.56
T580	45	93MPB052	C14-08	0.5-1.0	black	Ilmenite	0.00	50.69	0.12	0.13	45.26	0.54	2.64	0.00	0.03	0.00	99.40
T586	60	93MPB204	C14-05	0.5-1.0	black	Mg-Ilmenite	0.01	50.21	0.40	1.63	35.39	0.28	9.64	0.04	0.00	0.00	97.60
T586	48	93MPB204	C14-05	0.5-1.0	black	Mg-Ilmenite	0.00	52.80	0.91	0.28	32.37	0.19	11.89	0.06	0.03	0.02	98.54
T586	49	93MPB204	C14-05	0.5-1.0	black	Mg-Ilmenite	0.00	52.39	0.55	0.21	32.93	0.26	12.22	0.06	0.01	0.00	98.63
T496	102	93MPB205	C14-05	0.5-1.0	black	Mg-Ilmenite	0.00	52.00	0.64	0.21	33.08	0.29	10.67	0.05	0.00	0.00	96.94
T496	51	93MPB205	C14-05	0.25-0.5	black	Mg-Ilmenite	1.51	51.46	0.25	0.23	30.84	0.33	10.90	1.69	0.00	0.04	97.25
T496	69	93MPB205	C14-05	0.25-0.5	black	Mg-Ilmenite	0.00	52.88	0.56	0.21	32.99	0.33	11.37	0.07	0.00	0.01	98.42

**Appendix C.6 Microprobe data for chromites**

## APPENDIX C.6: Microprobe data for chromites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T453	18	93MPB001	C14-01	0.25-0.5	black	Cr-Spinel	0.27	1.49	29.29	30.81	20.25	0.23	15.00	0.02	0.00	0.00	97.35	
T453	33	93MPB002	C14-02	0.25-0.5	black	Chromite	0.24	1.28	23.58	38.66	18.00	0.21	15.05	0.01	0.00	0.03	97.06	
T453	61	93MPB003	C14-02	0.25-0.5	black	Chromite	0.23	1.47	16.08	46.64	19.32	0.24	13.96	0.00	0.00	0.00	97.93	
T453	64	93MPB003	C14-02	0.5-1.0	black	Chromite	0.12	0.30	14.89	54.36	15.74	0.26	12.47	0.01	0.04	0.00	98.18	
T453	81	93MPB004	C14-02	0.25-0.5	black	Cr-Spinel	0.24	1.06	31.58	30.64	18.03	0.22	16.06	0.01	0.00	0.00	97.85	
T453	86	93MPB004	C14-02	0.25-0.5	black	Cr-Spinel	0.25	0.74	35.89	27.05	15.43	0.13	17.38	0.01	0.00	0.00	96.87	
T453	89	93MPB004	C14-02	0.25-0.5	black	Cr-Spinel	0.14	1.96	25.51	32.23	27.71	2.18	7.89	0.00	0.15	0.01	97.77	
T453	90	93MPB004	C14-02	0.25-0.5	black	Cr-Spinel	0.27	0.86	28.38	35.36	16.04	0.18	16.36	0.00	0.02	0.01	97.48	
T453	82	93MPB004	C14-02	0.5-1.0	black	Chromite	0.25	1.48	20.24	42.39	18.03	0.25	14.84	0.03	0.01	0.01	97.52	
T454	12	93MPB005	C14-02	0.25-0.5	black	Chromite	0.12	0.91	11.56	50.96	24.21	0.31	9.62	0.02	0.00	0.02	97.73	
T454	48	93MPB007	C14-02	0.5-1.0	black	Cr-Spinel	0.32	0.86	30.21	36.40	16.23	0.21	17.92	0.01	0.03	0.00	102.19	
T577	30	93MPB008	C14-02	0.25-0.5	black	Chromite	0.16	6.43	15.19	36.74	25.69	0.32	13.74	0.03	0.00	0.00	98.28	
T577	59	93MPB009	C14-02	0.25-0.5	black	Chromite	0.15	2.59	9.39	51.68	21.18	0.24	13.28	0.02	0.00	0.02	98.56	
T577	89	93MPB010	C14-02	0.25-0.5	black	Chromite	0.42	0.22	17.39	40.70	24.66	0.29	13.99	0.02	0.00	0.00	97.69	
T577	114	93MPB011	C14-03	0.25-0.5	black	Chromite	0.13	1.56	10.73	49.69	26.87	0.25	9.19	0.00	0.03	0.03	98.47	
T577	116	93MPB011	C14-03	0.25-0.5	black	Chromite	0.23	0.39	12.04	53.92	21.47	0.34	10.25	0.01	0.02	0.02	98.68	
T577	119	93MPB011	C14-03	0.25-0.5	black	Chromite	0.37	1.20	25.64	38.09	16.25	0.15	16.04	0.01	0.02	0.00	97.78	
T577	121	93MPB011	C14-03	0.25-0.5	black	Chromite	0.16	0.47	11.97	52.08	22.87	0.29	9.98	0.02	0.01	0.02	97.87	
T577	115	93MPB011	C14-03	0.25-0.5	black	Cr-Spinel	0.25	1.08	31.22	32.22	14.48	0.19	17.76	0.00	0.00	0.00	97.19	
T577	120	93MPB011	C14-03	0.25-0.5	black	Cr-Spinel	0.29	1.08	24.59	38.58	17.13	0.17	15.93	0.02	0.00	0.01	97.80	
T577	95	93MPB011	C14-03	0.5-1.0	black	Chromite	0.22	0.35	14.05	53.49	16.74	0.24	13.31	0.02	0.00	0.00	98.40	
T577	124	93MPB011	C14-03	0.5-1.0	black	Chromite	0.12	0.08	13.67	53.56	19.31	0.36	11.81	0.00	0.10	0.00	99.03	
T577	125	93MPB011	C14-03	0.5-1.0	black	Chromite	0.10	1.55	10.26	49.97	26.08	0.32	9.19	0.01	0.01	0.00	97.49	
T577	123	93MPB011	C14-03	0.5-1.0	black	Cr-Spinel	0.52	0.42	24.52	33.81	22.40	0.17	15.69	0.00	0.00	0.02	97.55	
T578	32	93MPB012	C14-04	0.25-0.5	black	Chromite	0.18	0.36	15.34	48.12	28.31	0.78	5.01	0.02	0.04	0.01	98.18	
T578	33	93MPB012	C14-04	0.25-0.5	black	Chromite	0.16	0.21	25.20	41.46	16.58	0.22	15.59	0.02	0.00	0.02	99.47	
T578	69	93MPB013	C14-04	0.25-0.5	black	Chromite	0.17	0.68	21.39	37.56	26.52	0.28	11.92	0.02	0.00	0.01	98.54	
T578	71	93MPB013	C14-04	0.25-0.5	black	Chromite	0.26	0.92	23.92	41.45	15.00	0.18	16.27	0.01	0.00	0.02	98.02	
T578	70	93MPB013	C14-04	0.25-0.5	black	Cr-Spinel	0.29	1.12	29.62	34.01	14.14	0.14	17.43	0.01	0.00	0.00	96.76	
T454	82	93MPB020	C14-05	0.5-1.0	black	Chromite	0.19	0.88	22.17	40.45	15.80	0.17	15.40	0.02	0.00	0.00	95.08	
T578	131	93MPB022	C14-05	0.25-0.5	black	Cr-Spinel	0.24	1.07	30.78	31.65	18.09	0.16	16.26	0.00	0.03	0.01	98.29	
T579	47	93MPB023	C14-05	0.25-0.5	black	Chromite	0.17	1.66	5.17	58.02	21.25	0.36	11.50	0.02	0.00	0.04	98.17	
T579	68	93MPB023	C14-05	0.25-0.5	black	Chromite	0.10	0.47	8.56	57.76	20.00	0.33	11.65	0.00	0.02	0.02	98.90	
T579	69	93MPB023	C14-05	0.25-0.5	black	Chromite	0.30	3.52	7.66	52.13	21.74	0.31	13.34	0.01	0.02	0.00	99.02	
T579	75	93MPB023	C14-05	0.25-0.5	black	Chromite	0.15	2.49	11.19	45.09	29.33	0.33	8.95	0.02	0.05	0.01	97.61	
T579	76	93MPB023	C14-05	0.25-0.5	black	Chromite	0.15	0.06	14.84	55.82	15.03	0.25	13.23	0.00	0.00	0.03	99.41	
T579	79	93MPB023	C14-05	0.25-0.5	black	Chromite	0.11	0.27	16.21	52.59	17.18	0.30	11.64	0.04	0.00	0.00	98.33	
T579	81	93MPB023	C14-05	0.25-0.5	black	Chromite	0.31	5.27	10.18	45.57	22.74	0.28	14.19	0.03	0.00	0.00	98.57	
T579	67	93MPB023	C14-05	0.25-0.5	black	Chromite*	0.13	1.22	5.20	61.46	18.19	0.32	12.39	0.01	0.00	0.01	98.93	high Ti
T579	66	93MPB023	C14-05	0.25-0.5	black	Cr-Spinel	0.20	0.51	36.52	29.21	12.88	0.13	18.54	0.01	0.00	0.02	98.01	
T579	52	93MPB023	C14-05	0.5-1.0	black	Chromite	0.18	1.18	7.12	55.46	22.34	0.32	10.91	0.00	0.04	0.00	97.55	
T579	54	93MPB023	C14-05	0.5-1.0	black	Chromite	0.09	1.67	7.11	56.41	21.83	0.26	11.57	0.00	0.01	0.01	98.95	
T579	55	93MPB023	C14-05	0.5-1.0	black	Chromite	0.16	1.89	4.96	57.68	22.68	0.36	10.45	0.00	0.03	0.00	98.22	
T579	64	93MPB023	C14-05	0.5-1.0	black	Chromite	0.16	1.16	8.85	54.09	26.69	0.46	8.01	0.01	0.00	0.02	99.45	
T579	65	93MPB023	C14-05	0.5-1.0	black	Chromite	0.16	1.39	6.65	59.15	19.46	0.32	12.14	0.00	0.00	0.00	99.27	

## APPENDIX C.6: Microprobe data for chromites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T579	70	93MPB023	C14-05	0.5-1.0	black	Chromite	0.44	0.29	19.90	39.98	22.64	0.22	14.83	0.01	0.00	0.00	98.30	
T579	72	93MPB023	C14-05	0.5-1.0	black	Chromite	0.08	0.59	10.75	56.01	18.70	0.28	12.13	0.00	0.00	0.00	98.53	
T579	73	93MPB023	C14-05	0.5-1.0	black	Chromite	0.28	3.57	7.38	52.15	21.71	0.30	13.16	0.01	0.00	0.00	98.56	
T579	77	93MPB023	C14-05	0.5-1.0	black	Chromite	0.20	3.88	6.37	56.57	17.50	0.32	14.42	0.00	0.04	0.01	99.30	
T579	80	93MPB023	C14-05	0.5-1.0	black	Chromite	0.13	1.59	5.51	60.20	19.25	0.39	11.68	0.01	0.00	0.02	98.79	
T579	82	93MPB023	C14-05	0.5-1.0	black	Chromite	0.10	0.81	9.30	55.94	20.38	0.27	11.30	0.00	0.00	0.00	98.09	
T579	83	93MPB023	C14-05	0.5-1.0	black	Chromite	0.14	0.05	19.06	50.97	14.68	0.25	13.51	0.00	0.04	0.00	98.69	
T579	84	93MPB023	C14-05	0.5-1.0	black	Chromite	0.18	1.70	6.35	53.93	23.34	0.25	10.60	0.01	0.02	0.00	96.39	
T579	85	93MPB023	C14-05	0.5-1.0	black	Chromite	0.15	0.01	20.30	49.52	14.99	0.32	13.42	0.01	0.00	0.00	98.72	
T579	48	93MPB023	C14-05	0.5-1.0	black	Chromite*	0.15	0.89	2.57	64.42	19.65	0.34	11.21	0.02	0.00	0.00	99.25	high Ti
T579	71	93MPB023	C14-05	0.5-1.0	black	Chromite*	0.28	0.13	8.55	62.30	13.31	0.24	14.30	0.02	0.01	0.00	99.14	Diamond Ir
T579	59	93MPB023	C14-05	0.5-1.0	black	Cr-Spinel	0.58	1.14	24.87	29.23	25.39	0.16	15.23	0.05	0.00	0.02	96.66	
T455	10	93MPB025	C14-06	0.25-0.5	black	Chromite	0.22	1.02	27.16	37.97	14.12	0.22	16.64	0.03	0.00	0.03	97.40	
T463	33	93MPB048	C14-08	0.25-0.5	black	Chromite	0.05	1.90	13.26	44.44	33.98	0.46	4.96	0.04	0.00	0.00	99.07	
T463	65	93MPB049	C14-08	0.5-1.0	black	Chromite	0.08	1.35	6.66	54.25	25.17	0.36	10.50	0.01	0.00	0.01	98.40	
T463	68	93MPB049	C14-08	0.5-1.0	black	Chromite	0.09	0.43	12.13	51.36	25.12	0.35	8.81	0.00	0.00	0.02	98.30	
T579	112	93MPB050	C14-08	0.25-0.5	black	Cr-Spinel	0.26	1.21	27.90	34.45	18.25	0.25	16.00	0.02	0.03	0.00	98.38	
T579	113	93MPB050	C14-08	0.25-0.5	black	Cr-Spinel	0.23	0.89	32.63	29.62	17.84	0.15	16.59	0.00	0.00	0.01	97.96	
T580	36	93MPB051	C14-08	0.25-0.5	black	Chromite	0.30	0.23	10.43	52.92	20.51	0.50	10.51	0.04	0.00	0.01	95.45	
T580	42	93MPB051	C14-08	0.25-0.5	black	Chromite	1.55	0.86	13.36	49.78	20.58	0.32	11.88	0.04	0.05	0.01	98.43	
T580	13	93MPB051	C14-08	0.25-0.5	black	Cr-Spinel	0.20	0.91	33.78	29.49	15.89	0.21	17.37	0.02	0.00	0.00	97.88	
T580	34	93MPB051	C14-08	0.25-0.5	black	Cr-Spinel	0.25	1.70	24.98	35.03	21.59	0.24	14.86	0.01	0.00	0.01	98.68	
T580	35	93MPB051	C14-08	0.25-0.5	black	Cr-Spinel	0.26	1.02	27.40	36.69	15.64	0.17	16.63	0.01	0.00	0.00	97.81	
T580	37	93MPB051	C14-08	0.25-0.5	black	Cr-Spinel	0.26	0.83	31.18	33.19	16.10	0.16	17.20	0.01	0.00	0.00	98.93	
T580	39	93MPB051	C14-08	0.25-0.5	black	Cr-Spinel	0.30	0.92	32.67	31.26	15.54	0.17	17.20	0.00	0.00	0.02	98.08	
T580	66	93MPB052	C14-08	0.25-0.5	black	Chromite	0.18	0.36	13.62	50.83	22.68	0.33	10.18	0.01	0.00	0.01	98.19	
T580	68	93MPB052	C14-08	0.25-0.5	black	Chromite	0.23	1.42	23.80	39.43	17.46	0.16	15.36	0.01	0.00	0.00	97.86	
T580	69	93MPB052	C14-08	0.25-0.5	black	Cr-Spinel	0.21	1.85	36.80	23.70	16.61	0.24	16.37	0.01	0.01	0.02	95.82	
T586	83	93MPB204	C14-05	0.25-0.5	black	Chromite	1.01	2.87	7.00	47.28	20.36	0.29	12.21	1.47	0.14	0.42	93.06	
T586	95	93MPB204	C14-05	0.25-0.5	black	Chromite	0.17	2.03	4.98	55.10	26.26	0.39	8.71	0.00	0.03	0.01	97.66	
T586	50	93MPB204	C14-05	0.5-1.0	black	Chromite	0.32	1.23	7.78	56.19	20.07	0.26	12.08	0.04	0.01	0.01	97.98	
T586	51	93MPB204	C14-05	0.5-1.0	black	Chromite	0.13	0.07	17.93	50.26	16.41	0.16	13.92	0.02	0.03	0.02	98.96	
T586	52	93MPB204	C14-05	0.5-1.0	black	Chromite	0.15	1.77	6.01	57.17	21.37	0.38	11.67	0.00	0.00	0.00	98.53	
T586	57	93MPB204	C14-05	0.5-1.0	black	Chromite	0.14	0.10	15.38	52.33	17.28	0.31	12.16	0.01	0.03	0.00	97.74	
T586	62	93MPB204	C14-05	0.5-1.0	black	Chromite	0.17	0.12	8.49	58.65	18.34	0.31	12.04	0.00	0.06	0.00	98.17	
T586	65	93MPB204	C14-05	0.5-1.0	black	Chromite	0.15	0.08	20.51	50.13	13.36	0.22	14.91	0.05	0.05	0.02	99.48	
T586	66	93MPB204	C14-05	0.5-1.0	black	Chromite	0.19	0.07	20.22	47.51	12.60	14.29	0.26	0.03	0.03	0.00	95.20	
T586	67	93MPB204	C14-05	0.5-1.0	black	Chromite	0.11	0.05	18.67	50.19	16.43	0.35	13.53	0.01	0.00	0.00	99.35	
T586	68	93MPB204	C14-05	0.5-1.0	black	Chromite	0.23	1.99	7.61	58.83	15.09	0.28	14.88	0.00	0.00	0.02	98.92	
T586	70	93MPB204	C14-05	0.5-1.0	black	Chromite	0.28	0.12	14.16	53.95	14.69	0.22	15.25	0.02	0.00	0.00	98.68	
T586	72	93MPB204	C14-05	0.5-1.0	black	Chromite	0.29	1.20	11.41	55.43	15.92	0.27	14.82	0.03	0.00	0.00	99.35	
T586	73	93MPB204	C14-05	0.5-1.0	black	Chromite	0.10	1.13	5.74	59.44	19.39	0.37	11.90	0.02	0.00	0.02	98.11	
T586	74	93MPB204	C14-05	0.5-1.0	black	Chromite	0.16	0.14	15.37	54.13	15.26	0.23	12.72	0.02	0.01	0.00	98.04	
T586	75	93MPB204	C14-05	0.5-1.0	black	Chromite	0.19	1.37	14.96	41.00	30.77	0.26	8.72	0.03	0.00	0.00	97.30	
T586	76	93MPB204	C14-05	0.5-1.0	black	Chromite	0.11	2.34	11.61	38.35	35.68	0.43	7.97	0.02	0.01	0.01	96.52	

## APPENDIX C.6: Microprobe data for chromites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T586	77	93MPB204	C14-05	0.5-1.0	black	Chromite	0.18	0.83	7.01	53.54	21.89	10.63	0.34	0.00	0.00	0.01	94.42	
T586	78	93MPB204	C14-05	0.5-1.0	black	Chromite	0.18	1.89	5.35	55.81	23.69	0.33	10.41	0.01	0.00	0.00	97.69	
T586	79	93MPB204	C14-05	0.5-1.0	black	Chromite	0.17	2.41	6.87	54.62	22.13	0.29	11.44	0.01	0.00	0.01	97.95	
T586	80	93MPB204	C14-05	0.5-1.0	black	Chromite	0.11	0.09	20.91	48.11	14.73	0.27	13.56	0.00	0.00	0.04	97.82	
T586	81	93MPB204	C14-05	0.5-1.0	black	Chromite	0.17	0.60	5.68	54.94	26.28	0.40	9.64	0.01	0.00	0.01	97.73	
T586	82	93MPB204	C14-05	0.5-1.0	black	Chromite	0.11	2.98	5.20	43.57	36.91	0.36	7.80	0.02	0.00	0.01	96.96	
T586	84	93MPB204	C14-05	0.5-1.0	black	Chromite	0.19	1.31	6.68	56.58	22.58	0.39	10.89	0.03	0.00	0.00	98.65	
T586	85	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.06	19.46	50.02	15.18	0.29	13.39	0.01	0.00	0.00	98.54	
T586	86	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.60	11.09	56.97	18.09	0.32	11.42	0.02	0.00	0.00	98.62	
T586	88	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.77	16.29	46.67	23.48	0.33	10.92	0.00	0.00	0.01	98.59	
T586	89	93MPB204	C14-05	0.5-1.0	black	Chromite	0.19	1.24	8.04	56.79	19.79	0.34	12.41	0.03	0.00	0.00	98.83	
T586	90	93MPB204	C14-05	0.5-1.0	black	Chromite	0.13	0.38	13.35	52.34	22.95	0.38	9.19	0.02	0.00	0.01	98.74	
T586	92	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.07	21.95	46.36	16.35	0.26	12.37	0.03	0.07	0.01	97.59	
T586	94	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.08	22.05	47.79	13.78	0.24	14.34	0.02	0.00	0.01	98.44	
T586	97	93MPB204	C14-05	0.5-1.0	black	Chromite	0.28	0.97	6.61	60.87	15.42	0.28	13.91	0.01	0.00	0.00	98.33	
T586	98	93MPB204	C14-05	0.5-1.0	black	Chromite	0.14	0.08	16.91	52.83	15.35	0.23	12.88	0.01	0.00	0.03	98.45	
T586	99	93MPB204	C14-05	0.5-1.0	black	Chromite	0.13	0.06	12.63	56.54	17.61	0.33	10.58	0.00	0.02	0.00	97.90	
T586	100	93MPB204	C14-05	0.5-1.0	black	Chromite	0.15	0.04	14.55	52.57	17.67	0.25	12.70	0.01	0.00	0.00	97.93	
T586	101	93MPB204	C14-05	0.5-1.0	black	Chromite	0.10	2.34	7.06	43.97	34.94	0.35	7.95	0.00	0.00	0.00	96.70	
T586	102	93MPB204	C14-05	0.5-1.0	black	Chromite	0.14	0.04	15.89	54.15	14.56	0.25	12.99	0.02	0.00	0.01	98.05	
T586	103	93MPB204	C14-05	0.5-1.0	black	Chromite	0.12	0.75	10.95	54.40	20.30	0.37	11.04	0.00	0.02	0.00	97.95	
T586	104	93MPB204	C14-05	0.5-1.0	black	Chromite	0.23	1.89	7.00	56.83	19.94	0.35	12.23	0.00	0.00	0.00	98.46	
T586	105	93MPB204	C14-05	0.5-1.0	black	Chromite	0.16	2.33	7.15	56.99	18.32	0.25	12.92	0.03	0.00	0.01	98.15	
T586	87	93MPB204	C14-05	0.5-1.0	black	Chromite*	0.12	0.14	6.20	63.72	17.57	0.39	10.74	0.01	0.01	0.00	98.91	
T586	47	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.17	0.47	31.44	33.21	18.25	0.25	14.98	0.01	0.00	0.02	98.79	
T586	53	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.56	0.52	30.13	31.91	17.48	0.28	17.11	0.02	0.02	0.01	98.03	
T586	54	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.59	0.49	29.76	31.91	17.34	0.20	16.85	0.01	0.00	0.00	97.15	
T586	55	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.59	0.52	29.83	31.96	17.38	0.15	17.26	0.00	0.00	0.00	97.69	
T586	91	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.18	0.42	30.99	33.42	18.16	0.22	14.76	0.00	0.00	0.00	98.16	
T586	93	93MPB204	C14-05	0.5-1.0	black	Cr-Spinel	0.51	0.98	22.00	38.42	19.77	0.24	16.23	0.03	0.00	0.00	98.18	
T586	56	93MPB204	C14-05	0.5-1.0	black	Ti-Chromite	0.33	4.81	10.36	45.12	22.51	0.27	13.49	0.00	0.00	0.02	96.91	
T586	58	93MPB204	C14-05	0.5-1.0	black	Ti-Chromite	0.39	4.62	10.92	45.53	22.66	0.22	13.79	0.01	0.00	0.03	98.17	
T586	61	93MPB204	C14-05	0.5-1.0	black	Ti-Chromite	0.41	4.73	17.57	36.54	22.93	0.24	15.65	0.00	0.00	0.01	98.08	
T586	69	93MPB204	C14-05	0.5-1.0	black	Ti-Chromite	0.14	3.27	5.89	43.42	36.36	0.31	7.49	0.00	0.01	0.01	96.90	
T586	71	93MPB204	C14-05	0.5-1.0	black	Ti-Chromite	0.39	4.82	15.64	38.59	23.08	0.28	15.36	0.02	0.03	0.00	98.21	
T586	96	93MPB204	C14-05	1.0-2.0	black	Chromite	0.27	1.57	6.87	57.94	17.58	0.27	13.64	0.03	0.00	0.02	98.19	
T611	36	93MPB204	C14-05	1.0-2.0	black	Chromite	0.14	0.16	10.67	57.94	17.62	0.32	10.63	0.01	0.00	0.00	97.50	
T611	36b	93MPB204	C14-05	1.0-2.0	black	Chromite	0.19	0.18	10.72	57.84	17.83	0.32	10.77	0.00	0.00	0.00	97.85	
T586	59	93MPB204	C14-05	1.0-2.0	black	Cr-Spinel	0.11	0.02	26.47	42.16	15.10	0.28	13.56	0.01	0.02	0.01	97.73	
T586	64	93MPB204	C14-05	1.0-2.0	black	Ti-Chromite	0.17	3.81	7.05	50.13	25.69	0.28	11.25	0.02	0.00	0.00	98.40	
T496	59	93MPB205	C14-05	0.25-0.5	black	Chromite	0.15	0.15	10.99	57.84	16.04	0.35	11.84	0.00	0.00	0.00	97.35	
T496	68	93MPB205	C14-05	0.25-0.5	black	Chromite	0.16	1.27	7.49	56.96	19.67	0.31	12.01	0.01	0.00	0.01	97.87	
T496	70	93MPB205	C14-05	0.25-0.5	black	Chromite	0.23	1.59	6.68	59.66	16.27	0.27	13.62	0.04	0.00	0.01	98.37	
T496	71	93MPB205	C14-05	0.25-0.5	black	Chromite	0.13	0.02	7.90	60.49	17.74	0.40	10.66	0.01	0.00	0.00	97.34	
T496	73	93MPB205	C14-05	0.25-0.5	black	Chromite	0.14	0.17	8.57	58.21	18.05	0.34	11.35	0.01	0.00	0.01	96.85	



## APPENDIX C.6: Microprobe data for chromites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T496	75	93MPB205	C14-05	0.25-0.5	black	Chromite	0.08	0.19	4.98	61.58	19.05	0.30	11.23	0.03	0.00	0.00	97.44	
T496	77	93MPB205	C14-05	0.25-0.5	black	Chromite	0.12	1.47	7.28	53.19	24.34	0.42	10.03	0.04	0.00	0.02	96.89	
T496	80	93MPB205	C14-05	0.25-0.5	black	Chromite	0.14	0.02	14.31	55.90	13.58	0.27	13.40	0.00	0.00	0.02	97.64	
T496	81	93MPB205	C14-05	0.25-0.5	black	Chromite	0.11	0.03	13.10	56.46	15.12	0.37	12.35	0.01	0.00	0.02	97.57	
T496	83	93MPB205	C14-05	0.25-0.5	black	Chromite	0.25	2.68	7.74	52.09	21.21	0.24	12.83	0.01	0.00	0.02	97.07	
T496	85	93MPB205	C14-05	0.25-0.5	black	Chromite	0.14	0.72	8.33	55.98	21.20	0.32	10.49	0.01	0.00	0.01	97.21	
T496	86	93MPB205	C14-05	0.25-0.5	black	Chromite	0.17	0.71	7.96	54.92	18.83	0.29	10.58	0.02	0.00	0.02	93.49	
T496	87	93MPB205	C14-05	0.25-0.5	black	Chromite	0.03	0.04	12.20	57.50	16.10	0.33	12.00	0.01	0.00	0.02	98.22	
T496	90	93MPB205	C14-05	0.25-0.5	black	Chromite	0.14	1.48	5.76	57.39	21.57	0.32	10.85	0.01	0.00	0.01	97.53	
T496	92	93MPB205	C14-05	0.25-0.5	black	Chromite	0.10	1.37	3.56	59.87	21.17	0.34	11.07	0.01	0.00	0.01	97.50	
T496	93	93MPB205	C14-05	0.25-0.5	black	Chromite	0.11	0.31	8.32	58.02	19.07	0.28	11.79	0.03	0.00	0.01	97.92	
T496	94	93MPB205	C14-05	0.25-0.5	black	Chromite	0.30	2.27	6.93	54.78	20.04	0.23	12.68	0.02	0.00	0.01	97.26	
T496	96	93MPB205	C14-05	0.25-0.5	black	Chromite	0.12	0.22	8.92	57.64	19.28	0.39	10.84	0.03	0.00	0.00	97.45	
T496	98	93MPB205	C14-05	0.25-0.5	black	Chromite	0.13	0.37	9.08	57.14	18.73	0.28	11.73	0.00	0.00	0.01	97.47	
T496	103	93MPB205	C14-05	0.25-0.5	black	Chromite	0.11	0.06	15.43	48.68	21.41	0.41	10.62	0.01	0.00	0.00	96.73	
T496	105	93MPB205	C14-05	0.25-0.5	black	Chromite	0.14	0.36	7.82	57.98	19.36	0.35	11.67	0.01	0.00	0.01	97.69	
T496	106	93MPB205	C14-05	0.25-0.5	black	Chromite	0.30	1.42	15.26	44.93	21.24	0.24	13.94	0.02	0.00	0.00	97.36	
T496	107	93MPB205	C14-05	0.25-0.5	black	Chromite	0.12	1.84	7.37	54.72	21.82	0.30	10.88	0.02	0.00	0.01	97.08	
T496	61	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.22	4.49	5.71	51.64	22.88	0.24	11.72	0.02	0.00	0.03	96.94	
T496	67	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.15	3.47	6.92	52.88	22.70	0.29	11.43	0.02	0.00	0.02	97.88	
T496	79	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.40	4.70	9.27	46.14	22.24	0.25	13.52	0.02	0.00	0.01	96.54	
T496	95	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.20	3.76	6.05	54.90	19.98	0.26	12.42	0.00	0.00	0.00	97.56	
T496	108	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.21	3.69	6.70	56.10	15.90	0.26	14.59	0.02	0.00	0.02	97.50	
T496	111	93MPB205	C14-05	0.25-0.5	black	Ti-Chromite	0.28	4.60	8.69	48.23	21.85	0.29	13.87	0.01	0.00	0.00	97.81	
T496	53	93MPB205	C14-05	0.5-1.0	black	Chromite	0.19	2.05	6.88	56.79	17.95	0.27	12.90	0.03	0.00	0.00	97.07	
T496	54	93MPB205	C14-05	0.5-1.0	black	Chromite	0.09	0.40	9.13	58.43	17.56	0.31	11.68	0.00	0.00	0.00	97.60	
T496	56	93MPB205	C14-05	0.5-1.0	black	Chromite	0.15	1.42	4.66	57.31	23.59	0.29	9.61	0.00	0.00	0.00	97.02	
T496	57	93MPB205	C14-05	0.5-1.0	black	Chromite	0.11	1.19	6.55	56.14	22.07	0.25	11.16	0.00	0.00	0.01	97.48	
T496	58	93MPB205	C14-05	0.5-1.0	black	Chromite	0.11	1.48	6.39	53.68	24.99	0.40	9.72	0.02	0.00	0.01	96.79	
T496	60	93MPB205	C14-05	0.5-1.0	black	Chromite	0.43	0.51	20.63	35.86	24.92	0.23	14.15	0.04	0.00	0.00	96.76	
T496	63	93MPB205	C14-05	0.5-1.0	black	Chromite	0.15	0.78	7.08	57.74	19.81	0.32	11.44	0.01	0.00	0.00	97.33	
T496	64	93MPB205	C14-05	0.5-1.0	black	Chromite	0.15	1.43	4.09	60.54	19.04	0.28	11.83	0.01	0.00	0.00	97.36	
T496	65	93MPB205	C14-05	0.5-1.0	black	Chromite	0.07	1.07	8.47	55.29	21.54	0.27	10.96	0.02	0.00	0.00	97.70	
T496	66	93MPB205	C14-05	0.5-1.0	black	Chromite	0.24	1.77	7.50	59.31	14.86	0.20	14.07	0.02	0.00	0.01	97.97	
T496	72	93MPB205	C14-05	0.5-1.0	black	Chromite	0.13	1.66	6.52	54.65	23.18	0.33	10.94	0.01	0.00	0.00	97.41	
T496	74	93MPB205	C14-05	0.5-1.0	black	Chromite	0.07	0.04	13.41	55.01	17.04	0.35	11.69	0.00	0.00	0.01	97.62	
T496	76	93MPB205	C14-05	0.5-1.0	black	Chromite	0.06	0.27	9.92	57.05	18.24	0.33	11.69	0.01	0.00	0.01	97.59	
T496	78	93MPB205	C14-05	0.5-1.0	black	Chromite	0.09	1.64	8.85	53.42	21.64	0.33	11.20	0.01	0.00	0.00	97.17	
T496	82	93MPB205	C14-05	0.5-1.0	black	Chromite	0.08	0.03	16.70	51.70	16.32	0.32	12.02	0.01	0.00	0.00	97.18	
T496	84	93MPB205	C14-05	0.5-1.0	black	Chromite	0.14	1.66	11.23	47.47	25.60	0.31	10.12	0.00	0.00	0.01	96.54	
T496	89	93MPB205	C14-05	0.5-1.0	black	Chromite	0.16	1.94	2.76	60.21	21.85	0.39	10.55	0.00	0.00	0.01	97.86	
T496	91	93MPB205	C14-05	0.5-1.0	black	Chromite	0.13	0.03	18.95	50.90	14.26	0.28	13.50	0.04	0.00	0.00	98.08	
T496	97	93MPB205	C14-05	0.5-1.0	black	Chromite	0.64	2.84	7.14	54.79	19.39	0.21	12.49	0.02	0.00	0.00	97.52	
T496	99	93MPB205	C14-05	0.5-1.0	black	Chromite	0.19	1.25	7.44	55.18	22.03	0.31	10.91	0.01	0.00	0.00	97.32	
T496	100	93MPB205	C14-05	0.5-1.0	black	Chromite	0.21	1.06	7.95	59.69	14.54	0.27	14.07	0.03	0.00	0.02	97.83	

APPENDIX C.6: Microprobe data for chromites

MOUNT	NO.	SAMPLE	DRILL HOLE	SIZE	COLOR	MINERAL	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	TOTAL	REMARKS
T496	101	93MPB205	C14-05	0.5-1.0	black	Chromite	0.12	1.83	8.50	53.99	20.32	0.24	11.80	0.01	0.00	0.01	96.80	
T496	104	93MPB205	C14-05	0.5-1.0	black	Chromite	0.18	2.54	7.24	56.30	18.56	0.27	12.67	0.02	0.00	0.01	97.78	
T496	109	93MPB205	C14-05	0.5-1.0	black	Chromite	0.09	2.29	7.01	47.75	31.46	0.41	8.31	0.00	0.00	0.01	97.33	
T496	110	93MPB205	C14-05	0.5-1.0	black	Chromite	0.11	1.79	6.25	54.50	23.37	0.34	10.80	0.01	0.00	0.01	97.18	
T496	52	93MPB205	C14-05	0.5-1.0	black	Cr-Spinel	0.56	0.17	28.23	30.21	20.67	0.16	16.59	0.02	0.00	0.03	96.63	
T496	62	93MPB205	C14-05	0.5-1.0	black	Cr-Spinel	0.56	0.16	28.24	30.38	20.29	0.16	16.60	0.02	0.00	0.00	96.40	
T496	88	93MPB205	C14-05	1.0-2.0	black	Chromite	0.10	1.55	7.13	56.07	20.60	0.37	11.58	0.03	0.00	0.00	97.42	

**Appendix D. INAA data for the <1.0 mm, non-ferromagnetic heavy mineral fraction of kimberlite and glacial sediments**

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Table D.1 Elements determined and lower detection limits for INAA of the <1.0 mm nonferromagnetic heavy mineral fraction.

Element	Lower Detection limit
Ag ppm	5 ppm
As ppm	0.5 ppm
Au ppb	2 ppb
Ba ppm	200 ppm
Br ppm	0.5 ppm
Ca %	1%
Ce ppm	3.0 ppm
Co ppm	1 ppm
Cr ppm	5 ppm
Cs ppm	1 ppm
Eu ppm	0.2 ppm
Fe %	0.01%
Hf ppm	1 ppm
Hg	1 ppm
Ir ppb	10 ppb
La ppm	0.5 ppm
Lu ppm	0.05 ppm
Mo ppm	20 ppm
Na %	0.01%
Ni ppm	200 ppm
Nd ppm	5 ppm
Rb ppm	15 ppm
Sb ppm	0.1 ppm
Sc ppm	0.1 ppm
Se ppm	20 ppm
Sm ppm	0.1 ppm
Sn ppm	500 ppm
Sr ppm	500 ppm
Ta ppm	0.5 ppm
Tb ppm	0.5 ppm
Th ppm	0.2 ppm
U ppm	0.5 ppm
W ppm	1 ppm
Yb ppm	0.2 ppm
Zn ppm	50 ppm

APPENDIX D.1 INAA data for duplicate analyses of the <1.7 mm heavy mineral fraction

SAMPLE	VIAL No.	Au ppb	As ppm	Ba ppm	Ca %	Co ppm	Cr ppm	Fe %	Hf ppm	Na %	Rb ppm	Sb ppm	Sc ppm	Sr ppm	Ta ppm	Th ppm	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm	Mass g
93MPB002	1	78	<0.5	340	9	27	530	11.9	67	0.35	37	0.4	64	890	6.0	36	7.6	7	<50	110	220	85	19	4.7	3.5	13.9	2.22	64.4
93MPB002	2	131	2.4	210	9	27	500	11.0	56	0.34	<15	<0.1	60	<500	4.9	30	5.4	6	212	95	190	84	17	4.4	2.8	12.7	1.94	64.5
93MPB012	2	331	5.2	<200	13	43	450	12.8	62	0.49	<15	0.3	69	<500	5.4	29	5	<1	125	97	220	100	18	5.9	3.2	13.8	2.58	60.9
93MPB012	3	455	5.1	<200	11	35	390	11.2	69	0.43	<15	<0.1	60	<500	4.3	26	5.2	6	132	89	190	73	16	4.9	0.6	11.6	2.20	60.5
93MPB026	1	60	5.0	<200	7	36	430	9.8	72	0.28	<15	0.3	51	<500	4.5	41	7.2	3	84	110	210	88	17	4.0	2.8	12.0	1.95	63.3
93MPB026	2	225	6.4	<200	8	38	470	10.8	72	0.28	<15	0.4	56	<500	5.1	42	7	4	108	120	220	92	17	4.2	2.8	12.9	2.10	64.2
93MPB037	1	240	3.9	<200	5	32	530	11.1	82	0.28	<15	<0.1	56	<500	7.7	64	9.9	45	254	150	270	110	21	4.0	3.4	14.1	2.34	60.7
93MPB037	2	120	4.4	<200	8	30	520	11.7	83	0.33	<15	0.3	63	<500	6.7	54	8.7	11	251	150	260	100	21	4.7	3.4	15.3	2.38	59.9
93MPB044	1	57	5.4	<200	7	29	430	9.6	56	0.27	<15	0.3	58	<500	4.5	35	5.6	<1	230	110	190	87	16	3.9	2.8	11.7	1.85	62.0
93MPB044	2	50	4.1	<200	10	37	520	11.8	77	0.33	<15	0.5	64	<500	7.2	46	5.7	<1	161	140	280	100	23	5.5	3.5	16.0	2.63	60.0
93MPB060	1	72	8.6	<200	9	45	600	14.1	100	0.39	<15	<0.1	75	<500	8.0	61	9.4	<1	198	170	330	120	28	6.1	4.5	19.4	3.18	62.2
93MPB060	2	121	6.5	<200	10	46	590	13.6	99	0.38	<15	0.7	73	<500	8.0	57	11	<1	208	160	320	110	27	6.3	<0.5	18.3	3.08	60.2
93MPB064	1	49	5.2	<200	9	32	610	13.3	140	0.43	<15	0.6	71	<500	9.9	72	10	<1	164	190	390	120	32	6.6	5.3	19.0	2.71	62.7
93MPB064	2	16	3.4	<200	9	30	550	12.2	130	0.42	<15	<0.1	66	<500	9.5	64	10	<1	195	180	350	130	30	6.3	<0.5	18.6	3.12	61.9
93MPB075	1	303	4.4	<200	11	49	650	15.0	90	0.31	<15	<0.1	78	<500	7.2	54	9.3	<2	181	170	310	120	23	6.0	4.9	20.2	3.33	62.4
93MPB075	2	77	5.0	<200	11	44	590	13.6	83	0.31	<15	<0.1	72	1200	7.1	50	8.1	<2	<50	150	280	84	22	5.4	4.6	17.3	3.06	62.0
93MPB083	1	51	4.3	<200	10	31	410	11.2	48	0.40	<15	0.6	64	<500	4.5	28	5.8	<1	187	110	210	72	18	5.3	4.0	12.2	2.12	61.0
93MPB083	2	86	4.2	360	8	28	340	9.7	34	0.38	<15	0.7	59	<500	5.4	23	3.4	<1	191	90	180	74	17	4.7	2.6	11.0	1.82	60.3
93MPB091	1	<2	4.8	<200	9	24	390	9.4	81	0.28	<15	0.5	51	<500	6.1	42	9.5	<1	117	120	230	110	19	4.6	3.3	12.5	2.11	61.5
93MPB091	2	41	3.7	260	9	25	400	9.6	83	0.28	<15	0.4	52	<500	5.1	43	8.4	<1	115	120	240	100	19	4.7	3.3	12.5	2.09	61.8
93MPB095	2	32	1.7	<200	6	22	390	9.4	54	0.31	<15	0.3	52	<500	4.6	33	6.6	<1	159	99	200	87	17	4.2	3.0	11.2	1.76	60.9
93MPB095	3	9	0.6	<200	7	23	420	10.1	53	0.34	<15	0.3	56	<500	5.5	34	6	<1	214	100	200	90	17	4.4	3.0	12.1	1.90	61.1
93MPB101	1	32	<0.5	<200	7	20	370	8.9	57	0.28	<15	<0.1	48	<500	5.1	33	6	<1	180	91	170	74	15	3.6	2.5	10.8	1.83	65.8
93MPB101	2	248	1.7	<200	9	23	440	10.4	61	0.31	<15	0.4	54	<500	5.6	36	5.4	5	67	100	190	81	15	3.9	2.8	12.7	1.99	61.2
93MPB123	1	68	4.9	330	11	29	570	13.1	57	0.38	<15	0.8	72	<500	6.5	33	5	<2	172	100	230	94	20	5.5	3.6	15.2	2.49	59.7
93MPB123	2	146	<0.7	<200	12	28	700	14.5	83	0.35	<15	<0.1	73	<500	8.0	51	6.1	<2	225	130	280	130	22	5.4	4.2	19.0	2.96	55.4
93MPB125	2	71	<0.5	<200	10	27	430	11.1	49	0.36	<15	0.3	62	<500	5.4	28	4	<1	281	85	190	58	15	4.5	3.4	12.8	2.51	63.2
93MPB125	3	3620	<0.5	<200	11	26	440	10.9	49	0.36	<15	0.3	59	1100	4.7	26	5.9	6	307	86	200	77	15	4.6	3.6	12.4	2.50	63.4

APPENDIX D.1 INAA data for duplicate analyses of the <1.7 mm heavy mineral fraction

SAMPLE	VIAL No.	Au ppb	As ppm	Ba ppm	Ca %	Co ppm	Cr ppm	Fe %	Hf ppm	Na %	Rb ppm	Sb ppm	Sc ppm	Sr ppm	Ta ppm	Th ppm	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm	Mass g
93MPB143	1	68	<1	<200	14	35	700	15.8	100	0.41	<15	0.7	81	<500	11.0	57	10	<3	262	170	360	130	26	6.9	5.0	26.0	4.27	65.5
93MPB143	2	120	5.9	<200	12	32	640	15.2	98	0.38	<15	<0.1	79	<500	9.1	58	10	<3	210	170	340	130	26	6.9	4.3	25.3	4.20	64.4
93MPB144	1	24	4.5	<200	13	29	570	13.6	54	0.42	37	0.4	71	<500	8	40	5.3	<1	339	110	250	90	19	5.8	3.6	19.4	3.66	50.9
93MPB144	2	123	2.0	<200	6	22	510	11.4	43	0.34	<15	0.4	56	<500	4.7	33	5	<1	173	96	210	84	17	4.0	2.9	14.1	2.45	52.3
93MPB157	1	58	<0.9	<200	11	33	470	12.5	80	0.45	<15	<0.1	73	<500	5.0	47	7.7	<4	169	140	250	100	19	5.3	<0.5	16.8	2.91	61.4
93MPB157	2	42	5.8	<200	8	32	550	12.1	85	0.38	<15	0.7	65	1400	8.2	56	6.2	<2	116	150	290	91	22	5.2	3.2	16.9	2.86	60.9
93MPB182	1	32	3.6	<200	9	33	550	13.8	110	0.49	<15	<0.1	81	<500	7.5	78	12	<2	366	200	410	130	29	7.4	4.9	19.9	3.60	51.8
93MPB182	2	12	3.2	400	7	23	510	10.7	73	0.36	<15	<0.1	61	<500	4.1	57	9.3	<1	133	150	290	100	23	4.9	3.7	14.5	2.39	51.5
93MPB188	1	51	<0.6	<200	8	29	520	11.8	96	0.34	<15	<0.1	67	<500	7.2	53	8.9	11	241	140	280	81	19	4.7	3.2	14.6	2.97	67.2
93MPB188	2	19	6.1	680	10	32	610	12.6	98	0.35	<15	0.4	69	<500	7.2	58	8.4	<2	383	140	300	110	21	5.9	4.0	16.8	3.43	67.2
93MPB197	2	14	3.1	<200	<1	51	6100	8.2	33	0.22	<15	<0.1	34	<500	45.0	63	12	13	113	390	610	170	31	9.4	3.6	5.6	1.03	76.1
93MPB197	3	25	<0.7	<200	9	55	5500	8.8	40	0.25	<15	<0.1	38	<500	50.0	71	13	<1	113	460	710	220	37	11.6	<0.5	6.6	1.22	76.0
93MPB202	1	446	6.2	<200	8	39	610	12.3	69	0.34	<15	0.6	65	<500	5.8	36	6.7	8	130	130	240	92	19	4.6	3.4	14.1	2.70	69.8
93MPB202	2	178	7.5	320	10	41	630	13.3	82	0.39	<15	0.2	72	<500	6.0	39	5.5	<1	328	140	270	88	21	5.3	3.4	15.3	2.93	68.2
93MPB204	3	46	<2	<200	5	77	7700	6.8	24	0.23	<50	<0.2	45	<500	49	72	10	<4	<200	580	820	320	43	13.4	4	4.4	0.60	16.5
93MPB204	4	<5	<2	<200	7	66	7200	6.5	26	0.22	86	<0.2	44	<500	53	77	9	21	<200	620	860	320	45	14.0	4	4.4	0.60	16.3

APPEDNIX D.2 INAA data for the <1.7 mm heavy mineral fraction

SAMPLE	DRILL HOLE	MATERIAL TYPE	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Fe %	Hf ppm	Na %	Rb ppm	Sb ppm	Sc ppm	Sr ppm	Ta ppm	Th ppm	U ppm	W ppm	Zn ppm
93MPB001	C14-01	sand	553	8.4	<200	<0.5	9	54	550	13.9	52	0.35	<15	0.7	61	1000	7.7	35	7.3	<1	<50
93MPB002	C14-02	sand	114	2.0	262	<0.5	10	30	569	12.4	68	0.37	24	0.2	67	660	6.1	37	7.1	8	167
93MPB003	C14-02	sand	85	1.8	360	<0.5	11	28	687	13.5	129	0.35	<15	0.3	73	<500	7.8	58	10.9	<1	104
93MPB004	C14-02	sand	117	2.4	<200	<0.5	12	28	748	15.0	135	0.32	<15	0.6	81	<500	7.5	60	12.0	10	182
93MPB005	C14-02	till	150	5.4	<200	<0.5	11	33	693	14.0	143	0.40	<15	0.3	74	<500	7.9	72	12.7	<1	181
93MPB006	C14-02	till	325	3.2	<200	<0.5	7	27	444	10.3	93	0.39	<15	0.3	48	<500	4.7	44	7.1	<1	106
93MPB007	C14-02	till	129	5.1	<200	<0.5	9	62	489	11.2	74	0.35	<15	0.3	52	<500	6.5	34	7.7	170	133
93MPB008	C14-02	till	200	7.5	<200	<0.5	9	48	430	13.6	110	0.35	<15	<0.1	69	<500	7.6	44	9.5	28	100
93MPB009	C14-02	till	186	11.0	<200	<0.5	12	46	490	13.9	120	0.38	<15	0.4	70	<500	7.5	53	9.7	18	110
93MPB010	C14-02	till	598	9.2	560	<0.6	11	71	490	14.2	55	0.45	<15	0.5	72	<500	9.7	39	9.1	190	130
93MPB011	C14-03	till	51300	10.0	<200	<0.6	12	49	560	13.9	110	0.32	<15	<0.1	69	<500	7.0	44	6.8	31	394
93MPB012	C14-04	till	302	4.8	<200	<0.5	13	39	430	12.1	71	0.46	<15	0.3	65	<500	5.3	29	5.6	3	133
93MPB013	C14-04	till	127	6.6	<200	<0.5	9	44	465	12.6	82	0.39	<15	0.4	64	<500	7.5	36	5.8	<1	220
93MPB014	C14-05	sand	77	<0.5	<200	<0.5	10	27	590	12.9	87	0.31	<15	<0.1	69	<500	8.3	89	10.0	6	221
93MPB019	C14-05	till	87	5.2	<200	<0.5	8	39	413	11.5	66	0.35	<15	0.3	53	<500	6.6	35	6.1	36	129
93MPB020	C14-05	till	59	11.0	<200	<0.6	11	46	570	14.9	91	0.46	<15	0.6	76	<500	8.7	49	9.1	<2	239
93MPB021	C14-05	till	72	9.3	360	<0.5	13	44	470	14.2	110	0.43	<15	<0.1	75	<500	9.3	50	11.0	14	165
93MPB022	C14-05	till	61	8.8	<200	<0.5	12	47	425	12.9	92	0.40	<15	0.3	65	1141	7.2	40	7.9	5	252
93MPB023	C14-05	till	3020	5.3	<200	<0.6	11	38	2200	9.6	54	0.36	<15	<0.1	53	2300	32.0	64	7.2	13	170
93MPB024	C14-06	sand	85	2.6	<200	<0.5	8	27	471	11.0	90	0.30	<15	0.3	60	<500	6.1	38	8.8	<1	118
93MPB025	C14-06	sand&gravel	215	7.8	216	<0.5	9	49	413	11.8	48	0.32	<15	0.4	54	<500	5.0	28	5.5	12	145
93MPB048	C14-08	till	116	5.9	<200	<0.6	8	39	741	15.2	175	0.29	<16	<0.1	74	<500	10.6	93	12.0	<1	167
93MPB049	C14-08	till	228	2.5	<200	<0.5	9	36	578	12.9	98	0.31	<15	0.4	68	917	7.6	52	8.1	3	163
93MPB050	C14-08	till	314	4.4	<200	<0.5	11	29	605	12.9	145	0.40	<15	0.3	67	742	8.5	74	11.0	8	351
93MPB051	C14-08	till	221	2.8	<200	<0.5	9	36	633	13.6	162	0.36	<15	<0.1	69	<500	8.3	81	12.9	<1	270
93MPB052	C14-08	till	149	3.8	479	<0.5	13	25	462	12.2	102	0.40	<15	0.5	75	624	6.0	47	9.5	5	372
93MPB204	C14-05	kimberlite	16	<2	223	<5	7	74	7525	6.7	25	0.23	59	<0.2	45	<500	49.8	74	9.0	20	<200

APPENDIX D.2 INAA data for the <1.7 mm heavy mineral fraction

SAMPLE	DRILL HOLE	MATERIAL TYPE	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb pm	Yb ppm	Lu ppm	Mass g
93MPB001	C14-01	sand	110	210	77	18	4.9	3	13	2.25	62.5
93MPB002	C14-02	sand	113	229	96	20	5.0	3	14	2.27	156.5
93MPB003	C14-02	sand	159	314	126	25	6.0	4	19	3.04	146.9
93MPB004	C14-02	sand	170	339	145	27	7.1	4	21	3.41	109.3
93MPB005	C14-02	till	190	370	160	29	6.3	4	19	3.23	88.3
93MPB006	C14-02	till	120	230	99	18	4.0	3	12	1.99	123.3
93MPB007	C14-02	till	101	207	101	17	4.3	3	12	1.96	86.9
93MPB008	C14-02	till	140	270	88	21	6.1	4	16	3.10	66.6
93MPB009	C14-02	till	160	340	150	24	7.8	5	18	3.35	62.7
93MPB010	C14-02	till	140	270	120	23	6.9	4	14	2.93	37.2
93MPB011	C14-03	till	120	240	100	19	7.1	<0.5	17	3.22	49.4
93MPB012	C14-04	till	99	210	88	17	5.7	1	13	2.46	179.7
93MPB013	C14-04	till	110	235	83	18	5.2	3	14	2.61	131.4
93MPB014	C14-05	sand	190	380	140	29	5.7	4	19	3.14	35.6
93MPB019	C14-05	till	104	209	93	18	4.5	3	12	1.97	102.8
93MPB020	C14-05	till	150	330	160	27	7.2	4	18	2.83	20.3
93MPB021	C14-05	till	150	310	150	25	6.9	5	18	3.41	38.5
93MPB022	C14-05	till	125	270	115	20	6.2	4	15	2.99	128.3
93MPB023	C14-05	till	290	530	170	26	9.4	4	9	1.82	68.3
93MPB024	C14-06	sand	116	240	100	20	5.4	3	15	2.35	110.3
93MPB025	C14-06	sand&gravel	88	178	83	16	4.3	3	11	1.79	102.0
93MPB048	C14-08	till	217	474	162	33	6.5	4	25	4.24	76.1
93MPB049	C14-08	till	148	309	111	24	5.8	4	18	3.00	177.8
93MPB050	C14-08	till	175	345	125	23	5.8	4	20	3.77	115.2
93MPB051	C14-08	till	187	383	151	25	6.7	4	21	4.10	98.4
93MPB052	C14-08	till	146	318	128	23	7.3	4	16	3.11	80.9
93MPB204	C14-05	kimberlite	588	833	323	43	13.5	4	4	0.60	64.7



**Appendix E. ICP-ES and XRF data for the <0.063 mm fraction of  
kimberlite and glacial sediments**

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Table E.1 Analytical methods and lower detection limits for analysis of the &lt;0.063 mm fraction.

Element	Method	Lower Detection limit
Ag ppm	ICP-AES	0.2 ppm
Al %	ICP-AES	0.01%
As ppm	ICP-AES	2 ppm
Au ppb	Fire assay/ICP-AFS	2 ppb
Ba ppm	ICP-AES	10 ppm
Be ppm	ICP-AES	0.5 ppm
Bi ppm	ICP-AES	2 ppm
Ca %	ICP-AES	0.01%
Cd ppm	ICP-AES	0.5 ppm
Co ppm	ICP-AES	1 ppm
Cr ppm	ICP-AES	1 ppm
Cu ppm	ICP-AES	1 ppm
Fe %	ICP-AES	0.01%
Ga ppm	ICP-AES	10 ppm
Hg ppm	ICP-AES	1 ppm
K%	ICP-AES	0.01%
La ppm	ICP-AES	10 ppm
Mg %	ICP-AES	0.01%
Mn ppm	ICP-AES	5 ppm
Mo ppm	ICP-AES	1 ppm
Na %	ICP-AES	0.01%
Ni ppm	ICP-AES	1 ppm
P ppm	ICP-AES	10 ppm
Pb ppm	ICP-AES	2 ppm
Pd ppb	Fire assay/ICP-AFS	2 ppb
Pt ppb	Fire assay/ICP-AFS	3 ppb
Sb ppm	ICP-AES	2 ppm
Sc ppm	ICP-AES	1 ppm
Sr ppm	ICP-AES	1 ppm
Ti %	ICP-AES	0.01%
Tl ppm	ICP-AES	10 ppm
U ppm	ICP-AES	10 ppm
V ppm	ICP-AES	1 ppm
W ppm	ICP-AES	10 ppm
Zn ppm	ICP-AES	2 ppm

Appendix E.1 Quality control data for the &lt;0.063 mm fraction aqua regia/ICP-AES analysis

Sample	Status	Au ppb	Al %	As ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Na %	Ni ppm	P ppm	Pb ppm	Sc ppm	Sr ppm	Ti %	V ppm	Zn ppm
<b>Duplicates</b>																							
92MPB004A	original	4	0.85	<2	20	<0.5	0.34	6	29	9	1.02	0.02	0.24	145	0.01	18	560	<2	2	16	0.07	20	16
92MPB004B	duplicate	2	0.82	<2	20	<0.5	0.34	6	28	8	0.99	0.03	0.23	145	0.01	17	540	2	2	17	0.07	20	16
92MPB005	original	8	0.47	<2	10	<0.5	0.30	3	26	9	0.88	0.01	0.15	105	0.01	16	580	<2	1	14	0.06	19	8
92MPB005B	duplicate	22	0.45	<2	10	<0.5	0.28	3	22	8	0.82	0.01	0.14	100	0.01	15	560	2	1	13	0.05	18	6
92MPB329	original	12	0.88	<2	30	<0.5	0.33	6	34	22	1.06	0.04	0.27	180	0.01	25	580	4	2	16	0.07	21	16
92MPB329A	duplicate	6	0.89	<2	30	<0.5	0.34	6	31	22	1.06	0.04	0.27	180	0.01	25	570	4	2	17	0.08	22	16
92MPB338	original	8	0.64	2	20	<0.5	0.24	3	26	9	0.80	0.02	0.20	120	0.01	19	530	2	2	10	0.05	17	12
92MPB338B	duplicate	4	0.66	<2	20	<0.5	0.25	3	26	9	0.82	0.03	0.20	115	0.01	18	480	2	2	11	0.06	17	10
93MPB003	original	8	0.41	<2	10	<0.5	1.39	3	21	9	0.79	0.02	0.64	95	0.02	8	410	<2	1	18	0.05	19	12
93MPB003A	duplicate	20	0.44	<2	10	<0.5	1.46	4	22	9	0.82	0.02	0.67	100	0.02	10	420	<2	1	20	0.06	21	12
93MPB013	original	<2	0.63	<2	20	<0.5	2.71	4	31	13	1.00	0.04	1.14	175	0.02	12	450	4	2	31	0.08	24	16
93MPB013A	duplicate	2	0.62	<2	20	<0.5	2.69	4	30	12	0.99	0.04	1.13	175	0.02	12	460	<2	2	31	0.08	24	16
93MPB017	original	<2	0.48	<2	10	<0.5	3.10	3	30	11	0.86	0.06	1.42	155	0.01	13	400	2	1	28	0.04	19	14
93MPB017A	duplicate	2	0.47	<2	10	<0.5	3.08	3	29	11	0.84	0.05	1.42	150	0.01	12	390	<2	1	28	0.04	18	14
93MPB027	original	6	0.38	<2	10	<0.5	1.61	3	26	9	0.83	0.02	0.71	105	0.01	8	420	2	1	21	0.06	22	8
93MPB027A	duplicate	4	0.38	<2	10	<0.5	1.64	3	27	10	0.84	0.02	0.73	110	0.02	10	450	4	1	21	0.06	22	8
93MPB053	original	4	0.55	<2	10	<0.5	2.78	4	34	10	0.94	0.03	1.29	135	0.01	17	510	6	2	26	0.06	23	14
93MPB053B	duplicate	4	0.47	<2	10	<0.5	2.49	3	29	9	0.83	0.03	1.15	120	0.01	15	490	2	2	22	0.04	19	12
93MPB054	original	4	0.37	<2	10	<0.5	2.58	3	24	8	0.76	0.03	1.09	115	0.01	13	480	2	1	22	0.04	18	10
93MPB054A	duplicate	6	0.35	<2	10	<0.5	2.54	3	25	8	0.74	0.02	1.07	115	0.01	13	460	<2	1	20	0.04	17	8
93MPB054B	duplicate	2	0.33	<2	10	<0.5	2.51	3	24	8	0.72	0.02	1.05	110	0.01	13	470	<2	1	20	0.03	17	8
93MPB055	original	4	0.30	<2	10	<0.5	2.24	2	24	8	0.77	0.03	0.95	110	0.01	14	540	<2	1	18	0.03	17	8
93MPB055A	duplicate	6	0.33	<2	10	<0.5	2.21	3	25	8	0.79	0.02	0.93	115	0.01	15	520	<2	1	20	0.04	18	8

Appendix E.1 Quality control data for the <0.063 mm fraction aqua regia/ICP-AES analysis

Sample	Status	Au ppb	Al %	As ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Na %	Ni ppm	P ppm	Pb ppm	Sc ppm	Sr ppm	Ti %	V ppm	Zn ppm
93MPB055B	duplicate	6	0.36	<2	10	<0.5	2.32	4	28	8	0.84	0.03	0.97	120	0.01	16	540	4	1	23	0.05	20	8
93MPB056	original	6	0.37	<2	10	<0.5	2.53	4	29	8	0.79	0.03	1.07	125	0.01	15	490	4	1	23	0.05	19	10
93MPB056A	duplicate	6	0.35	<2	10	<0.5	2.46	3	28	8	0.77	0.03	1.04	120	0.01	15	480	6	1	22	0.04	18	8
93MPB058A	original	8	0.37	<2	10	<0.5	2.38	4	28	10	0.97	0.02	0.95	130	0.01	14	630	2	1	24	0.06	24	10
93MPB058B	duplicate	6	0.36	<2	10	<0.5	2.34	3	28	10	0.97	0.02	0.93	125	0.01	14	630	<2	1	23	0.05	23	8
93MPB059	original	2	0.37	<2	10	<0.5	2.75	2	26	9	0.85	0.03	1.12	130	0.01	12	550	6	1	25	0.06	21	8
93MPB059A	duplicate	2	0.37	<2	10	<0.5	2.70	4	25	9	0.86	0.03	1.09	130	0.01	12	540	<2	1	25	0.06	21	8
93MPB078	original	12	0.52	<2	10	<0.5	2.84	5	25	12	1.00	0.03	1.28	150	0.01	14	460	<2	2	25	0.07	27	16
93MPB078A	duplicate	6	0.52	<2	10	<0.5	2.86	4	27	12	1.01	0.03	1.29	150	0.01	15	460	2	2	24	0.06	26	16
93MPB091	original	8	0.29	<2	10	<0.5	1.94	2	15	5	0.62	0.01	0.75	95	0.01	7	520	2	1	20	0.04	16	6
93MPB091A	duplicate	4	0.32	4	10	<0.5	1.99	2	18	6	0.67	0.02	0.77	100	0.01	8	530	4	1	22	0.05	17	8
93MPB130	original	6	0.48	4	10	<0.5	2.08	4	25	11	0.98	0.01	0.88	135	0.01	13	510	<2	1	21	0.06	23	16
93MPB130A	duplicate	6	0.50	4	10	<0.5	2.15	5	25	11	1.01	0.01	0.91	140	0.01	13	520	<2	2	22	0.06	24	16
93MPB152	original	6	0.42	6	10	<0.5	1.83	3	24	9	0.90	0.01	0.79	125	0.01	12	450	4	1	23	0.06	23	12
93MPB152A	duplicate	4	0.42	<2	10	<0.5	1.83	3	26	9	0.90	0.01	0.77	125	0.01	12	460	<2	1	24	0.07	24	12
93MPB194	original	6	0.41	<2	10	<0.5	1.99	2	28	6	0.78	0.06	0.85	110	0.02	11	460	<2	1	24	0.04	16	16
93MPB194A	duplicate	10	0.43	2	10	<0.5	2.01	3	30	6	0.80	0.06	0.85	110	0.02	10	460	<2	1	25	0.04	16	16
<b>Standards</b>																							
92MPB005A	SBA	ISS	2.90	28	90	1	0.07	15	43	70	3.54	0.31	0.80	800	0.00	33	550	30	8	8	0.09	45	100
93MPB053A	SBA	<2	2.87	22	90	2	0.08	15	38	71	3.73	0.29	0.81	845	0.00	37	570	24	8	8	0.09	47	102
93MPB152B	SBA	<2	2.92	22	100	3	0.08	15	41	74	4.01	0.29	0.86	900	0.00	39	590	22	8	9	0.10	51	108
92MPB338A	TCA 8010	178	0.96	2	30	<0.5	0.40	8	29	36	1.84	0.04	0.45	270	0.01	19	510	4	6	19	0.08	29	32
93MPB039A	TCA 8010	180	0.90	<2	30	<0.5	0.42	8	28	37	1.79	0.04	0.43	270	0.01	18	540	2	6	19	0.07	29	30
93MPB069A	TCA 8010	178	0.91	8	30	0.5	0.43	9	27	37	1.82	0.04	0.44	270	0.01	18	530	4	6	19	0.07	30	30

Appendix E.2 Aqua-regia/ICP-AES and XRF data for the <0.063 mm fraction of kimberlite and glacial sediments

SAMPLE	DRILL HOLE	MATERIAL TYPE	Au ppb	Pd ppb	Pt ppb	Al %	As ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Na %	Ni ppm	P ppm	Pb ppm	Sc ppm
93MPB001	C14-01	sand	84	2	<5	0.62	2	10	<0.5	2.16	5	32	18	1.21	0.04	0.96	170	0.01	13	510	<2	1
93MPB002	C14-02	sand	14	2	<5	0.75	4	20	<0.5	1.31	10	34	34	1.79	0.04	0.70	190	0.03	17	450	<2	2
93MPB003	C14-02	sand	8	2	<5	0.41	<2	10	<0.5	1.39	3	21	9	0.79	0.02	0.64	95	0.02	8	410	<2	1
93MPB004	C14-02	sand	2	<2	<5	0.46	4	10	<0.5	1.31	6	26	13	0.98	0.02	0.65	110	0.02	11	440	2	1
93MPB005	C14-02	till	8	<2	<5	0.60	4	20	<0.5	2.24	4	35	10	1.02	0.05	1.01	155	0.03	11	420	<2	2
93MPB006	C14-02	till	2	<2	<5	0.70	2	20	<0.5	3.02	4	37	12	1.12	0.06	1.32	185	0.03	14	450	<2	2
93MPB007	C14-02	till	<2	2	<5	2.10	<2	30	<0.5	3.60	13	92	42	2.03	0.07	1.45	370	0.07	30	360	4	3
93MPB008	C14-02	till	8	<2	<5	1.07	2	40	<0.5	3.81	7	54	24	1.53	0.13	1.62	280	0.03	19	460	4	3
93MPB009	C14-02	till	<2	2	<5	1.26	<2	70	<0.5	4.53	8	57	22	1.72	0.19	1.79	350	0.03	24	450	6	4
93MPB010	C14-02	till	8	2	<5	1.22	<2	70	<0.5	3.63	10	53	21	1.65	0.20	1.49	370	0.04	23	470	4	3
93MPB011	C14-03	till	18	<2	5	1.52	2	20	<0.5	2.10	15	122	23	2.32	0.03	1.99	340	0.03	57	460	4	4
93MPB012	C14-04	till	4	<2	10	0.51	<2	10	<0.5	2.07	3	28	11	0.95	0.03	0.90	140	0.02	11	490	4	2
93MPB013	C14-04	till	<2	2	<5	0.63	<2	20	<0.5	2.71	4	31	13	1.00	0.04	1.14	175	0.02	12	450	4	2
93MPB014	C14-05	sand	<2	<2	10	0.58	<2	20	<0.5	3.08	3	34	10	0.94	0.07	1.40	145	0.02	14	440	<2	2
93MPB015	C14-05	silt	<2	<2	<5	1.33	4	70	<0.5	4.41	8	76	22	1.79	0.22	2.09	345	0.04	30	460	<2	4
93MPB016	C14-05	silt	2	<2	5	0.62	4	20	<0.5	3.70	4	42	12	1.03	0.08	1.71	190	0.02	18	410	2	2
93MPB017	C14-05	silt	<2	<2	5	0.48	<2	10	<0.5	3.10	3	30	11	0.86	0.06	1.42	155	0.01	13	400	2	1
93MPB018	C14-05	silt	6	<2	<5	0.38	<2	10	<0.5	2.09	3	22	8	0.72	0.03	0.94	115	0.01	9	410	2	1
93MPB019	C14-05	till	8	2	<5	0.75	<2	30	<0.5	2.92	7	35	17	1.22	0.09	1.21	200	0.02	15	490	2	2
93MPB020	C14-05	till	8	<2	<5	1.36	4	70	0.5	3.98	8	54	28	1.82	0.20	1.55	325	0.03	23	450	4	4
93MPB021	C14-05	till	8	<2	<5	0.81	2	30	<0.5	2.95	5	38	18	1.31	0.11	1.16	200	0.02	14	530	6	2
93MPB022	C14-05	till	6	<2	<5	1.22	2	70	0.5	3.47	8	56	24	1.73	0.17	1.56	285	0.03	30	460	4	4
93MPB023	C14-05	till	24	<2	<5	1.50	<2	160	0.5	3.36	20	117	36	2.39	0.34	4.02	365	0.05	185	550	6	4
93MPB024	C14-06	sand	14	<2	<5	0.40	<2	0	<0.5	0.39	2	23	18	0.84	0.02	0.25	75	0.01	10	500	2	1
93MPB025	C14-06	sand&gravel	NA	NA	NA	0.63	<2	10	<0.5	0.91	7	39	25	1.56	0.02	0.56	145	0.01	17	610	<2	2
93MPB048	C14-08	till	8	<2	<5	0.45	<2	10	<0.5	2.15	3	22	7	0.85	0.03	0.89	145	0.02	10	500	2	1
93MPB049	C14-08	till	14	<2	<5	0.39	2	10	<0.5	1.81	3	21	6	0.76	0.02	0.74	115	0.02	9	460	6	1
93MPB050	C14-08	till	2	<2	<5	0.45	<2	10	<0.5	1.98	3	23	8	0.84	0.03	0.82	125	0.02	11	480	2	1
93MPB051	C14-08	till	4	2	<5	0.56	2	20	<0.5	2.13	3	26	9	0.97	0.07	0.92	145	0.02	13	500	4	1
93MPB052	C14-08	till	<2	<2	<5	1.31	<2	30	<0.5	1.64	8	39	25	1.63	0.09	1.01	245	0.02	29	470	6	3
93MPB204	C14-05	kimberlite	<2	<2	<5	1.51	<2	300	<0.5	4.31	25	149	34	2.77	0.58	6.77	425	0.03	404	530	<2	4
93MPB205	C14-05	kimberlite	<2	2	<5	1.51	4	390	<0.5	9.83	24	155	33	2.52	0.69	7.17	400	0.05	376	420	<2	5

NA = not analyzed, not applicable

ISS= insufficient sample

Appendix E.2 Aqua-regia/ICP-AES and XRF data for the <0.063 mm fraction of kimberlite and glacial sediments

SAMPLE	DRILL HOLE	MATERIAL TYPE	Sr	Ti	V	Zn	Sr ppm	Zr ppm	Nb ppm
			ppm	%	ppm	ppm	XRF	XRF	XRF
93MPB001	C14-01	sand	22	0.07	25	18	ISS	ISS	ISS
93MPB002	C14-02	sand	20	0.09	47	22	327	281	9
93MPB003	C14-02	sand	18	0.05	19	12	351	292	9
93MPB004	C14-02	sand	18	0.06	22	12	342	291	6
93MPB005	C14-02	till	27	0.07	24	14	341	277	11
93MPB006	C14-02	till	31	0.08	25	18	319	264	10
93MPB007	C14-02	till	31	0.14	53	26	239	170	7
93MPB008	C14-02	till	42	0.10	33	28	307	190	8
93MPB009	C14-02	till	48	0.10	35	34	285	184	9
93MPB010	C14-02	till	42	0.08	30	34	257	191	13
93MPB011	C14-03	till	26	0.13	52	38	NA	NA	NA
93MPB012	C14-04	till	26	0.07	23	16	346	331	10
93MPB013	C14-04	till	31	0.08	24	16	334	251	9
93MPB014	C14-05	sand	30	0.06	22	18	322	229	8
93MPB015	C14-05	silt	62	0.11	38	38	NA	NA	NA
93MPB016	C14-05	silt	38	0.06	23	18	NA	NA	NA
93MPB017	C14-05	silt	28	0.04	19	14	320	223	7
93MPB018	C14-05	silt	20	0.04	17	10	NA	NA	NA
93MPB019	C14-05	till	30	0.07	26	20	321	281	9
93MPB020	C14-05	till	42	0.09	37	36	292	211	9
93MPB021	C14-05	till	32	0.08	29	26	NA	NA	NA
93MPB022	C14-05	till	45	0.10	37	32	NA	NA	NA
93MPB023	C14-05	till	67	0.16	53	34	293	188	26
93MPB024	C14-06	sand	13	0.06	22	14	370	325	9
93MPB025	C14-06	sand&gravel	17	0.09	37	20	354	530	10
93MPB048	C14-08	till	21	0.05	20	12	342	293	7
93MPB049	C14-08	till	19	0.04	18	8	344	314	9
93MPB050	C14-08	till	20	0.04	19	12	338	293	9
93MPB051	C14-08	till	22	0.05	22	14	345	292	8
93MPB052	C14-08	till	25	0.12	37	26	305	233	9
93MPB204	C14-05	kimberlite	128	0.16	52	42	NA	NA	NA
93MPB205	C14-05	kimberlite	221	0.15	53	36	285	240	9

NA = not analyzed, not applicable

ISS= insufficient sample

## Appendix F. Kimberlite and Archean bedrock descriptions and geochemical data

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## Appendix F.1 C14 kimberlite description

**B.A. Kjarsgaard**  
**Geological Survey of Canada**

### **Hole C14-05**

Sample C14-05: 42.0m

Diatreme facies heterolithic tuffisitic kimberlite breccia

The hand sample is light green to grey in colour, with abundant limestone fragments (white, grey and light green in colour) and rarer volcanic (dark brown in colour) fragments. These country rock inclusions are dominantly 1-2 cm in size, but range from <1 to >8 cm in size and are variably coated with kimberlite groundmass material. Black kimberlite autoliths to 4 cm in size were noted, but are not common. Large (.5 - 1 cm) altered olivine grains are also conspicuous, along with rarer garnet and phlogopite crystals. A few larger pelletal lapilli can also be discerned.

Petrographic examination of a thin section from the sample reveals that the macrocryst assemblage is dominated by olivine (typically 5 - 8 mm in size) with phlogopite and garnet and rare orthopyroxene and clinopyroxene. Pelletal lapilli are quite common, and quite variable in size (mm - cm). Olivine which is typically .25 - 2 mm in size is observed in the groundmass, and also in the pelletal lapilli. All the olivine grains in the sample, regardless of size, are completely replaced by serpentine. In rare instances, olivine has been replaced by calcite and serpentine. The groundmass consists of serpentine, Fe-rich spinels with atoll textures, calcite, perovskite and apatite. Micro-crystalline diopside is locally developed.

Sample C14-05: 38.9 m

Virtually identical to that described above and is not separately described, although there appears to be additional sheet silicates (clays) related to weathering processes.



## Appendix F.1 C14 area Archean bedrock descriptions

**B.R. Berger**  
Ontario Geological Survey

**Hole C-14-01:** 17.5-23.0 m. From 17.5 to 20.0 m is weathered bedrock consisting of clay, rock chips and broken rock fragments. From 20.0-23.0 m, bedrock is a dark grey phaneritic basalt. It contains plagioclase phenocrysts and is similar to the bedrock from hole C14-04. There are well developed lineations on some slip faces (slickensides?) indicative of vertical movement. Magnetic susceptibility 5-20 S.I. units; average 10 S.I. units. No sample submitted for thin section.

**Hole C-14-02:** 38.0-40.0 m. From 38.0 to 39.8 m, bedrock is ground up bedrock, consisting of clay and broken rock fragments. From 39.8 to 40.0 m, bedrock is hard, yellow-green felsic rock that is plagioclase porphyritic. There are white plagioclase phenocrysts in a yellow-green groundmass and there is sericite on fracture faces. The rock is largely unaltered but there is trace amounts of disseminated pyrite throughout the rock. The geochemistry indicates that this is a rhyolite. Magnetic susceptibility 5-50 S.I. units with the highest spikes in the clay; the rock average 5-15 S.I. units.

Thin section description:

Quartz	35%
Plagioclase	40%
Sericite	15%
Carbonate	6%
Chlorite	2%
Opaques	2%

This is felsic porphyritic flow with euhedral to anhedral quartz phenocrysts 2-5 mm in size. The plagioclase in the groundmass defines a weak preferred crystal orientation. The geochemistry agrees with the petrography.

**Hole C-14-03:** 8.3-11.0 m. Bedrock is a green-grey phaneritic basalt that has a granular textured fresh surface. There are quartz stringers in many places which makes this rock unsuitable for sampling. The basalt is similar to basalts from other holes in Clifford Township. Trace amounts of disseminated pyrite occur in the upper part of the drill core. No sample submitted for thin section.

**Hole C-14-04:** 13.6-17.0 m. Bedrock is composed of plagioclase porphyritic basalt. The rock is green, medium-grained and contains euhedral to anhedral, white plagioclase phenocrysts up to 1 cm in size (average 2-5 mm).

The basalt is massive to weakly foliated and contains weak hematite alteration.

Thin section description:

Plagioclase	45%
Quartz	25%
Epidote	23%
Chlorite	5%
Carbonate	1%
Opaques	1%

The rock is a quartz-feldspar porphyry (QFP) with 40-50% phenocrysts. The feldspar are euhedral to subhedral and the quartz phenocrysts are subhedral to anhedral. Some of the quartz contains embayments of the groundmass indicating it is primary. There is no foliation or preferred crystal orientation. Original mafic phenocrysts are now altered to epidote. Very typical textures for a QFP intrusion.

**Hole C-14-06:** 19.0-20.0 m. Bedrock is a green foliated mafic flow. Plagioclase phenocrysts comprise approximately 5% of the rock. It is non-magnetic and contains a few widely scattered quartz veins. There is from trace to 1% pyrite on the slip faces. Magnetic susceptibility box 4 – 5-700 S.I. units; average 15 S.I. units.

Thin section description:

Plagioclase	50%
Sericite	28%
Chlorite	13%
Carbonate	7%
Opaques	2%

The rock contains 15% plagioclase phenocrysts in a very fine-grained groundmass containing plagioclase, carbonate and sericite. The plagioclase phenocrysts are euhedral and there does not appear to be any quartz in the rock. There is a weak tectonic foliation. The geochemistry indicates dacitic composition.

**Hole C-14-07:** 11.8 to 15.0 m. From 11.8 to 14.0 m, bedrock consists of bedrock broken into rock fragments and mud ground during drilling. The bedrock is composed of densely amygdaloidal, grey-green basalt. The amygdules are quartz filled and show a preferred elongation which is inferred to be along the foliation planes. Some of the amygdules are rimmed by hematite and there is hematite in a few stringers. There are small mafic phenocrysts in the groundmass and there is trace pyrite throughout the rock. Magnetic susceptibility 5-30 S.I. units; average 15 S.I. units.

## Thin section description:

Plagioclase	50%
Carbonate	10%
White mica	10%
Quartz	10%
Chlorite	10%
Epidote	9%
Opaques	1%
Titanite	trace - 1%

Quartz, carbonate and chlorite are concentrated in amygdules but also occur in the groundmass. Some of the carbonate is botryoidal. White mica replaced some of the plagioclase laths and also occurs in the groundmass. Much of the plagioclase is trachytic textured. This is more an intermediate to mafic flow.

**Hole C-14-08:** 14.0 to 16.5 m. From 14.0-15.0 m, bedrock consists of clay and broken rock fragments of weathered bedrock. From 15.0 to 16.5 m, bedrock is a saussuritized plagioclase phyric basalt. The rock is fine- to medium-grained and has a granular texture. The rock has a subvertical foliation and contains mafic clots. Material is similar to the bedrock in hole C14-06. Magnetic susceptibility 10-30 S.I. units; average 15 S.I. units. No sample submitted for thin section.

## APPENDIX F.2 Analytical methods and lower detection limits for bedrock analysis by X-Ray Assay Labs.

Bedrock type	Element	Method	Lower Detection limit
Archean rocks	major oxides	XRF	0.01%
Archean rocks	As ppm	ICP-ES	3 ppm
Archean rocks	Au ppb	Fire assay/DCP	1 ppb
Archean rocks	Cu ppm	ICP-ES	0.5 ppm
Archean rocks	Co ppm	ICP-ES	1 ppm
Archean rocks	Ni ppm	ICP-ES	1 ppm
Archean rocks	Rb ppm	XRF	2 ppm
Archean rocks	Sr ppm	XRF	2 ppm
Archean rocks	Y ppm	XRF	2 ppm
Archean rocks	Zn ppm	ICP-ES	0.5 ppm
Archean rocks	Zr ppm	XRF	3 ppm

## Appendix F.3 Geochemical data for C14 kimberlite samples

Sample Facies	Analytical Method	Units	Det. Limit	C14-5@38.8m diatreme	C14-5@42.0m diatreme	C14-M@730' hypabyssal	C14-D@260' diatreme	C14-D@560' diatreme
SiO <sub>2</sub>	XRF102	%	0.01	38.1	37.9	35.7	38.7	38.1
TiO <sub>2</sub>	XRF102	%	0.001	1.95	1.88	3	1.65	2.17
Al <sub>2</sub> O <sub>3</sub>	XRF102	%	0.01	4.94	4.86	3.55	4.77	5.37
Fe <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub> t-FeO	%	0.01	4.12	4.08	5.78	3.28	4.01
FeO	CHM111	%	0.10	3.80	3.90	3.8	3.7	3.8
MnO	XRF102	%	0.01	0.13	0.13	0.16	0.13	0.15
MgO	XRF102	%	0.01	23.8	24	25.7	19.8	20.8
CaO	XRF102	%	0.01	8.79	8.63	7.73	12.9	9.46
Na <sub>2</sub> O	XRF102	%	0.01	0.49	0.55	0.49	1.52	1.45
K <sub>2</sub> O	XRF102	%	0.01	1.65	1.45	1.81	1.54	1.99
P <sub>2</sub> O <sub>5</sub>	XRF102	%	0.01	0.28	0.26	0.38	0.31	0.38
CO <sub>2</sub>	CHM114	%	0.01	1.37	1.44	0.43	2.44	11.5
H <sub>2</sub> O+	CHM115	%	0.1	7.7	8.4	9.07	7.86	1.75
Sum	XRF102	%	0.01	97.12	97.48	98.4	98.9	98.2
Cs	NA-BAS	ppm	3	bd	bd	bd	bd	bd
Rb	XRF102	ppm	2	99	84	83	98	118
Be	ICP80	ppm	0.5	0.9	0.8	nd	nd	nd
Sr	ICP80	ppm	0.5	330	323	468	444	461
Ba	ICP80	ppm	1	1130	733	911	615	893
Nb	XRF102	ppm	2	69	68	133	94	118
Zr	XRF102	ppm	2	144	138	121	106	144
Hf	NA-BAS	ppm	1	bd	bd	4	3	4
Ta	NA-BAS	ppm	1	bd	bd	7	4	7
Th	NA-BAS	ppm	0.5	5.8	5.2	7.9	7.1	8.8
U	NA-BAS	ppm	0.5	bd	bd	2.4	1.6	1
Pb	ICP80	ppm	2	8	7	bd	bd	bd
Sc	NA-BAS	ppm	1	12	11	15.5	11.7	13.4
V	ICP80	ppm	2	135	127	nd	nd	nd
Cr	XRF102	ppm	0.01	958	889	1400	710	870
Ni	NA-BAS	ppm	1	864	918	1400	700	800
Co	NA-BAS	ppm	5	73	75	85	55	60
Cu	ICP80	ppm	0.5	218	87.3	nd	nd	nd
Zn	ICP80	ppm	0.5	167	92.8	nd	nd	nd
La	ICP80	ppm	0.5	34.6	39.2	64	49	63
Ce	NA-BAS	ppm	3	89	85	113	91	115
Nd	NA-BAS	ppm	10	bd	bd	40	30	40
Sm	NA-BAS	ppm	0.5	3.9	3.7	6.2	5.1	6.7
Eu	NA-BAS	ppm	0.2	1.1	1	1.5	1.9	1.8
Tb	NA-BAS	ppm	0.5	bd	bd	bd	bd	bd
Yb	NA-BAS	ppm	0.5	0.7	0.8	0.7	1	1.2
Lu	NA-BAS	ppm	0.05	nd	nd	bd	0.11	0.16
Y	ICP80	ppm	0.5	8.7	8.9	nd	nd	nd
As	NA-BAS	ppm	2	4	3	bd	bd	bd
Sb	NA-BAS	ppm	0.2	0.5	0.4	0.2	bd	bd
Bi	ICP80	ppm	5	32	9	nd	nd	nd
Ag	ICP80	ppm	0.2	0.4	0.4	nd	nd	nd
W	NA-BAS	ppm	4	bd	bd	nd	nd	nd
Hg	NA-BAS	ppm	1	bd	bd	nd	nd	nd
Mo	ICP80	ppm	1	bd	bd	nd	nd	nd
Cd	ICP80	ppm	1	bd	bd	nd	nd	nd
Sn	ICP80	ppm	10	bd	bd	nd	nd	nd
Se	NA-BAS	ppm	5	bd	bd	nd	nd	nd
Br	NA-BAS	ppm	1	bd	2	11	1	3
Ir	NA-BAS	ppb	20	bd	bd	nd	nd	nd
Au	NA-BAS	ppb	5	bd	bd	nd	nd	nd

bd= below detection limit  
nd= not determined

# APPENDIX F.2 ARCHEAN BEDROCK GEOCHEMICAL DATA

SAMPLE	DRILL HOLE	SiO2	Al2O3	CaO	MgO	Na2O	K2O	Fe2O3	MnO	TiO2	P2O5	Cr2O3	LOI	Total
93MPB229	C14-02	75.3	13.0	0.28	0.54	4.07	1.87	1.42	0.05	0.22	0.08	<0.01	1.45	98.3
93MPB230	C14-06	65.1	12.8	4.87	1.44	3.15	1.47	6.56	0.11	0.79	0.01	<0.01	4.05	100.5

SAMPLE	DRILL HOLE	Au ppb	Co ppm	Ni ppm	Cu ppm	Zn ppm	As ppm	Rb ppm	Sr ppm	Y ppm	Zr ppm
93MPB229	C14-02	<1	3	2	5.3	18.0	<3	56	94	<2	100
93MPB230	C14-06	<1	10	5	26.8	63.1	<3	37	84	25	192

**Appendix G. Gold grain data**

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APPENDIX G.1 GOLD GRAIN COUNTS

SAMPLE	MATERIAL	DRILL HOLE	NUMBER OF GOLD GRAINS				WEIGHT <2 mm MATERIAL	No. GOLD GRAINS/ kg <2 mm	CALC Au ppb	ACTUAL Au ppb
			Reshaped	Modified	Pristine	Total				
93MPB001	sand	C14-01	41	6	0	47	7.40	64	264	553
93MPB002	sand	C14-02	9	0	0	9	20.75	4	15	114
93MPB003	sand	C14-02	29	2	0	31	24.25	13	48	85
93MPB004	sand	C14-02	13	0	0	13	17.80	7	51	117
93MPB005	till	C14-02	38	1	0	39	15.25	26	51	150
93MPB006	till	C14-02	22	1	0	23	19.50	12	119	325
93MPB007	till	C14-02	24	2	0	26	15.75	17	189	129
93MPB008	till	C14-02	11	0	0	11	18.10	6	58	200
93MPB009	till	C14-02	17	2	0	19	16.70	11	112	186
93MPB010	till	C14-02	8	0	0	8	9.15	9	19	598
93MPB011	till	C14-03	20	0	1	21	7.25	29	2429	51300
93MPB012	till	C14-04	25	0	0	25	16.80	15	18	302
93MPB013	till	C14-04	28	0	0	28	19.85	14	239	127
93MPB014	sand	C14-05	4	0	0	4	7.85	5	39	77
93MPB019	till	C14-05	8	0	0	8	13.20	6	12	87
93MPB020	till	C14-05	2	0	0	2	3.65	5	20	59
93MPB021	till	C14-05	6	0	0	6	5.95	10	12	72
93MPB022	till	C14-05	22	0	0	22	18.55	12	24	61
93MPB023	till	C14-05	0	0	0	0	9.50	0	0	3020
93MPB024	sand	C14-06	17	2	0	19	15.25	12	44	85
93MPB025	sand&gravel	C14-06	14	0	0	14	10.25	14	42	215
93MPB048	till	C14-08	34	1	0	35	17.90	20	155	116
93MPB049	till	C14-08	53	0	0	53	24.40	22	210	228
93MPB050	till	C14-08	55	0	0	55	22.55	24	391	314
93MPB051	till	C14-08	49	0	0	49	23.05	21	203	221
93MPB052	till	C14-08	10	1	0	11	14.90	7	113	149
93MPB204	kimberlite	C14-05	0	0	0	0	9.95	0	0	16
93MPB205	kimberlite	C14-05	0	0	0	0	11.70	0	0	NA

NA= not analyzed



## APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN DIAMET	ER	NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
				RESHAPED	MODIFIED	PRISTINE				
93MPB001	sand	15 X	15	6			6			EST. 2% PYRITE
93MPB001	sand	25 X	25	13	3		16			
93MPB001	sand	25 X	50	8	3		11			
93MPB001	sand	25 X	75	5			5			
93MPB001	sand	50 X	50	3			3			
93MPB001	sand	50 X	75	1			1			
93MPB001	sand	75 X	75	2			2			
93MPB001	sand	100 X	125	1			1			
93MPB001	sand	125 X	175	2			2			
							47	62.6	264	
93MPB002	sand	25 X	25	1			1			EST 0.1% PYRITE
93MPB002	sand	25 X	50	3			3			
93MPB002	sand	25 X	75	2			2			
93MPB002	sand	50 X	75	1			1			
93MPB002	sand	50 X	100	2			2			
							0			
							0			
							9	156.9	15	
							0			
93MPB003	sand	15 X	15	1			1			EST. 0.1% PYRITE
93MPB003	sand	25 X	25	8	2		10			
93MPB003	sand	25 X	50	11			11			
93MPB003	sand	50 X	50	4			4			
93MPB003	sand	50 X	75	1			1			
93MPB003	sand	75 X	75	1			1			
93MPB003	sand	75 X	100	2			2			
93MPB003	sand	100 X	125	1			1			
							31	147.8	48	
93MPB004	sand	15 X	15	1			1			NO SULPHIDES
93MPB004	sand	25 X	25	1			1			
93MPB004	sand	25 X	50	5			5			
93MPB004	sand	25 X	75	1			1			
93MPB004	sand	25 X	100	1			1			
93MPB004	sand	50 X	75	1			1			

APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB004	sand	50 X	50	2			2			
93MPB004	sand	75 X	200	1			1			
							13	109.6	51	
93MPB005	till	15 X	15	8			8			EST. 0.1% PYRITE
93MPB005	till	25 X	25	12	1		13			
93MPB005	till	25 X	50	9			9			
93MPB005	till	25 X	75	4			4			
93MPB005	till	50 X	75	2			2			
93MPB005	till	50 X	100	2			2			
93MPB005	till	75 X	75	1			1			
							39	89.4	51	
93MPB006	till	15 X	15	3			3			EST. 1% PYRITE
93MPB006	till	25 X	25	7			7			50 GRAINS ARSENOPYRITE
93MPB006	till	25 X	50	5			5			
93MPB006	till	25 X	75	1			1			
93MPB006	till	50 X	50	1			1			
93MPB006	till	50 X	100	2			2			
93MPB006	till	50 X	125	1			1			
93MPB006	till	75 X	100	1	1		2			
93MPB006	till	125 X	250	1			1			
							23	123.7	119	
93MPB007	till	25 X	25	9			9			EST. 2% PYRITE
93MPB007	till	25 X	50	4			4			<0.1% ARSENOPYRITE
93MPB007	till	25 X	75	2	2		4			
93MPB007	till	50 X	50	3			3			
93MPB007	till	50 X	75	2			2			
93MPB007	till	50 X	100	1			1			
93MPB007	till	75 X	75	1			1			
93MPB007	till	100 X	250	1			1			
93MPB007	till	125 X	175	1			1			
							26	87.6	189	

APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB008	till	15 X	15	1			1			EST. 2% PYRITE
93MPB008	till	25 X	25	4			4			
93MPB008	till	25 X	50	3			3			
93MPB008	till	25 X	100	1			1			
93MPB008	till	75 X	100	1			1			
93MPB008	till	75 X	150	1			1			
							11	66.8	58	
93MPB009	till	25 X	25	3	1		4			EST. 3% PYRITE 5 GRAINS NATIVE COPPER, ALL ARE LESS THAN 50 MICRONS
93MPB009	till	25 X	50	5			5			
93MPB009	till	25 X	75	2	1		3			
93MPB009	till	50 X	50	1			1			
93MPB009	till	50 X	75	2			2			
93MPB009	till	50 X	100	1			1			
93MPB009	till	75 X	75	1			1			
93MPB009	till	75 X	125	1			1			
93MPB009	till	75 X	150	1			1			
							19	61.9	112	
93MPB010	till	15 X	15	3			3			EST. 0.5% PYRITE
93MPB010	till	25 X	25	2			2			
93MPB010	till	25 X	50	1			1			
93MPB010	till	25 X	75	1			1			
93MPB010	till	50 X	75	1			1			
							8	37.6	19	
93MPB011	till	15 X	15	0		1	1			EST. 0.5% PYRITE
93MPB011	till	25 X	25	2			2			
93MPB011	till	25 X	50	2			2			
93MPB011	till	25 X	75	1			1			
93MPB011	till	50 X	50	2			2			
93MPB011	till	50 X	75	2			2			
93MPB011	till	50 X	100	2			2			
93MPB011	till	75 X	100	2			2			

APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB011	till	100 X	125	2			2			
93MPB011	till	100 X	150	1			1			
93MPB011	till	125 X	175	1			1			
93MPB011	till	125 X	200	1			1			
93MPB011	till	125 X	250	1			1			
93MPB011	till	325 X	500	1			1			
							21	50	2429	
93MPB012	till	15 X	15	7			7			EST. 0.5% PYRITE
93MPB012	till	25 X	25	7			7			
93MPB012	till	25 X	50	7			7			
93MPB012	till	50 X	50	2			2			
93MPB012	till	50 X	100	1			1			
93MPB012	till	75 X	125	1			1			
							25	182.2	18	
93MPB013	till	15 X	15	4			4			EST. 0.5% PYRITE
93MPB013	till	25 X	25	6			6			
93MPB013	till	25 X	50	5			5			
93MPB013	till	25 X	100	1			1			
93MPB013	till	50 X	50	3			3			
93MPB013	till	50 X	75	4			4			
93MPB013	till	75 X	100	1			1			
93MPB013	till	100 X	150	1			1			
93MPB013	till	100 X	250	1			1			
93MPB013	till	150 X	225	1			1			
93MPB013	till	175 X	175	1			1			
							28	133.4	239	
93MPB014	sand	50 X	50	2			2			NO SULPHIDES
93MPB014	sand	50 X	75	1			1			
93MPB014	sand	50 X	100	1			1			
							4	35.7	39	

## APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB019	till	25 X	25	2			2			EST. 5% PYRITE
93MPB019	till	25 X	50	4			4			
93MPB019	till	50 X	50	1			1			
93MPB019	till	50 X	100	1			1			
							8	102.8	12	
93MPB020	till	25 X	25	1			1			EST. 1% PYRITE
93MPB020	till	50 X	75	1			1			
							2	20.3	20	
93MPB021	till	15 X	15	1			1			EST. 5% PYRITE
93MPB021	till	25 X	25	4			4			
93MPB021	till	50 X	75	1			1			
							6	38.7	12	
93MPB022	till	15 X	15	4			4			EST. 3% PYRITE 2% MARCASITE
93MPB022	till	25 X	25	8			8			
93MPB022	till	25 X	50	6			6			
93MPB022	till	25 X	75	1			1			
93MPB022	till	50 X	50	1			1			
93MPB022	till	50 X	125	1			1			
93MPB022	till	75 X	100	1			1			
							22	129.3	24	
93MPB023	till			NO VISIBLE GOLD						EST. 10% PYRITE
93MPB024	sand	25 X	25	7	2		9			NO SULPHIDES
93MPB024	sand	25 X	50	3			3			
93MPB024	sand	25 X	75	1			1			
93MPB024	sand	50 X	50	1			1			
93MPB024	sand	50 X	75	1			1			
93MPB024	sand	50 X	100	1			1			
93MPB024	sand	50 X	125	1			1			
93MPB024	sand	75 X	100	2			2			

APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN DIAMET	ER	NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
				RESHAPED	MODIFIED	PRISTINE				
							19	110.5	44	
93MPB025	sand&gravel	25 X	25	1			1			EST. 15% PYRITE
93MPB025	sand&gravel	25 X	50	3			3			
93MPB025	sand&gravel	25 X	75	2			2			
93MPB025	sand&gravel	50 X	50	4			4			
93MPB025	sand&gravel	50 X	75	2			2			
93MPB025	sand&gravel	50 X	100	1			1			
93MPB025	sand&gravel	75 X	125	1			1			
							14	101.8	42	
93MPB048	till	15 X	15	2			2			EST. 1% PYRITE
93MPB048	till	25 X	25	6			6			
93MPB048	till	25 X	50	9			9			
93MPB048	till	25 X	75	3			3			
93MPB048	till	50 X	50	2			2			
93MPB048	till	50 X	75	7	1		8			
93MPB048	till	50 X	100	3			3			
93MPB048	till	75 X	150	1			1			
93MPB048	till	75 X	175	1			1			
							35	75.9	155	
93MPB049	till	25 X	25	6			6			EST. 2% PYRITE
93MPB049	till	25 X	50	16			16			
93MPB049	till	25 X	150	1			1			
93MPB049	till	50 X	50	11			11			
93MPB049	till	50 X	75	10			10			
93MPB049	till	50 X	100	1			1			
93MPB049	till	50 X	125	1			1			
93MPB049	till	75 X	75	1			1			
93MPB049	till	75 X	100	1			1			
93MPB049	till	75 X	150	1			1			
93MPB049	till	75 X	175	1			1			
93MPB049	till	125 X	175	1			1			
93MPB049	till	175 X	150	1			1			

## APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB049	till	200 X	175	1			1			
							53	177.7	210	
93MPB050	till	15 X	15	7			7			EST. 2% PYRITE
93MPB050	till	25 X	25	11			11			
93MPB050	till	25 X	50	9			9			
93MPB050	till	25 X	75	1			1			
93MPB050	till	25 X	100	1			1			
93MPB050	till	50 X	50	8			8			
93MPB050	till	50 X	75	3			3			
93MPB050	till	50 X	100	2			2			
93MPB050	till	50 X	150	1			1			
93MPB050	till	75 X	75	2			2			
93MPB050	till	75 X	125	2			2			
93MPB050	till	100 X	100	1			1			
93MPB050	till	100 X	125	1			1			
93MPB050	till	100 X	150	1			1			
93MPB050	till	100 X	200	2			2			
93MPB050	till	100 X	225	1			1			
93MPB050	till	125 X	175	1			1			
93MPB050	till	125 X	200	1			1			
				0			55	115.5	391	
93MPB051	till	15 X	15	7			7			EST. 3% PYRITE
93MPB051	till	25 X	25	5			5			
93MPB051	till	25 X	50	9			9			
93MPB051	till	50 X	50	10			10			
93MPB051	till	50 X	75	4			4			
93MPB051	till	50 X	100	3			3			
93MPB051	till	75 X	75	4			4			
93MPB051	till	75 X	100	4			4			
93MPB051	till	75 X	150	1			1			
93MPB051	till	100 X	125	1			1			
93MPB051	till	100 X	150	1			1			
							49	98.5	203	

APPENDIX G.2 GOLD GRAIN SIZE AND SHAPE

SAMPLE	MATERIAL	GRAIN		NUMBER OF GRAINS			TOTAL	NON-MAG grams	CALC Au ppb	COMMENTS
		DIAMET	ER	RESHAPED	MODIFIED	PRISTINE				
93MPB052	till	25 X	25	1			1			EST. 0.5% PYRITE
93MPB052	till	25 X	50	2			2			
93MPB052	till	25 X	75	1			1			
93MPB052	till	50 X	75	1	1		2			
93MPB052	till	50 X	100	1			1			
93MPB052	till	75 X	100	2			2			
93MPB052	till	75 X	125	1			1			
93MPB052	till	125 X	150	1			1			
							11	80.4	113	
93MPB204	kimberlite			NO VISIBLE GOLD						NO SULPHIDES
93MPB205	kimberlite			NO VISIBLE GOLD						NO SULPHIDES



## Appendix H. Pebble lithology data for the 0.56 to 6.0 cm fraction

### Legend

Felsic & Int intr - felsic and intermediate intrusive rock  
Mafic intr - mafic intrusive rock  
Met-volcs - metavolcanic rock  
Ultramafic - ultramafic rock  
Meta-seds - metasedimentary rock  
Paleo carb - Paleozoic carbonate rock from Hudson Bay Lowlands  
Kimb - kimberlite, including limestone xenoliths  
Vein Qtz - vein quartz  
Other/unknown - other or unidentified rock types

**Note:** data reported as frequency percent (%)

Appendix H. Pebble lithology data for >5.6 mm fraction of glacial sediment samples

Sample Number	Drill Hole	Material Type	Felsic &int Intr.	Mafic Intr.	Meta-volcs	Ultra-mafic	Meta-seds	Paleo Carb	Kimb	Vein Qtz	Other/ ???	% Total	Comments
93MPB002	C14-02	sand	18.0	4.7	76.3	0.0	1.0	0.0	0.0	0.0	0.0	100.0	
93MPB003	C14-02	sand	24.3	2.7	71.7	0.0	0.7	0.7	0.0	0.0	0.0	100.0	
93MPB004	C14-02	sand	21.9	1.7	74.1	0.3	1.7	0.3	0.0	0.0	0.0	100.0	
93MPB005	C14-02	till	23.1	2.7	70.2	0.3	2.0	0.0	0.0	1.3	0.3	100.0	iron f'm and jasper in <5.6 mm
93MPB006	C14-02	till	17.9	3.3	74.4	0.0	2.0	0.3	0.0	2.0	0.0	100.0	
93MPB007	C14-02	till	16.3	3.7	77.4	0.0	0.7	0.7	0.0	1.3	0.0	100.0	iron f'm in <5.6 mm
93MPB008	C14-02	till	21.1	2.0	73.6	0.0	2.3	0.3	0.0	0.7	0.0	100.0	
93MPB009	C14-02	till	11.3	6.7	76.0	0.0	3.0	0.3	1.0	1.7	0.0	100.0	kimberlite in <5.6 mm
93MPB010	C14-02	till	3.0	2.0	91.0	0.3	1.3	0.7	0.7	0.7	0.3	100.0	pyrope in <5.6 mm
93MPB011	C14-03	till	3.7	2.0	91.0	0.3	1.7	0.0	0.0	1.0	0.3	100.0	
93MPB012	C14-04	till	15.9	5.6	75.1	0.0	3.0	0.0	0.0	0.0	0.3	100.0	pyrope,iron fm, oolitic jasper in <5.6 mm
93MPB013	C14-04	till	17.3	4.0	75.0	0.0	2.7	0.7	0.0	0.0	0.3	100.0	sulphides & jasper in <5.6 mm
93MPB014	C14-05	sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB015	C14-05	silt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB016	C14-05	silt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB017	C14-05	silt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB018	C14-05	silt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB019	C14-05	till	23.3	2.7	69.7	0.7	2.0	0.3	0.0	0.0	1.3	100.0	
93MPB020	C14-05	till	16.8	0.0	77.7	1.1	4.3	0.0	0.0	0.0	0.0	100.0	wood in <5.6 mm
93MPB021	C14-05	till	31.3	5.4	55.4	0.0	4.5	0.9	0.0	0.0	2.7	100.0	
93MPB022	C14-05	till	22.3	5.0	66.3	0.0	4.0	1.3	0.7	0.3	0.0	100.0	kimberlite clasts in <5.6 mm
93MPB023	C14-05	till	10.3	5.0	51.7	0.0	1.3	0.3	30.3	0.3	0.7	100.0	kimberlite clasts in <5.6 mm
93MPB024	C14-06	sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
93MPB025	C14-06	sand&gravel	13.3	1.0	85.3	0.0	0.3	0.0	0.0	0.0	0.0	100.0	iron fm in <5.6 mm
93MPB048	C14-08	till	9.0	6.7	81.3	0.3	2.7	0.0	0.0	0.0	0.0	100.0	
93MPB049	C14-08	till	15.0	6.3	75.7	0.0	2.7	0.0	0.0	0.3	0.0	100.0	BIF, red sandstone in <5.6 mm
93MPB050	C14-08	till	15.7	3.0	78.0	0.0	2.0	0.0	0.0	0.7	0.7	100.0	
93MPB051	C14-08	till	10.3	1.0	86.3	0.3	1.0	0.3	0.0	0.3	0.3	100.0	
93MPB052	C14-08	till	3.0	2.0	91.7	0.3	1.3	0.3	0.0	1.0	0.3	100.0	Pyrope in <5.6 mm