Lakehead University

Whole rock geochemistry, mineral chemistry, petrology and Pt, Pd mineralization of the Seagull Intrusion, Northwestern Ontario.

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Abstract

The Seagull Intrusion emplaced during formation of the 1.1 Ga Mid-continental Rift centred around Lake Superior was studied in several drill core and surface samples and consists of a lower ultramafic section (~650 m) and an upper mafic section of unknown thickness (<100m). The lower ultramafic section is texturally dominated by cumulate olivine and poikilitic clinopyroxene with lithologies consisting of dunites, peridotites and pyroxenites. The upper mafic section is variable in lithology, with increasing upwards in abundance of cumulate pyroxene and poikilitic feldspar, dominated by olivine gabbro and gabbros.

Olivine, pyroxene and oxide mineral chemistry from the lower ultramafic section, indicates limited fractionation throughout the section. Forsterite compositions range from $Fo_{75.8}$ to $Fo_{86.3}$. Pyroxene also exhibits a limited range of variability with clinopyroxene restricted to the compositions of $En_{42}Wo_{48}Fs_{10}$ to $En_{54}Wo_{39}Fs_{7}$. Oxides occur as inclusions in olivine and in pyroxene with compositions reflecting subsolidus re-equilibrium with the host mineral. Olivine compositions from the mafic section exhibit a more differentiated nature and range in composition from $Fo_{57.4}$ to $Fo_{75.8}$.

Whole rock geochemistry is consistent with the homogeneous nature of the ultramafic section and more differentiated character of the mafic section. Major elements only exhibit minor variations in abundance through the ultramafics, and exhibit enrichment in Fe and Si only in the mafic section. Trace elements and primitive mantle normalised patterns identified five geochemical units, characterised by total trace element abundances and Eu, Nb and Th anomalies. Sm-Nd and Rb-Sr isotopes indicate the intrusion was variably contaminated by older continental crust. The most extensive contamination is found in the basal section of the intrusion and decreases away from the contact.

Platinum, palladium, nickel and copper mineralization is found at the base of the ultramafic section of the intrusion, formed during initial emplacement and sulphur saturation at that point in time. A second mineralized horizon (RGB Horizon) occurs ~100 to 150m above the basal contact. The RGB Horizon is continuous over 700 m and contains three distinct horizons separated by at least 2 m of unmineralized ultramafic rock. These layers are interpreted to have formed as individual events related to the injection of primitive magma refreshing the chamber.

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CHAPTER 1
INTRODUCTION AND SCOPE

1.1 Background

Over the last 10 years the demand for noble metals (Pt, Pd, Os, Ir, Rh, Re and Au) has increased 5% for platinum and 15% for palladium annually (U.S.G.S. Mineral Commodity Summaries, Jan. 2002, 2003 and 2004). This has resulted in a steady increase in the development of potential resources through out the world. Production of platinum and palladium originally came from placer deposits until 1919 when platinum group metals were recovered as a by product from Sudbury nickel-copper ores. In 1924 the Bushveld complex was discovered and production by 1956 surpassed Canada and continues to be the world leader. With South Africa and Russia producing 90% of the worlds supply, diversification to other sources is continually being investigated. Current production by country is shown in Table 1.1.

Table 1.1 Platinum and palladium mine production (kg), modified from U.S. Geological Survey, Mineral Commodity Summaries, Jan. 2001.

	1987	1999	2000
South Africa	113000	1946000	2050000
Russia	115000	112000	112000
Canada	10930	14034	14300
United States	3600	12720	13050

Production currently is focussed on orthomagmatic deposits (Sudbury, Noril'sk, Bushveld, Stillwater Complex), and as such exploration has focused on these types of deposits, as well as other potential resources as yet undeveloped and undiscovered. Exploration in northwestern Ontario for PGE's has been ongoing since the 1980s with the discovery of Lac des Iles (Pd mine), although Archean, a number of PGE prospects in the area have been identified associated with the younger Mid-Continental Rift, with Seagull Intrusion being one of four mafic to ultramafic intrusion with active exploration programs.

1.2 Objective

This thesis provides a detailed mineralogical and whole rock geochemical study of the Seagull Intrusion in northwestern Ontario. The objective of this study was to understand the distribution and origin of the Ni-Cu and PGE mineralization within the context of its crystallization and differentiation. The broader goal of the study is to develop a mineralization model for application to the intrusion itself and for further exploration in other ultramafic/mafic igneous intrusions. PGE mineralization occurring in the intrusion was poorly understood due to the sporadic distribution of recognized mineralization. Petrographic work was proposed around known mineralized areas to accurately determine lithologies related to mineralization and the sequence of lithologies observed in the intrusion. The homogenous nature of the ultramafics lithologies lead to the use of mineral chemistry analysis by SEM-EDS to distinguish mineralogical trends in the intrusion. Whole rock geochemistry and trace element analysis was utilized to support the petrologic observations. Mineralization occurring at the base of the intrusion was though to be related to contamination by local wall rocks and as such isotopic analysis (Rb-Sr, Sm-Nd) was carried out to look at these effect in the lower sections of the intrusion.

1.3 Structure of Thesis

The thesis is organized into 8 chapters consisting of: 1) introduction and scope, 2) methodology, 3) regional geology, 4) petrography, 5) mineral chemistry, 6) whole rock geochemistry, 7) mineralization and 8) mineralization model and conclusions. The methodology chapter outlines the location and access to the study area, followed by an overview of the exploration work carried out on the property as of 2002 and the mineralization zones of interest identified. Sampling procedures and analytical techniques utilized are also included in this chapter. The chapter regional geology summarizes the current literature on the formation of basement lithologies to the Seagull Intrusion, and followed by an overview of the Proterozoic events and the development of the Midcontinent Rift and its association with the Seagull Intrusion. The petrography chapter illustrates the distribution of lithologies, and describes the petrographic characteristics of all lithologies observed in the Seagull Intrusion. The mineral chemistry chapter documents the stratigraphic variation in olivine, pyroxene and oxide compositions and are valuated as the crystallization history of the Seagull Intrusion and the relationship to mineralized zones. The whole rock geochemistry chapter presents the major elements, trace elements, and isotope analyses and discusses the significance of the variations in the Seagull Intrusion in terms of magmatic processes and mineralization. The mineralization chapter presents data on the geochemistry and ore mineralogy of the mineralized and evaluates the distribution of base and precious metals and the role of sulphur in mineralization. The last chapter mineralization model and conclusions proposes a model for the formation of the Seagull Intrusion and the mineralization which is contained within it.

CHAPTER 2
METHODOLOGY

2.1 Location and Access

The Seagull Intrusion is situated approximately 90 kilometres north-northeast of Thunder Bay, Ontario (Fig. 2.1). The intrusion is centred at 357000mE and 5432500mN (national topographic sheet 52H/2 in UTM zone 16). Access to the property is gained by travelling 45 kilometres north on Highway 527 from Highway 11/17, 22 kilometres along the gravel Dorion Cut-off (Wolf Lake Road), and then north along the dirt/gravel Anders Lake Road which passes through the centre of the intrusion. The Seagull Intrusion is relatively well exposed in the area, with a large number gabbroic outcrops forming small ridges. However, the ultramafic lithologies tend to be more recessively weathered, commonly occurring as black sands and regolith. As a result only a few ultramafic outcrops are found. The flat lying, undeformed nature of the intrusion limits the extent of lithologies exposed; however, a number of drill holes have penetrated through the intrusion into basement lithologies. Drill core from these holes is currently stored at the field office of East West Resource Corporation (1158A Russell St., Thunder Bay, Ont) and at the Conmee Core Yard operated by the Ministry of Northern Development and Mines (MNDM). Core at the Conmee Yard is accessible through the MNDM. Access to the core stored at East West Resource Corporation is through R.S. Middleton (Exploration Manager, East West Resource Corp.).

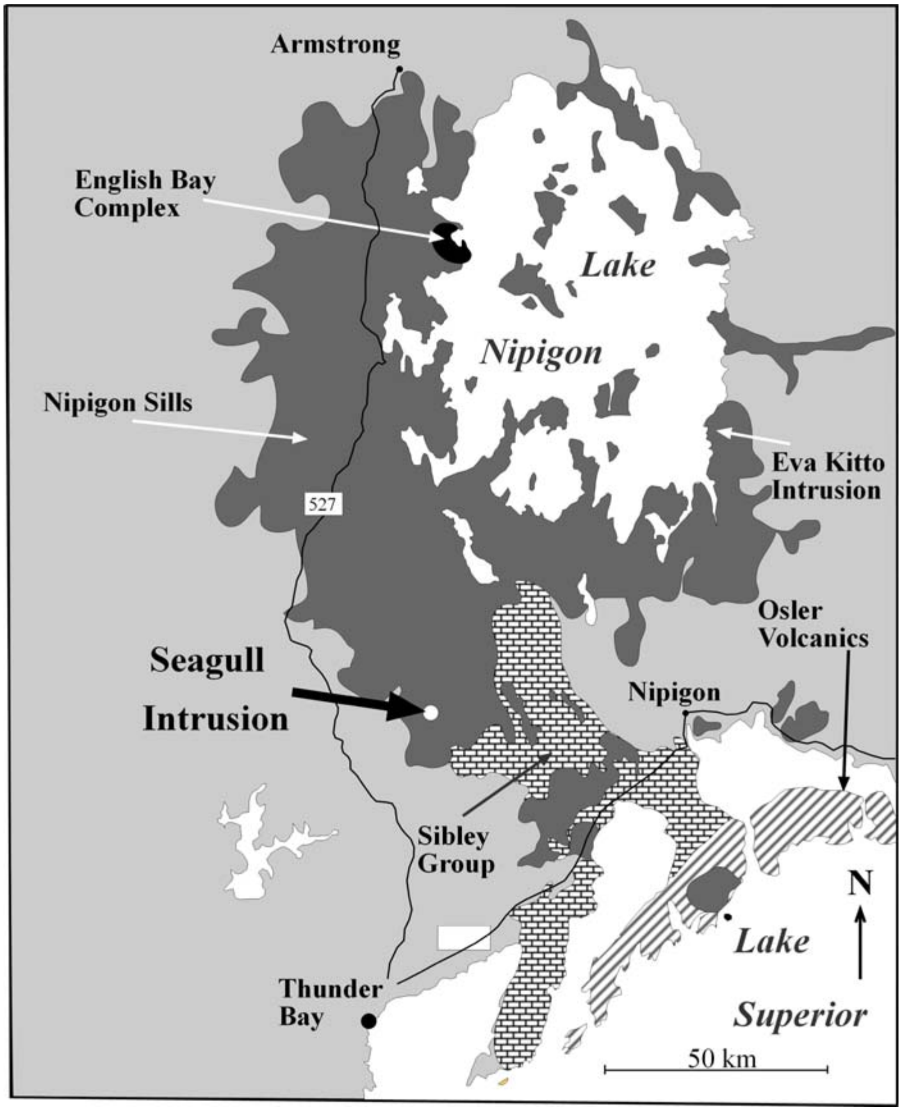

Figure 2.1 Location map of Seagull Intrusion, with Thunder Bay, Armstrong and Nipigon shown.

2.2 Previous Work and Mineral Exploration

2.2.1 Exploration

Ultramafic rocks around Disraeli Lake were first identified by Franklin (1970) and further delineated to include the area around Seagull Lake by Sutcliffe (1981). Exploration for potential nickel, copper and platinum group minerals started in 1987 by Platinum Exploration Canada Limited, who conducted a geological mapping and sampling program, VLF-EM (very low frequency electromagnetic) and ground total magnetic field surveys over the intrusion. Exploration targets were not identified and the claims were allowed to lapse. Cominco Limited staked the area and carried out an aeromagnetic survey and ground gravity profiles over the area in 1992, but also allowed the claims to lapse. An area of magnetic sand found above the intrusion was then staked by R. Fairservice and optioned to Avalon Ventures Limited in 1997, with additional claim staking in the surrounding area. Avalon Ventures proceeded to carry out line cutting, a ground magnetometer survey, trenching, soil and rock geochemistry (Osmani and Rees, 1998a). This work confirmed the presence of an ultramafic body and potential PGE mineralisation. Drilling carried out in 1998 totalled 2004m between eight holes summarised in Table 2.1 (Osmani and Rees, 1998b) and spatial distribution shown in Figure 2.2.

Table 2.1 Location and depth of drilling done in 1998 by Avalon Ventures Limited (Osmani and Rees, 1998b).

Drill Hole	Easting	Northing	Plunge	Azimuth	Depth (m)
WM98-01	356521	5432535	45°	180°	162
WM98-02	356521	5432534	90°	-	551
WM98-03	356521	5432734	90°	-	141
WM98-04	356521	5432708	90°	-	138
WM98-05	356532	5432250	90°	-	622
WM98-06	356521	5430816	90°	-	138
WM98-07	357521	5432408	90°	-	102
WM98-08	357514	5432710	90°	-	150

In 1999, East West Resource Corporation and Canadian Golden Dragon formed a joint venture with Avalon Ventures Limited and continued work on the ultramafic body. A MaxMin II EM survey was carried out, but no conductors were identified within the depth of search allowed by the instrument. Two new holes and the extension of two existing holes drilled in 1998 were carried out and are summarized in Table 2.2 (Rees, 2000) with the spatial distribution shown in Figure 2.2.

Table 2.2 Location and depth of drilling done in 2000 by Avalon Ventures, East West Resources and Canadian Golden Dragon (Rees, 2000).

Drill Hole	Easting	Northing	Plunge	Azimuth	Depth (m)
WM00-01	357242	5432105	90°	-	819
WM00-02	357494	5432179	90°	-	445
WM98-02 Ext	356521	5432534	90°	-	552
WM98-05 Ext	356532	5432250	87°	180°	622

Samples were taken from holes WM00-01 (360.4, 405.8, 484.5, 524.18, 579.0, 669.05, and 702.00m) and WM98-05 (571.0 and 574.0m) for silicate mineral chemistry, sulfide mineral, and platinum group mineral chemistry by SEM-EDS (scanning electron microscope), and microprobe at Department of Earth Sciences, Carlton University by Richard Taylor (Taylor, 2000). Drilling continued over the fall and winter of 2000 finishing in August of 2001. A further 8 drill holes were completed with a total meterage of 5060 metres (Avalon Ventures 2001; 2002) summarized below in Table 2.3 with the spatial distribution shown in Figure 2.2.

Table 2.3 Summary of drilling in 2000 and 2001 (Avalon, 2000; 2001)

Drill Hole	**Easting**	**Northing**	**Plunge**	**Azimuth**	**Depth (m)**
WM00-03	356534	5432139	90°	-	551
WM00-04	354534	5432539	75°	270°	137
WM00-05	356884	5432139	90°	-	785
WM00-06	356284	5432089	90°	-	431
WM00-07	356984	5432069	90°	-	637
WM01-08	356834	5432114	90°	-	885
WM01-09	357059	5432089	90°	-	827
WM01-10	356959	5431989	90°	-	807

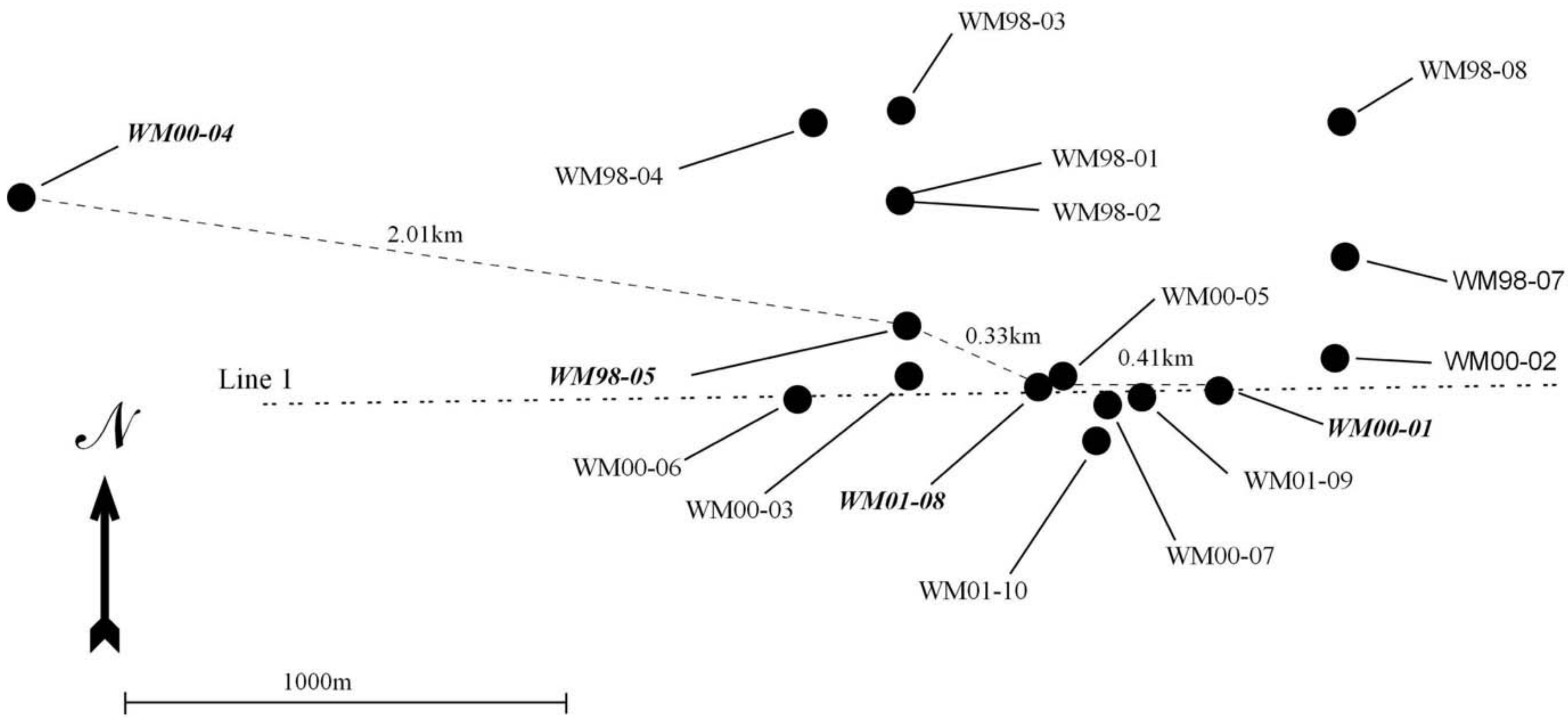

Figure 2.2 Diamond drill hole location map for Seagull Intrusion. Holes utilized in this study shown in italics. With cross-section line 1 and distances between holes of interest shown.

Further work carried out on the ultramafic units consisted of a surface induced polarization study, down hole magnetic and physical properties, down hole and surface pulse EM survey, Airborne Megatem EM survey, airborne magnetic survey, geological mapping, sampling and prospecting (Pettigrew, 2002). Subsidiary work was carried out on mineralized sections from drill core, focusing on sulphur isotope geochemistry of the Cu-Ni-PGE sulphides and sulphur selenium ratios (unpublished data Franklin, 2001). Work on the sulphide saturation observed in mineralized zones of the Seagull Intrusion was undertaken by Kissin (2003). Olivine compositions from the Nipigon Intrusive suite were further examined in a compilation of existing data from Taylor (2000), unpublished data from Naldrett (1998) and J. Franklin (pers. com. 2003).

2.3 Discovery of Mineralized Zones

Anomalous metal values recognized in the drill programs carried out on the Seagull Intrusion between 1998 and 2001 are summarized in Table 2.4. Mineralized zones were initially identified by assays carried out by the operators of the property. To identify mineralized zones above background, a cut off value determined as the average of Pt, Pd and Pt + Pd was applied to platinum, palladium and total PGE (Pt + Pd) assay values. Values above the average (background) were used to recalculate a second average. Pt, Pd, and total PGE values above this second average were considered to be a mineralized zone (Pt >110 ppb and Pd >145). A complete record of assayed intervals for drill holes WM98-05, WM00-01 and WM01-08 are available in the assessment work filed with the Ministry of Northern Development and Mines (MNDM-Thunder Bay Office).

Table 2.4 Major mineralized zones from the Seagull Intrusion, values are weighted averages over the indicated intervals (Cavén, 2000; Avalon 2001, 2002).

Hole	From (m)	To (m)	Ni (ppm)	Cu (ppm)	Pt (ppb)	Pd (ppb)
WM00-01	405.00	412.50	1028	301	202	244
WM00-01	576.00	584.00	1661	1117	457	554
WM00-02	348.00	354.00	1130	160	223	265
WM00-03	526.30	530.80	1363	1540	635	760
WM98-05	379.00	387.00	1647	112	336	393
WM98-05	569.00	585.00	1531	1429	475	565
WM00-05	751.00	761.50	1537	1700	370	391
WM01-08	729.80	730.8	1755	3430	1340	1465

Mineralized zones in drill holes WM00-01 and WM98-05 were the first two holes investigated in this study. A more detailed transect of mineralization in these holes is listed in Tables 2.5 and 2.6. Within drill hole WM00-01 anomalous PGE concentrations occurred over the interval of 572 m to 582 m (Table 2.5). Two zones of mineralization (597 to 583 m) and between 379 m and 385 m (Table 2.6) were selected for further study in drill hole WM98-05.

Table 2.5 Au, Pt, Pd, Co, Cr, Cu and Ni abundances from mineralized zones in drill hole WM00-01 with mineralized zones marked by *. Data from filed assessment work (Avalon 2001, 2002).

From (m)	Width (m)	Au (ppb)	Pt (ppb)	Pd (ppb)	Co (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)
34.00	2.00	4	70	402	68	842	6	510
40.00	2.00	2	125	30	94	647	2	728
116.00	2.00	4	180	56	116	473	10	879
237.00	2.00	4	175	150	119	331	12	804
341.00	2.00	6	135	240	132	314	106	1050
375.00	2.00	34	515	662	133	289	511	1275
377.00	2.00	4	110	104	123	342	28	1045
405.00	1.00	8	115	138	153	365	234	1415
406.00	2.00	8	145	150	151	348	187	1370
408.00	1.50	10	135	144	158	314	284	1455
409.50	1.50	14	200	248	144	305	260	1330
411.00	1.50	36	675	862	150	403	959	1455
434.00	2.00	12	180	208	135	280	429	1155
436.00	1.68	6	115	140	141	399	237	1170
489.00	2.00	28	140	150	144	358	590	1215
532.00	2.00	6	140	160	140	324	113	1420
534.00	2.00	6	145	156	132	336	140	1355
544.00	2.00	4	170	196	129	405	43	1260
564.00	2.00	4	110	112	113	399	21	1215
*572.00	2.00	28	335	400	131	442	187	1545
*576.00	2.00	18	230	260	126	359	433	1510
*578.00	2.00	72	740	916	138	359	2120	1980
*580.00	2.00	52	650	790	135	336	1850	1750
*582.00	2.00	6	210	252	122	346	66	1405
672.00	2.00	0	125	126	130	349	52	1410

Table 2.6 Au, Pt, Pd, Co, Cr, Cu and Ni abundances from mineralized zones in drill hole WM98-05 with mineralized zone marked by * Data from filed assessment work (Avalon 2001, 2002).

From (m)	Width (m)	Au (ppb)	Pt (ppb)	Pd (ppb)	Co (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)
53.16	2.00	0	271	306	-	-	-	-
353.00	2.00	22	205	256	152	262	285	1310
*379.00	2.00	1	270	294	152	377	122	1360
*381.00	2.00	0	275	310	158	315	35	1610
*383.00	2.00	10	420	512	171	300	209	1890
*385.00	2.00	6	380	458	172	307	82	1730
553.00	2.00	0	155	164	132	442	55	1305
555.00	2.00	4	260	298	141	483	159	1415
569.00	2.00	42	455	540	127	494	1495	1535
*571.00	2.00	62	750	948	138	482	2700	1950
*573.00	2.00	36	875	1055	164	645	1335	2040
*575.00	2.00	6	255	264	117	725	177	1255
*579.00	2.00	20	230	260	98	574	987	1145
*581.00	2.00	42	500	604	107	564	1995	1430
*583.00	2.00	50	645	748	106	835	2480	1790

Mineralization in the Seagull Intrusion has been broadly subdivided into three types (Pettigrew, 2002). The first is a PGE-rich detrital type found in the black sands overlying the Leckie Stock. These are thought to be a product of weathering of magnetite-PGE-rich layers and a natural heavy mineral concentration (Pettigrew, 2002). The second type of mineralization found within the intrusion is a magnetite-PGE-rich reef type. This occurs in the upper 65m of the intrusion and is characterized by layers rich in magnetite and anomalous PGE values and grades into the overlying weathered regolith (Pettigrew, 2002). The third type of mineralization is a Cu-Ni-PGE-rich Noril'sk type (Pettigrew, 2002) found at the base of the intrusion and consisting of disseminated to blebby sulphides (pyrrhotite, pyrite, chalcopyrite, cubanite and pentlandite). The focus of this study is the third style of mineralization (Fig. 2.3), which will be referred to as basal mineralization, and a new fourth style, previously not recognized as significant in the intrusion which occurs in up from the basal contact.

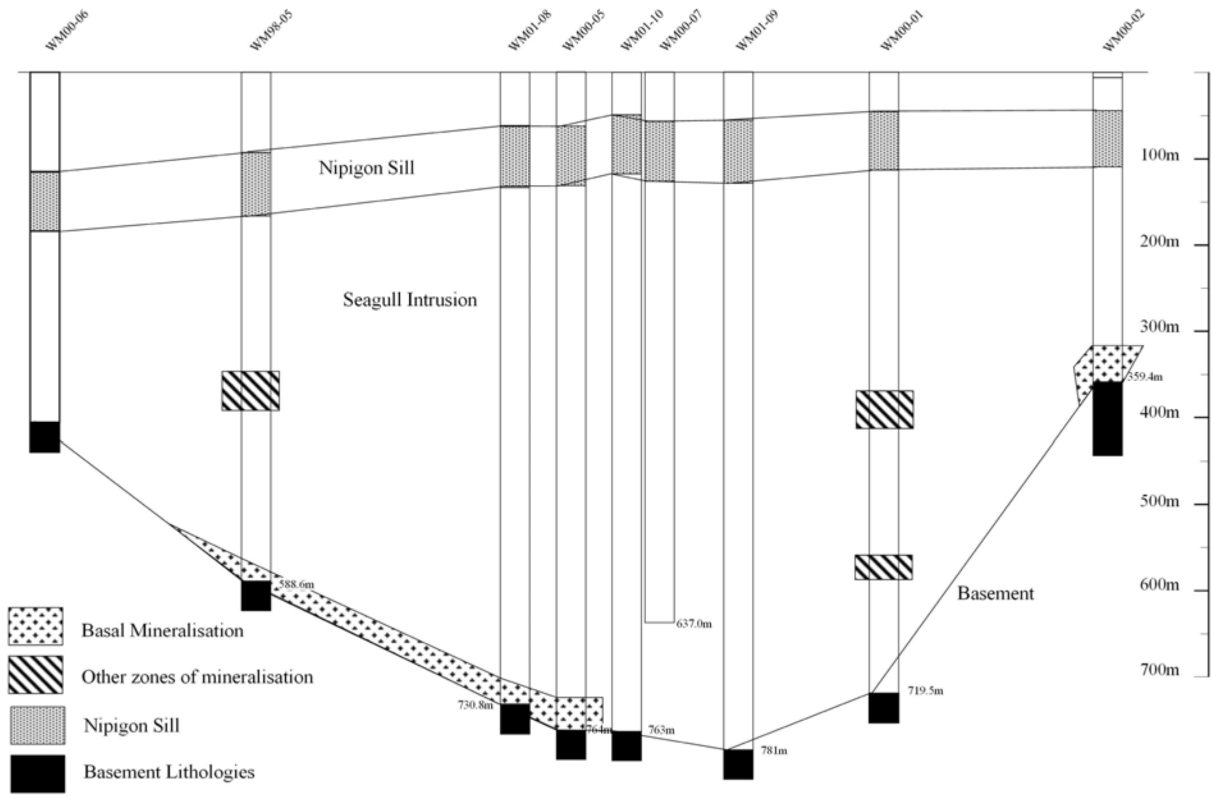

Figure 2.3 Location of mineralised zones of interest in the Seagull Intrusion as of 2002.From assay results of Avalon Ventrues and East West Resources.

2.4 Sampling Procedures and Locations

Sampling for this study was focused on stratigraphic variations occurring in the Seagull Intrusion with initial sampling carried out from drill core provided by East West Resources. Least altered samples from representative lithologies were selected by visual examination. Samples were between 5 and 10 cm in length. Where mineralization was known to occur from company sampling the core was split leaving half for future use.

Sampling started in drill hole WM00-01 as it was thought to be the most stratigraphically complete representation of the intrusion. Drill hole WM00-01 was 819 m deep, intersected basement, contained elevated PGE values within the body of the intrusion and was located roughly in the centre of drilling completed (Figs. 2.2 and 2.3). Initial sampling of WM00-01 was carried out at ~10m spacing unless a lithological change was noted or a zone of known mineralization was close in which case smaller sample spacings were used (1m to 30cm: Appendix A).

Sampling was also undertaken on drill hole WM98-05, about 740 m west of drill hole WM00-01 (Fig. 2.2). Drill hole WM98-06 exhibited similar gross characteristics to WM00-01, but it was far enough away to exhibit variability (complete drill log is available at MNDM Thunder Bay). Samples were selected for petrological work and mineral chemistry at a wider spacing than that of WM00-01 except where known zones of mineralization occurred in which case sampling was carried out at smaller intervals (Appendix A).

To provide a more detailed cross section through the Seagull Intrusion drill hole WM00-04 was sampled (Appendix A). WM00-04 occurs about 2km west of drill hole WM98-5 and about 2.7 km west of WM00-01 (Figs. 2.2 and 2.3). It is a considerably shallower hole, first intersecting basement lithologies (Sibley Group metasedimentary rocks) at ~84 m.

Drill hole WM01-08 was sampled in order to provide additional information for the area between drill holes WM00-01 and WM98-05. WM01-08 was drilled between WM00-01 and WM98-05 and is similar in nature to WM00-01 and WM98-05 with the basal contact occurring at 730 metres.

A representative suite of surface samples were collected from outcrops along the road which transects the intrusion (sample locations are in Appendix A.)

2.5 Analytical Methods

2.5.1 Introduction

The following section outlines the analytical techniques and methodologies utilized in the gathering of data for the Seagull Intrusion. Mineral chemistries were determined by a scanning electron microscope with an energy dispersive spectrometer (SEM-EDS) and by an electron microprobe. Whole rock geochemical analyses were carried out using inductively coupled plasma – atomic emission spectrometer (ICP-AES), inductively coupled plasma – mass spectrometer (ICP-MS) and X-Ray Florescence (XRF). Sm-Nd isotope analyses were carried out utilizing thermal ionization mass spectrometry (TIMS). Additional data was used from other sources and, if not from a published source, an overview of the analytical procedure used in acquisition is included (i.e. assay results).

2.5.2 SEM-EDS

Mineral chemistries were analysed at the Lakehead Instrumentation Laboratory, Lakehead University, using a JEOL 5900 scanning electron microscope equipped with an Oxford energy-dispersion spectrometry (EDS) with a resolution of 139eV. Olivine was analysed for Mg, Fe, Si and Ni; pyroxene for Mg, Fe, Ca, Ti, Al, Na and Cr; oxide was analysed for Fe, Cr, Mg, Al, Ti, V; and amphibole for Mg, Fe, Si, Ca, Na, Al, and Ti. All mineral compositions were determined using the LINK ISIS analytical system incorporating a Super ATW Light Element Detector. Raw EDS spectra were acquired for 60 seconds (live time) with an accelerating voltage of 20 kV and a beam current of 0.475 nA. The spectra were processed with the LINK ISIS SEMQUANT software, with full ZAF algorithm matrix corrections applied. Standardization at the start of each session was carried out using both geological and pure metal standards: pyroxene for Na, Ca and Si; chromite for Cr, Mg and Al; ilmenite for Ti and Fe; chalcopyrite for Cu and S; millerite for Ni; sphalerite for Zn; platinum metal for Pt; palladium metal for Pd; tellurium metal for Te; antimony metal for Sb; arsenic metal for As and vanadium metal for V. The instrument was calibrated each hour during analysis, using a pure nickel metal standard. Longer count times of 300 seconds were utilized in assessing the accuracy of SEM-EDS on detection of Ni in olivine and comparison of data with that obtained by microprobe analyses resulting in a detection limit of >1000pmm for Ni by SEM. Accuracy is 0.2 to 1.0 weight percent and precision of 0.5 to 1.0 weight percent depending on the atomic weight of the element on major elements at 60s (live time). Precision in the composition of mineral analyses was calculated based on sigma % output from the SEM-EDS. Twenty point analyses from two different thin sections from drill hole WM98-05 were used to generating an average error in Wt% for oxides, and an average error in %Fo (forsterite), %En (enstatite), %Wo (wollastonite) and %Fs (ferrosilite) compositions. Duplicate analyses carried out by electron microprobe at the University of Saskatchewan are consistent with the analytical data acquired by SEM-EDS at Lakehead University (Table 2.7).

Table 2.7 Comparison of pyroxene data acquired from SEM analyses and microprobe. Data is mean for each thin section with the number of analyses indicated "Number" row. Atomic proportion calculated based on 6 oxygen.

	Method	SEM	Probe	SEM	Probe	SEM	Probe	SEM	Probe
	Pyroxene	Ortho	Ortho	Clino	Clino	Clino	Clino	Clino	Clino
	Sample	SW01-29	SW01-29	SW01-32	SW01-32	SW01-29	SW01-29	SW01-25	SW01-25
	Number	2	3	2	8	10	4	4	7
Atomic	**Mg**	1.66	1.63	0.93	0.96	0.97	0.96	0.94	0.94
	Al	0.03	0.02	0.04	0.03	0.04	0.04	0.04	0.03
	Ti	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02
	Fe	0.32	0.32	0.15	0.13	0.15	0.13	0.16	0.15
	Si	1.90	1.92	1.94	1.92	1.92	1.93	1.93	1.92
	Ca	0.01	0.02	0.85	0.90	0.84	0.87	0.86	0.89
	Na	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01
	Cation total	2.01	1.99	1.97	2.04	2.00	2.00	2.00	2.02
Wt %	**MgO**	32.33	31.54	17.03	17.56	17.57	17.30	16.91	17.10
	Al_2O_3	1.28	1.13	1.76	1.49	1.97	1.80	1.73	1.53
	TiO_2	0.00	0.03	0.87	0.71	0.89	0.84	0.70	0.70
	FeO	10.98	10.99	4.97	4.29	4.88	4.33	5.10	4.73
	SiO_2	55.16	55.20	52.55	52.02	52.18	52.05	51.67	51.94
	CaO	0.17	0.45	21.47	22.74	21.22	21.82	21.55	22.50
	Na_2O	0.00	0.02	0.00	0.29	0.00	0.15	0.12	0.27
	Cr_2O_3	0.39	0.15	0.80	0.81	0.72	0.72	0.83	0.77
	Total	100.32	99.51	99.45	99.91	99.43	99.01	98.61	99.54
	Cr ppm	3946	1504	8039	8097	7220	7152	8295	7691
	% En	83.65	82.92	48.31	48.36	49.39	48.85	47.96	47.59
	% Fs	16.03	16.22	7.91	6.63	7.70	6.86	8.12	7.40
	% Wo	0.32	0.86	43.78	45.01	42.91	44.30	43.92	45.01
	Mg #	0.84	0.84	0.86	0.88	0.87	0.88	0.86	0.87

2.5.3 Electron Microprobe

Additional mineral chemistry work was carried out at the University of Saskatchewan on a Jeol 8600 microprobe equipped with four energy dispersive spectrometers (EDS). Analyses were carried out using a 15000kV accelerating voltage, 35 nA beam current and a 5µm electron beam width. Standardization was carried out utilizing both natural and synthetic materials for the elements of Mg, Fe, Si, Al, Ti, Mn, Ca, Ni and Cr with ZAF corrections applied to all microprobe analysis.

2.5.4 ICP-AES

Least altered samples were selected for whole rock analyses based on petrographic microscope examination. Samples then underwent primary crushing using a tungsten carbide mallet and plate reducing samples to approximately 3-4 mm in size. Secondary crushing was undertaken in a carbide tungsten ring mill until the sample passed through a -200mesh ~75µm. Dissolution of samples was carried out as follows: 0.5000 grams were weighed out and placed in Teflon crucibles, then 10ml of double distilled deionized water (DDW) and 5ml of Nitric acid was added to each sample and left at 90°C for 12 hours. Crucibles were then filled with 10ml nitric acid and 5ml hydrofluoric acid and left at low heat for 12 hours (this addition of nitric and hydrofluoric acid is repeated three times). On the last cycle temperature was increased to 150°C and samples evaporated to dryness. The temperature was then turned down to 90°C, 5ml of hydrochloric acid was added and simmered for 20 minutes, crucibles were then filled with 10ml DDW and simmered for an additional 10 minutes. Solutions were transferred to a 100ml volumetric flask and made up to 100ml by addition of DDW upon cooling. For each run three blanks were prepared and one internal standard.

Analysis of whole rock was carried out using a Varian Vista Pro Radial ICP-AES, with a Cetac autosampler operating at 1100 watts, with a 10 second read-time. Final data processing was carried out using an Excel program developed at Lakehead University which calculates the abundance of elements (except SiO_2) the difference between this and 100 is assumed to be the abundance of SiO_2. As a result of this processing all ICP-AES results will total 100% which may not be an accurate representation. Accuracy and precision was assessed by duplicate analysis of known standards with each batch of samples run (Table 2.8) and comparison with duplicate samples analysed by other methodologies (ICP-MS and XRF at University of Saskatchewan see Table 2.9) indicates the major element data was within 10% of each other while trace elements and metals exhibit a much larger error (Table 2.9).

Table 2.8 Comparison of standards CE21 and CE44 analysed by ICP-AES.
Sample CE21

Date / Wt%	Mar. 31/03	May 28/03	May 28/03	June 11/03	Mean n=4	Std Dev	Recommended *
Al_2O_3	16.51	17.90	17.59	16.21	17.05	0.71	18.14
CaO	8.09	8.62	8.55	7.64	8.23	0.39	8.67
Fe_2O_3T	10.18	10.78	10.67	10.24	10.47	0.26	10.93
K_2O	1.15	1.24	1.22	1.27	1.22	0.04	1.23
MgO	3.55	3.59	3.56	3.38	3.52	0.08	3.68
MnO	0.16	0.17	0.17	0.16	0.17	0.00	0.18
Na_2O	4.17	4.64	4.51	3.94	4.31	0.28	3.96
P_2O_5	0.29	0.31	0.31	0.30	0.30	0.01	0.34
SiO_2	53.57	50.32	51.01	55.02	52.48	1.90	51.41
TiO_2	1.23	1.33	1.31	1.27	1.29	0.04	1.45
CO_2	0.11	0.12	0.09	0.10	0.11	0.01	NA
H_2O	0.89	0.99	0.78	0.45	0.78	0.20	NA
TOTAL	100	100	100	100			99.99
(ppm)							
Ba	289	339	317	NA	315.01	137.53	346.60
Co	38	40	39	NA	39.43	17.09	28.41
Cr	110	75	81	NA	89.04	40.77	21.37
Cu	175	194	192	NA	187.15	81.36	169.25
Mo	1	2	2	NA	1.64	0.73	1.17
Nb	1	1	2	NA	1.55	0.70	3.45
Ni	77	64	68	NA	69.30	30.37	14.19
Pb	10	11	10	NA	10.35	4.52	6.99
S	4	0	0	NA	1.36	1.77	NA
Sr	486	519	512	NA	505.33	219.16	534.00
V	266	286	284	NA	278.81	121.00	301.60
Y	20	22	22	NA	21.33	9.26	23.30
Zn	101	105	107	NA	104.38	45.25	96.28
Zr	156	142	143	NA	146.92	63.85	114.60

Sample CE44

Date / Wt%	Mar. 31/03	May 28/03	May 28/03	June 11/03	Aug. 13/03	Mean n=5	Std Dev	Recommended*
Al_2O_3	18.29	19.84	19.33	17.87	19.58	18.98	0.77	20.21
CaO	8.22	8.88	8.57	7.83	8.35	8.37	0.35	8.88
Fe_2O_3T	7.62	8.14	7.90	7.52	7.85	7.80	0.22	7.91
K_2O	0.98	1.06	1.05	0.98	1.07	1.03	0.04	1.06
MgO	2.85	3.00	2.79	2.74	2.90	2.86	0.09	2.97
MnO	0.12	0.13	0.13	0.12	0.12	0.12	0.00	0.14
Na_2O	4.05	4.52	4.43	4.07	4.53	4.32	0.21	3.86
P_2O_5	0.22	0.24	0.24	0.22	0.24	0.23	0.01	0.26
SiO_2	55.20	51.71	53.08	55.49	53.93	53.88	1.39	53.73
TiO_2	0.85	0.91	0.90	0.85	0.91	0.89	0.03	0.97
CO_2	0.13	0.10	0.15	0.12	0.07	0.11	0.03	NA
H_2O	0.78	1.35	1.44	2.16	0.45	1.24	0.59	NA
TOTAL	100	100	100	100	100			99.99

Table 2.8 continued

Date (ppm)	Mar. 31/03	May 28/03	May 28/03	June 11/03	Aug. 13/03	Mean	Std Dev	Recommended*
Ba	305	335	334	NA	333	326.67	131.17	366.00
Co	27	27	26	NA	25	26.14	10.48	19.20
Cr	93	40	51	NA	4	47.07	34.09	9.77
Cu	111	119	114	NA	121	116.34	46.66	122.02
Mo	1	2	2	NA	0	1.02	0.68	0.86
Nb	1	2	2	NA	1	1.26	0.59	2.65
Ni	66	38	46	NA	17	41.63	22.80	8.78
Pb	10	5	6	NA	7	7.04	3.36	7.53
S	39	29	30	NA	35	33.49	13.85	NA
Sr	567	606	602	NA	612	596.76	239.23	640.00
V	186	202	198	NA	202	196.82	78.94	213.60
Y	14	15	14	NA	15	14.55	5.83	16.00
Zn	74	76	78	NA	73	75.38	30.20	64.42
Zr	118	103	96	NA	128	111.58	46.02	89.60

NA = Not Analysed

* Recommended values obtained from ICP-MS and XRF University of Tasmania

Table 2.9. Comparison of duplicate samples by XRF[1] and ICP-AES[2]

Sample/ WT%	XRF WM00-01-600	ICP-AES WM00-01-600	XRF WM00-01-340	ICP-AES WM00-01-340	XRF WM00-01-96	ICP-AES WM00-01-96
Al_2O_3	2.16	3.06	1.23	2.43	15.79	16.42
CaO	2.18	2.35	1.15	0.92	10.04	10.02
Fe_2O_3T	16.62	14.68	16.47	15.65	13.79	13.54
K_2O	0.81	0.74	0.51	0.51	0.37	0.36
MgO	35.95	31.71	36.3	35.07	7.31	7.59
MnO	0.23	0.19	0.24	0.21	0.19	0.18
Na_2O	0.23	1.26	<0.01	1.24	2.38	3.30
P_2O_5	0.04	0.04	0.04	0.05	0.13	0.12
SiO_2	39.42	43.97	36.01	36.98	48.74	46.22
TiO_2	0.74	0.42	0.39	0.30	1.18	1.17
CO_2		0.15		0.26		0.55
H_2O	1.1	1.44	7.05	6.39	0.05	0.54
TOTAL	100.4	100	100.3	100	100	100

Table 2.9 continued

(ppm)	XRF WM00-01-600	ICP-AES WM00-01-600	XRF WM00-01-340	ICP-AES WM00-01-340	XRF WM00-01-96	ICP-AES WM00-01-96
Ba	154	107	119	66	239	120
Co		149		170		98
Cr		4592		2932		77
Cu		15		14		182
Mo		0		1		0
Nb	8	3	3	3	4	4
Ni		1463		1354		171
Pb		16		17		8
S		253		268		98
Sr	49	41	31	25	162	159
V		76		40		287
Y	7	4	7	3	24	21
Zn		134		110		120
Zr	157	124	87	127	70	181

[1] Analysis done at University of Saskatchewan
[2] Analysis done at Lakehead University

Geochemical data acquired by ICP-AES is variable in accuracy when compared to other methods. However, major element abundances are within error of other procedures and will be utilized in the thesis. The larger errors and discrepancies between ICP-AES analysis and ICP-MS and XRF for the rare earth elements and metals exist (Table 2.9). As a result of the poor accuracy, rare earth element data and metal abundances by ICP-AES are not utilized as specific point values in this thesis and only used as gross stratigraphic trends where the vertical change exceeds the error.

2.5.5 ICP-MS and XRF

Samples selection and primary crushing was carried out as described in ICP-AES, with samples wrapped in paper to minimize contamination during primary crushing. Secondary crushing was carried out in an agate rotary mill reducing samples to -200 mesh, ~75µm. Major elements were determined by X-ray fluorescence spectrometry (XRF) by fused disk at XRAL (X ray Assay Labs); relative standard deviations (RSD) are within 5%, loss on ignition (LOI) ranged from <0.01 to 11.65% and totals for all samples were 100% ± 1%.

Trace elements were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS, Perkin Elmer Elan 5000 at the University of Saskatchewan) using the protocol of Jenner et al.

(1990), with standard additions, and pure elemental standards for external calibration. Wet chemistry operations were conducted under class-100 clean lab conditions. Analysis of acids, distilled deionized water and procedural blanks yielded levels of <1ppb for REEs, Nb, Zr and Hf, referenced to concentrations in rock. Detection limits are defined as 3σ of the procedural blank. Due to the possibility of refractory minerals being resistant to complete digestion during HF + HNO_3 dissolution, a comparison was made with results for HF+ HNO_3 dissolution and Na_2O_2 peroxide sinter (Jenner et al., 1990) with sinter values on average giving a higher abundance but within 10 to 15% of values determined by acid digestion (see Appendix E). Detailed analytical methodology is presented in Fan and Kerrich (1997).

2.5.6 TIMS

Analysis of isotopes was carried out by TIMS (thermal ionization mass spectrometry) on Finnigan Mat 261 at Carleton University, Ontario. Nd isotopic analyses were performed on crushed powders. Between 100 and 200mg of sample were spiked with a mixed ^{149}Sm-^{148}Nd spike and then dissolved in Savillex Teflon beakers. Nd and Sm were separated following standard cation exchange techniques. Sr was separated in a borosilicate glass column using AG50-X8 cation resin and 2.5 N HCl, followed by the rare earth elements using 6 N HCl. The REE- bearing solution was dried and the residue dissolved in 0.26 N HCl, then loaded into a column containing a 2-cm high bed of Teflon powder coated with HDEHP (di(2-ethylhexyl) orthophosphoric acid (Richard et al., 1976). Nd was eluted using 0.26 N HCl. Total procedural blanks for Nd are <400pg. The $^{147}Sm/^{144}Nd$ ratios are reproducible to 1%. Samples were loaded with 1 N HNO_3 on one side of a Re double filament and run in a Finnigan MAT261 thermal ionization mass spectrometer at temperatures of 1780° to 1820°C. Isotope ratios were normalized to $^{146}Nd/^{144}Nd$ = 0.72190 (Cousens 1996). Analyses of the La Jolla standard correspond closely to those obtained by other laboratories are averaged $^{143}Nd/^{144}Nd$ = 0.511877± 18 during the period of analysis. Initial ε_{Nd} values were calculated using available U-Pb zircon age of 1115Ma (Pers com. L. Heaman, 2004). Epsilon values at time T are calculated using the following formula:

$$\varepsilon^{T}_{Nd} = [(^{143}Nd/^{144}Nd^{T}_{sample}/^{143}Nd/^{144}Nd^{T}_{CHUR})-1] \times 10000$$

where CHUR is the Chondrite Uniform Reservoir and T is generally the time the rock is formed.

2.5.7 Assay Procedures

Assay data from the files of Avalon Ventures and East West Resources was also incorporated into this study. The data is dominantly from assessment files with some additional data from East West Resource's press releases (www.eastwestres.com). Analytical procedures as described in Caven (2002) are as follows; all samples were sent to ALS Chemex, sample preparation was carried out in Thunder Bay with analysis completed in Vancouver by various techniques (neutron activation analysis, X-ray fluorescence, inductively coupled plasma (ICP) mass spectrometry, ICP-atomic emission spectrometry). Detection limits for Au (2 ppb), Pt (5 ppb) and Pd (2 ppb) by ICP-MS.

CHAPTER 3
REGIONAL GEOLOGY

3.1 Archean Superior Province

The Superior Province is the largest Archean craton and comprises 23% of the exposed Archean crust in the world (Thurston, 1991). This has led to extensive mapping, research and exploration across the province. As a result, the Superior Province has been subdivided into subprovinces based on distinct ages, lithologies, metamorphism, and structural elements. The result is a series of linear subprovinces (Fig. 3.1) classified largely on the dominant lithology present (metasedimentary, metavolcanic/granite-greenstone, gneissic/plutonic, and high-grade gneissic; Thurston, 1991 modified from Card and Ciesielski, 1986). The Superior Province is thought to have formed through plate tectonic processes comparable to those operating in the Phanerozoic with subduction dominated accretion accounting for the majority of crustal growth (Tomlinson et al., 1996; Hollings and Wyman, 1999; Desrochers et al., 1993; Jackson et al., 1994). An accretionary model is supported by the generally southward younging of ages across the Superior Province, and the association of meta-sedimentary terranes separating meta-volcanic terranes and granitic terranes (Thurston and Chivers, 1990; Feng et al., 1992). Formation of the Superior Province by plate tectonics is not accepted by all workers (e.g., Hamilton, 1998 and 1988). Other models exist for the formation of geological provinces including successive underplating by mafic and ultramafic melts rising from the mantle. This lead to the thickening and partial melting of thickening crust forming granitic sheets and felsic volcanics (Hamilton, 1998). The Superior Province is bounded to the northwest by the Trans-Hudson Orogen (Green et al., 1985) and to the Southeast by the Grenville Province and associated suture zone (Stockwell, 1964; Fig. 3.1). The Superior-Grenville collision has been dated from 1250 to 1100 Ma (Wynne-Edwards, 1972; Baer, 1981; Anderson and Burke, 1983).

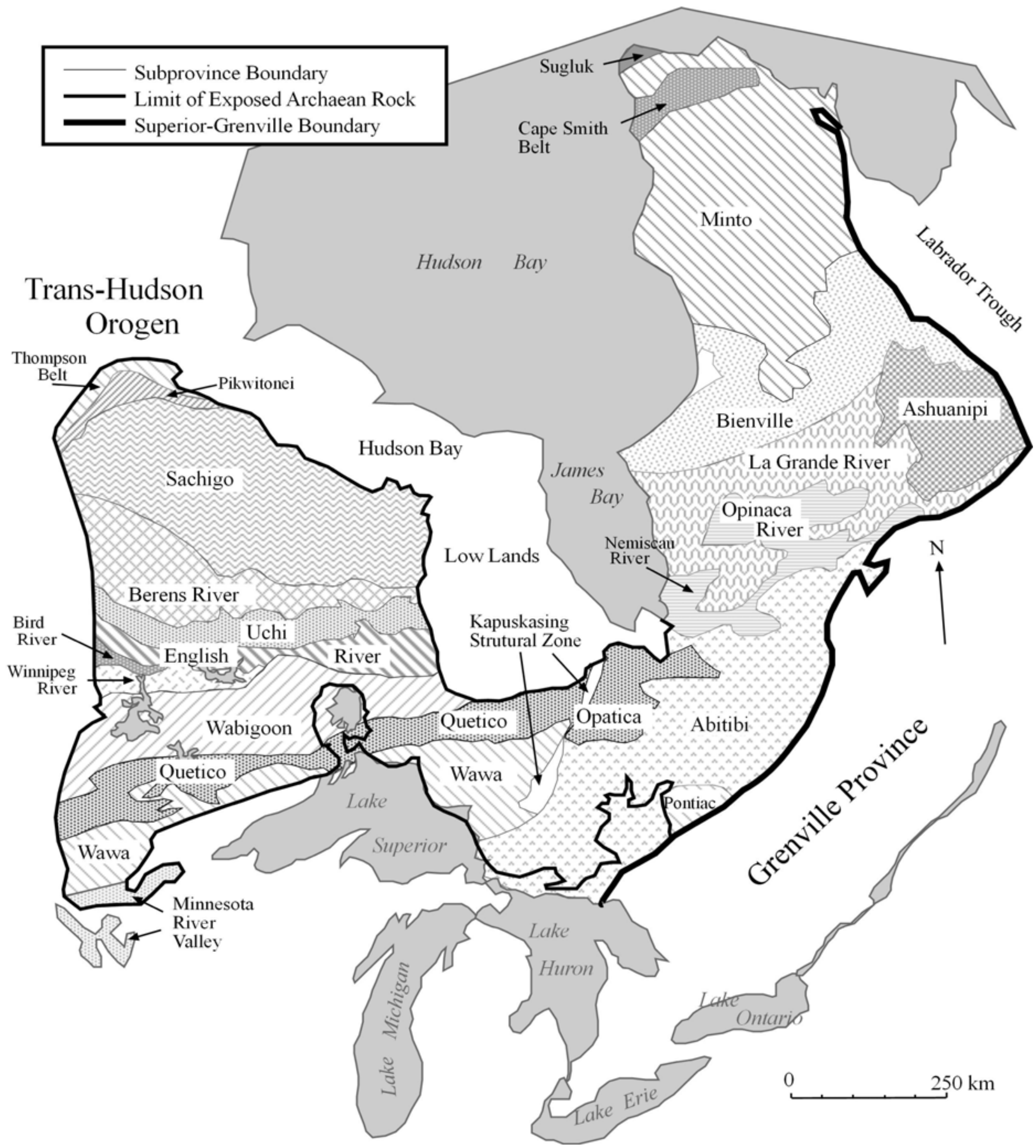

Figure 3.1 Superior Province, with major subprovince boundaries and other bounding geological provinces (Grenville and Trans-Hudson). Modified from Card and Ciesielski (1986).

3.1.1 Wabigoon Subprovince

The Wabigoon subprovince is one of the largest subprovinces in the Superior craton with a length of 900km and a width of approximately 150km (Blackburn et al., 1991). It is classified as a granite-greenstone subprovince and is dominated by metamorphosed volcanic rocks and batholithic granites with minor sedimentary units. The Wabigoon subprovince is bounded to the northeast by the English River subprovince (metasedimentary to migmatitic), to the northwest by the Winnipeg River subprovince (metaplutonic), and to the south by the metasedimentary dominated Quetico subprovince (Fig. 3.1).

The Wabigoon subprovince is broadly divided into three regions West, East, and Central, as the central region is of most interest the east and west regions will only be briefly discussed. The western Wabigoon consists of a series of connected greenstone belts surrounded by granitiod batholiths (Blackburn et al., 1991). Ages in this region vary from 2775±1Ma for an interflow tuff (Davis et al., 1988), to 2711-2685 Ma for late stage plutonism (Blackburn et al., 1991). The Eastern Wabigoon is characterised by isolated greenstone belts surrounded by granitiod units. Few age determinations have been carried out in the Eastern region, however work to date indicates the eastern region is slightly older than the western region, as felsic volcanism has an age of 2769 +6/-5 Ma (Anglin et al., 1988). The Central Wabigoon region is dominated by granitoid and gneissic rocks with narrow lenses of greenstone units. Ages for this region are older than those of the Eastern and Western Region with volcanic greenstone units falling in an age bracket of 2695-2775 Ma, with granitiods and gneisses being at least 3000 Ma (Davis et al., 1988). These extreme ages, in comparison with the East and West Wabigoon regions has lead to the interpretation of the central region as a basement complex (Thurston and Davis, 1985).

The Wabigoon subprovince contains a number of mafic to ultramafic intrusive bodies ranging from sills emplaced into granitic batholiths and supracrustal sequences, to alpine type intrusions (Blackburn et al., 1991). Ages range from 2733±1Ma for Mulcahy Lake Intrusion (Morrison et al., 1985) to 2692+42 Ma for Lac Des Iles intrusive complex (Sutcliffe et al., 1989).

3.1.2 Quetico Subprovince

The Quetico subprovince is approximately 1000km in length, stretching from Minnesota across Ontario and into Quebec (where it is referred to as the Opatica subprovince; Fig. 3.1). It maintains a relatively constant width of 100km, but is poorly exposed along its length (Williams, 1991). The Quetico is bounded to the north by the Wabigoon Subprovince and to the south by the Wawa subprovince in Ontario and by the Abitibi subprovince in Quebec (Fig.

3.1). Due to the poor exposure of the Quetico subprovince, the nature of the boundaries with adjacent subprovinces are still in doubt (Williams, 1991). Generally boundaries are seen as steep contacts with distinct changes in lithology and changes in metamorphic grade (Williams, 1991). There is debate as to whether they are tectonic boundaries (Card et al. 1981; Card, 1982, 1983) or were originally just unconformities (Harris, 1970).

Lithologically the Quetico is classified as a metasedimentary subprovince and as such is dominated by metasediments, migmatites, and anatectic intrusive units (Williams, 1991). The metasediments consists dominantly of siltstone and wackes, with minor conglomerates and iron formations (Williams, 1991). The igneous rocks are predominately felsic and mafic extrusives, intermediate to felsic intrusions, and a small suite of gabbroic to ultramafic intrusions. Felsic and intermediate intrusions are thought to be derived from melting of both sedimentary (Williams, 1989) and igneous sources (Williams, 1991).

Ultramafic intrusions are found throughout the Quetico subprovince in a number of different morphologies (plutons, pods, and sills) within the metasediments both as intrusions (Irvine 1963, Watkinson and Irvine, 1964), and as relic bodies and enclaves within granitic rocks (Williams 1987, 1989). Most of these bodies are quite small, on the scale of hundreds of metres or less. Boundary contacts between small ultramafic intrusions and the adjacent rocks are typically very diffuse as metasomatism has extensively altered the primary mineralogy to chlorite, actinolite, and biotite (Pirie, 1978). Larger bodies generally have preserved more of their primary mineralogy and consist of hornblendites, pyroxenites and peridotites. These larger bodies have been an exploration target for numerous metals including nickel, copper and platinum group minerals (Larsen, 1974; McTavish, 1992; Selway, 1993).

3.2 Mesoproterozoic

The Mesoproterozoic in northern Ontario consists of five major geologic suites which will be discussed in assumed chronological order. They are the suite of intrusive and extrusive felsic rocks (English Bay Complex), suite of the Sibley Group metasedimentary rocks, a suite of mafic to ultramafic intrusions (Leckie Stock, Seagull Intrusion, Eva Kitto Intrusion, Hele Intrusion), a suite of diabase sills (Nipigon Sills), and suite of volcanics (Osler volcanics) see Figure 3.2.

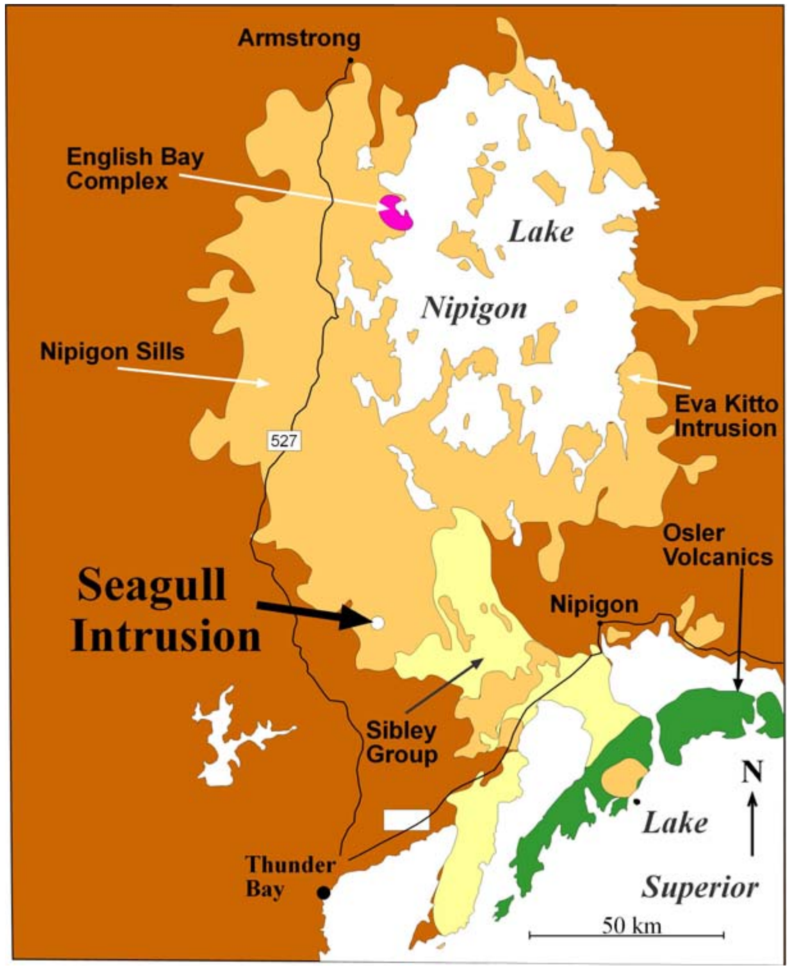

Figure 3.2 Map showing Mesoproterozoic units including the Nipigon Sills, Sibley Group, Osler Volcanics, Seagull Intrusion and Eva Kitto Intrusion.

3.2.1 English Bay Complex

The English Bay Complex is an anorogenic granite-rhyolite suite (Sutcliffe and Greenwood, 1982, 1985; Hollings et al., 2003) found on the northwestern edge of Lake Nipigon (Fig. 3.2). The complex was first mapped by Sutcliffe and Greenwood (1982) as subvolcanic quartz-alkali feldspar porphyry to alkali granite with minor fragmental dacite and rhyolites. U-Pb geochronology produced an age of 1536.7 +10/-2.3 Ma (Davis and Sutcliffe, 1985). Recent mapping work has shown the volume of subareal volcanics, to be in greater abundance than intrusives units on the basis of extrusive features (vesicles, flow structures, flow tops) in porphyritic units (Hart and MacDonald, 2003). Three main lithologies are seen in the complex: 1) fine-grained, crystal-poor tuff, 2) medium-grained quartz-feldspar crystal tuff to crystal lapilli tuff, and 3) coarse-grained massive quartz and feldspar crystal-rich rock (Hart and MacDonald, 2003). Total thickness of the volcanic package is not known, but a minimum thickness of 100 m is interpreted from cliff sections (Hollings et al., 2003) with a maximum observed of approximately 400 m (pers. com. P. Hollings, 2003)

3.2.2 Sibley Group Metasedimentary Rocks

The Sibley Group consists of five formal formations distinguished by lithology and depositional environment. Upward these are the Pass Lake Formation, the Rossport Formation, the Kama Hill Formation, the Outan Island Formation and the Nipigon Bay Formation (Rogala, 2003; Franklin, 1970; Franklin et al., 1980). Lithologically, the Sibley Group is a flat-lying red bed sequence now found in outcrop predominantly south of Lake Nipigon (Fig. 3.2), and in drill core around Lake Nipigon. It has a minimum thickness of 950 m (Rogala, 2003).

The Pass Lake Formation consists of a basal conglomerate and sandstone ranging in thickness from a maximum of 15 m to absent. The conglomerate is typically 2 to 3 m in thickness and is found sporadically throughout the Lake Nipigon basin. The overlying sandstone unit varies from well-sorted massive sandstone to laminated siltstone/sandstone with numerous sedimentary structures throughout (plane-bedded, cross-bedded, ripple marks; Rogala, 2003; Cheadle, 1986a).

The Rossport Formation largely a dolomitic sandstone unit. It is transitional with the Pass Lake sandstones and the contact is defined as the point where dolomitic units become more abundant than sandstones. The Rossport Formation has a maximum thickness of approximately 100 m (Rogala, 2003). It is variable in lithology and includes siltstone/sandstones, dolomitic sandstone units, stromatolitic chert-carbonate, to intraformational conglomerates and evaporates (gypsum, anhydrite) (Rogala, 2003).

The Kama Hill Formation has a thickness ranging from 10 to 50 m and consists of sandstones, siltstones, shales and mudstones. These are dominantly found laminated or rippled (Rogala, 2003). It is overlain by the Outan Island Formation, which is only observed in drill core.
The Outan Island Formation has a maximum thickness of 250 m and consists of mudstone, sandstone/mudstone, siltstone, sandstone and conglomerate units (Rogala, 2003). The Nipigon Bay Formation form the top of the Sibley Group. It consists of approximately 450 to 500 m of

sandstones with cross stratification and horizontally-laminated, thought to be aeolian in origin (Rogala, 2003).

The nature of the sedimentary basin in which the Sibley Group was deposited has been controversial for as long as units have been described initially thought to be related to the Midcontinent Rift (Franklin, 1980). The Sibley Group was first dated by Franklin (1978) by radiogenic Rb-Sr age dating and produced an age of 1339±33 Ma, now recognized as a later metamorphic event (Rogala, 2003). Magnetostratigraphy work carried out produced a number of ages which have been assigned to diagenetic events between 1300 Ma and 1400 Ma, discordant poles, thermal resetting, and one age of 1500 Ma in the Kama Hill formation thought to represent either deposition or an early diagenetic event (Rogala, 2003). These ages give a probable range for the time of deposition of the Sibley Group from 1300 to 1500 Ma. Mapping by Cheadle (1986a) recognized the intercalation of English Bay Complex Rhyolites (1537 Ma) with Sibley Sandstones supporting an age of 1500 Ma. This predates the first magmatic events of the Midcontinental Rift (1109 Ma Nipigon Sills, 1108 Ma Osler rhyolite, 1108 Ma Coldwell complex: Davis and Green, 1997) by 400 Ma to 200 Ma debunking any genetic relation between. Initially thought to be a Midcontinental Rift basin (Franklin et al., 1980) formed during a time of crustal extension. This was later replaced with a model of broad subsidence induced by lithospheric stretching prior to rifting (Cheadle, 1986a, b). Further work on the basin structure has lead to the hypothesis that the Sibley represents an intracratonic basin unrelated to the Midcontinental Rift (Fralick and Kissin, 1996) but rather formed by subsidence of an early cooling thermal welt, induced by a mantle plume at 1550 Ma.

3.2.3 Ultramafic Intrusives

Ultramafic intrusive rocks are found sporadically throughout the Lake Nipigon area. Ultramafic intrusive units were first mapped by Franklin (1970) with the identification of ultramafic rocks around Disraeli Lake. Further mapping by Sutcliffe (1981) and Sutcliffe and Greenwood (1982) recognized two other ultramafic bodies, the first on the east shore of Lake Nipigon in the Eva and Kitto Townships (Eva Kitto Intrusion) interpreted at the time to be a ring complex (Sutcliffe, 1986; Sutcliffe, 1981), and a picrite dyke in the Jackfish Island area in northern Lake Nipigon. They further redefined the area around Disraeli Lake to include Leckie

Lake (Leckie Stock). Ultramafics were determined to be Proterozoic in age as they cross cut Archaean structures. They were assumed to be younger than the Sibley Group based on outcrop distributions. Recently identified Sibley Metasedimentary rocks found in the basal region of the Eva Kitto Intrusion (R. Middleton, pers. com. 2003) supports this age relationship. Observed chills of diabase against ultramafic rocks at Disraeli Lake and the Eva Kitto Intrusion imply that these predate the Nipigon Sills. Lithologically, the ultramafic units identified by Sutcliffe (1981) and Sutcliffe and Greenwood (1982) are very similar ranging from lherzolite, wehrlite to olivine gabbronorite. The picritic dyke was interpreted to be derived by olivine fractionation in a magma, which was enriched in iron compared to the Nipigon Sills (Sutcliffe, 1987). Further work on Seagull intrusion has identified dunites and peridotites (Osmani and Rees, 1998a,b).

Ultramafic extrusive rocks have not been recognized in the Lake Nipigon area; however, picrites have been documented at Mamainse Point (Fig. 3.3) and have been interpreted to be associated with the Midcontinental Rift. The Mamainse Point Formation represents a sequence of Keweenawan volcanics approximately 5.3 km thick (Annells, 1973; Massey 1983; Berg and Klewin 1988; Klewin and Berg 1990, 1991; Shirey et al. 1994; Shirey, 1997). Picrites are found towards the base of the sequence with lavas becoming less primitive towards the top of the sequence (Shirey, 1997). Rhenium-osmium age determinations on these extrusive volcanics have yielded an age of 1128±54 Ma (Shirey, 1997).

3.2.4 Nipigon and Logan Diabase Sills

Diabase sills around Lake Nipigon (Fig. 3.3) were first mapped and recorded by Wilson (1910) and thought to be post-Paleozoic; he concluded that the diabase was an intrusive body consisting of at least two sills. Further work on the sills around Thunder Bay and Lake Nipigon has been carried out by Tanton (1931), Blackadar (1956), Weiblen et al. (1972) Coates (1972), Sutcliffe (1981,1986), Sutcliffe and Greenwood (1982), and Hart and McDonald (2003). The intrusive sills were separated, based principally on location, by Weiblen et al. (1972) into two groups, Logan Sills (Thunder Bay and North Shore area) and Nipigon Sills (Lake Nipigon and Black Sturgeon River area). As the area of interest is located north of Thunder Bay, only the Nipigon Sills will be discussed further.

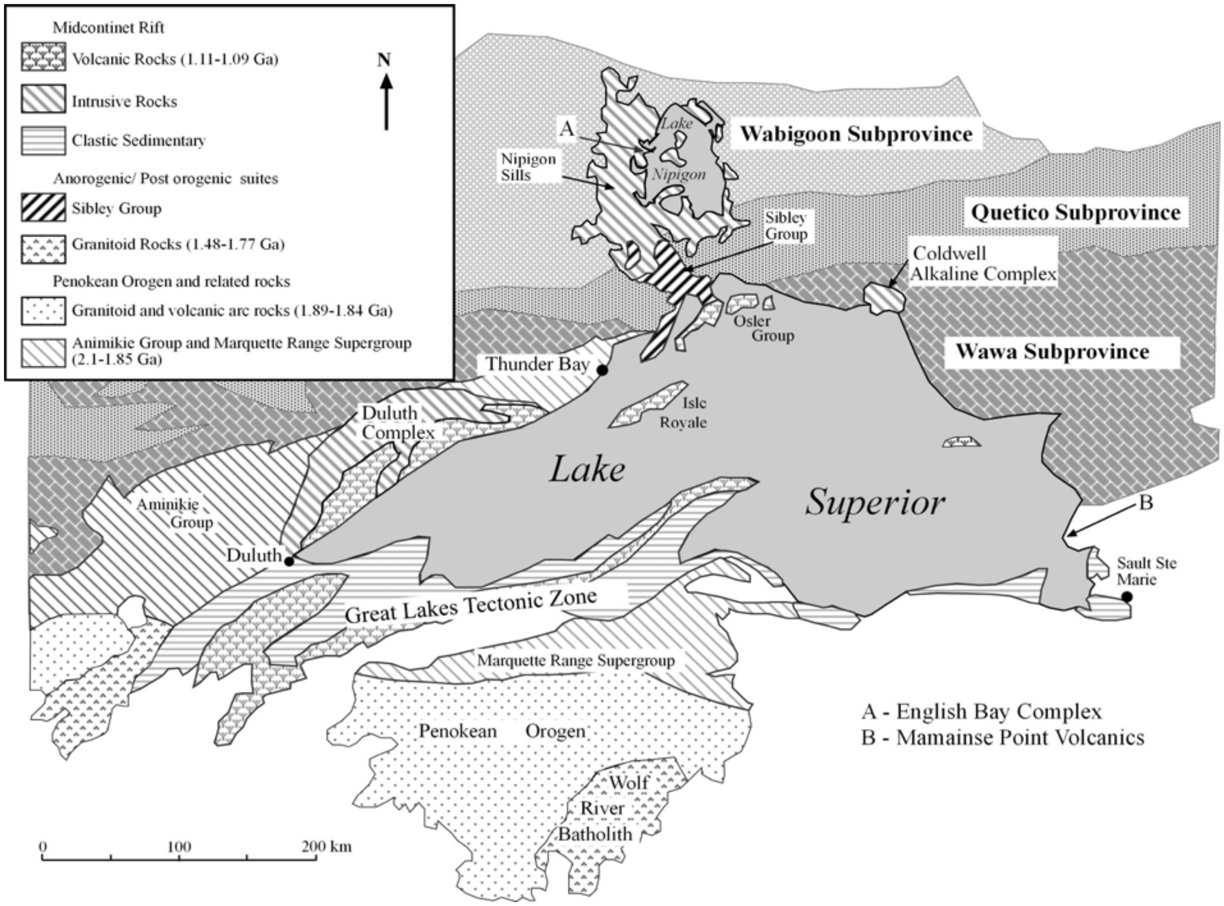

Figure 3.3 Distribution of Keweenawan volcanics, Nipigon Sills, Sibley Group Metasedimentary rocks and Archean Subprovinces. Location “A” indicates the English Bay Complex and “B” the location of the Mamainse Point Volcanics. Modified after Sutcliffe, 1991.

The Nipigon Sills are found around Lake Nipigon (Fig. 3.3), and probably originally covered an area of approximately 25 000 km^2 (Sutcliffe, 1986). The sills form numerous cliffs along the lakeshore and river valleys. Sills are found cross cutting or chilled against Archaean basement, Sibley Group sediments and ultramafic intrusions, indicating they are younger (Wilson, 1910). Various age determinations methods have been applied to the Nipigon Sills with the most recent carried out by Davis and Sutcliffe (1985) using zircon and baddeleyite from pegmatoidal patches within the sill produced an age of 1108.8+4/-2 Ma.

The lithology of the sills is remarkably consistent in outcrop being a diabase/gabbro, with only minor changes in mineral abundances, and crystal size. In thin section, mineralogy and textures appear also to be very consistent with only minor changes in the olivine abundance. However, cryptic variations in olivine, pyroxene, and feldspar compositions are extensive and imply significant in situ differentiation within the tops of sills (Sutcliffe, 1989).

3.2.5 Extrusive Volcanic Units

Extrusive volcanics are perhaps the most volumetrically important unit associated with the Midcontinent Rift, with assumed thickness ranging from 5 km outcropping onshore (Mamainse Point, Osler Group and North Shore Volcanics), to an excess of 30 km of volcanics intercalated with sediments underneath Lake Superior (Cannon et al., 1989). Extensive work has been carried out on the volcanic rocks cropping out in Canada and the United States. Age determinations and paleomagnetic studies have concluded extrusive volcanism commenced at 1108±1 Ma (Davis and Green, 1997) with the majority of volcanic activity occurring around 1100-1094 Ma (Davis and Green, 1997). The majority of lavas are olivine tholeiites, with transitional alkaline Fe-Ti basalts, basaltic andesites, and rhyolites also present (Green, 1982). Minor ultramafics (picrites) are found intercalated with less primitive flows (Shirey, 1997).

3.2.6 Relationship of Mesoproterozoic Units to the Midcontinental Rift

The extensive Mesoproterozoic igneous activity seen around the Lake Superior region is though to consist of a 2200 km long basin with a thickness of up to 20 km of flood basalts in the central portion (Cannon, 1994). This igneous activity has been attributed to the development of the Midcontinental Rift by the impingement of a mantle plume under the Superior Province at about 1.1 Ga (Shirey, 1997; Nicholson et al., 1997; Nicholson, 1990; White, 1997).

Regional isotopic studies on the Keweenawan volcanics looking at rhenium osmium isotopes (Shirey, 1997) neodymium and samarium (Nicholson et al., 1997) and strontium, neodymium and lead (Nicholson, 1990 and Shirey, 1997) have produced evidence supporting a mantle source for many of the extrusive igneous units.

Cross cutting relationships and age determinations on the igneous bodies located in the northern part of the Midcontinent Rift (Osler Volcanics, Nipigon Sills and Seagull Intrusion) would suggest that ultramafic intrusions are early in the history of the rift. This first phase of ultramafic to mafic magmatism is followed by the volumetrically extensive intruding of the Nipigon Sills followed by the extrusive Osler Volcanics as the last igneous phase recognized in the area.

CHAPTER 4
PETROGRAPHY

4.1 Introduction

Prior to this study the nature of the Seagull Intrusion's igneous history was poorly constrained. Detailed re-examination of select drill core, mapping and sampling of surface exposures of the intrusion and detailed petrological work were undertaken in order to better understand the magmatic and emplacement history of the Seagull Intrusion. The first phase of this petrologic study involved petrographic examination of 160 samples from drill holes WM00-01, WM01-08, WM98-05 and surface samples. A complete listing of sample location and lithologies is provided in Appendix A. Distribution of surface samples and drill hole collars are shown in Figure 4.1, and a cross section through drill holes WM00-01, WM01-08, WM98-05 and WM00-04 is shown in Figure 4.2 and 4.3. Petrographic work was undertaken utilizing both transmitted and reflected light microscopy. Analysis mineral chemistry was carried out using SEM-EDS and is outlined in Chapter 5. The rock classification scheme utilized in the description of the lithologies from the Seagull Intrusion is from the IUGS classification of igneous petrology. Modal abundance was estimated by visual estimation. Crystal size was determined on the microscope, with fine grained being characterized by crystal size less than 1 mm in size. Medium grained ranging from 1 mm to 3 mm and coarse grained having crystals exceeding 3 mm in size.

4.2 General Lithostratigraphy of the Seagull Intrusion

The lithologic subdivisions described in drill holes WM00-01, WM00-08 and WM98-05 are based primarily on thin section petrography, as macroscopic examination of the drill core fails to present any significant recognisable lithological variation. Transitions between lithological units are typically gradational, making divisions based on lithology alone difficult. In addition, extensive alteration and replacement masks primary mineralogy in some locations. The intrusion is generally bowl shaped, with basement lithologies consisting of Quetico

Metasediments, Sibley Group Metasediments and granites to pegmatites. Within the intrusion the basal unit is characterized by an olivine amphibole-pyroxenite this grades upwards into a thick unit of peridotite making up the largest portion of the Seagull Intrusion. In the upper section of the peridotite unit, thin pyroxenite units are observed (Fig. 4.2 and 4.3). Surface samples stratigraphically above the drill core cross section are characterized by more felsic lithologies consisting of plagioclase bearing pyroxenites.

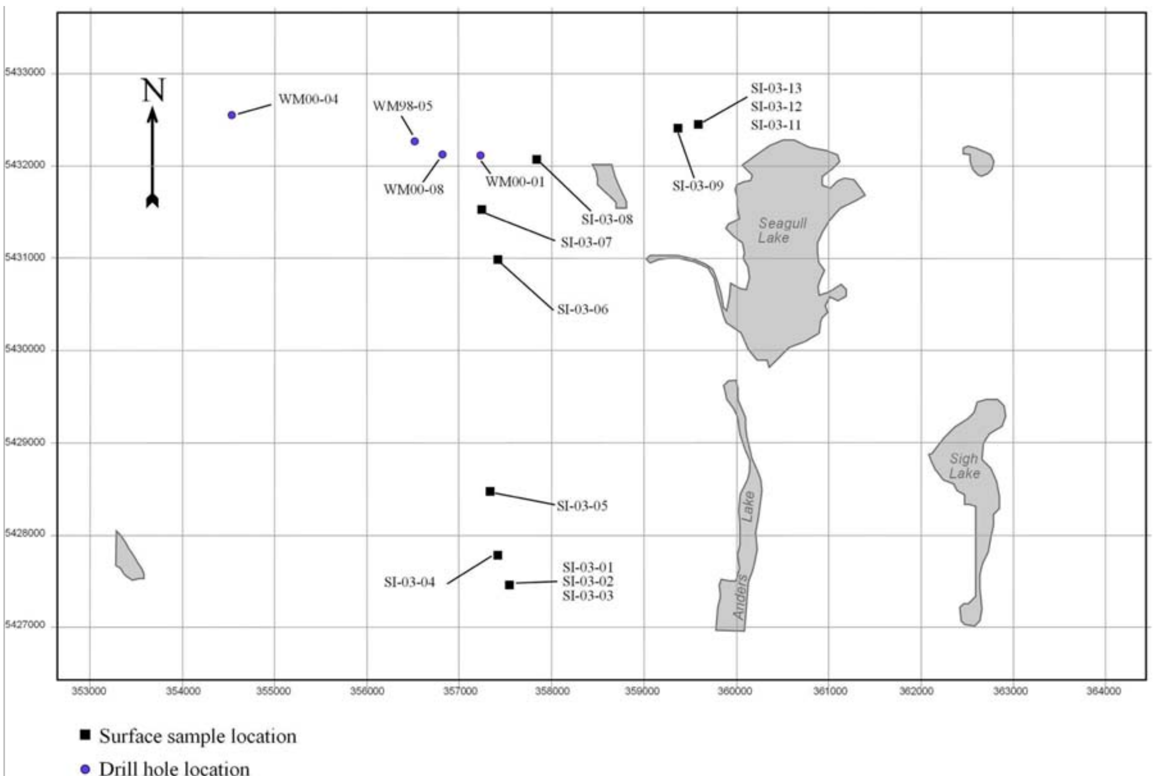

Figure 4.1 Map showing surface sample distribution and drill hole collars WM00-01, WM98-05, WM01-08 and WM00-04. Map UTMs based on NAD 83

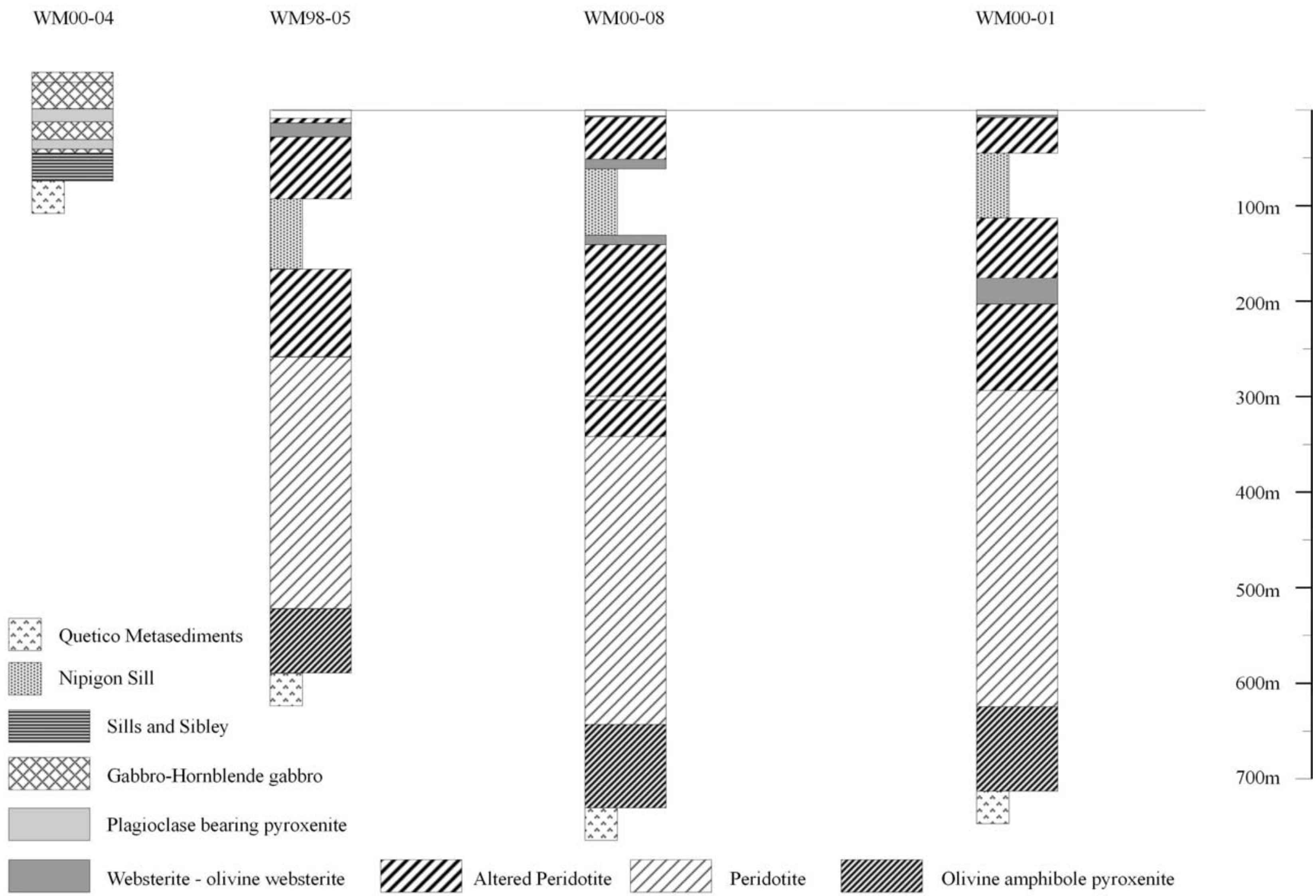

Figure 4.2. Cross section through drill holes WM00-01, WM00-08, WM98-05 and WM00-04. Depth from surface shown on right hand side. Distance between WM00-01, WM01-08 and WM98-05 are to scale, distance from WM98-05 to WM00-04 is not to scale. Topographical height of drill holes was determined from digital topographical map. No vertical exageration.

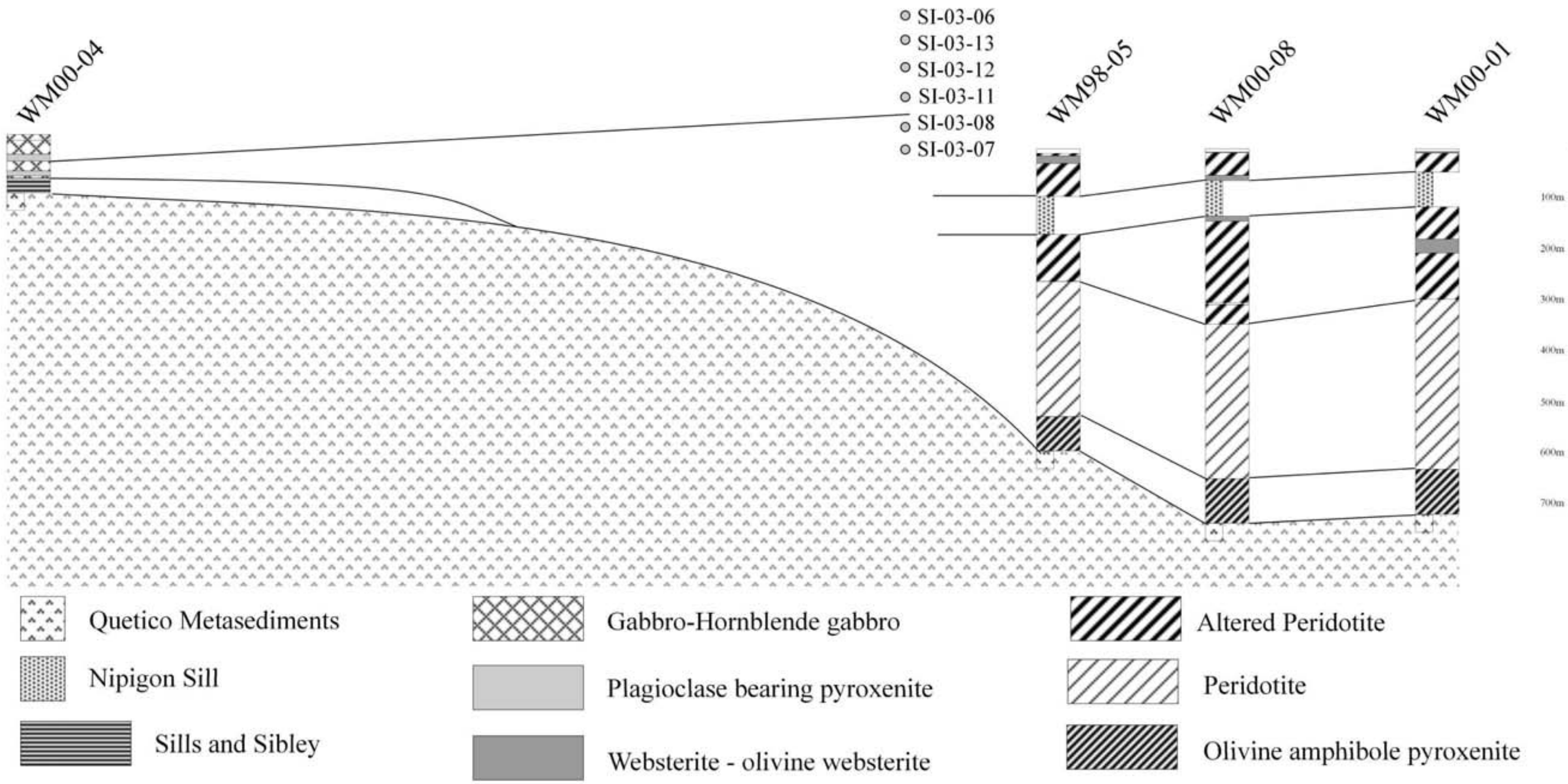

Figure 4.3. Cross section through drill holes WM00-01, WM00-08, 98-05 and WM00-04 with lithologic correlations shown by solid lines. Surface samples are arranged in possible stratigrahic sequence. Horizontal and vertical scale are the same.

4.2.1 Pyroxenite Units

Pyroxenitic rocks are dominantly found in drill hole WM00-04 (Fig. 4.2) and in samples from surface outcrops of the Seagull Intrusion. Pyroxenite units are observed in the other three drill holes but are restricted to the upper third of the intrusion. The pyroxenite lithology is further subdivided into three types; an olivine websterite, a websterite and a plagioclase-bearing pyroxenite.

4.2.1.1 Olivine Websterite

Olivine websterite is found in the upper portions of drill holes WM00-01 (<9 m depth), WM98-05 (<25 m depth) and in one surface sample (SI-03-08) which occurs in close proximity to WM00-01 (Fig. 4.1). Olivine websterite is characterised by subhedral to anhedral granular cumulus pyroxene and olivine with minor amounts of intercumulus poikilitic clinopyroxene (Fig. 4.4A). Pyroxene comprises 60-70% of the rock volume and is dominantly orthopyroxene occurring as anhedral crystals ranging in size from 2 mm to 0.25 mm. The variance in mode within each sample being quite limited. Olivine occurring within this lithology ranges in abundance from 30 to 40 vol% appearing as relict granular crystals replaced by serpentine.

4.2.1.2 Websterite

Websterite is characterised by 90-95% cumulus clinopyroxene and minor (5-10%) amounts of granular olivine replaced by serpentine, chlorite and iddingsite. Pyroxene in this lithology is found as subhedral granular crystals ranging in size from 1 mm to 0.5 mm. This lithology is observed in drill holes WM00-01 at 188 m and in WM01-08 at 6.5 m 53.9 m and 137.1 m.

4.2.1.3 Plagioclase-Bearing Pyroxenite

Plagioclase-bearing pyroxenite is characterised by dominant (70%) cumulus clinopyroxene, with little (<2%) to no olivine and plagioclase oikocrysts (Fig. 4.4B). Pyroxene occurs as anhedral to subhedral crystals ranging in size from 0.25 mm to 1 mm, with an average of approximately 0.5 mm. Euhedral granular olivine relicts are sometimes found in this lithology. Plagioclase oikiocrysts range in abundance from trace amounts up to 10 vol%. This lithology is found at three different levels only in drill hole WM00-04 (51.1 m, 72.9 m and 77.0 m).

4.2.2 Peridotite Units

Lherzolite to dunite is the dominant lithology observed in the Seagull Intrusion (Fig. 4.2). Transitions between lherzolite and dunite are gradational leading to a very complex cross section. In order to simplify the section, these two lithologies were grouped together under the broader term of peridotite. Peridotite is found in the bottom half of the intrusion (below 250 to 300 m; Figs. 4.2 and 4.3). The peridotite consists dominantly of olivine and pyroxene, with lesser amounts of biotite and amphibole, and trace amounts of feldspar observed in drill holes WM00-01 and WM98-05 (Figs. 4.5A and B). Olivine ranges in abundance from 60 to 90 vol% and is characterised by anhedral to euhedral granular crystals ranging in size from less than 0.5 mm to approximately 6 mm with an average of approximately 1-2 mm. Olivine is always found as a cumulate mineral, enclosed in amphibole or pyroxene. Pyroxene is dominantly found as poikilitic to sub-poikilitic mineral (sample SW08-40 appeared to have minor amounts of granular pyroxene) and dominated by clinopyroxene (90%). Pyroxene oikocrysts range in size from 2 mm to 14 mm. The abundance of pyroxene varies from 10 to 40 vol%. Approximately 1 to 5 vol% biotite is found in most samples where it occurs as small anhedral crystals interstitial to olivine, pyroxene and amphibole. Amphibole is found in some of the thin sections as anhedral crystals both interstitial and as sub-poikilitic crystals. Up to 2% interstitial feldspar is observed locally within this lithology in drill holes WM00-01 and WM00-08. Opaque minerals are present in all samples and consist of both oxides and sulphides. Oxides are more common (~1%) and occur as inclusions in olivine and pyroxene (Fig. 4.6A and B). Sulphides are less common (<1%) and only observed in a few thin sections, most taken from known zones of PGM mineralization. Sulphides occur interstitially between olivine and pyroxene. Alteration is variable and is mineral specific, feldspar is most commonly altered followed by of olivine then pyroxene.

In some intervals, peridotite is extensively altered to serpentine, chlorite and iddingsite, while still preserving primary crystal morphology (Figs. 4.7A and B). Primary mineralogy is assumed to be olivine and pyroxene, as relict cores of olivine are still present in some thin sections.

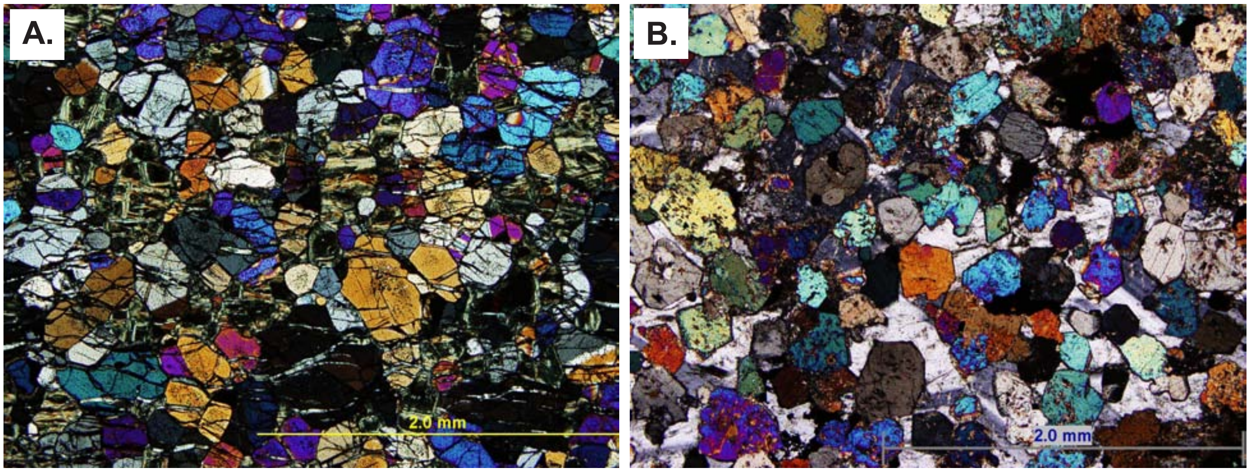

Figure4.4. Pyroxenites. **A**.Websterite exhibiting cumululate pyroxene and olivine (altered), sample SW01-10. **B**. Photomicrograph (X-polarized) of plagioclase bearing pyroxenite, cumulate pyroxene with intercumulus feldspar, sample SW04-11.

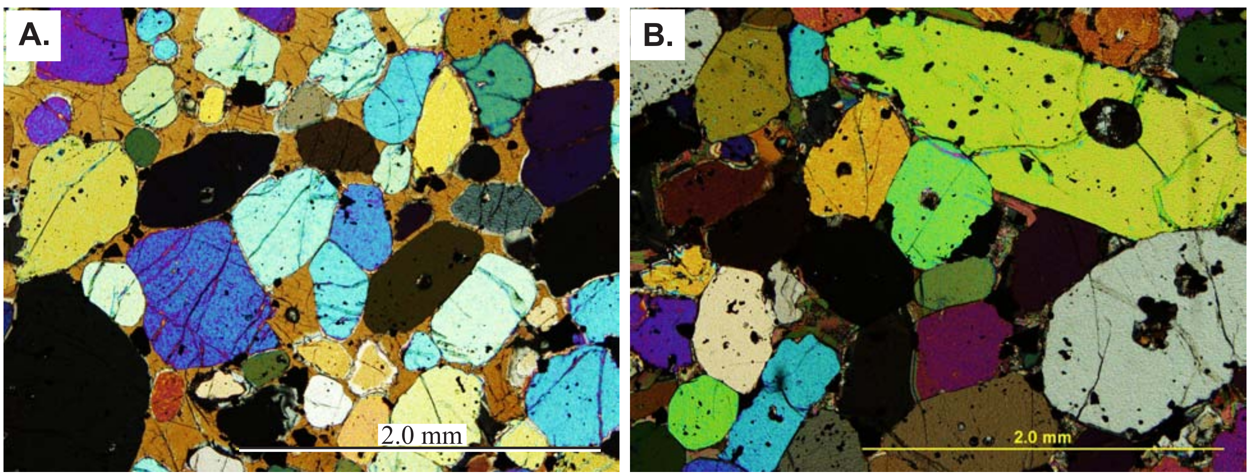

Figure 4.5 Peridotite. **A**. X-polarized photomicrgraph of lherzolite, showing cumulate olivine with poikilitic pyroxene, sample SW08-36. **B**. X-polarized photomicrograph of dunite, showing cumulate olivine, sample SW08-37.

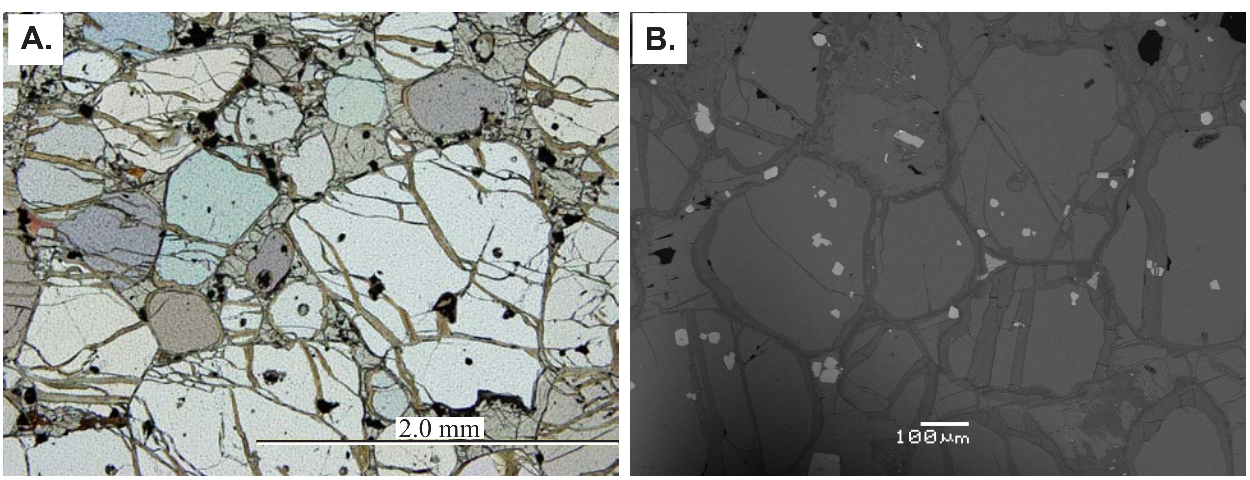

Figure 4.6. Oxide distribution. **A**. transmitted light photomicrogrpah showing oxides occuring in both olivine and pyroxene crystals, sample SW01-24. **B**. Back Scatter electron image from SEM. showing distribution of oxides, sample SW98-5-24.

This morphology and original crystal size is consistent with better preserved olivine observed in other lithologies. Relict pyroxene oikocrysts are also observed in some thin sections but generally exhibit better preservation than the olivine. This lithology is observed in drill holes WM00-01, WM98-05 and WM01-08 in the upper half of the intrusion (Fig. 4.2).

4.2.3 Olivine Amphibole Pyroxenite- Olivine Pyroxene Amphibolite

This lithology is found at the base of the intrusion in drill holes WM00-01, WM00-08 and WM98-05. It is characterised by dominant olivine and pyroxene (both clinopyroxene and orthopyroxene) with abundant amphibole and biotite, and trace amounts of feldspar (Figs. 4.8A and B). Olivine varies in modal abundance from approximately 10 to 6%, crystal size and morphology have a wide range from anhedral to euhedral granular crystals that range in diameter, from less than 0.5 mm to 4 mm and average approximately 1-2 mm across. Olivine is variably altered from complete replacement by serpentine in some thin sections to no visible alteration in others. Clinopyroxene is commonly found as poikilitic to subpoikilitic crystals, but is also seen as a minor granular cumulus phase near the bottom of drill hole WM00-01 at 704.0 m. Oikiocryst sizes varies from 2 mm to greater than 8 mm with an average of 3 to 4 mm. Modal abundance of pyroxene varies from 15 up to 40%. Alteration of pyroxene is not as common or as extensive as olivine. However, partial replacement by amphibole is evident in most thin sections from this unit. Amphibole is most abundant (approximately 50%) near the base of the intrusion and decreases in abundance upwards until it is no longer observed. It is commonly found as interstitial crystals along margins of pyroxene and olivine, but is also observed forming oikocrysts enclosing olivine chadacrysts (Fig. 4.8). It has the appearance of being both primary and an alteration phase after pyroxene in the same thin section throughout the unit. Biotite is also abundant in this lithology ranging in mode from 2% up to 15-20%. It is found interstitially to pyroxene and olivine, occurring as both primary in nature and also a secondary alteration affect. Trace amounts of interstitial feldspar are observed in this lithology, with drill hole WM00-08 yielding the highest abundance (3%). This is the least altered drill hole of the three, and it is possible that alteration has masked the presence of feldspar in the other two drill holes. Opaque minerals are observed in all holes and consist of both oxides and sulphides. Oxides are more abundant (1-2%) and are commonly found as chadacrysts in olivine crystals and also in the poikilitic pyroxene. Oxides in olivine are commonly smaller in size than those in pyroxene, which occur as approximately 1mm subhedral crystals. Trace amounts of apatite, zircon and baddeleyite were identified by SEM.

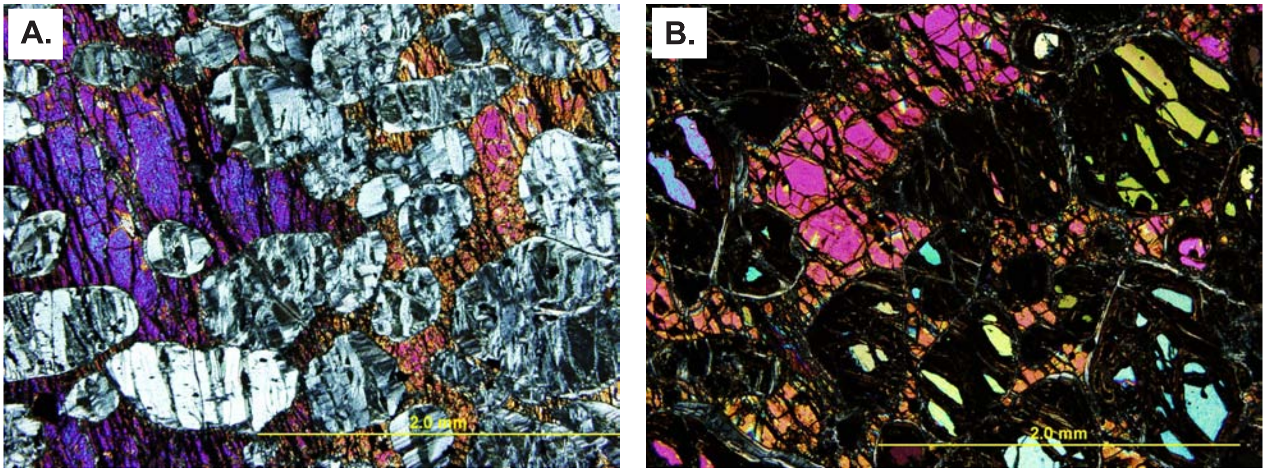

Figure 4.7 Altered peridotite. **A**. X-polarized photomicrograph of altered peridotite with complete replacement of olivine, sample SW01-04. **B**. X-polarized photomicrograph of altered peridotite with partial replacment of olivine, sample SW08-14.

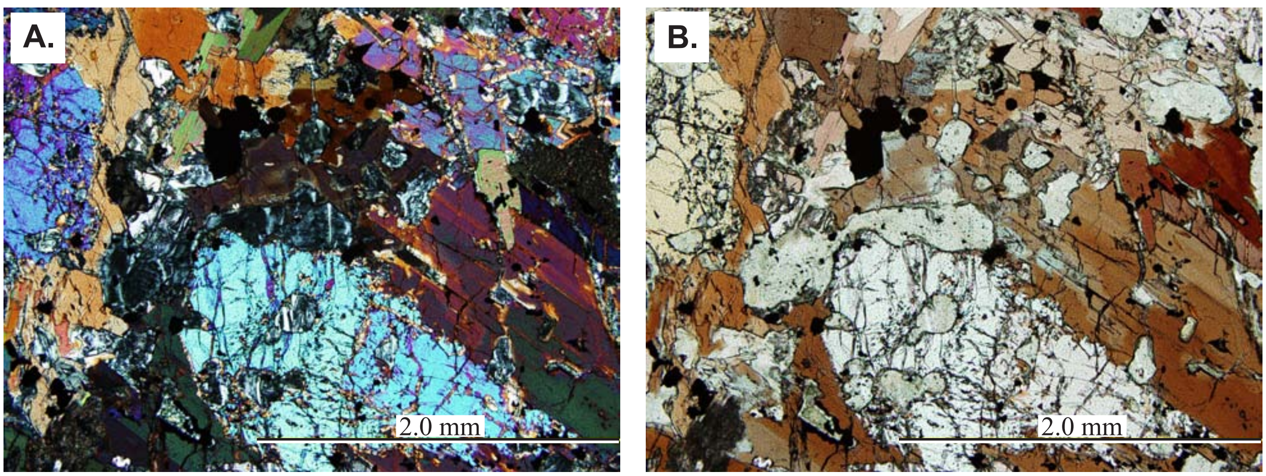

Figure 4.8 Olivine amphibole pyroxenite- olivine pyroxene amphibolite. **A**. X-polarized, **B**. Transmitted light. Dominate pyroxene, and amphibole, with minor olivine (altered chadacrysts in pyroxene and amphibole), minor amounts of biotite, sample SW01-38.

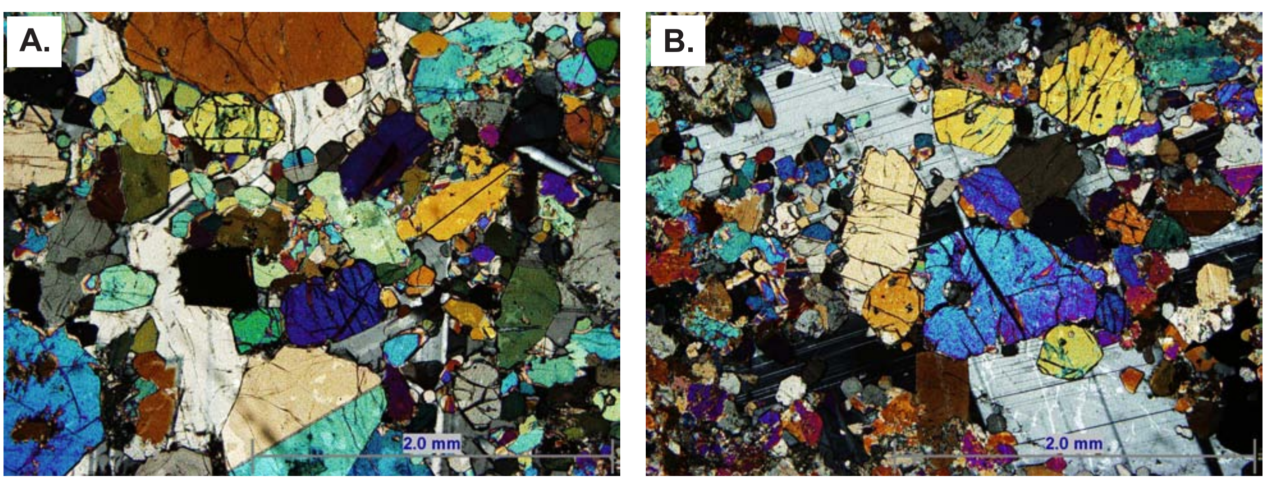

Figure 4.9 Olivine Gabbro, **A**. and **B**, X-polarized photomicrograph exhibiting cumulate pyroxene with minor cumulate olivine and sub-poikilitic feldspar. **A** from sample SI-03-06, **B** from sample SI-03-03

4.2.4 GabbroUnit

This lithology is restricted to samples taken from surface outcrops (refer to Fig. 4.1. for sample locations) and drill hole WM00-04 (Fig. 4.1 for drill hole location). The gabbro is subdivided into an olivine gabbro (Figs. 4.9A and B) and a hornblende gabbro.

4.2.4.1 Olivine Gabbro

The olivine gabbro is characterised by pyroxene and olivine occurring as subhedral to anhedral cumulus minerals partially or fully enclosed in oikocrysts of plagioclase feldspar. The modal abundance of feldspar is variable ranging from 10 to 40% with oikocrysts ranging in size from 1 mm to 4 mm with an average of approximately 2 mm. Clinopyroxene appears as a cumulus mineral, with abundance ranging from 60 to 90% and crystal size from less than 0.1 mm up to 2 mm with an average of 0.5 mm. Olivine occurs as anhedral to subhedral crystals ranging in size from less than 0.5 mm to 2 mm with the most common size being approximately 0.5 mm to 1 mm. The mode of olivine varies from 2 up to 15%. Biotite (less than 5%) occurs as irregular sheets commonly 1-2mm in size is common in the gabbro. Gabbro in drill hole WM00-04 (sample SW04-04) consisted of the same mineralogy but cumulate feldspar with cumulus and intercumulus pyroxene. Alteration is very variable, from little alteration to complete replacement of feldspars and olivine. Olivine gabbro occurs only in surface samples, although suspected relict crystals of olivine occur in samples SW04-01 and SW04-10 from drill hole WM00-04.

4.2.4.2 Hornblende Gabbro

The hornblende gabbro is very similar to the olivine gabbro lithology and is characterised by the absence of olivine and the presence of 1-2 vol% hornblende as small, (approximately 1 mm) subhedral interstitial crystals. Hornblende gabbro is only observed in drill hole WM00-04 at 0.30 m, 7.2 m and 87.4 m depth intervals.

4.2.5 Nipigon Sill

A diabase sill is observed to intrude part of the Seagull Intrusion in drill core and exhibit cross cutting relationships on surface (T. Hart, pers. com.). Chill margins occur in the Nipigon Sill at both top and bottom contacts with the Seagull Intrusion. The sill has a relatively constant thickness of ~70 m as seen in WM00-01, WM00-08 and WM98-05 (Fig. 4.2).

Petrographically it is an (olivine) gabbro to gabbronorite (Fig. 4.10A and B). Olivine mode is variable within the sill ranging from 1 to ~10%. Crystal size is dependent upon location in the sill, the margins exhibit fine crystals and coarsening towards the centre, for pyroxene (2 mm to 12 mm), feldspar (1 mm to approximately 1.5 mm). Olivine exhibits a fining upwards, where largest crystals (approximately 1 mm) and the highest abundance is found near the bottom of the sill whereas smaller (less than 0.5 mm) and less abundant olivine is found at higher levels. Opaque minerals are present but usually less than 2% and are dominated by oxides with subhedral to skeleton crystal forms approximately 1 mm in size. Under reflected light extensive exsolution lamella can be observed in them. The dominant texture observed in the sill is ophitic, with oikocrysts of clinopyroxene enclosing chadacrysts of plagioclase, olivine, and cumulate pyroxene. Alteration is variable in the Nipigon Sill consisting dominantly of the partial replacement of feldspars. The most extensive replacement is observed in samples closest to sill contacts.

4.2.6 Basement Lithologies

Basement to the Seagull Intrusion is variable ranging from Sibley Group Metasedimentary rocks observed in drill hole WM00-04, to granitic and pegmatitic igneous bodies in drill hole WM00-02, to Archean metasedimentary rocks as observed in drill holes WM00-01, WM98-05 and WM01-08. Granoblastic texture is developed along some contacts.

4.2.6.1 Sibley Group Metasedimentary Rocks

Sibley Group metasedimentary rocks are observed intercalated with igneous lithologies at the base of drill hole WM00-04 (Figs. 4.1 and 4.3 for location). The metasediments include quartzites (medium grained well sorted semi-mature quartz dominated) and meta-conglomerates which are medium to coarse grained (up to 2cm lithic fragments occur), semi-mature and matrix supported. The contact zone in the periphery of the intrusion is about 29m thick and is characterized by the intercalation of Sibley and 11 small igneous sills ranging in size from 0.10 m to 4.0 m in thickness. The last observed sill in the drill hole intrudes along the unconformity between the Sibley Group Metasedimentary (meta-conglomerate) rocks and the Archean metasedimentary rocks.

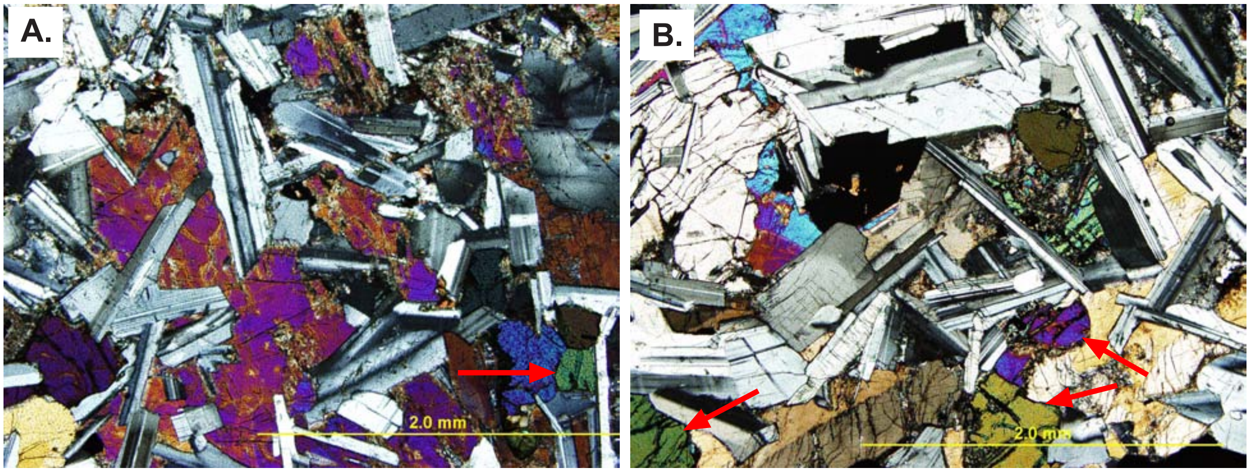

Figure 4.10. Nipigon Sill, (olivine) gabbro - gabbronorite. **A** and **B**. X-polarized photomicrographs exhibiting sub-poikilitic texture with pyroxene and feldspar, minor olivine (lower right corner of **A**. and centre to bottom of **B**. shown by arrow) **A** from sample SW01-06, **B** from sample SW08-

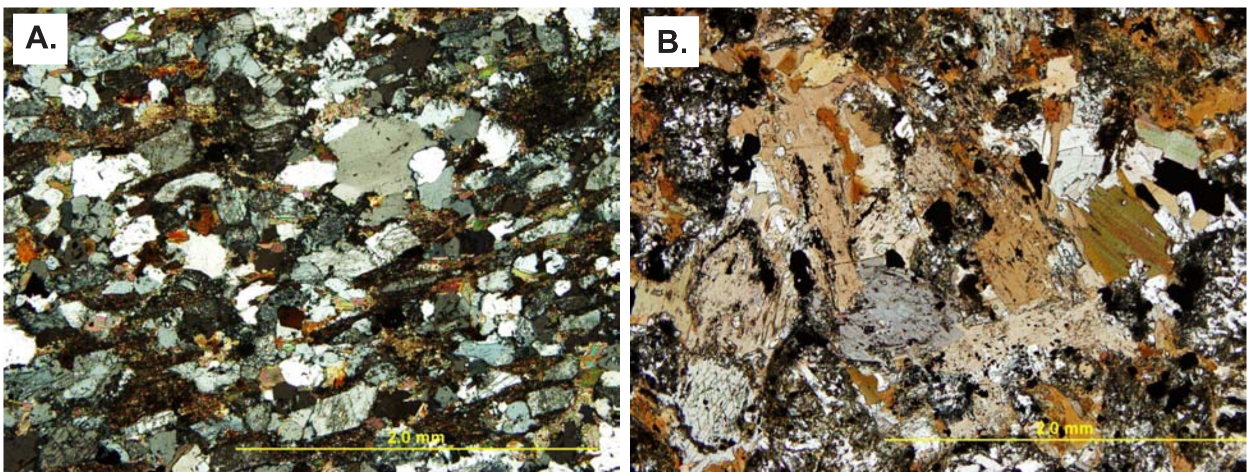

Figure 4.11 Basement metasedimentary rocks. **A**. X-polarized, **B** transmited light. Dominant quartz, with lesser amounts of biotite (altered) and trace garnet. Sample from SW08-52.

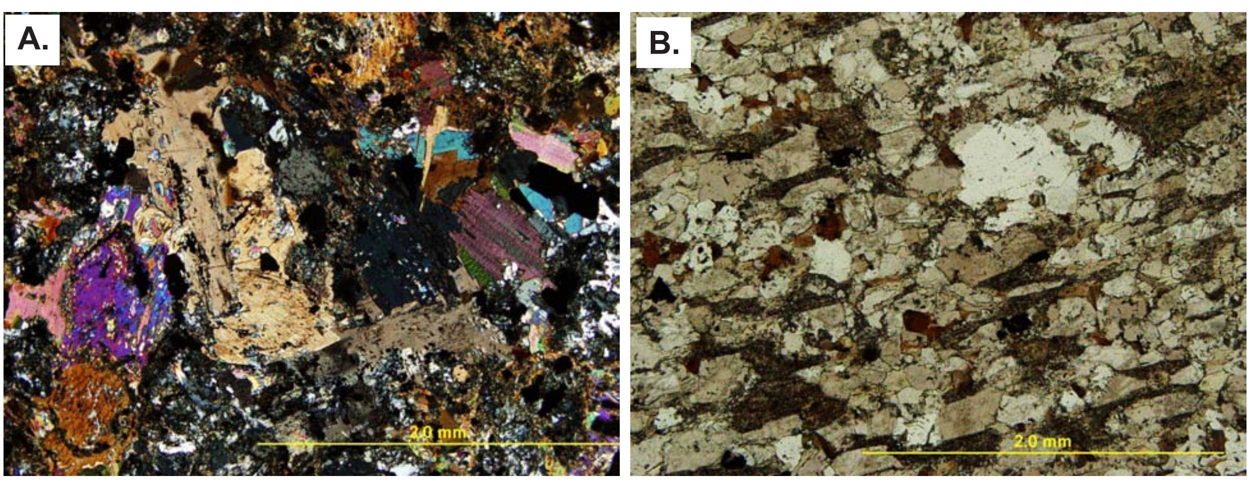

Figure 4.12 Basement hornfels. **A**. X-polarized photomicrograph with dominant amphibole and biotite and minor pyroxene. **B**. Transmitted light photomicrograph exhibiting pleochroism of biotite and amphibole. Sample from SW01-41.

4.2.6.2 Archean Metasedimentary Rocks

Archean metasedimentary rocks are observed in all four of the drill holes WM00-01, WM00-08, WM98-05 and WM00-04 (Figs. 4.1. and 4.3 for location) utilized in this study. In drill hole WM00-01 basement is encountered at 719.56 m (Rees, 2000), WM00-08 at 730.80 m, WM98-05 at 588.60 m and in WM00-04 at 118 m. The Archean metasedimentary rocks are very consistently in three of these holes (WM00-01, WM98-05 and WM01-08) a garnet biotite quartz feldspar schist (Figs. 4.11A and B). Crystal size is constant within individual thin sections, but variable between drill holes with WM98-05 exhibiting the largest crystal size (~0.5 mm) and numerous triple points compared to a crystal size of >0.5 mm in other drill holes. In contrast Archean metasedimentary rocks observed in drill hole WM00-04 are characterised by the absence of garnet and a stronger green pleochroism in the biotite. Variable alteration is observed in basement lithologies with an apparent increase in degradation of biotite and feldspar towards the basal contact.

4.2.6.3 Hornfels

Extensive recrystallization has occurred at the base of the intrusion in drill hole WM00-01 and exhibits the development of a granoblastic texture consisting of approximately 70 vol% amphibole (Figs. 4.12A and B) this grades downward into a less recrystallized Archean metasedimentary rocks.

4.3 Discussion

The delineated lithologies of the Seagull Intrusion and adjacent lithologies (basement and Nipigon Sill) exhibit various textures associated with emplacement of a mafic igneous intrusion (e.g., granoblastic texture at contacts, dominant cumulus crystals phases with lesser interstitial phases throughout most of the intrusion and a decreasing ultramafic component in the upper section of the intrusion).

The basement lithology as observed in the four drill holes examined consists either of Proterozoic Sibley Group metasedimentary rocks or Archean metasedimentary rocks assumed to belong to the Quetico Subprovince (see Chapter 3). Quetico metasedimentary rocks exhibits variable degrees of granoblastic texture and coarsening indicative of contact metamorphism at the base of the intrusion. Approaching the basal contact in drill hole WM00-08, in the metasediments there is a noticeable increase in crystal size and abundance of alteration of hydrous minerals. The sample of Quetico metasediment taken closest to the basal contact (SW01-41) exhibits this to the greatest extent and is characterised as a hornfels dominated by amphiboles.

Lithologies in the Seagull Intrusion represent an ultramafic intrusion produce by fractional crystallization. The mineralogy is dominated by olivine and pyroxene with higher abundances of feldspar only occurring in upper parts of drill hole WM00-04 and surface samples. Lithological units recognized in drill core are consistent with a prolonged crystallization of olivine from a magma, with transitions from one lithology to another being the result of gradual increases or decreases in a minerals abundance. The basal unit of the Seagull Intrusion is an olivine amphibole pyroxenite – olivine pyroxene amphibolite (Figs. 4.2 and 4.3) and is distinguished from the lithology above by the abundance of amphibole and biotite, and a lower abundance of olivine. The hydrous minerals (amphibole and biotite) appear to be both primary and secondary in nature. Primary amphibole occurring as oikocrysts and interstitial crystals probably represents contamination by assimilation of country rock (Sibley Group metasedimentary rocks or Quetico metasedimentary rocks) as the abundance decreases away from the basal contact. Secondary amphibole is recognized by the partial replacement of pyroxenes. Biotite is observed in close association with primary amphibole in many of the samples and appears also to be a primary phase. However, there are other occurrences where biotite appears to replace pyroxene and is secondary in nature. The gradual decrease in amphibole and increase in cumulate olivine and poikilitic pyroxene marks the transition into the peridotite which ranges in composition from a lherzolite to a dunite. Within this unit, there are subtle variations in the modal abundance and crystal size of olivine and pyroxene. The most common lithology is granular olivine enclosed in poikilitic pyroxene. Although variations are present there appears to be no obvious layering or cyclicity in the distribution of olivine and pyroxene though this lithology. The peridotite unit grades into the overlying altered peridotite (Figs. 4.2 and 4.3) by an abrupt increase in the extent of replacement of olivine by chlorite, sericite and iddingsite. The extensive alteration within this lithology may be associated with the intrusion of the Nipigon Sill and the resultant contact metamorphism aureole around it. Further alteration may reflect the extent of a weathering profile and the infiltration of both surface waters and subsurface brines, the latter being found in the Seagull

Intrusion (R. S. Middleton, 2003 pers. com.). Contained within this zone of alteration are intervals of pyroxenite which show a greater resistance to alteration. These units are dominated by fine crystals of cumulate pyroxene and are the first indication of layering and a cyclical nature to the intrusion. Pyroxenite layers are perhaps correlative but the occurrence of two, pyroxene- dominated lithologies in WM00-01, three, pyroxene-dominated lithologies in WM00-08, and only one identified in WM98-05 makes correlations more difficult. Further complexities with correlating pyroxene units arise from the possibility of high angle faulting occurring in the Seagull Intrusion, producing a series of horsts and grabens as suggested by Hart and Magyarosi (2004). Additional pyroxenite layers in the upper half of the intrusion may exist but are difficult to recognize due to the altered and stained nature of the core.

There is an increase in the occurrence of pyroxenite lithologies towards the top of the altered peridotite unit, as discussed previously, and holes WM00-01 and WM00-08 are collared in olivine websterite and websterite, respectively. Above this there is poor vertical control on the location of samples as they are from surface outcrops; however, surface samples of olivine websterite to plagioclase-bearing pyroxenite SI-03-07 and SI-03-08 (Fig. 4.1) are found closest to the area where drilling occurred are interpreted to be the next lithology in the stratigraphic sequence of the Seagull Intrusion (olivine compositions are similar to those observed in drill holes WM00-01 and WM98-05; see Chapter 5). The other surface samples were collected further away from the drill site and are interpreted to be at a higher stratigraphic given the near horizontal layering and that the drill site is in a topographic low relative to the elevation of the surface samples. Surface samples are characterised by cumulate pyroxene and lesser amounts of cumulate olivine enclosed in poikilitic feldspar. Surface samples are the only samples with abundant feldspar present (greater than 5 vol%) and reflect an increasing abundance of silica in the fractionating magma. Surface samples SI-03-11, 12 and 13 were taken from one outcrop approximately 2 m in height (11 at the base 13 at the top) and exhibit an upward decrease in the abundance of ferromagnesian minerals. These surface samples may tie into drill hole WM00-04 as lithologies observed in WM00-04 are similar to those seen in the surface samples. This hole was drilled approximately 2 kilometres from the main drill site (Fig. 4.1) and does not encounter the extensive ultramafic units observed in the other three drill holes. However, it does contains two horizons of plagioclase-bearing pyroxenite that grade upwards into more felsic lithologies (gabbro) and then end in a zone of granophyric material, defining a repetitive fractionation sequence (sequence-1 starts at sample SW04-11 through to sample SW04-07 and sequence-2 starts at sample SW04-06 to sample SW04-04; see Fig 4.3). This sequence of lithologies is very similar in nature to that observed in surface samples SI-03-11, 12 and 13. The base of drill hole WM00-04 contains numerous small sills. These small fingers of mafic rock may represent the propagation and expansion of the Seagull Intrusion outward into the country rock by assimilating Sibley Group metasedimentary rocks occurring on top of the Quetico Subprovince.

4.4 Conclusions

The Seagull Intrusion consists of a basal olivine amphibole pyroxenite observed in drill holes WM00-01, WM01-08 and WM98-05; this lithology grades upward into a homogeneous unaltered peridotite unit dominated by cumulate olivine and poikilitic pyroxene. This unit originally would have been continuous to the top but extensive alteration in the upper 250 to 300 m of the intrusion has resulted in replacement of olivine and partially replacement of pyroxene by chlorite, serpentine and iddingsite. The increasing occurrence of pyroxenite bodies in the upper half of the intrusion reflects to the changing magmatic conditions and fractionation in the Seagull Intrusion. Further fractionation in the Seagull Intrusion is observed in the top section where surface samples and samples from drill hole WM00-04 are dominated by mafic lithologies. The mechanism of intrusion is poorly constrained with the Seagull Intrusion. However, Quetico metasedimentary rocks observed under the thickest section exhibit the development of hornfels. While the thinnest section (drill hole WM00-04) only consist of greenschist indicating less fluid mobility and less heat. Drill hole WM00-04 also contains some evidence for the mechanism of the expansion of the intrusion as the bottom of the drill hole consist of a series of small sills propagating through the Sibley Group metasedimentary rocks.

CHAPTER 5
MINERAL CHEMISTRY

5.1 Introduction

The Seagull Intrusion is dominated by cumulus olivine and intercumulus pyroxene with little to no indication of rhythmic layering occurring in the intrusion. Small scale layering which is commonly observed in other mafic to ultramafic intrusions (Stillwater Complex, Bushveld Complex, Muskox Intrusion, Skaergaard Intrusion) all of which are of interest because of their known PGE resources or potential and because of similarities with proven deposits. In the absence of obvious phase or modal layering, the dominate ferromagnesian minerals and oxide minerals in the Seagull Intrusion were looked at to identify any cryptic layering, and to determine how mineral chemistry relates to zones of known mineralization in the Seagull Intrusion.

Mineral analyses was carried out by SEM-EDS, at Lakehead University and electron microprobe at the University of Saskatchewan (see Chapter 2 for operating parameters). Samples were selected from drill core based on representative lithologies and spatial distribution (see Appendix A). Surface samples were taken from exposures identified as Seagull Intrusion (Fig. 3.1). Sampling was undertaken to avoid obvious alteration where possible. Samples with moderate alteration were utilized when large vertical sections of drill core was altered as observed near the surface. All samples were thin sectioned and screened with a petrographic microscope, identifying further alteration and extensive replacement and not suitable for mineral analyses. The remaining sections were utilized in determining silicate mineral chemistry.

5.2 Previous Work

Mineralogical work done on the Seagull Intrusion prior to this study include studies of olivine, pyroxene and oxide compositions by Taylor (2000). Taylor utilized ten samples from throughout the intrusion were looked at with a petrological microscope and JEOL 6400 SEM-EDS. Olivine compositions reported ranged from Fo_{84} to $Fo_{77.}$ Pyroxene compositions reported by Taylor were described as augite with high chromium content (up to 1.00 wt%). Taylor reported the occurrence of at least two different types of spinels. The first being a magnetite characterised by high Fe content, high Fe_2O_3/FeO ratios and very low Cr (<2 wt% Cr_2O_3). The second type of spinel reported is a chromian spinel (chromian titanomagnetite) with variable contents of both Cr (5-40 wt% Cr_2O_3) and Ti (0-9 wt% TiO_2) and lower Fe_2O_3/Fe ratios.

Nickel content of olivine has been examined by A.J. Naldrett looking at both drill core and outcrop samples (R.S. Middleton, 2002 pers. com), and is summarized by Franklin (unpublished East West Resources report, 2002).

5.3 Olivine Mineral Chemistry

5.3.1 Introduction

Olivine is a major and common rock forming mineral in ultramafic and mafic lithologies. With a general formula of $(Mg,Fe)_2SiO_4$, olivine exhibits complete solid solution between end-members Mg_2SiO_4 (forsterite) and Fe_2SiO_4 (fayalite). Naming olivine is based on mineral chemistry $Fo_{[100\ Mg/(Mg+Fe^{2+}+Fe^{3+}+Mn)]}$ with forsterite restricted to compositions Fo_{100-90}, and fayalite to compositions of Fo_{10-0}, intermediate compositions are chysolite Fo_{90-70}, hyalosiderite Fo_{70-50}, hortonolite Fo_{50-30}, ferrohortonolite Fo_{30-10} (Deer et al., 1992).

5.3.2 Objective

Olivine mineral chemistry was looked at stratigraphically through the intrusion to investigate the compositional changes in the Mg/(Mg/Fe) ratios observed in olivine. In a closed system a cryptic variation occurs as the magma chamber crystallizes, resulting in Mg-rich olivines (forsterite) occurring at the base of the intrusion and increasingly more Fe-rich (fayalite) stratigraphically upwards. Such cryptic variation is observed in the Skaergaard Intrusion, the classic example of closed system differentiation (Wagner and Brown, 1967). In open systems, cryptic variation does occur, but in a non-systematic or cyclical way as it is influenced by magma injection, removal and contamination. Examples of these processes have been observed at the Insizwa Complex (Tischler et al., 1981), Mechanic Settlement pluton (Paktunc, 2000) and the Newark Island layered intrusion (Snyder and Simmons, 1999). Within an open system a change in the Mg/Fe ratio in the magma brought about by magma replenishment (both more primitive and more evolved) and contamination will result in a change in the composition of the olivine crystallizing at that time. Observing these mineralogical changes and seeing their spatial associations with known mineralized zones can help understand the magmatic processes and their influence on mineralization.

Nickel contents of olivine can be used to indicate the segregation of a sulphide phase from a silicate magma (Maier et al., 1998). Upon the removal of a sulphide phase (consisting siderophile elements) from a magma there is a sharp decrease in the abundance of remaining Ni in the silicate melt. Olivine crystallizing subsequently will have lower Ni-contents and consequently may be used to identify mineralized stratigraphic areas. This observation has been applied to various mafic intrusions including the Insizwa Intrusion (Lightfoot et al. 1984) and Norwegian Rana Intrusion (Barnes, 1987) with varied success.

5.3.3 Results

5.3.3.1 Seagull Intrusion

Olivine observed in the drill core has been interpreted to be cumulus in origin (see Chapter 4; Pettigrew, 2002), with olivine occurring as chadacrysts enclosed in oikocrysts of pyroxene. Crystal size of the olivines is very variable ranging from <0.05 mm to 5 mm. Olivines are found as anhedral to euhedral crystals and commonly contain one or more inclusions of oxides within the olivine crystal (Fig. 4.6). Alteration seen in drill core is also variable, with the most extensive alteration occurring within the top 300 metres of all drill core logged. Within this zone olivine can be completely replaced by serpentine and iddingsite (Fig. 4.7). Below this, olivine is better preserved, with alteration restricted to fractures and crystal margins. Replacement does occur but is controlled by structural features (faults, fractures) and fluid flow along these.

Olivine was analysed through two drill holes WM00-01 (24 samples, 421 point analyses) and WM98-05 (24 samples, 278 point analyses) (see Appendix A for sample locations and number of point analyses for each sample). Analysis were carried out in the centre of each olivine and the effects of zoning in each crystal is unknown. Duplicate analysis of random grains exhibited little intra-crystal variation. Olivine compositions in drill hole WM00-01 ranged from a maximum of $Fo_{86.31}$ (based on cation %) occurring at a depth of 603.70m to a minimum value of $Fo_{75.8}$ at a depth 713.60m. Analyses of 421 points resulted in a mean value of $Fo_{83.1}$ with a standard deviation of 1.25 illustrating the homogeneity of olivine compositions through the intrusion. Drill hole WM98-05 also exhibits a very narrow range in olivine compositions, with a maximum of $Fo_{85.96}$ occurring at 586.0m, a minimum of $Fo_{77.8}$, occurring at 582.14m, with a mean value of $Fo_{82.6}$ and a standard deviation of 1.17 on analyses of 278 olivine points.

Although drill hole WM00-01 exhibits a narrow range in olivine compositions over the 548.6m in which olivine was analysed, there are observable trends and variations occurring stratigraphically through the drill hole as seen in Figure 5.1.

Table 5.1. Average olivine compositions from drill hole WM00-01. Complete olivine analyses are listed in Appendix B. Atomic proportions calculated based on 4 oxygen.

		Atomic Proportions							
Thin Sec	Depth (m)	Mg	Fe	Ni	Si	Ca	Mn	Total Cation	%Fosterite
SW01-09	165.30	1.65	0.34	0.00	1.00	0.00	0.00	1.99	82.69
SW01-11	219.30	1.66	0.34	0.00	1.00	0.00	0.00	2.00	82.83
SW01-13	237.80	1.64	0.34	0.00	1.01	0.00	0.00	1.99	82.69
SW01-17	296.40	1.67	0.32	0.00	1.01	0.00	0.00	1.99	83.88
SW01-19	332.39	1.70	0.33	0.00	0.99	0.00	0.00	2.03	83.60
SW01-20	354.49	1.69	0.34	0.00	0.99	0.00	0.00	2.03	83.46
SW01-22	376.92	1.69	0.32	0.00	1.00	0.00	0.00	2.01	84.11
SW01-21	386.50	1.66	0.32	0.00	1.01	0.00	0.00	1.98	83.88
SW01-23	435.00	1.65	0.34	0.00	1.00	0.00	0.00	2.00	82.84
SW01-24	448.00	1.66	0.34	0.00	1.00	0.00	0.00	2.00	83.03
SW01-25	477.70	1.67	0.36	0.00	0.98	0.00	0.00	2.03	82.20
SW01-26	499.00	1.68	0.34	0.00	0.99	0.00	0.00	2.03	83.15
SW01-27	530.80	1.68	0.34	0.00	0.99	0.00	0.00	2.02	83.12
SW01-28	571.70	1.68	0.32	0.00	1.00	0.00	0.00	2.01	83.96
SW01-29	573.40	1.72	0.31	0.00	0.98	0.00	0.00	2.03	84.53
SW01-30	574.35	1.69	0.32	0.00	0.99	0.00	0.00	2.01	83.91
SW01-31	577.79	1.69	0.33	0.00	0.99	0.00	0.00	2.03	83.73
SW01-32	583.70	1.66	0.34	0.00	1.00	0.00	0.00	2.00	83.19
SW01-33	585.50	1.67	0.34	0.00	0.99	0.00	0.00	2.01	83.25
SW01-34	603.70	1.62	0.35	0.00	1.01	0.00	0.00	1.97	82.31
SW01-35	647.00	1.60	0.36	0.00	1.02	0.00	0.00	1.97	81.56
SW01-36	665.00	1.60	0.36	0.00	1.02	0.00	0.00	1.97	81.62
SW01-37	693.00	1.65	0.39	0.00	0.98	0.00	0.00	2.04	80.90
SW01-38	704.00	1.62	0.39	0.00	0.99	0.00	0.00	2.01	80.68
SW01-40	713.60	1.58	0.43	0.00	0.99	0.00	0.00	2.01	78.49

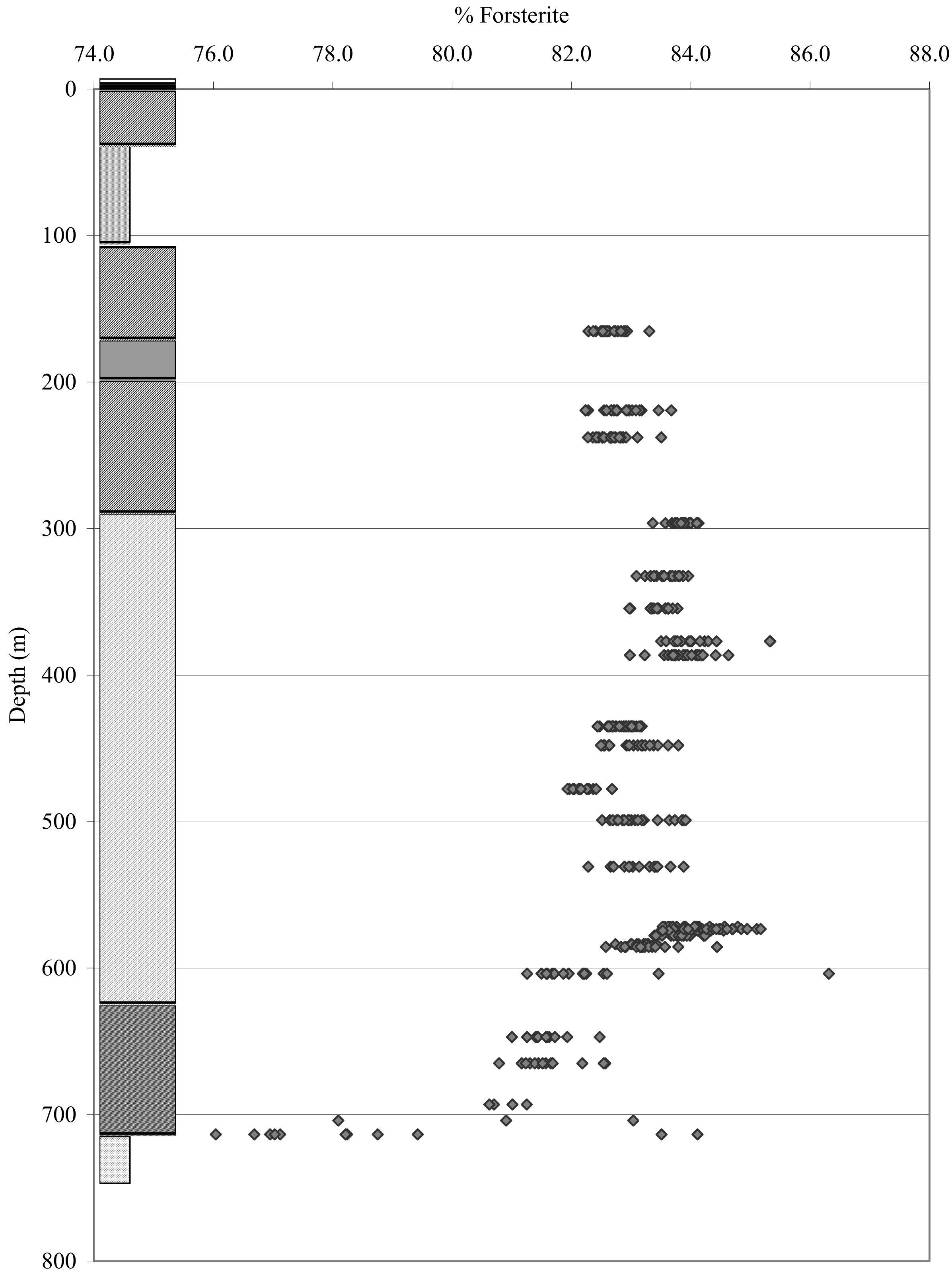

Figure 5.1. Plot of olivine analyses from drill hole WM00-01 with lithologic units shown from Fig 4.2.

Based on the mean olivine compositions, four major zones which exhibit distinct characteristics and gross trends distinct from the adjacent zones can be identified. Zone 1 is found at the basal contact area (713.60 m to 603.70 m) of drill hole WM00-01 (Fig. 5.2.) and is characterised by a steady increase in forsterite from the basal value of $Fo_{78.4}$ to a value of $Fo_{82.3}$ at 603.70m.

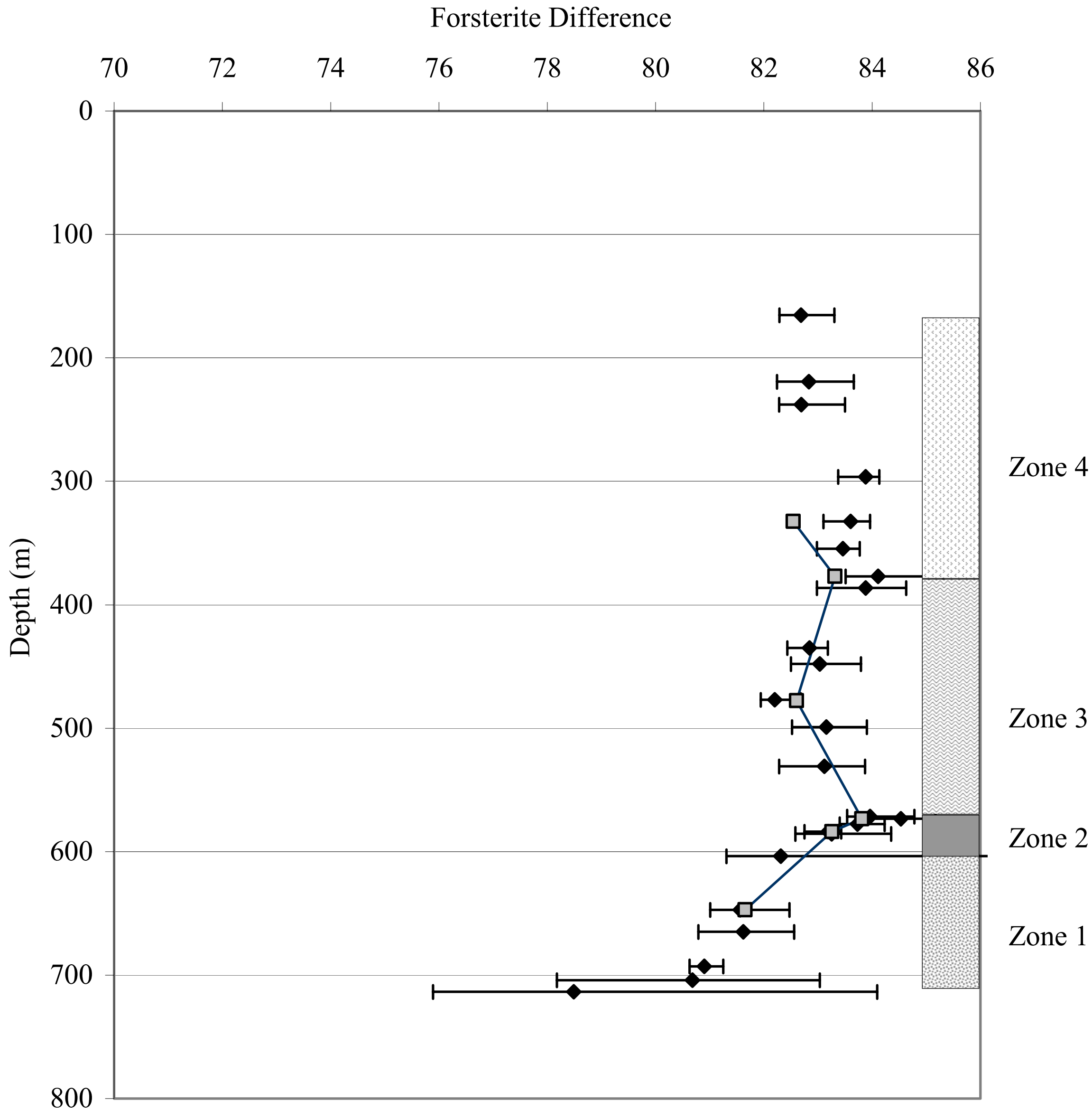

Figure 5.2. Mean olivine composition, SEM analyses shown by black diamond in %Fo with range of Fo values observed shown by error bars for olivine observed in WM00-01 versus depth (m). Zone subdivisions marked along side. Mean electron microprobe analyses plotted as grey squares for comparison.

The top contact of the zone was selected based on the change in the slope of forsterite content line. Below 603.70 m the rate of Fo change with height is much lower than the rate above this level. Contained within Zone 1 is the minimum forsterite value observed in drill hole WM00-01. This sample (SW01-40) is stratigraphically the lowest sample analysed in drill hole WM00-01 and occurs approximately 5 metres above the basal contact.

Zone 2 is defined as the interval between 603.70 m to 573.40 m and is characterised by a rapid increase in the Mg content of olivine to a maximum forsterite composition ($Fo_{84.5}$) observed in the drill hole at the top of the zone (Fig. 5.2).

Zone 3 covers the interval from 573.40 to 376.92 m, and is characterised by a concave pattern. Forsterite values over this interval exhibit a decrease immediately above Zone 2 to the middle of the zone at which point there is a steady increase in forsterite values till the top of the zone.

Zone 4 occurs in the upper section of the drill hole (Fig. 5.2) and is characterised by an overall decrease in forsterite values throughout the zone (376.92 m to 165.30 m). Olivine compositions above this level in drill hole WM00-01 were not measured due to the extensive alteration and replacement of the olivine.

Variation exists in olivine composition at each sample location (Fig. 5.1). The range of Fo values occurring in a single sample changes throughout the intrusion, this internal sample difference is defined by (Max Fo_x – Min Fo_x) for a given sample is plotted against depth in Figure 5.3. The difference values in drill hole WM00-01 range from a maximum difference of 8.3, to a minimum difference of 0.6 (Fig. 5.3).

At the bottom of the drill hole WM00-01 (713.6 m) the highest difference is observed. Upward from this point to 693.0m there is a rapid decrease in the amount of difference in forsterite compositions. From 693.0 to 647.0m the difference remains relatively constant at a value of less than 2. At 603.7m there is a sharp increase in the Fo difference (~5). This is followed by a sharp decline and a relatively constant value of approximately 2 for the rest of the drill hole.

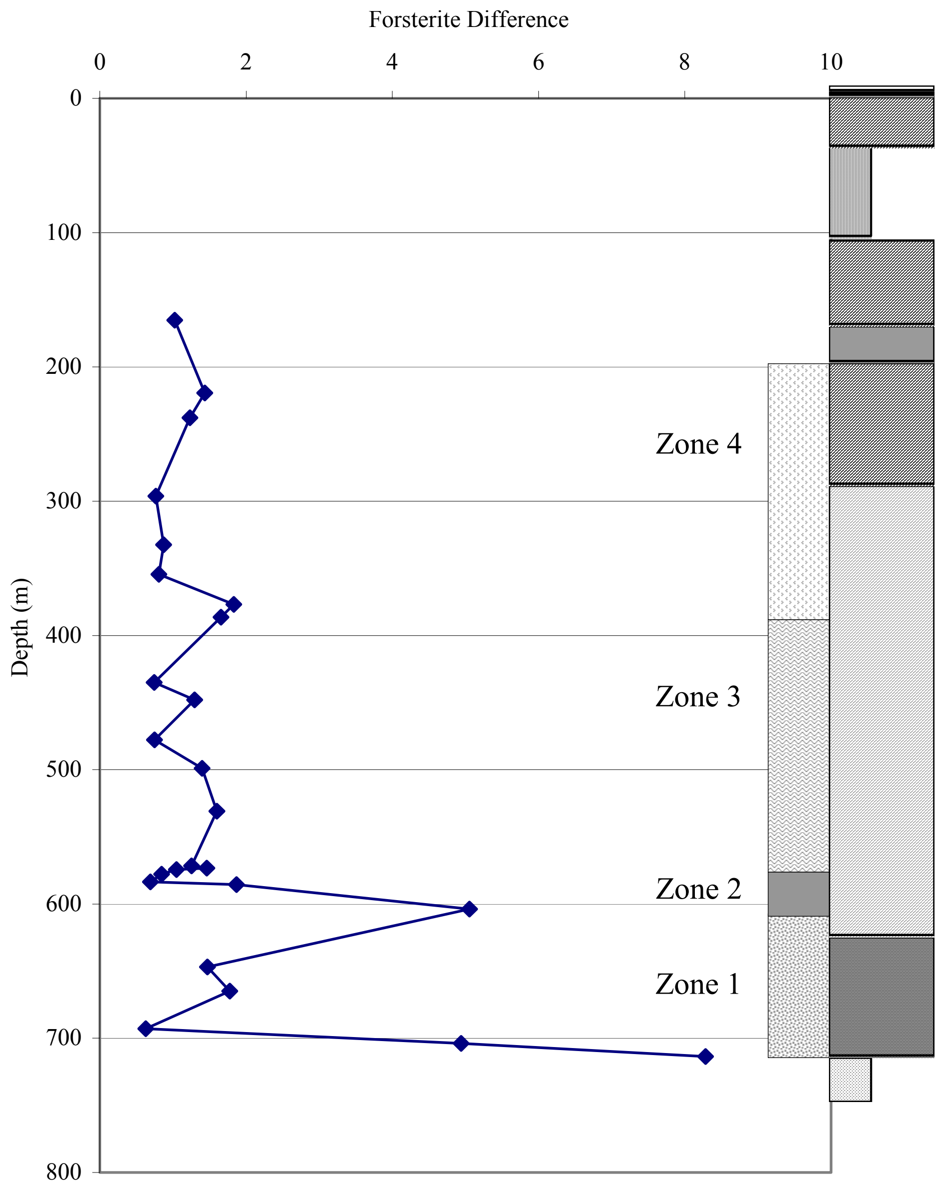

Figure 5.3. Forsterite difference (Max Fo_x-Min Fo_x) in WM00-01 versus depth (m), with zones and lithology shown along the right side.

Drill hole WM98-05 is located approximately 710 m west of drill hole WM00-01 and collared at the same elevation. Although not far from WM00-01, olivine analysed in WM98-05 show a somewhat different cryptic variation through stratigraphy. The same narrow range in olivine composition are observed over the 568.38 m in which olivine was analysed (*note*: this hole intercepts basement at a shallower depth than WM00-01 (Fig. 4.2), but analyses of olivine within the top 200 m was possible, where it was not in WM00-01). Observable trends and variations in %Fo for all olivine analysed occurring stratigraphically up through the drill hole is seen in Figure 5.4.

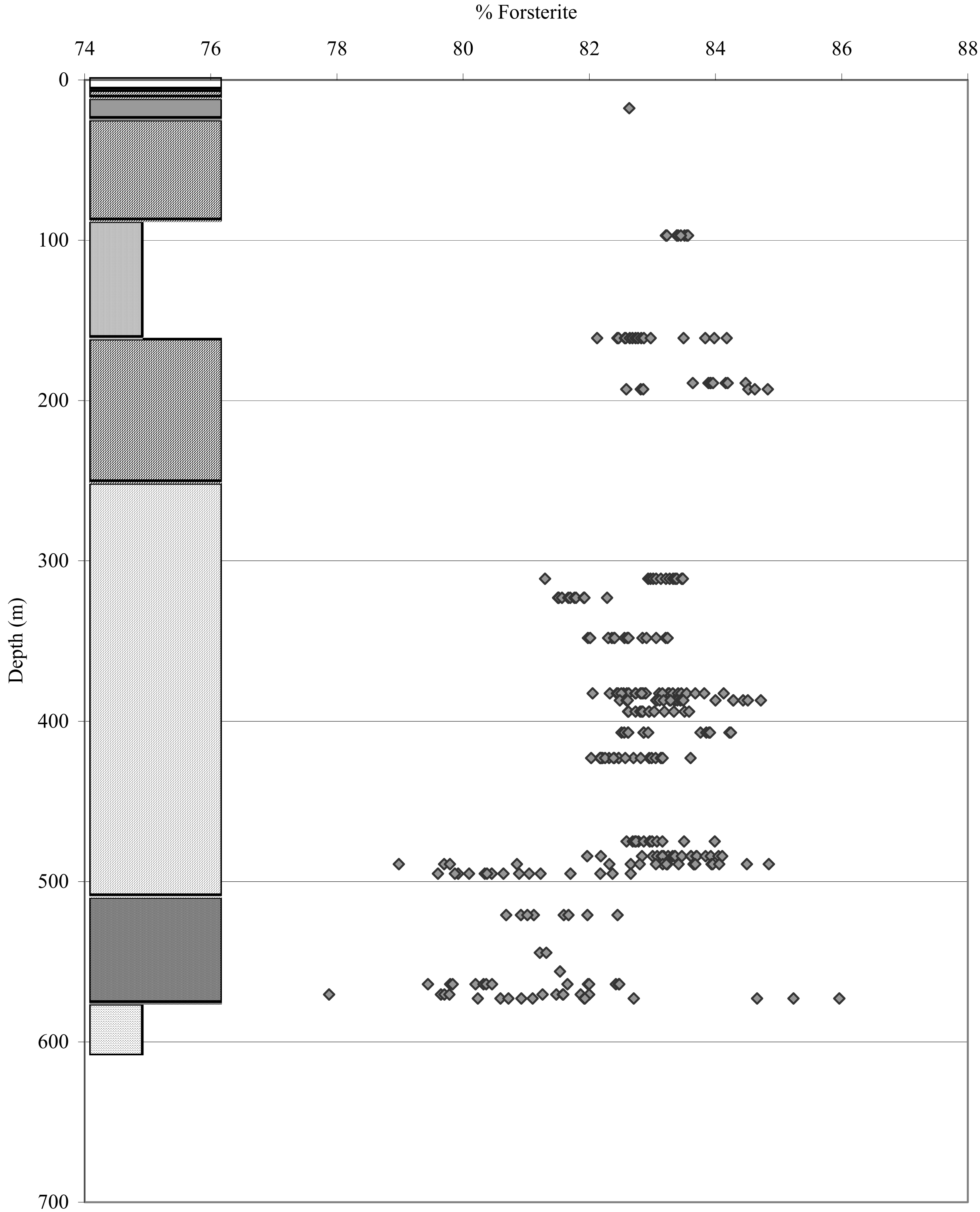

Figure 5.4. Olivine analyses %Fo from drill hole WM98-05 versus depth (m) with lithology shown along the left side.

Table 5.2. Mean olivine compositions from WM98-05. Atomic proportions calculated based on 4 oxygen. Complete analyses available in Appendix B.

Thin Section	Depth (m)	Atomic Proportion							
		Mg	Fe	Ni	Si	Ca	Mn	Total Cation	% Forsterite
SW98-5-02	17.62	1.69	0.36	0.00	0.98	0.00	0.00	2.05	82.61
SW98-5-09	189.00	1.70	0.34	0.00	0.98	0.00	0.00	2.05	83.35
SW98-5-10	193.00	1.70	0.33	0.00	0.98	0.00	0.00	2.03	83.72
SW98-5-13	311.20	1.64	0.34	0.00	1.01	0.00	0.00	1.99	82.69
SW98-5-14	323.00	1.73	0.33	0.00	0.97	0.00	0.00	2.05	84.06
SW98-5-15	348.00	1.71	0.35	0.00	0.97	0.00	0.00	2.05	83.15
SW98-5-18	382.60	1.65	0.36	0.00	1.00	0.00	0.00	2.01	82.09
SW98-5-19	387.00	1.71	0.34	0.00	0.97	0.00	0.00	2.05	83.45
SW98-5-20	394.00	1.66	0.34	0.00	1.00	0.00	0.00	2.00	83.19
SW98-5-21	407.00	1.71	0.33	0.00	0.98	0.00	0.00	2.05	83.66
SW98-5-22	423.00	1.66	0.34	0.00	1.00	0.00	0.00	2.00	83.21
SW98-5-23	475.02	1.64	0.34	0.00	1.01	0.00	0.00	1.98	82.91
SW98-5-24	484.10	1.67	0.35	0.00	0.99	0.00	0.00	2.02	82.46
SW98-5-25	489.13	1.67	0.33	0.00	1.00	0.00	0.00	2.00	83.36
SW98-5-26	495.03	1.67	0.34	0.00	0.99	0.00	0.00	2.01	83.22
SW98-5-27	520.90	1.69	0.33	0.00	0.99	0.00	0.00	2.02	83.43
SW98-5-28	544.40	1.71	0.34	0.00	0.97	0.00	0.00	2.05	83.32
SW98-5-29	556.04	1.64	0.39	0.01	0.98	0.00	0.00	2.04	80.85
SW98-5-31	564.00	1.61	0.38	0.00	1.00	0.00	0.00	2.00	80.80
SW98-5-32	570.50	1.60	0.38	0.00	1.01	0.00	0.00	1.98	81.02
SW98-5-33	573.00	1.62	0.36	0.00	1.01	0.00	0.00	1.99	81.64
SW98-5-34	578.04	1.62	0.39	0.00	1.00	0.00	0.00	2.01	80.78
SW98-5-35	582.14	1.60	0.39	0.00	1.01	0.00	0.00	1.99	80.59
SW98-5-36	586.00	1.77	0.30	0.00	0.96	0.00	0.00	2.07	85.29

Based on the mean olivine compositions five major zones can be identified which exhibit distinctive forsterite trends. Trends observed in this hole have much sharper transitions than those observed in WM00-01. A different basal unit is recognised in drill hole WM98-05 than in WM00-01. Zone 0 is characterised by the most primitive Fo compositions observed in the Seagull Intrusion ($Fo_{85.2}$). This zone is defined by one sample of olivine amphibole-pyroxenite (3 analyses) occurring approximately 2 m above the basal contact and has a stratigraphic thickness of less than 4 m. Above this occurs Zone 1 as described in drill hole WM00-01. This zone from 582.1 to 387.0 m (Fig. 5.5) exhibits very polarized trends with the bottom section of the zone exhibiting a constant olivine composition richer in Fe, while the upper section of the zone exhibits a constant more Mg rich olivine with a sharp drop in forsterite marking the top of the zone. Zone 2 is defined by the interval occurring from 382.0 m to 323.0 m and is characterised by a sharp and substantial increase in forsterite content to the maximum observed in olivine above Zone 0 from drill hole WM98-05. Zone 3 is characterised by a rapid decrease in the forsterite values from the zone below, followed by a small increase over the rest of the zone, until the top at 193.0 m. Zone 4 consists of the remainder of the intrusion (from 193.0 m to 17.6 m) and is characterised by a gradual decrease in forsterite content over the interval.

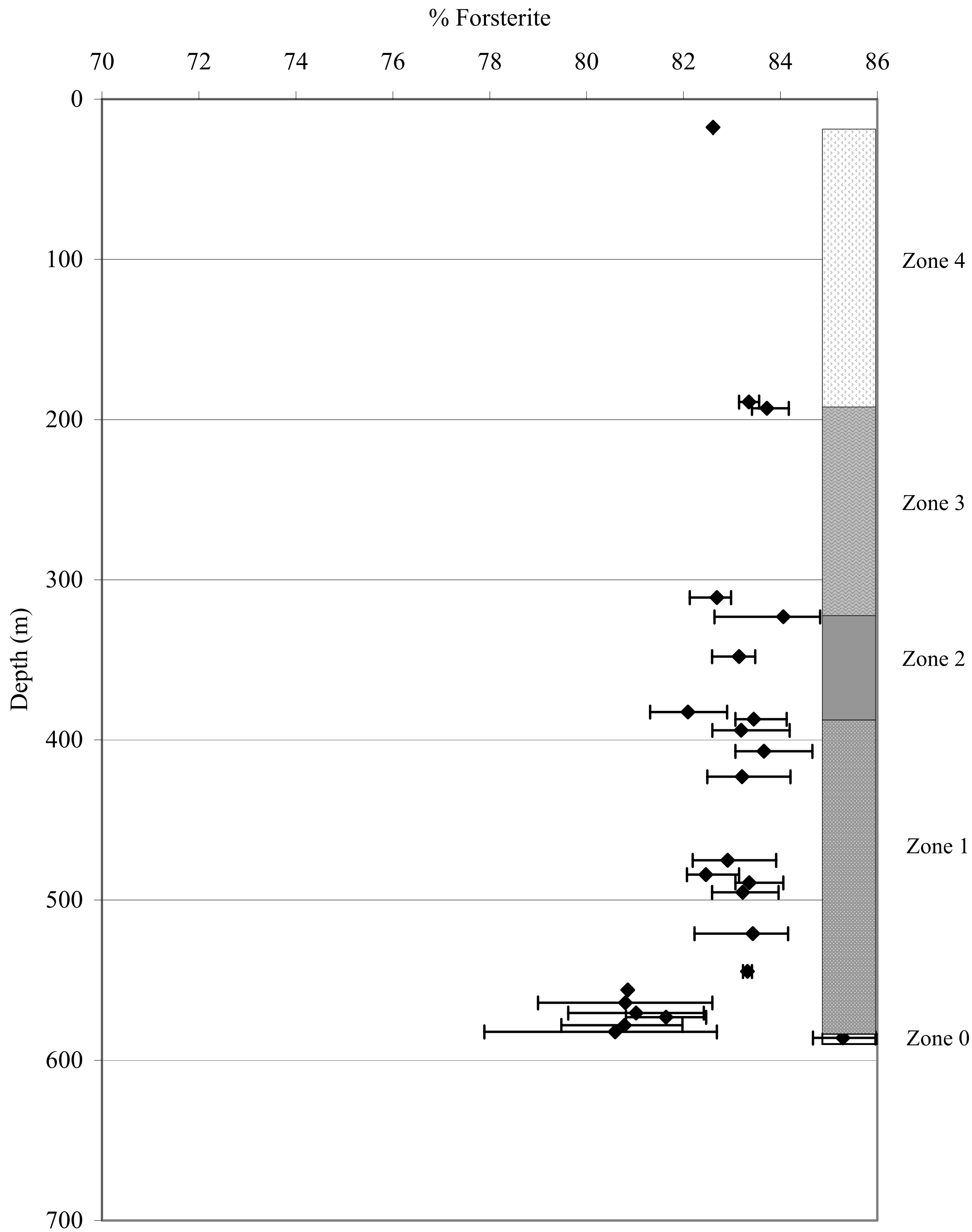

Figure 5.5. Mean olivine compositions in hole WM98-05, with olivine zones and range of compositions for each sample shown.

The range of forsterite compositions within samples in drill hole WM98-05 differs somewhat from drill hole WM00-01. Changes from one level to the next appear to be much more abrupt (Fig. 5.6). Starting at the bottom of the hole (586.0 m), differences in forsterite compositions is small less than 2. This moves into an area from 586.0 to 564.0 where the forsterite difference increases to a maximum (4.8) in the drill hole, then varies up and down from a low of 1.8 to a high of 3.6. Above this from 556.0 to 544.4 variance drops well below 2, only to increase to a value greater than 2 over the interval of 520.9 to 495.0 m. Above this, from 489.1 m to the top 17.6 m the difference remains relatively constant with values less than 2.2. Contained within this zone is an area (323.0 m) which shows a sharp increase in the amount of difference relative to the two adjacent samples.

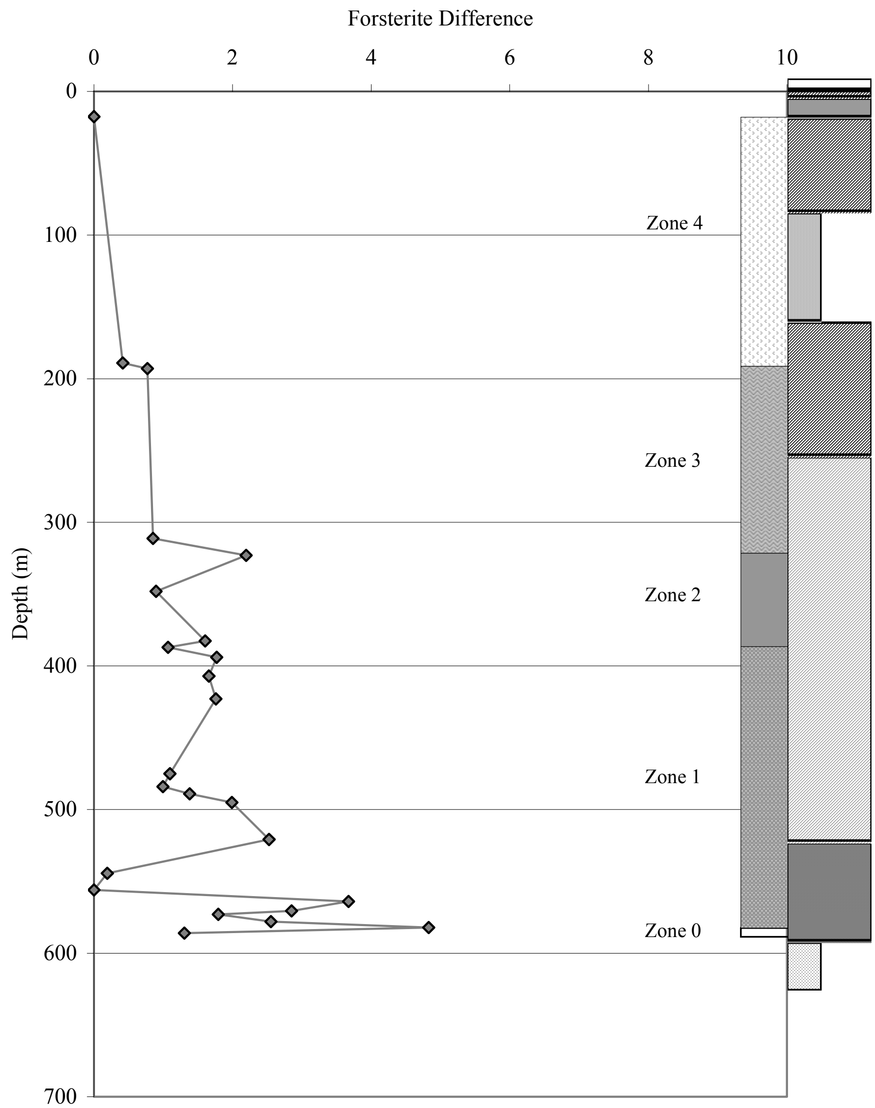

Figure 5.6. Forsterite difference (Max Fo_x-Min Fo_x) in drill hole WM98-05 versus depth (m), with olivine zones and lithology shown on the right side.

Olivine analysed from surface outcrops consisted of a total of six samples, five of which are mafic in nature and characteristic of lithologies observed in drill hole WM00-04 and the ‘top’ portion of the Seagull Intrusion, while one sample is characteristic of the lithologies observed in drill holes WM00-01, WM98-05 and WM01-08 of the lower ultramafic section of the Seagull Intrusion (Fig. 4.3; Table 5.3).

Table 5.3. Lithological breakdown of surface samples.

Sample	% Fo Difference (max-min)	Grouping
SI-03-01	2.99	Mafic
SI-03-03	4.50	Mafic
SI-03-04	3.64	Mafic
SI-03-08	1.33	Ultramafic
SI-03-09	6.07	Mafic
SI-03-11	6.00	Mafic

Due to the sporadic distribution of outcrop of the Seagull Intrusion there is poor vertical control on the surface sample locations, as a consequence they will be looked at as a whole and compared to olivine compositions observed in the drill core (WM98-05 and WM00-01) and to olivine observed in the Nipigon Sill from drill core.

Olivine analysed from surface outcrops showed considerably more variability than that observed in the drill holes. Olivine has a mean value of $Fo_{67.33}$ with a maximum of $Fo_{75.84}$ and a minimum value of $Fo_{57.48}$ with a standard deviation of 4.12 based on 77 olivine analyses. Average analyses for each sample are listed in Table 5.4 with complete analyses in Appendix B.

Table 5.4. Mean olivine compositions from surface exposures

	Atomic						Total Cation	%Forsterite
Sample	**Mg**	**Fe**	**Ni**	**Si**	**Ca**	**Mn**		
Sur01	1.38	0.65	0.00	0.98	0.00	0.00	2.04	67.99
Sur03	1.32	0.68	0.00	1.00	0.00	0.00	2.00	65.97
Sur04	1.41	0.63	0.00	0.98	0.00	0.00	2.03	69.21
Sur08	1.48	0.49	0.00	1.02	0.00	0.00	1.96	75.16
Sur09	1.21	0.79	0.00	1.00	0.00	0.00	2.00	60.45
Sur11	1.34	0.67	0.00	1.00	0.00	0.00	2.00	66.69

The difference of %Fo within each sample is also increased, compared to that of drill core (Table 5.3 above) where samples from WM00-01 had an average %Fo difference of 1.78 within each sample. The olivine analysed from surface outcrops are more iron rich than those seen in the two drill holes WM00-01 and WM98-05 (Fig. 5.7).

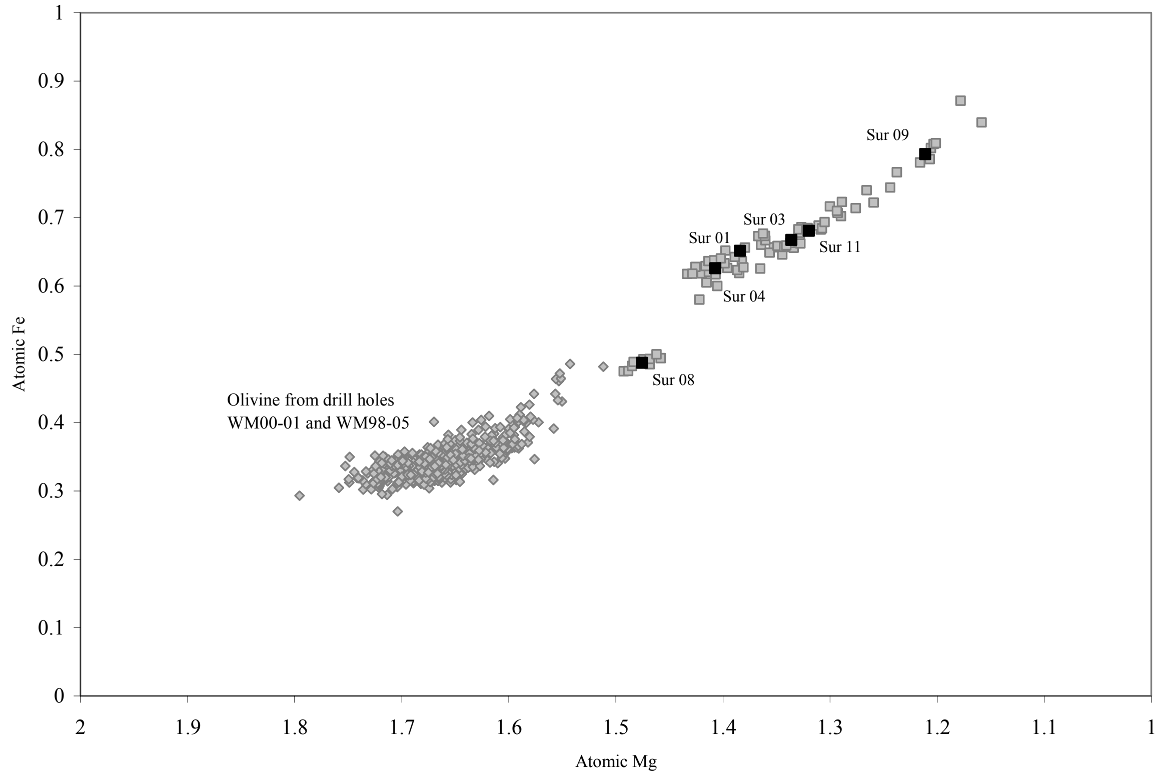

Figure 5.7. Olivine atomic proportion plot Mg versus Fe. All surface samples with average of surface samples in black.

5.3.3.2 Olivine: Nipigon Sill

A Nipigon Sill is observed to cross cut the Seagull Intrusion at depth in the drill core. For comparative purposes olivine was analysed in three Nipigon Sill samples (two from WM98-05 and one from WM00-01). The olivine in the Nipigon Sill had a wide range in composition Fo_{66} to Fo_{33}. This range in olivine compositions and iron enrichment is not seen in the main intrusion but olivine from the Nipigon Sill does exhibit some compositional overlap with the surface samples (Fig. 5.8.).

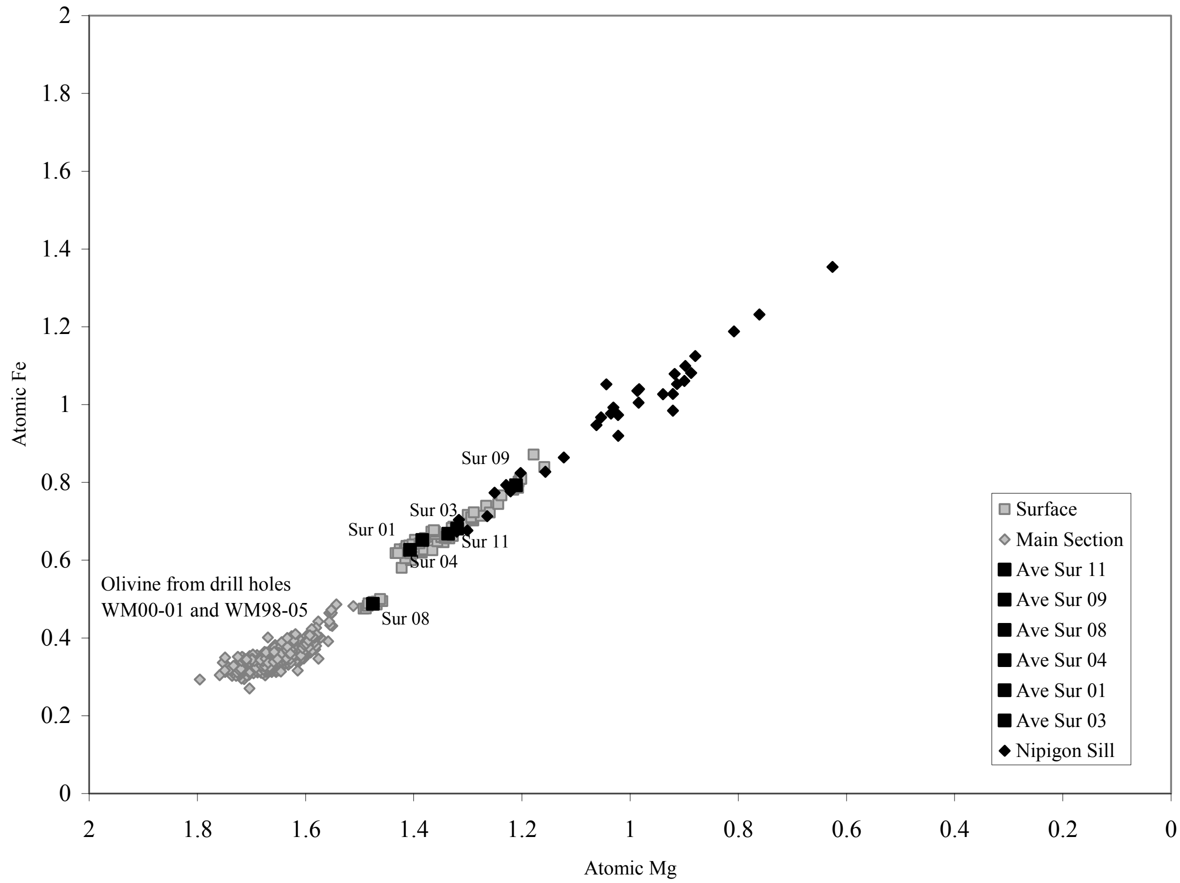

Figure 5.8. All olivine analysed plotted in Atomic proportion Mg versus Fe.

5.3.4 Ni in Olivine

Analyses for Ni contained within olivine was carried out using three techniques. Six samples were analysed at University of Saskatchewan with an electron microprobe for metal contents (Ni, Cr, Ti, Al, and Mn) of olivine. All olivine analysed by microprobe had Ni in measurable abundances. Nickel was also analysed by SEM-EDS at Lakehead University using two different count times (50 s and 300 s). Repeat analyses of samples analysed at University of Saskatchewan (microprobe) was carried out at 300 s (live time) at 20KeV and 0.475na. The SEM-EDS analyses reproduced within error the results by microprobe (Fig. 5.9). However, 300 s count times was not performed for all samples. All other olivine was analysed at 50 s count times, and nickel concentrations may not be determined with this short analyses time (Fig. 5.9). Although not quantitative, SEM-EDS analyses at 50 s count times values do parallel the trends of the microprobe and SEM-EDS (at 300 s count times).

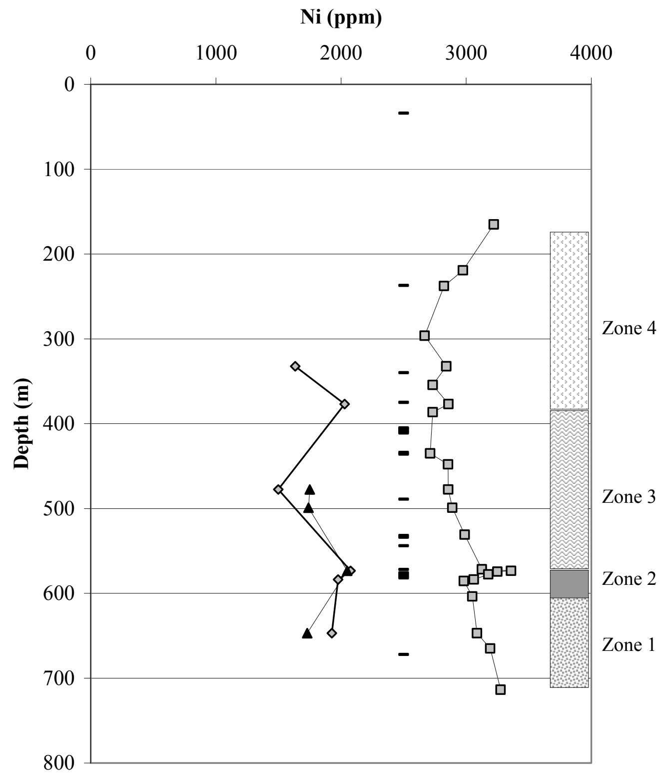

Figure 5.9 Ni (ppm) in olivine versus depth from drill hole WM00-01. Comparison of different methodologies. Microprobe grey diamonds, SEM-EDS (300s count time) black triangles, SEM-EDS (50s count time) grey squares. Mineralized horizons (total PGE >242ppb) shown as black dashes along 2500 ppm line.

Six samples from drill hole WM00-01 were analysed by electron microprobe based on their distribution within known zones of mineralization (see Chapter 2). Analyses from these samples is compared with SEM-EDS (300s) in Table 5.5 and full analyses is in Appendix B. From 300s count time SEM-EDS analyses the nickel content in olivine appears quite variable. Starting at 647.0 m the nickel content is low and increases upwards to a maximum value (2077 ppm) at 573.7 m where there is a known mineralized zone (Rees, 2000). After this point there is a decrease over the interval from 573.7 m to 477.7 m, within this interval there are three known mineralized zones. From 477.70m to 376.92m the nickel content of olivine increases again, contained within the interval are two mineralized horizons. The last interval from 376.9 m to 332.3 m show a decrease in the Ni content of olivine, with one mineralized zone present.

Table 5.5 Ni (ppm) in olivine by microprobe and multiple analyses by SEM-EDS (300s count time)

		Microprobe	Microprobe	SEM-EDS
Sample	**Depth (m)**	**%Fosterite**	**Ni (ppm)**	**Ni(ppm)**
SW01-19	332.39	82.540	1635	n.d.
SW01-22	376.92	83.311	2029	n.d.
SW01-25	477.70	82.606	1498	1750
SW01-29	573.40	83.811	2077	2050
SW01-32	583.70	83.254	1975	n.d.
SW01-35	647.00	81.655	1927	1730

n.d.- not determined

The trend observed by SEM-EDS (50s count time) exhibits a decreasing Ni-content from the base of the intrusion upwards until there is a major increase over the interval covering a mineralized zone (~570-580 m). Above this there is a steady decrease in Ni upwards to ~300 m where the trend changes and there is a progressive increase in the Ni content.

5.3.5 Discussion

Olivine in the Seagull Intrusion exhibits some evidence of fractionation from relatively primitive magma to produce the ultramafic section of the intrusion and the more evolved olivine compositions in gabbroic surface samples. The lower ultramafic section, although having a limited lithologic variation, still displays cryptic variation vertically. The two drill holes WM00-01 and WM98-05 although only drilled 750 metres apart, exhibit moderately different profiles. Part of this difference may be in part to proximity to wall rock or proximity to the feeder zone, as WM00-01 is thought to be drilled near the centre of the intrusion and WM98-05 closer to an edge, based on geophysical work carried out by Avalon Ventures and East West Resources. Overall there are correlations between the two holes, represented by the zone subdivisions 1 thru 4 (Fig. 5.10). These subdivisions are exclusively based on the forsterite trends. (Fig. 5.11).

Zone 0 was only observed in hole WM98-05 (Figs. 5.4 and 5.10) and characterised by the most primitive Fo composition observed in the Seagull Intrusion. This sample was taken 2.6m above the recognised contact with basement metasediments (Rees, 2000). This may be why this unit is not observed in WM00-01 where the closest sample to the basement contact in WM00-01 is approximately 6 m above recognised basement. The nature of Zone 0 is very different from the bottom section of Zone 1 in WM98-05 which contains values of Fo_{80} immediately above the primitive olivine, where as the rest of the zone and the rest of hole has an average value of $Fo_{82.6}$. Given the primitive nature of the olivines and proximity to basal contact one possible interpolation is that these olivines are xenocrysts, which crystallized at depth and were incorporated into a basal chill zone formed by initial emplacement of a magma.

Zone 1 is identified in both drill holes (Fig. 5.10) and is characterised by olivine with substantially lower Fo values than the rest of the Seagull Intrusion at the bottom of the zone in each drill hole. One possibility of this iron enrichment relative to the rest of the intrusion is that it represents contamination. Initial magma (after the development of a possible chilled zone, Zone 0) may have been contaminated by wall rock incorporated during transport and initial emplacement, lowering the Mg/Fe ratio of the magma resulting crystallization of more Fe rich olivines. This is further supported by the range of forsterite variability values (Fig. 5.11). The base of Zone 1 exhibits the highest olivine composition variability, this is possibly a function of incomplete assimilation and lack of re-equilibration with a homogeneous magma. The upper section of Zone 1 exhibits an increase in the Fo content of the olivine. This increase appears different in both drill holes. Drill hole WM00-01 exhibits a slow, steady increase in Mg up from the bottom part of the zone, while WM98-05 exhibits a very punctuated increase followed by a constant olivine composition till the top of the zone. The increase in Fo values is thought to be a function of diluting the contaminated magma with fresh, more primitive magma. The two different styles of Mg enrichment in the olivine are perhaps a partial function of heterogeneous contamination, the assimilation potential of the magma (heat, density, viscosity) and internal magma chamber dynamics (distance from input, flow dynamics, crystallization front) vary throughout the chamber resulting in some areas being more effective in assimilating and then diluting the primitive magma than other areas. At the top of Zone 1 in drill hole WM98-05 there is a sharp drop in Fo values perhaps indicative of a magma compositional change occurring in the chamber. Within Zone 1 significant mineralization occurs at the base of the zone in drill hole WM98-05 but not in WM00-01.

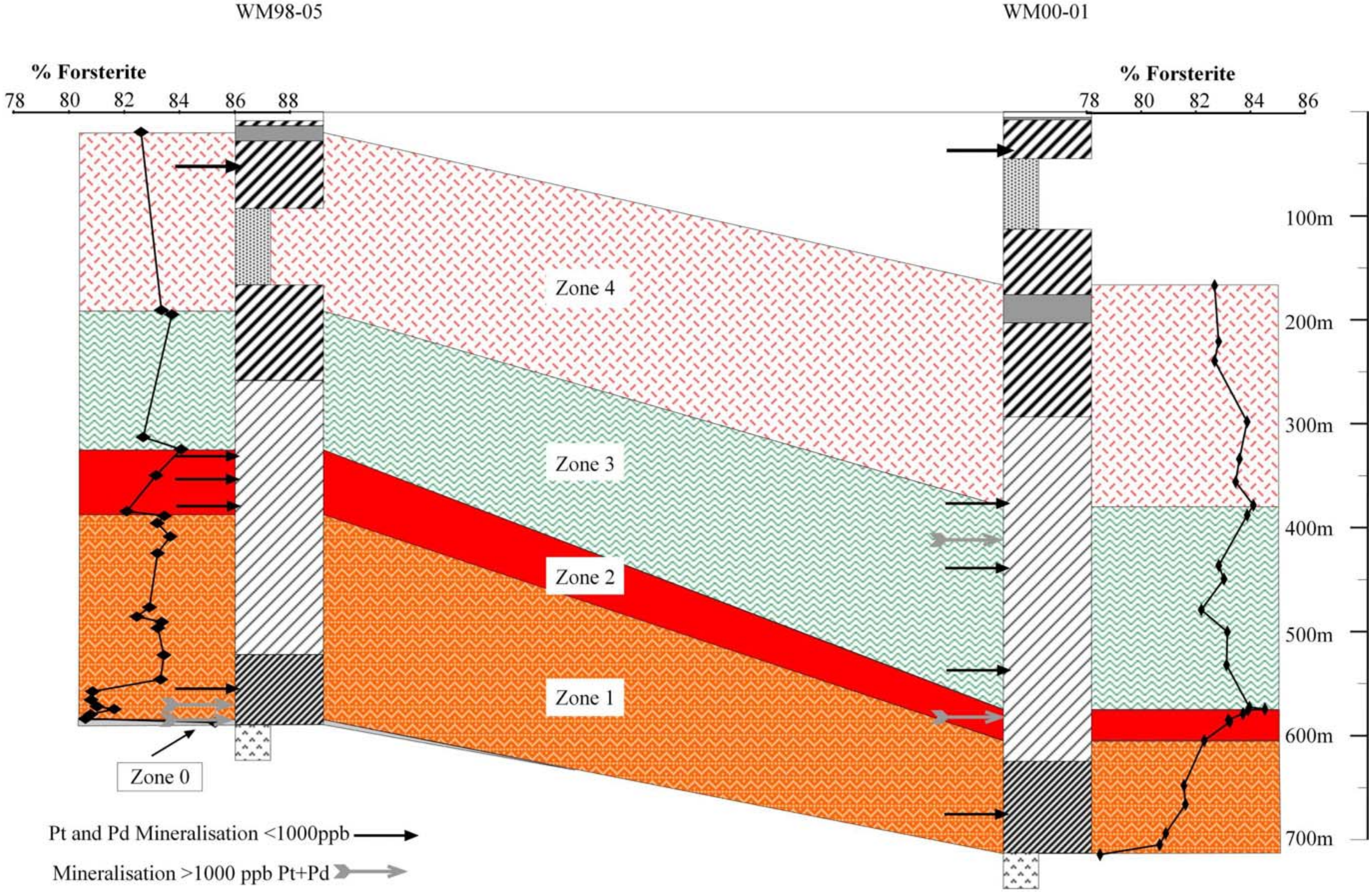

Figure 5.10 Average forsterite value plotted vs depth (m), with olivine zones 0 through 4 shown by shading and significant mineralisation shown by arrows. Lithology shown in each drill hole see Figure 4.2 for legend.

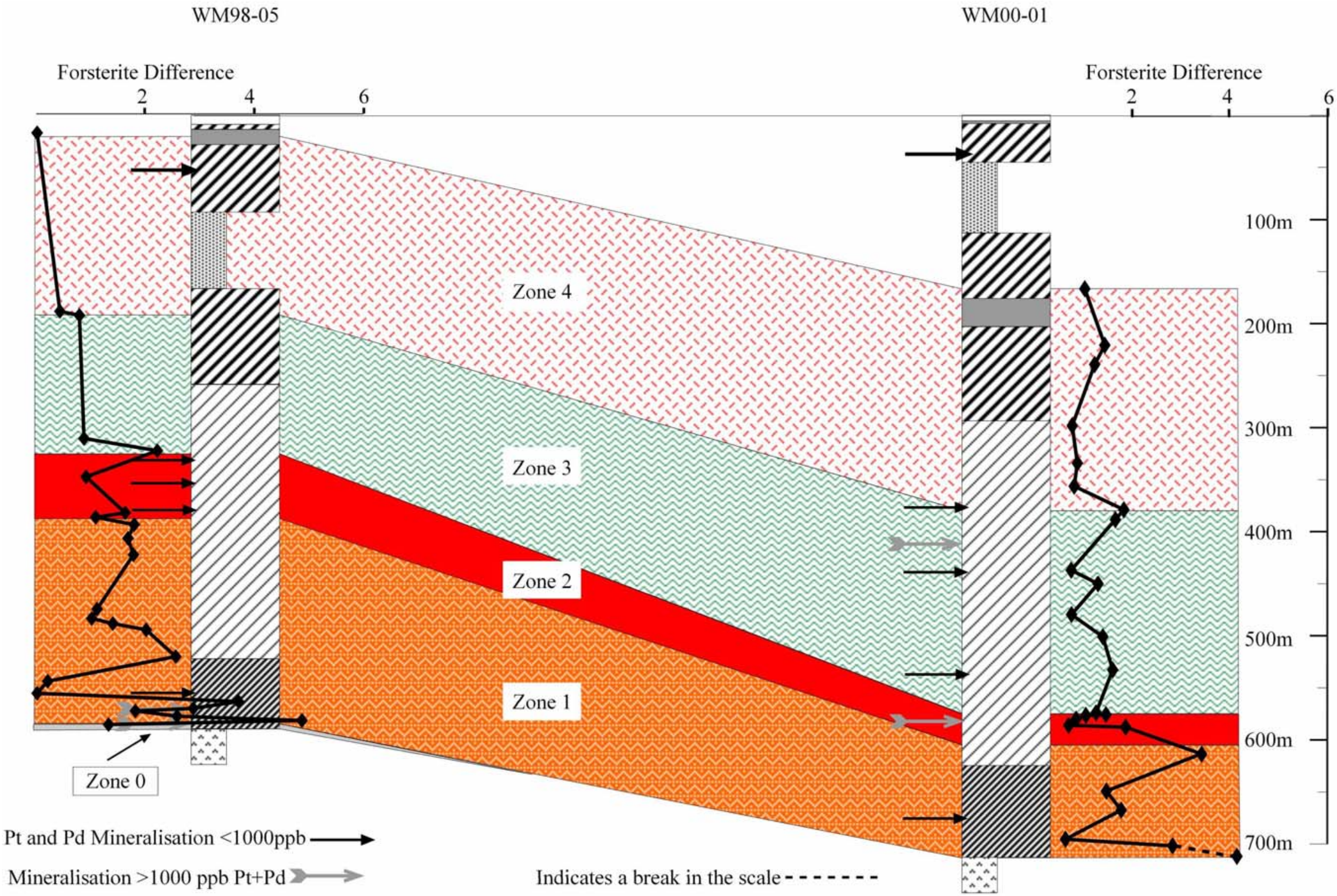

Figure 5.11 Forsterite difference (Max Fo-Min Fo) versus depth(m), with olivine zones 0 through 4 shown by shading and significant mineralisation shown by arrows. Lithology shown in each drill hole see Figure 4.2 for legend.

Zone 2 exhibits a trend of strong Mg enrichment in the olivine in both drill holes. In WM00-01 this is a continuation of the trend from Zone 1; however, the rate of Mg enrichment becomes much greater until it reaches a maximum value. The enrichment trend in WM98-05 is not as rapid but becomes more apparent contrasted with the sharp drop in Fo content directly below in Zone 1. The increase in Fo values to more primitive compositions maybe indicative of a magma that is becoming more primitive in composition. Assimilation of adjacent country rocks (see Chapter 4) will not contribute to making the magma composition increasingly primitive. Injection of relatively uncontaminated magma from a primitive source will, however, make the system more primitive in nature and it is thought that this occurred during the formation of this zone. Contained within Zone 2 are several intervals of mineralization in both drill holes, and one interval of significant mineralization (>1000 ppb Pt+Pd) in drill hole WM00-01.

Zone 3 exhibits a concave-shaped pattern in both drill holes that is very well defined in drill hole WM00-01 with a number of analyses defining the decrease and subsequent increase in the Fo values (Fig. 5.10). However, drill hole WM98-05 only has three data points defining the zone so exhibits a much more abrupt transition but still portrays a decrease in Fo values followed by an increase (Fig. 5.10). This pattern would be expected in a magma chamber that had undergone an injection of primitive magma (Campbell and Turner, 1989). The fractionation of that magma results in Fe enrichment and lower Fo values; however, this process is truncated by the injection of more magma, again increasing the Mg-content of olivine in the upper half of the zone. Zone 4 is poorly constrained in drill hole WM98-05 with only two samples defining the trend, and in drill hole WM00-01 there are no olivine analyses above 163 m. The general trend observed is the decreasing Fo values towards the top of each drill hole. This Fe-enrichment in the upper part of the intrusion reflects the progressive fractionation of the magma in the chamber at the top.

The transition from the ultramafic lithologies observed in the drill holes WM00-01, WM98-05 and WM01-08 to the mafic lithologies observed in drill hole WM00-04 and the surface samples is poorly constrained. Olivine analysed from surface outcrops further highlight the differences between the two lithologies. Olivine from surface outcrops of the Seagull Intrusion were divided into two groups, ultramafic and mafic. The mafic samples are olivine gabbros that are characterised by forsterite values ranging from $Fo_{57.48}$ to $Fo_{71.02}$, with Fo differences from 2.9 to 6.0 while the ultramafic surface sample has forsterite values ranging from $Fo_{75.15}$ to $Fo_{75.84}$ with a variance of 1.3. Atomic proportions of Mg and Fe (Fig. 5.7) results for sample Sur08 (ultramafic) plot close to the field defined by olivine from drill core. This sample is thought to represent the next fractionation step up from the ultramafic units observed in drill core (see Chapter 4). This is supported by the olivine analyses that are enriched in Fe compared to the ultramafic units in drill core suggesting a continued fractionation from the highest level observed in drill core. The rest of the surface samples (mafic) suggest a strong Fe-enrichment fractionation trend in olivine compositions from the Seagull Intrusion indicating the magma system was becoming more differentiated. The comparison of olivine analyses from the Nipigon Sill with those observed from the Seagull Intrusion indicates that the sill is considerably more evolved than the ultramafic rocks it cross-cuts. Olivine from the sill are more fractionated than those olivine observed from surface samples of the Seagull.

The abundance of Ni in olivine is controlled its concentration in a magma. In a magmatic system the concentration of Ni will increase steadily in a magma as crystallization and fractionation occurs. The enrichment of Ni in olivine results in a linear trend (Beattie et al., 1991) independent of temperature and pressure and weakly dependent upon composition of co-existing melt (Jones, 1984). A strong decrease in Ni-content of olivine is more likely indicative of sulphide saturation removing the Ni from the system, as the partition coefficient for Ni into sulphide is significantly higher than the partition coefficient into a silicate mineral (Barnes and Maier, 1999). The trends observed in the Seagull Intrusion do not exhibit sharp changes in the Ni-content indicative of a sulphide phase. However, the presence of known sulphide-rich zones precludes the possibility of Ni not being removed unless the sulphides postdate the crystallization and accumulation of olivine. There are transitions in Ni concentration through the intrusion shown by electron microprobe and SEM-EDS (300s count time), but the variations do not seem to correlate with mineralized zones (Fig. 5.9). This is perhaps a function of a too large sample spacing, resulting in missing the zones above mineralization that should be Ni depleted. Overall Ni-contents of olivine are >1000 ppm. This relatively high Ni-content for primitive olivine (Fo_{85-78}) does not deviate far from undepleted magma field outlined by Maier et al. (1998). Indicating perhaps the magma did not undergo a complete removal of Ni from the system by the generation of a sulphide melt. This is further supported by the Ni-trend shown by SEM-EDS (50s count time) exhibiting a decrease in abundance stratigraphically up to the mineralized zone and a continued decrease through the mineralized zones. However there is a change in the trend to increasing Ni with one mineralized zone contained in the interval of Ni analyses (Fig. 5.9). A similar occurrence is found in the Stillwater Complex where there are no trends of decreasing Ni in olivine over cyclic units 10 and 11 (Campbell et al., 1992). They attributed this to three possible causes: 1) olivine/liquid partition coefficient for Ni increases with decreasing temperature as the melt changes composition through olivine fractionation, this effect is large enough that Ni content of olivine does not have to decrease even though an immiscible sulphide melt developed; 2) magma was repeatedly replenished during crystallization by numerous minor additions of fresh liquid; or 3) the amount of fractionation required for the formation of the cyclic units was small. The first explanation does not apply extensively to the Seagull Intrusion, as variation in olivine is not significant between the zones where olivine was analysed for Ni. The last two explanations by Campbell et al., (1992) fit better with the observed changes in olivine compositions being a result of small amounts of fractionation between semi-continuous injections of new magma. A fourth explanation for the lack of Ni trends indicating mineralization is perhaps the duration of sulphide saturation. If the magma becomes saturated for a limited time, the partition coefficients of the PGE and Cu are all higher than that of Ni resulting in their extraction from the silicate melt but a negligible effect on the Ni content of the magma.

5.4 Pyroxene Mineral Chemistry

5.4.1 Introduction

Pyroxene is a common rock forming mineral in mafic to ultramafic lithologies. Pyroxenes are found both as orthorhombic and monoclinic minerals. Orthopyroxenes consist of the solid solution series between the Mg-end member enstatite ($Mg_2Si_2O_6$) and Fe-end member ferrosilite ($Fe_2Si_2O_6$). Clinopyroxenes exhibit a much more diverse range of mineral chemistry but only Fe-Mg-Ca system is studied here (clinopyroxene Fe- and Mg-end-members are rare in terrestrial environments, and as such, end-members of these compositions are believed to be orthopyroxene in the current geological setting). Clinopyroxene members of interest are shown on Figure 5.12. Extensive ionic substitution occurs in clinopyroxenes with complete solid solution observed between diopside and hedenbergite endmembers. However, a solid solution does not exist between augite and pigeonite and a miscibility gap is seen at subsolidus temperatures (Deer et al., 1999). Pyroxene compositions will be referred to as a percent of end-members enstatite (En_{XX}), wollastonite (Wo_{XX}) and ferrosilite (Fs_{XX}).

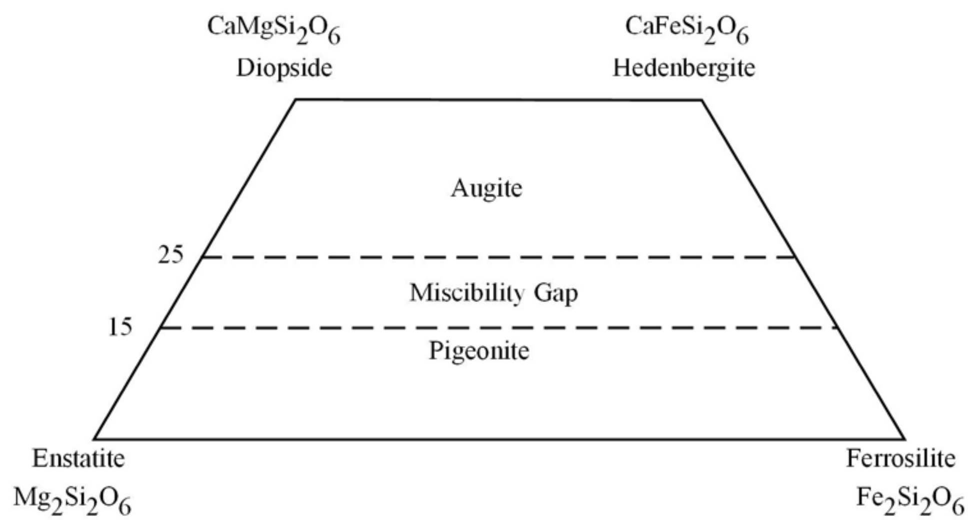

Figure 5.12. Pyroxene quadrilateral showing othropyroxenes and clinopyroxenes with subsolidus miscibility gap between augite and pigeonite shown. Modified from Deer et al. (1999).

5.4.2 Objective

Pyroxene mineral chemistry was examined vertically through the intrusion to quantify the compositional changes in the Mg # defined by (atomic Mg/(atomic Mg + atomic Fe)) which are interpreted to be in part an indication of the primitiveness of the liquid they are crystallizing from. The chromium content of pyroxene was investigated to gauge the evolution of Cr in the system and its relation to the Cr-spinels observed in the intrusion. In other ultramafic intrusions the cessation of Cr-spinel crystallization commonly occurs as pyroxene becomes the dominate cumulate mineral (Irvine, 1975). Finally the general mineralogy was observed at various levels to understand the crystallization sequence observed in the Seagull Intrusion and its relation to mineralization.

5.4.3 Results

Pyroxene observed in the Seagull Intrusion is found in two broad morphological forms. The first and more common being interstitial clinopyroxene, forming oikocrysts enclosing olivine and spinel. Poikilitic clinopyroxene is found exclusively in drill core. The second form is clinopyroxene and orthopyroxene as a cumulus mineral. These occurs as both a pyroxenite cumulates and a websterite-olivine websterite cumulate with oikocrysts feldspar as described in Chapter 4. Monomineralic cumulate pyroxene is only observed in drill core in one location (drill hole WM00-01, 188.5 m). Bimodal cumulate orthopyroxene/clinopyroxene and olivine are not observed in drill core and are observed only in surface samples. Clinopyroxene from the Seagull Intrusion is relatively well preserved. Partial replacement of clinopyroxene has occurred in the upper 250 m of the drill core but not to the extent of the observed olivine replacement (see Chapter 4), with clinopyroxenes altered to undifferentiated sheet silicates in the upper 250m and to micas and amphiboles in the basal section of the intrusion.

Pyroxene was analysed in three drill holes; WM00-01 (25 samples, 292 point analyses) WM98-05 (24 samples, 190 point analyses) and WM00-04 (3 samples, 29 point analyses) (see Appendix A for sample locations). Eight surface samples were also analysed (93 point analyses; see Appendix A for sample locations). Pyroxene observed from these four sample groups were found to contain both orthopyroxene and clinopyroxene with both types exhibiting the development of a fractionation trend towards more Fe-rich end members (Fig. 5.13). Pyroxene observed in the Seagull Intrusion consist of orthopyroxene (bronzite-hypersthene) and clinopyroxene (diopside-augite). Orthopyroxene are Mg rich but range in composition from En_{88} to En_{55}. Orthopyroxene from drill holes WM98-05 and WM00-01 exhibit the highest Mg content and are defined by a compositional range of En_{88} to En_{78} with two points falling below at ~En_{75}.

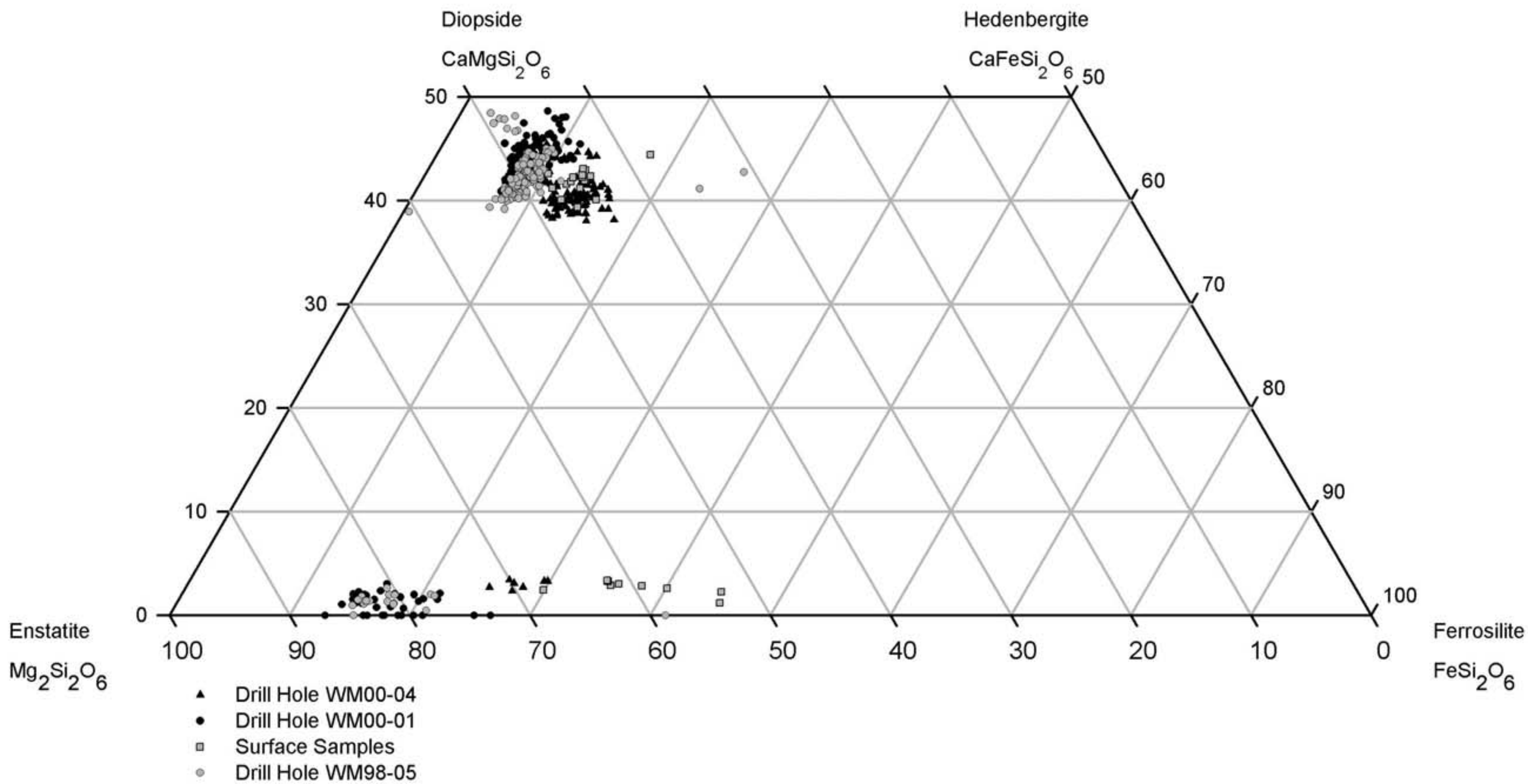

Figure 5.13. Pyroxene tetrahedron showing distribution of pyroxene analyses from Seagull Intrusion.

The remaining samples are surface samples and samples from drill hole WM00-04. Surface samples have orthopyroxene which exhibit a range from En_{75} to En_{70} and samples from drill hole WM01-04 contains pyroxene with values between En_{65} to En_{55}. Clinopyroxene is the dominant (90%) pyroxene observed in the Seagull Intrusion and covers the range of $En_{53}Wo_{37}Fs_{2}$ to $En_{42}Wo_{48}Fs_{28}$. Clinopyroxene observed in drill holes WM98-05 and WM00-01 again display the highest Mg and Ca contents with compositions restricted between $En_{42}Wo_{48}Fs_{10}$ and $En_{54}Wo_{39}Fs_{7}$. Pyroxene observed in surface samples overlaps the range observed in drill holes WM98-05 and WM00-01 but also exhibits an increasing Fe enrichment with compositions up to $En_{43}Wo_{38}Fs_{28}$. Pyroxenes sampled from drill hole WM00-04 exhibit limited overlap with drill holes WM98-05 and WM00-01 (one point) but exhibit extensive overlap with surface samples (Fig. 5.13).

Pyroxene is found throughout the intrusion, with clinopyroxene occurring as an intercumulus mineral phase while orthopyroxene commonly occurs as an interstitial phase. The contrast in morphology relates to the distribution of orthopyroxene and clinopyroxene as they do not have the same ranges in distribution. Clinopyroxene is found throughout the intrusion, as shown in Figures 5.14 and 5.15. While orthopyroxene exhibits a more restricted distribution as it only occurs at the bottom of the intrusion in the drill holes WM00-01 (below 530.0 m) and WM98-05 (below 348.0 m) but occurs throughout drill hole WM00-04 and in the surface samples. The vertical variation in pyroxene major element (Mg, Fe, Ca) mineral chemistry observed in the two drill holes WM98-05 and WM00-01 is quite limited (Figs. 5.14 and 5.15) while Ti and Al exhibit much more variable abundances (Figs. 5.16 and 5.17). Clinopyroxene in both drill holes as mentioned previously is very homogenous in composition, with only minor deviation from average occurring in the basal region of both drill holes where it exhibits a slight enrichment in Fe and Ca (Mg is lower in abundance as a result of substitution) over the compositions observed above. Mg# further amplifies this relationship and clearly exhibits an increase in Mg# up from the base of the intrusion in both drill holes (Figs. 5.16 and 5.17). Al and Ti abundances in diopside appear to generally parallel each other in relative abundance changes. Both drill holes exhibit a relatively constant abundance in the basal sections (~320m in WM98-05 and ~480m in WM00-01) above this there is a general trend of decreasing Al and Ti abundance. Significant trends of increasing or decreasing abundance of Ti or Al between the two drill holes aside from these gross trends were not observed.

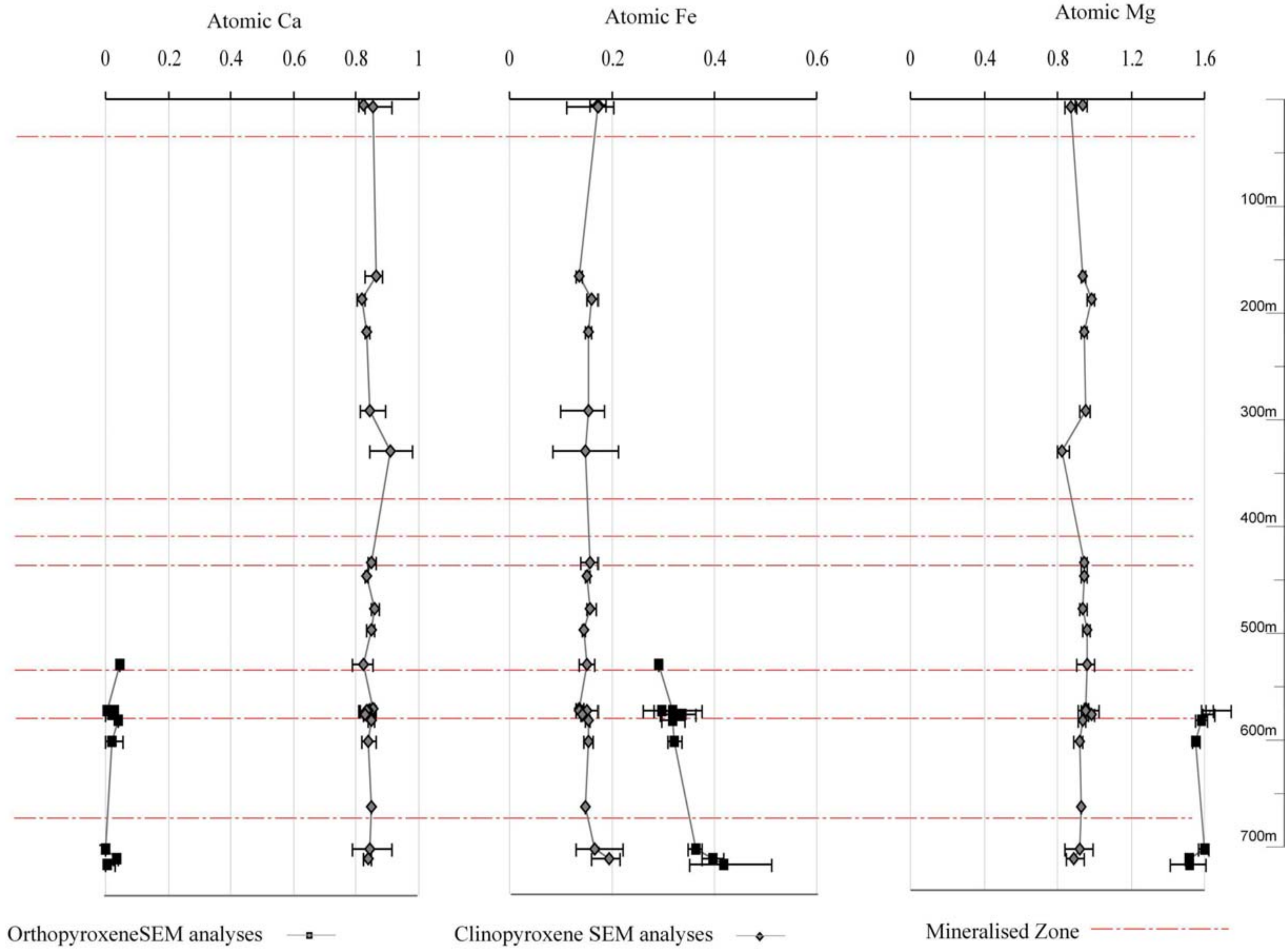

Figure 5.14. Distribution of pyroxene in drill hole WM00-01 showing atomic abundance of Mg, Fe and Ca in pyroxene from SEM with range of compositions shown by bars and zones of known mineralisation indicated by dashed lines.

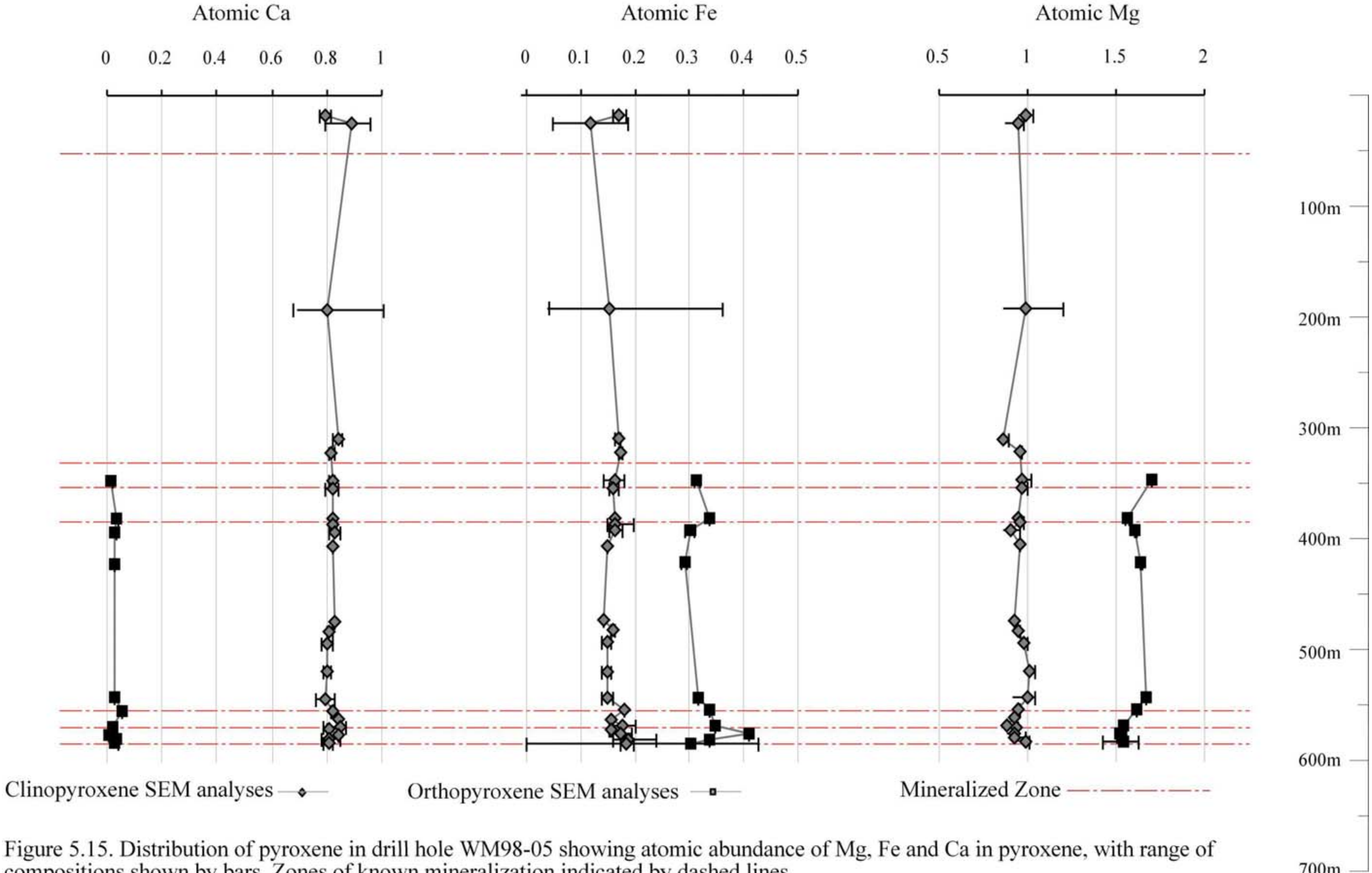

Figure 5.15. Distribution of pyroxene in drill hole WM98-05 showing atomic abundance of Mg, Fe and Ca in pyroxene, with range of compositions shown by bars. Zones of known mineralization indicated by dashed lines.

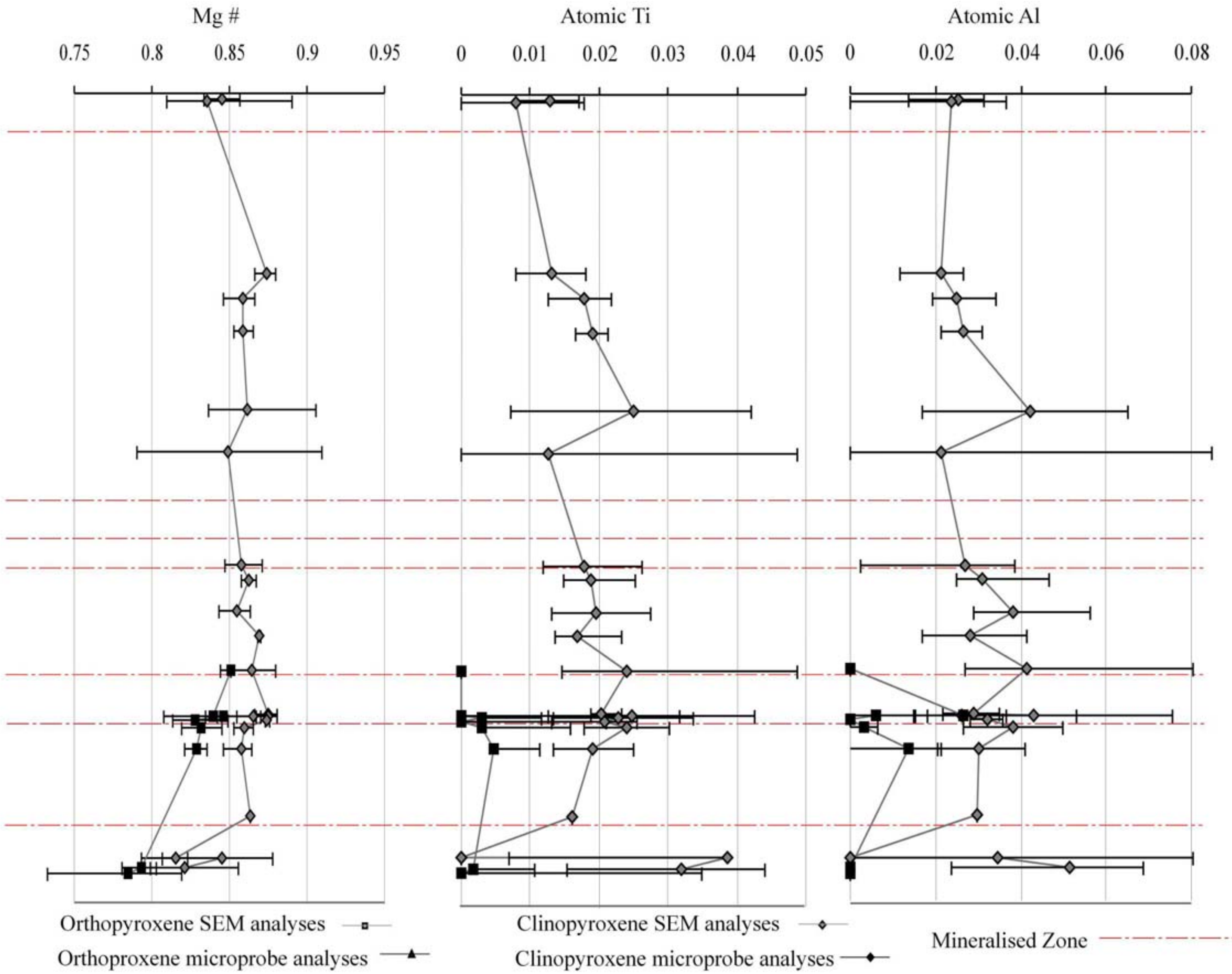

Figure 5.16. Mg# and atomic abundance of Ti and Al in pyroxene by SEM from drill hole WM00.01. Range of values from each elevation shown for each sample. Mineralised zones are shown with dashed lines.

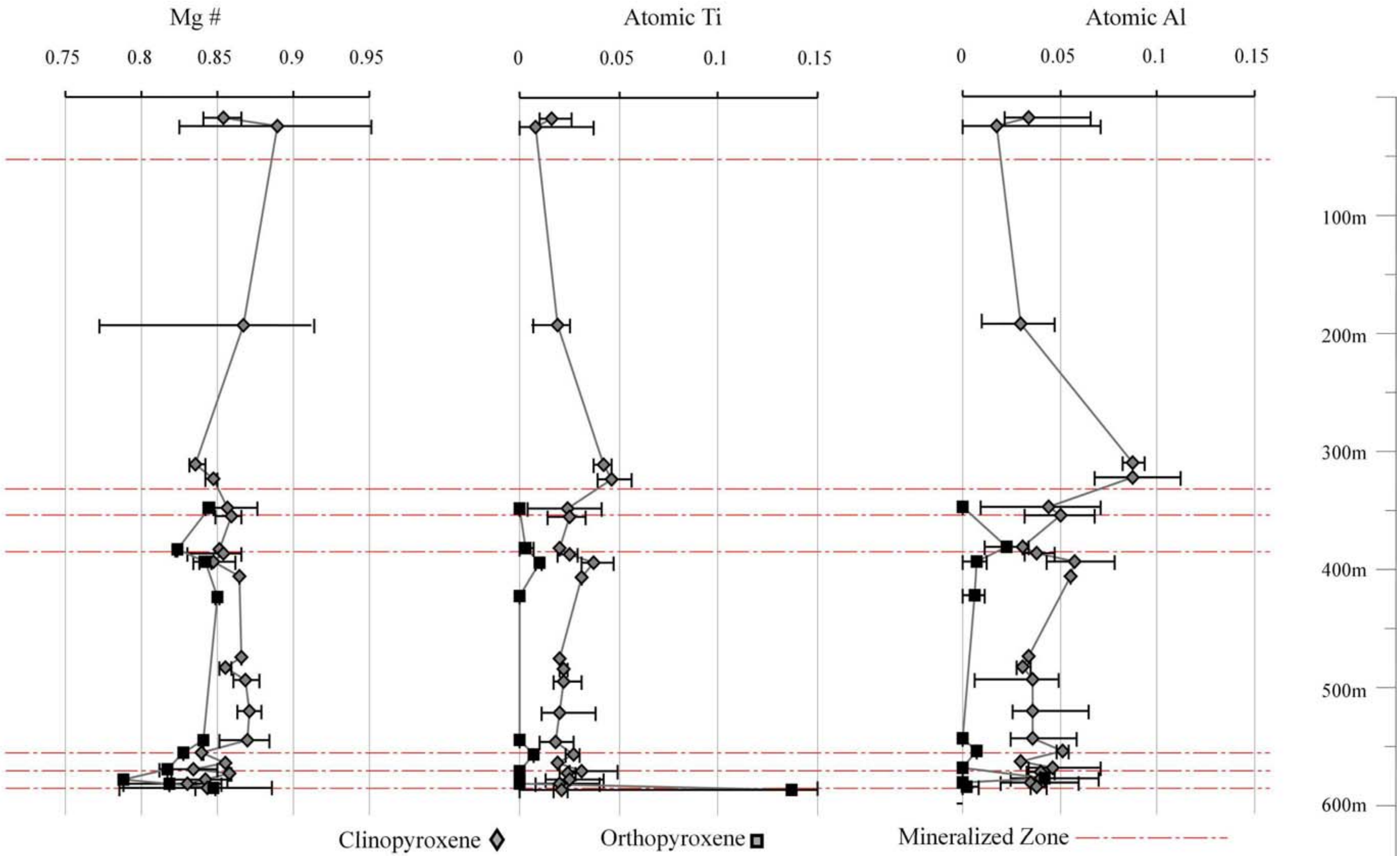

Figure 5.17. Mg# and atomic abundance of Ti and Al in pyroxene from drill hole WM98-05. Range of compositions shown by bars. Mineralized zones are shown with dashed lines.

Orthopyroxene is limited in its distribution and exhibits slightly more variability than clinopyroxene. Orthopyroxene appears to closely mimic the Mg and Fe trends observed in olivine (see Section 5.2), and exhibits a constant Ca abundance, with a general trend of decreasing Fe and increasing Mg up from the basal contact (as shown by Mg# in Figs. 5.16 and 5.17). The most Mg rich orthopyroxene occurring in the highest sample analysed in both drill holes. Al and Ti abundances in orthopyroxene exhibit parallel patterns with a general trend of increasing Ti and Al abundance towards the base of its occurrence (below approximately 570 m in WM00-01 and below approximately 370 m in WM98-05. Above this in both drill holes there is a trend of decreasing Al and Ti abundance.

Surface samples collected are not vertically well constrained and the relationship between these and drill core is not clear. In relation to bulk analyses of clinopyroxene from WM00-01 and WM98-05, surface samples have lower Mg# values and similar to lower abundance of Cr (Fig. 5.18). Orthopyroxene from the surface samples also exhibit lower Mg#. Aluminium and Ti contents of pyroxenes for surface samples fall within the field defined by the data acquired from drill core.

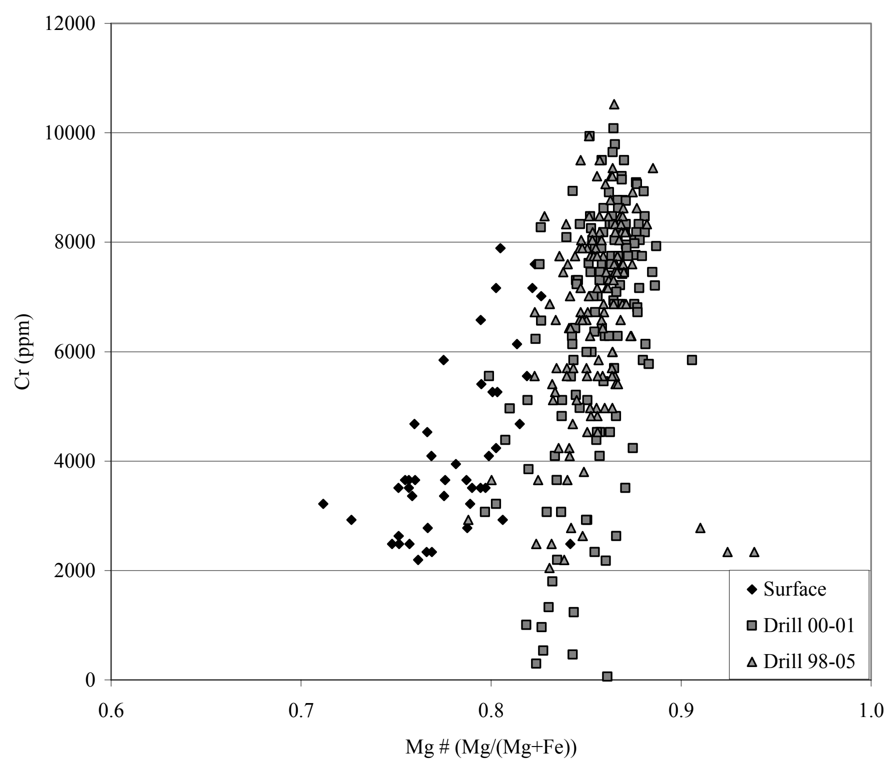

Figure 5.18. Plot of clinopyroxene Cr (ppm) versus Mg# from surface samples and drill holes WM98-05 and WM00-01.

5.4.4 Discussion

Olivine accumulating at the bottom of a magma chamber forming a crystal mush pile will contain interstitial melt, it is this intercumulus interstitial melt which contributes to the crystallization of late phase intercumulus minerals. In the Seagull Intrusion this is poikilitic diopside, as clinopyroxene is always observed enclosing a number of olivine crystals thought to be cumulate in nature. The diopside observed in the Seagull Intrusion is very consistent in composition indicating that the interstitial melt responsible for the crystallization of this phase maintain a constant composition, negating the possibility of a trapped interstitial melt fractionating independently of the intrusion as a whole. Fe enrichment in olivine is observed to occur at the base of the intrusion and is interpreted to be a function of the primary magma becoming enriched in Fe from contamination, as a result the interstitial melt is also marginally enriched in Fe. There is a slight Fe enrichment towards the top of the drill holes which is likely a function of fractionation occurring in the system, as olivines are observed to become more Fe rich near the top of the drill core and there is a much larger Fe enrichment in olivine from surface samples.

Al and Ti abundances in pyroxene are relatively constant in the bottom section of the intrusion, but decrease in abundance in the upper sections. As olivine and pyroxene remove limited amount of Al from the system, a decrease in its abundance has been attributed in other systems to the start of feldspar crystallization. However, in those systems cumulate orthopyroxene was utilized in the studies (Eales et al., 1994: Eales et al., 1993 and Cawthorn, 2002). Feldspar is not observed to occur as an interstitial mineral leaving only communication between the interstitial melt and an overlying magma, which is crystallizing feldspar or another mineral phase (oxides) to be account for the depletion. The distribution of pyroxene in the Seagull Intrusion indicates changing magmatic conditions, as orthopyroxene is only observed in the bottom section of the intrusion, and near the top and surface samples while clinopyroxene is found throughout the intrusion. Major elements indicate that the orthopyroxene compositions become more primitive away from the base of the intrusion similar to olivine, indicating the decreasing effects of contamination or increasing primitiveness of the magma (or a combination there of). Aluminium and titanium contents of pyroxene provide limited insight into magma chamber processes, as Al and Ti are relatively constant in abundance. However, both elements exhibit maximum contents in close proximity to the level where they are no longer observed above. This peak in both drill holes and the absence of orthopyroxene occurs in close proximity to zones of known mineralization, perhaps indicative of a changing environment. Pyroxene from the Seagull Intrusion as shown in Figure 5.13 exhibits a fractionation trend in pyroxene composition as described by Brown (1957) and Brown and Vincent (1963). The most primitive pyroxenes are observed in the centre of the lower ultramafic section and trends to more fractionated compositions towards the base and towards the top. Basal contact pyroxenes become more Fe-rich possibly as a function of increasing contamination, while towards the top of the intrusion more evolved pyroxenes are again observed as a function of the magmatic system as a whole becoming more fractionated. This is clearly evident in the samples taken from surface outcrop and in drill hole WM00-04 which exhibit a strong trend towards Fe rich end member compositions.

5.4.5 Conclusions

Intercumulus clinopyroxene in the Seagull Intrusion exhibits limited variability, a function of a steady interstitial melt composition that did not undergo isolated fractionation to produce interstitial pyroxene of a highly fractionated composition. The major elements indicate a zone of more fractionated pyroxene occurring at the base of the intrusion but this is interpreted to be a function of contamination rather than a product of the system fractionating. However, some fractionation of the magmatic system is observed throughout the Seagull Intrusion from the base to surface samples. Orthopyroxenes have a limited distribution indicating that a change in the system caused it to cease its crystallization. The uppermost sample analysed in both drill holes occurs in close proximity to zones of mineralization suggesting some relationship between the changing magmatic conditions and the development of Ni-Cu-PGE mineralization.

5.5 Oxide Mineral Chemistry

5.5.1 Introduction

Oxide minerals are common accessory minerals in igneous rocks and show a wide range in compositions (Table 5.6) with extensive solid solution between end members (Fig. 5.19).

Table 5.6 End member compositions for oxides, including spinel group, hematite group, and rutile group (Klein and Hurlbut, 1999).

	Mineral	**Formula**
Spinel Group XY_2O_4		
	Spinel	$MgAl_2O_4$
	Hercynite	$FeAl_2O_4$
	Chromite	$FeCr_2O_4$
	Magnesiochromite	$MgCr_2O_4$
	Magnetite	Fe_3O_4
	Magnesioferrite	Fe_2MgO_4
	Ulvöspinel	Fe_2TiO_4
Hematite Group X_2O_3		
	Hematite	Fe_2O_3
	Ilmenite	$FeTiO_3$
Rutile Group XO_2		
	Rutile	TiO_2

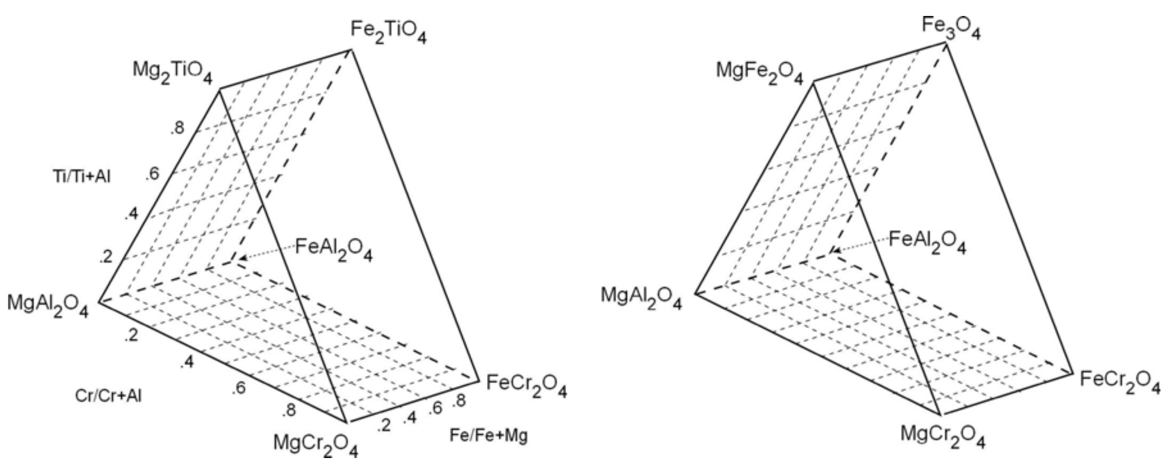

Figure 5.19. Spinel prisms showing possible range of solid solution between end-member compositions of spinel. Modified after Klein and Hurlbut (1999).

5.5.2 Objective

Oxide mineralogy was examined in the Seagull Intrusion and Nipigon Sill to investigate the compositional changes as a magma crystallized. Oxides are found associated with all lithologies (sedimentary, metamorphic and igneous) and as such form under very diverse environmental conditions. The compositions of oxides occurring in igneous rocks is dependent upon 5 factors: 1) Magma composition proposed by Irvine (1965). Allan et al. (1988) observed that Cr-spinel compositions vary systematically with host-lava composition based on 'primitiveness' of Mg/(Mg+Fe) ratios. They found that spinels richer in Cr and Fe^{2+} crystallized from more evolved lavas. Additional work carried out comparing compositions of Cr-spinel in quenched glasses by Poustovetov and Roeder (2001) has lead to a more general model describing Cr spinel-melt equilibria. 2) The second factor is the crystallizing phases (Irvine, 1966), Cr-spinel is one of the earliest minerals to crystallize from a mafic-ultramafic magma, and during fractionation a small portion (2-3%) of Cr-spinel will continue to crystallize until pyroxene becomes an important cumulate mineral (Irvine, 1966,1975) at which point Cr will be incorporated into pyroxenes (the amount of chromium in the rocks exhibits a relatively smooth transition from units without pyroxenes but with chromite, to units with pyroxene but no chromite: Irvine, 1975). This then limits the distribution of chromite to forsteritic olivine and calcic plagioclase dominated units (Roeder, 1994). 3) The oxygen fugacity of the system (Irvine, 1965). The major effect of changing the f_{O2} in a system is a large increase in the Fe_2O_3 contents of the spinels with increasing oxygen fugacity (Murck and Campbell, 1986; Roeder and Reynolds, 1991). 4) The effect of increasing temperature is to increase the Cr_2O_3 and MgO contents and lower the FeO, Fe_2O_3 and Al_2O_3 contents of spinels (Murck and Campbell, 1986; Roeder and Reynolds, 1991). 5) Late stage magmatic exchange between intercumulus liquids and cumulate minerals. Exchange and re-equilibration of spinels with host silicates has been documented from some igneous bodies and absent in others. Spinels from the Rhum Intrusion, are thought to have reacted with olivine and plagioclase to generate more Al rich spinels (Henderson, 1975). However, the Eastern Bushveld Intrusion contains numerous layers of cumulate minerals (olivine, chromite, pyroxene, and plagioclase) in varying proportions and the composition of coexisting chromite varies systematically (De Waal, 1975). Cameron (1975) concluded that the main variation in chromite was not controlled by re-equilibration in post-cumulus phases but was a primary feature of the cumulate stage. Roeder and Reynolds (1991) concluded that pressure changes have relatively little effect on chromium in a melt and the composition of coexisting chromite. However, aluminium in the melt is indirectly controlled by pressure as plagioclase becomes less stable at higher pressures, increasing the Al-content (Roeder and Reynolds, 1991). The effect of this in MORB-type lavas was investigated by Allan et al. (1988) who concluded that Al-rich spinels previously thought to be relicts of high pressure formation, were products of magma mixing.

Oxides have been used to examine relationships between physically associated ore deposits, as in the Bushveld Complex where oxides observed in the dunitic pipes of the complex show distinct compositional and zoning differences compared to oxides observed in the layered sequences of the Bushveld. This has been attributed to the effects of metasomatism on primary oxides and associated mineralization of PGEs (Stumpfl and Rucklidge, 1982). Primary oxides observed in the Sublayer and in the mafic-ultramafic inclusions found in the footwall of the Sublayer in the Sudbury Igneous Complex exhibit a continuum in composition, genetically linking the two to a common magma (Zhou et al., 1997). Lastly, oxides may be used in understanding magmatic systems. Differentiation trends in magmatic systems are linked to the crystallization of oxides as seen in Skaergaard (Jang et al., 2001) and the occurrence of massive oxides (both chromite and magnetite) throughout the stratigraphy in the Bushveld Complex have been used to investigate the magmatic processes which were occurring (Klemm et al., 1982). Investigating the oxides present and compositional changes in the Seagull Intrusion and Nipigon Sill, will further the understanding of the magmatic processes, genetic relationships and controls on mineralization within the intrusion.

5.5.3 Results

5.5.3.1 Oxide Compositions

Oxides were analysed in two drill holes WM00-01 (30 samples, 598 point analyses) and WM98-05 (26 samples, 410 point analyses) a complete list of sample locations is provided in Appendix A. For drill hole WM98-05 all oxides analysed were classified as three types based on their occurrence 1) IM oxides (internal magnetite contained within an olivine crystal), 2) BM oxide (boundary magnetite contained within a pyroxene crystal) or 3) SBM oxide (secondary oxide) and UN oxide (unknown association). Unfortunately, this was not done for the first analyses carried out on drill hole WM00-01 where analyses were just classified as general oxides. However, classification was documented for the last 11 thin sections (out of 30) for drill hole WM00-01. IM oxides vary in size from greater than 10 µm to less than 75 µm (in glomeroporphyritic masses), with an average size of approximately 25-35 µm. Crystals are generally equant with rounded corners to circular morphology. Zoning was not observed in any of these of oxides. BM oxides are on average larger than IM oxides and range in size from greater than 10 µm to less than 200 µm. BM oxides display similar morphologies to IM oxides with many having a rounded appearance, but there are also a higher number of oxides exhibiting subhedral to euhedral morphologies. SBM oxides have been interpreted to be a secondary phase of oxides. They are found only where there has been extensive alteration. SBM oxides are common in the upper section of the Seagull Intrusion were olivine has been replaced by iddingsite and serpentine (Chapter 4), and in veins and fracture zones deeper in the intrusion. The SBM oxides are characterised by euhedral to subhedral crystals, ranging in size from 50 µm to 4 mm. Mineralogy of the SBM oxides is dominated by the titanium rich end members rutile and ilmenite, with lesser amounts of the iron rich end member magnetite.

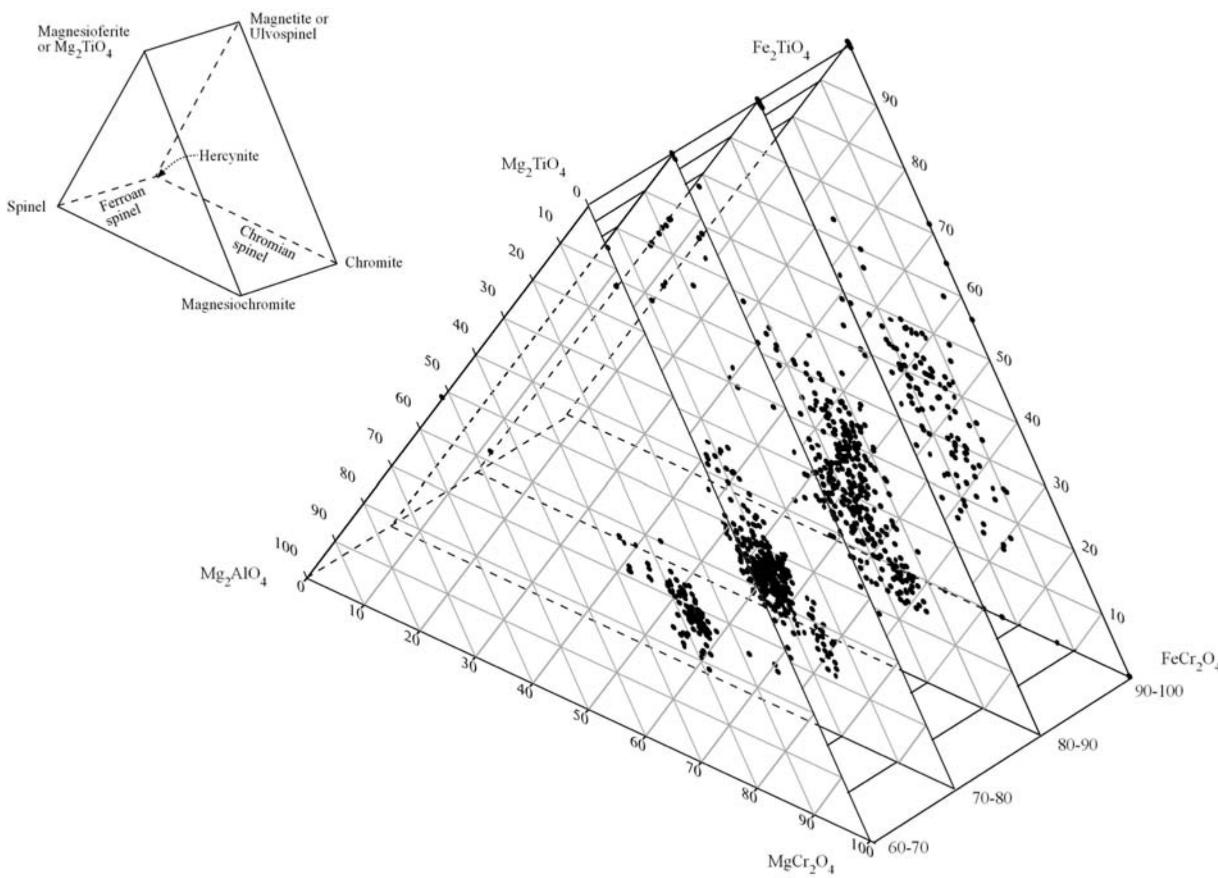

Figure 5.20. Oxides ploted on a spinel prism. Oxides are plotted on planes in Mg-Fe substitution direction, grouped into Fe 60-70, Fe 70-80, Fe 80-90, Fe 90-100. Modified trom Klein and Hurlbut (1999)

As shown in Figure 5.20 there is a compositional zone defined by the oxides observed in the Seagull Intrusion. The majority of oxide compositions fall within the zone of the chromian titanomagnetite field identified by Taylor (2000). Oxides are characterised by Fe/(Mg+Fe)*100 greater than 60, no oxides below this were observed. Cr/(Cr+Ti)*100 stayed relatively constant between 50 and 60 for low Fe, but shows a considerable spread as the iron content increases. Ti/(Ti+Al)*100 show a very constant ratio of 15 to 20. Secondary oxides plot along edge tie lines enriched in Fe and Ti on Figure 5.20. The majority of substitutions occurring in the oxides are between Fe and Mg. Oxide analyses plotted on further graphs are sorted to remove oxides identified as secondary alteration oxides.

Oxides observed in drill hole WM98-05 and part of WM00-01 plotted on ternary diagrams exhibit a complete compositional overlap between the IM and BM oxide groups (Fig. 5.21) Complete mineral analyses is in Appendix D.

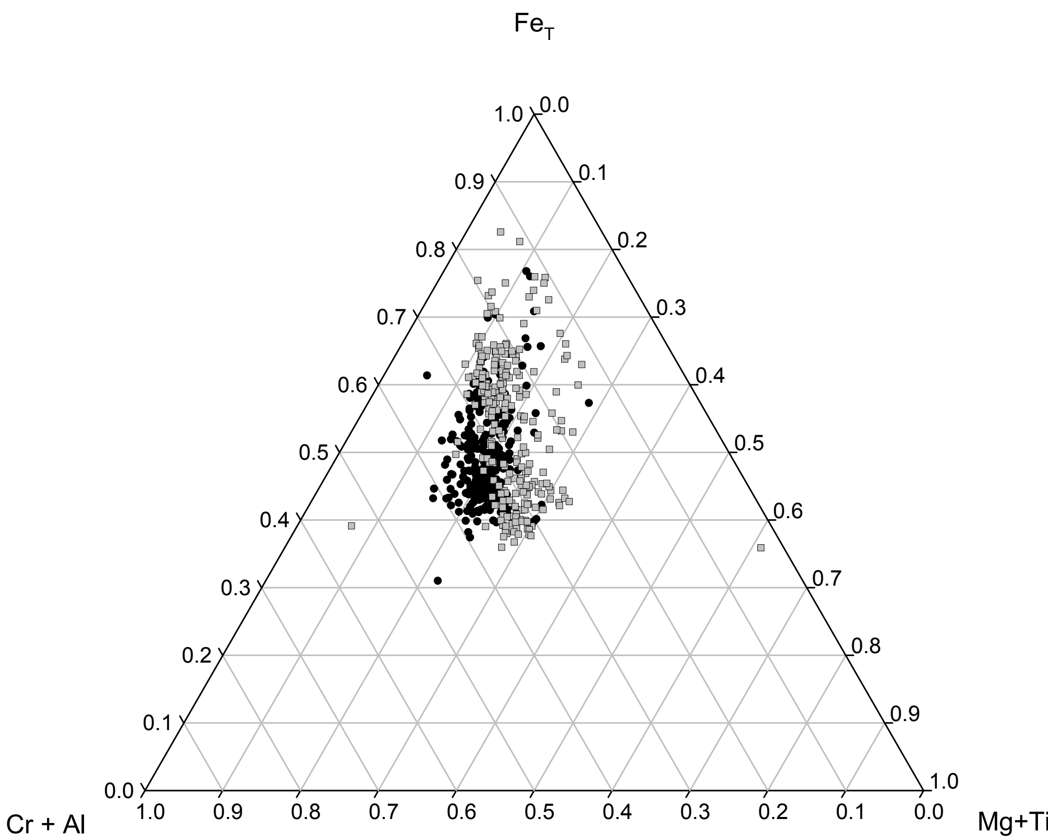

Figure 5.21. Oxide mineral compositions (normalized atomic proportion) from WM98-05 and WM00-01. Oxides found in olivine (IM) as black circles and oxides found in pyroxene crystals (BM) as grey squares. Fe_T = Total Fe

There is a tendency for BM oxides to have elevated Fe over IM oxides and in general a larger distribution in the range of oxide compositions observed (Fig. 5.21). Further subdivision of the oxides is possible by examining each thin section, through the intrusion. Within each thin section each group (IM or BM) oxide is relatively homogenous in composition. IM oxides are very homogenous throughout the intrusion and all fall within a narrow compositional field (Fig. 5.22), except at the base of the intrusion where they exhibit an extensive range.

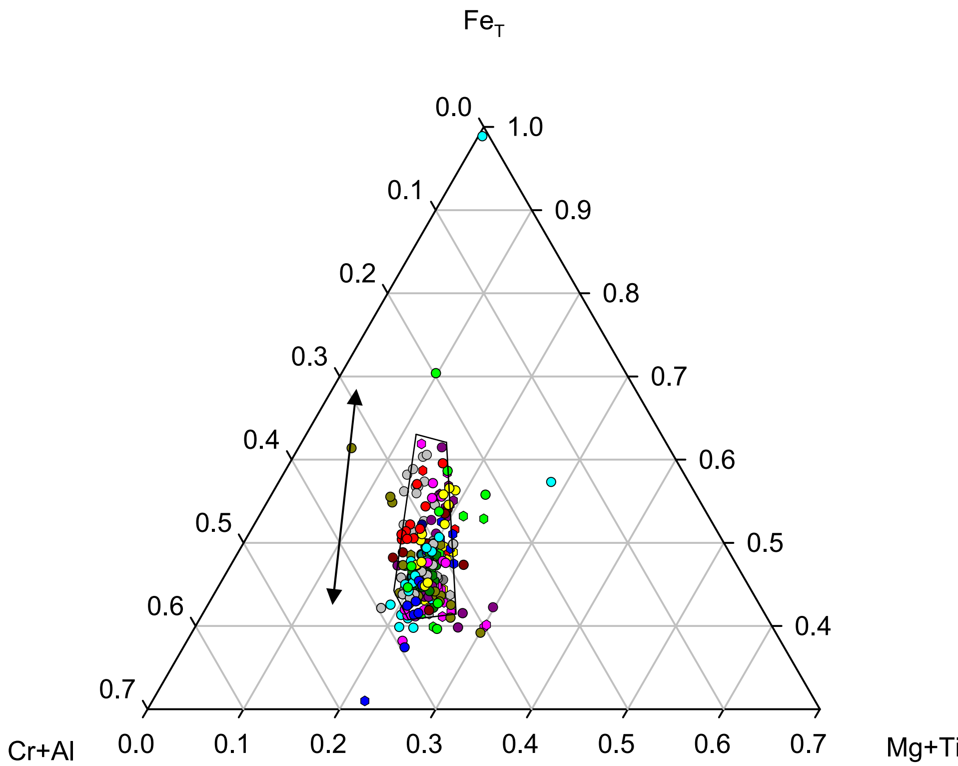

Figure 5.22. Atomic proportions (recalculated to 100) of all IM oxides (excluding oxides found in basal unit) from drill holes WM98-05 and WM00-01. Field drawn contains approximately 95% of analyses (27 out of 567 fall outside of drawn field). Arrow showing trend of Cr+Al increase and decrease observed in the sample analyses.

IM oxides from different levels in the intrusion tend to plot together in groups. Groups of oxides commonly exhibit trends of increasing or decreasing element abundance sequentially with height for certain intervals of the intrusion. Increases or decreases dominantly occur along the arrow shown in Figure 5.23 with compositional changes being caused by the substitution between Fe_T and Cr+Al, with limited variability in the Mg+Ti abundance. IM oxides occurring near the basal contact (below 570.5 m in WM98-05, with basement at 588.6 m and below 603.7 m to basement at 710.5 m in drill hole WM00-01) show some compositional overlap with the field of IM oxides identified previously (Fig. 5.23). However, these IM oxides have a significantly larger range in Fe– Cr+Al distribution (Fig. 5.23) with the slope of Fe_T – Cr+Al substitution being flatter (less variability in Mg+Ti) than that observed in oxides from the main body. However, the shallower slope observed in the basal samples grades slowly to a steeper slope observed in the main body of the intrusion (Fig. 5.22) with increasing vertical distance from the base.

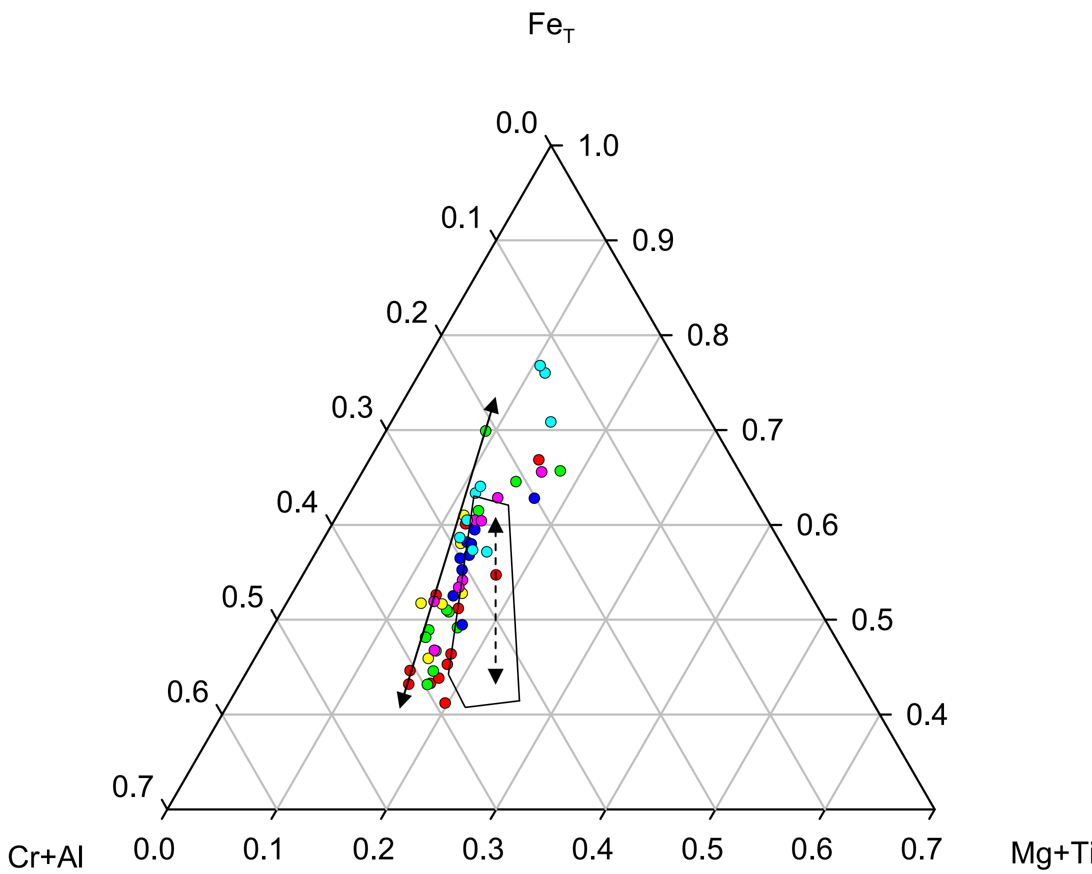

Figure 5.23. Atomic proportions (recalculated to 100) of IM oxides found in basal unit from drill hole WM98-05 and WM00-01. The compositional field for IM oxides occurring in the main body of the intrusion from Figure 5.23 is shown, with the general trend of Fe-Cr+Al substitution shown by dashed line. Trend of Cr+Al – Fe substitution observed in the basal region shown by solid line.

BM oxides exhibit a much more diverse range of compositions and element substitutions. The base of both drill holes contain BM oxides which are characterised by elevated Fe contents and generally lower Cr+Al with variable Mg+Ti contents (Figs. 5.24 and 5.25). In both drill holes this Fe enrichment decreases with matched increases in both Cr+Al and Mg+Ti up to approximately the 470 m level in WM98-05 and ~ 580 m in WM00-01. Above this the two drill holes exhibit marked differences. Drill hole WM98-05 exhibits a sharp decrease in Mg+Ti correlating to an increase in Fe.

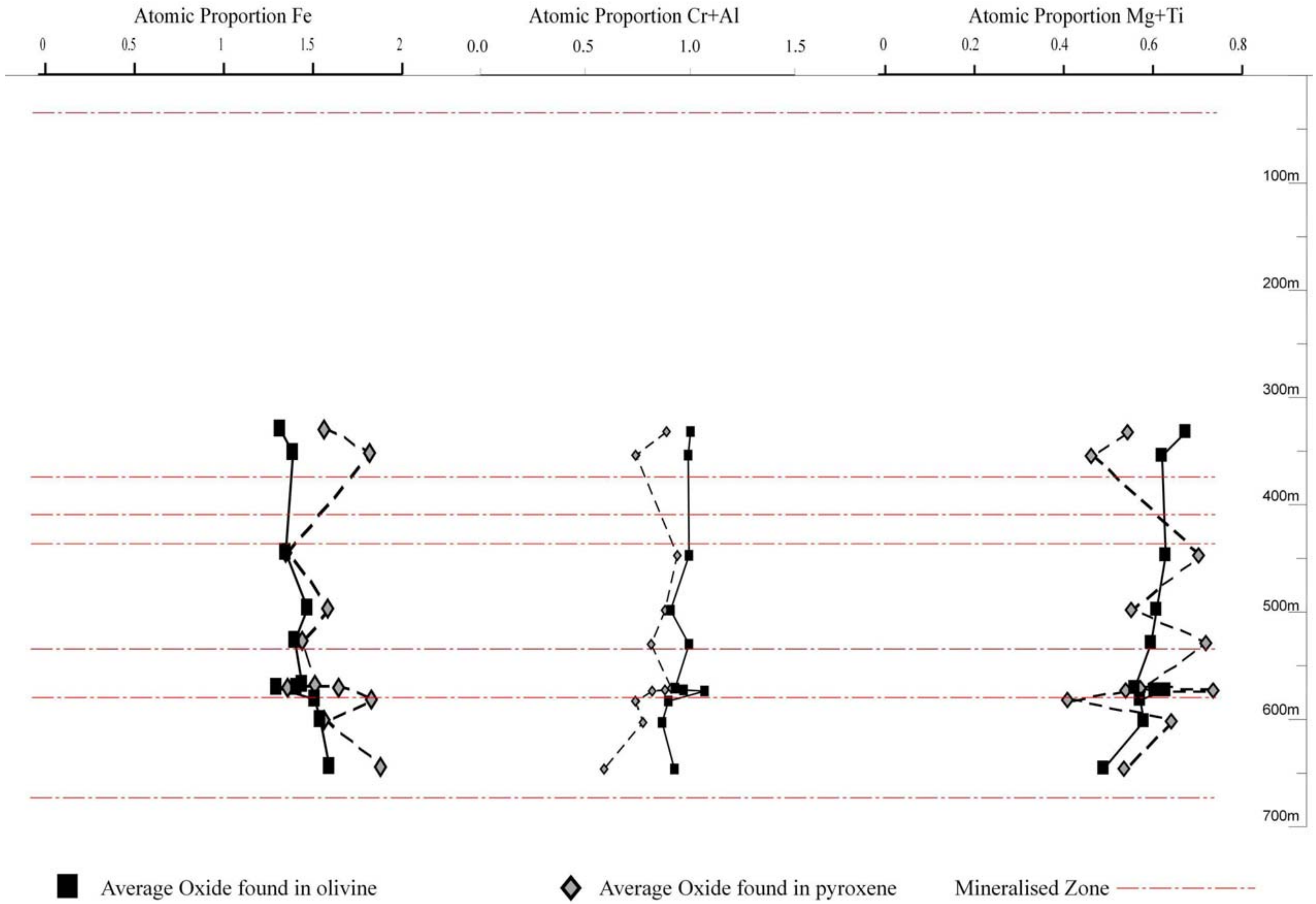

Figure 5.24 Average atomic proportions of Fe, Cr+Al and Mg+Ti for IM oxides (black squares) and BM oxides (grey diamonds) from drill hole wM00-01. With mineralised zones shown with dashed lines.

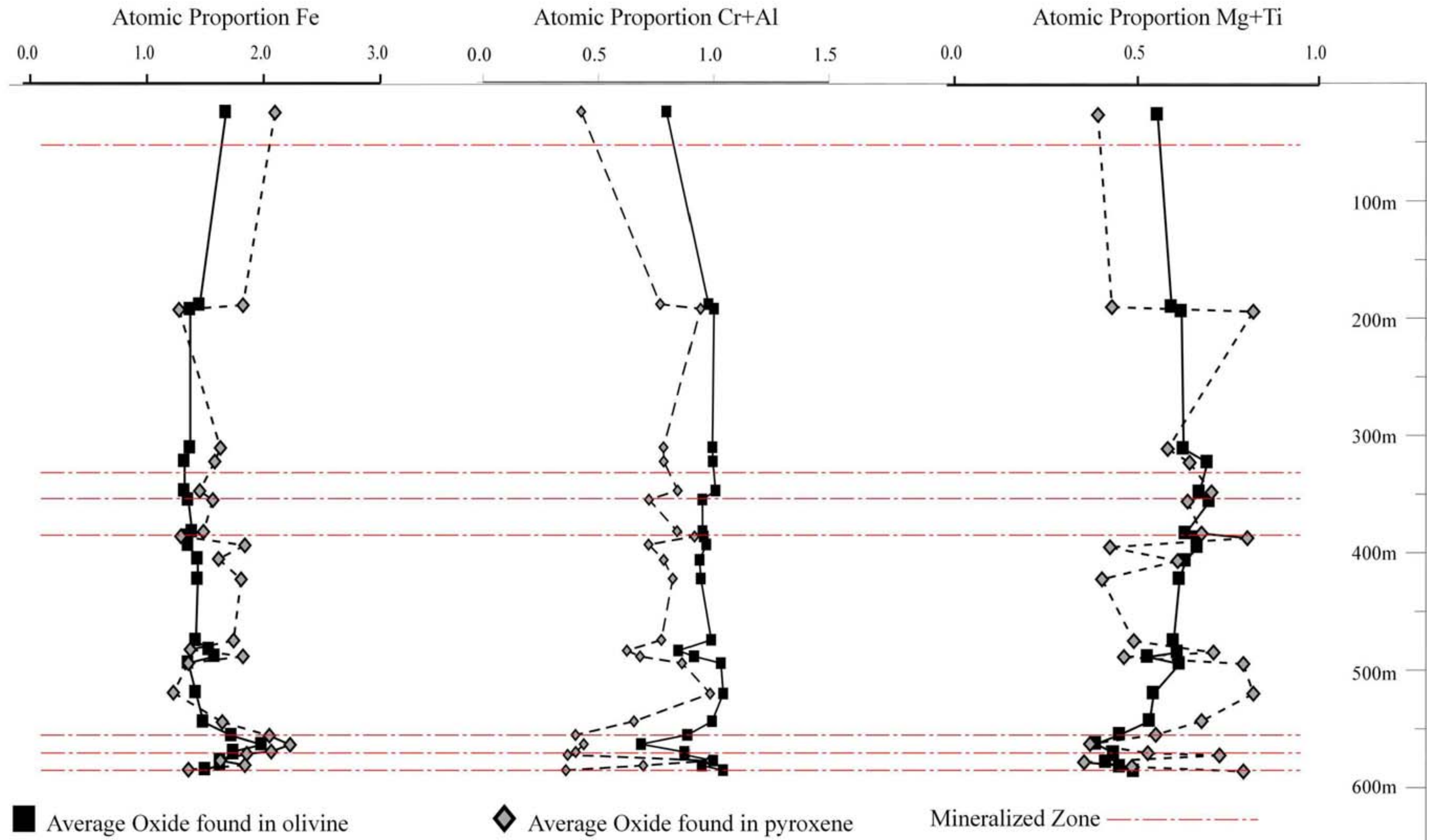

Figure 5.25 Average atomic proportions of Fe, Cr+Al and Mg+Ti for IM oxides (black squares) and BM oxides (grey diamonds) from drill hole WM98-05. With mineralization zones shown by dashed lines

Above this Mg+Ti values return to a near average compositions for approximately 100 m after which the compositions of BM oxides become very erratic. Drill hole WM00-01 generally exhibits an erratic pattern in Mg+Ti, a relatively constant Cr+Al content and a trend of increasing Fe content upwards. BM oxides exhibit an extensive overlap with the IM oxide field. However IM oxides and BM oxides from the same sample do not generally plot in the same area. Instead they exhibit a relationship of increased Fe+Ti and/or an increase in Mg from the composition of IM oxides observed in that sample. Shown in Figure 5.26 is a hypothetical IM oxide composition (black dot) and the two dominant composition shift observed in the BM oxides from the same hypothetical sample.

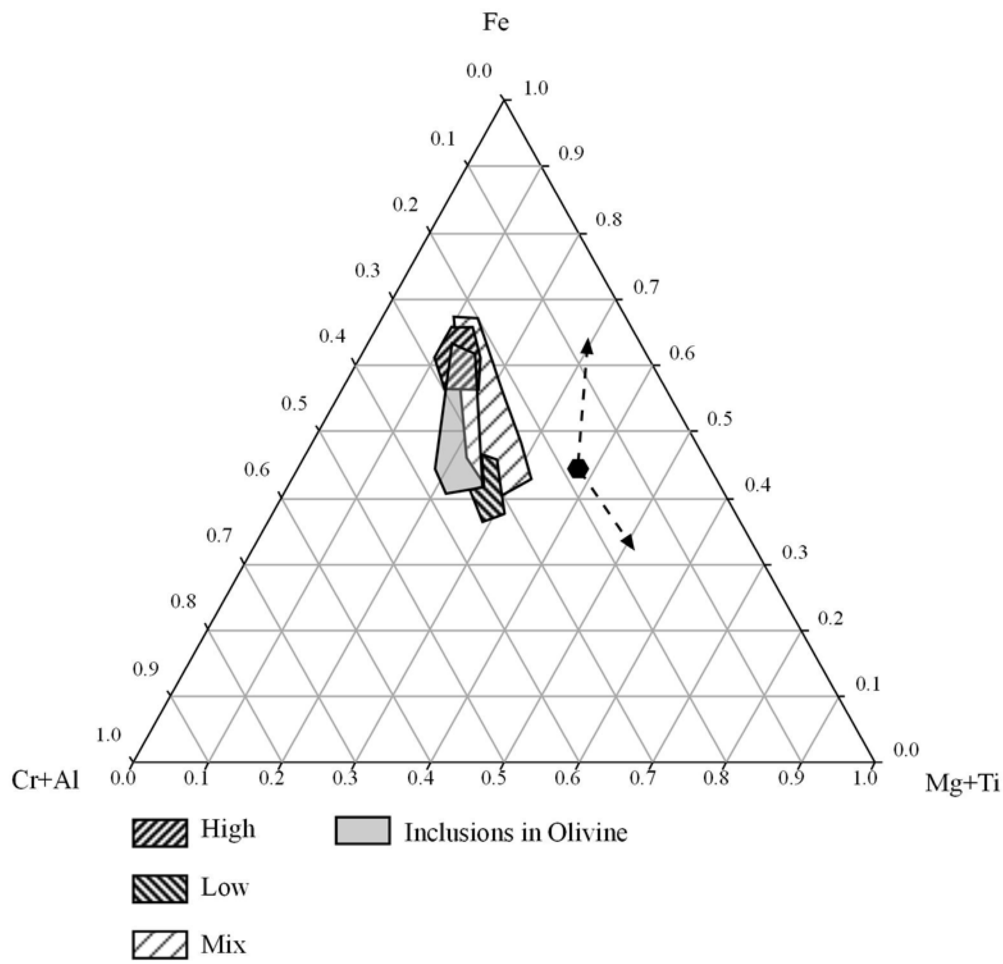

Figure 5.26 Oxide fields defined from IM oxides and BM oxides (shown as common oxide groups; high field compositions, low field compositions and a mix zone). With trend lines (by visual estimation) shown of increasing Fe or Mg+Ti from a hypothetical starting composition shown by the black hexagon.

5.5.3.2 Oxidation State

The oxidation state of iron (Fe^{3+} and Fe^{2+}) in the Seagull Intrusion is variable through the vertical extent of drill core. Calculation of Fe^{3+} and Fe^{2+} was done based on the stoichiometric oxide formula of $R^{3+}{}_2R^{2+}O_4$ with Mg and Ti occupying the R^{2+} site and the deficiency representing Fe^{2+}, as the SEM-EDS is not able to distinguish between the two oxidation states. The vertical variation in the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio in drill hole WM98-05 (Fig. 5.27) exhibits a relatively consistent ratio for IM oxides exhibiting a slight convex, shaped pattern. While the base of the intrusion exhibits the lowest $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio observed in the drill hole. From the base upwards there is a slight increase in the ratio towards the centre of the intrusion, then it decreases slightly towards the top of the drill hole. Looking at the BM oxides there is a wider distribution in the range of the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio. BM oxides generally have elevated Fe^{3+} compared to IM oxides at the base of the intrusion, but higher in the intrusion BM oxides overlap the IM oxides.

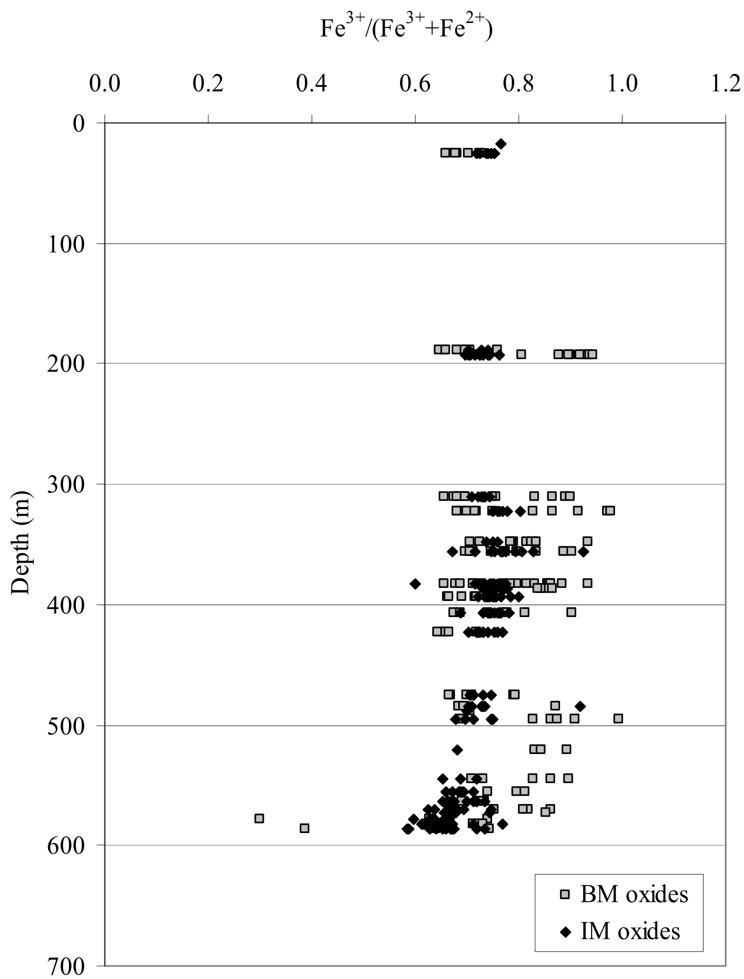

Figure 5.27. Plot of $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ versus depth for IM and BM oxides for drill hole WM98-05.

5.5.4 Discussion

Primary oxides in the Seagull Intrusion define a limited compositional range (Fig. 5.20) and are best classified as chromian titanomagnetite (Taylor, 2000). Also present within the intrusion are ilmenite and magnetite which are thought to be products of contact metamorphism (Nipigon Sill) and alteration, as these Ti-and Fe-rich oxides are found in close association with zones of extensive alteration and replacement of primary mineralogy. The distribution of these oxides is restricted to the upper section of the intrusion both above and below the cross-cutting Nipigon Sill and found at depth only along alteration veins.

The primary oxides occurring in the Seagull Intrusion either are enclosed in olivine (IM oxides) or in pyroxene (BM oxides). IM oxides show a very homogeneous composition with very limited difference stratigraphically (Figs. 5.24 and 5.25) or laterally (WM98-05 compared to WM00-01). Variations which are observed correlate to changes observed in olivine (section 5.2). An Fe-enriched zone occurring at the base of the intrusion observed in olivine is also apparent in the IM oxides with lower Mg values. Peaks observed in Fo composition of olivine are also present in the IM oxides. The close correlation between olivine compositional trends and the compositional trends observed for the oxides included in olivine imply that either the IM oxides have re-equilibrated with their respective olivines or formed from the same liquid that olivine crystallized from. The location of BM oxides within pyroxenes indicates that the first phase to crystallize were IM oxides as they are found in olivine, which in turn are enclosed by pyroxene. BM oxides could have crystallized at the same time and not being incorporated into the olivine crystals, crystallizing after olivine had ceased growth but not yet accumulated, or crystallized in situ as a late stage interstitial phase. It is thought that both IM oxides and BM oxides were crystallizing at the same time along with olivine as it is difficult to have BM oxides crystallizing after IM oxides and olivine while accumulating at the same time without the development of oxide layers. However, the compositions are very similar (Fig. 5.26) and if BM oxides were a product of only intercumulus crystallization it would be expected that there would be a larger discrepancy between the two compositions. The difference between the compositions of IM and BM oxides, if crystallizing at the same time, is more likely a function of subsolidus re-equilibrium with intercumulus melt, as documented in numerous other intrusions (Cameron, 1975; Roeder and Campbell, 1985; Campbell and Murck, 1992). The subsolidus re-equilibrium occurring in the Seagull Intrusion occurs in BM oxides as either an enrichment in Fe or as an enrichment in Mg+Ti (Fig. 5.26) from a composition observed in IM oxides. Subsolidus re-equilibration occurring in BM oxides is dependent upon the local subsolidus environment as mineral chemistry shifts observed in BM oxides are commonly correlated with observed shifts in the intercumulus pyroxene (diopside) mineral chemistry (e.g., a BM oxide increase in Fe-content is observed in pyroxene as an increase also: Figs. 5.16 and 5.17).

The similar crystallization history but varied cooling history of IM oxides and BM oxides is further differentiated based on the oxygen fugacity. Comparing the Fe^{3+}-content to the Fe^{2+} of the two oxide groups differences between the two are observed (Fig. 5.27). IM oxides remain constant through the intrusion defining a narrow range of $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ values in each sample with an overall trend of increasing oxygen fugacity in IM oxides (Murck and Campbell, 1986; Roeder and Reynolds, 1991) towards the centre section of drill hole WM98-05, followed by a slight decrease to the top. BM oxides exhibit a similar convex shaped pattern as that observed in IM; oxides however, BM oxides exhibit a much wider range of $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ values with a dominance being higher than those of IM oxides, indicating an environment with marginally higher oxygen fugacity.

A comparison of oxides present in other igneous complexes with oxides observed in the Seagull Intrusion indicates strong similarities in compositions with oxides observed in the Sudbury Igneous Complex (Fig. 5.28). Oxides from other intrusions (Rhum Intrusion and Bushveld dunite pipes) are shown in Figure 5.28 but exhibit larger differences in compositions. Oxides from the Rhum Intrusion plot in an area higher in Cr+Al than the Seagull Intrusion oxides. Bushveld oxides (Dunite Pipes) plot off to the side of the field defined by the Seagull Intrusion along a trend from Cr+Al to Fe with constant Mg. Oxides from the Sudbury Igneous Complex plot along the same trend as those observed in Seagull Intrusion but have a trend which become more Fe-enriched than oxides observed in the Seagull Intrusion.

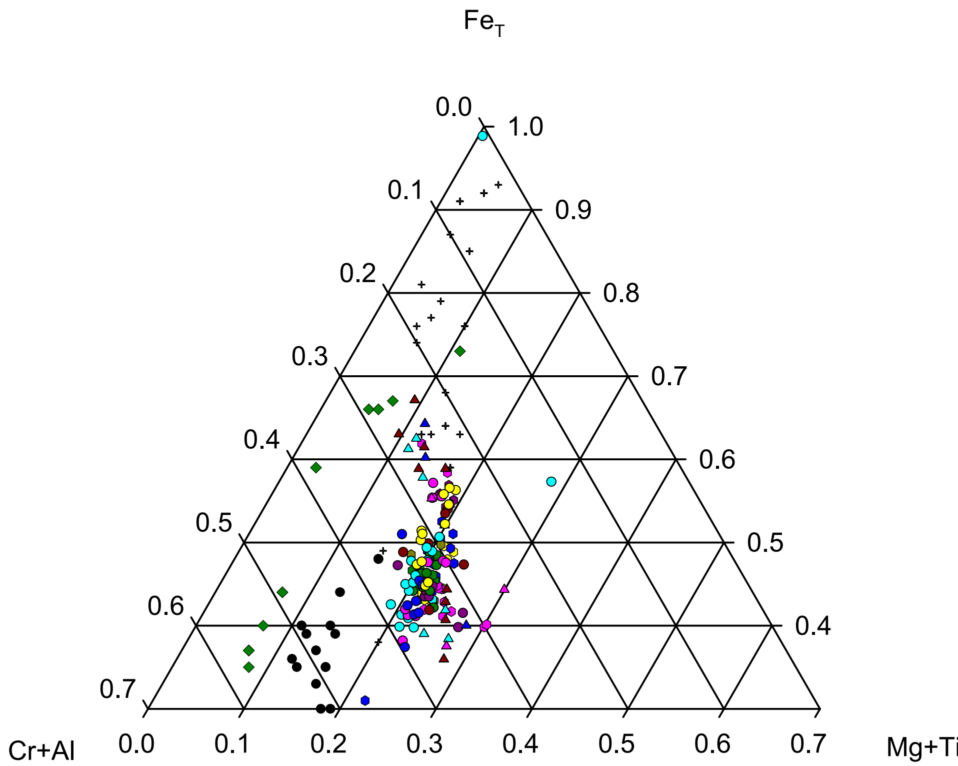

Figure 5.28. Comparison with other oxides from the Rhum Intrusion (Black circles), Bushveld Dunitic Pipes (Dark grey diamonds) and Sudbury Igneous Complex (black +). With oxides from Leckie Stock as circles and triangles.

Indicating potential similarities in a parental magma for Seagull Intrusion and ultramafics occurring in the Sudbury Complex. The source region for magmas responsible for the Seagull Intrusion are thought to originate in the mantle as there is a close temporal and spatial association between the Seagull Intrusion and the Mid-Continent Rift (see Chapter 3).

Fractionation of oxides occurring in the Seagull Intrusion may not be apparent but compositionally, oxides observed in the drill holes are different than those observed in surface samples. Oxides occurring in drill core whether they are IM oxides or BM oxides contain some chrome. This contrasts with the surface samples which contain oxides (magnetite, titanite) but do not have any chromium present in them. The lack of chromian spinel in surface samples is thought to be a function of the crystallizing phases. As pyroxene becomes the dominate cumulate mineral in a system, Cr in the system is accommodated into the pyroxene crystal structure and chromian spinel will no longer crystallize until there is a change in magmatic conditions (Irvine, 1966). Petrology of the upper section of the Seagull Intrusion and surface outcrops would indicate that clinopyroxene has become a major cumulate phase (see Chapter 4) indicating changing magmatic conditions occurring in the transition zone from the top of the drill core to the lowest surface sample collected. Oxide minerals observed in the two drill holes do not provide any further evidence for causes of mineralization in the Seagull Intrusion. There are no significant changes in oxide chemistry to support changes in magma composition other than what was previously described in Section 5.2.

5.5.5 Conclusion

Oxides from the Seagull Intrusion display a restricted range of compositions. Contained within the range are two distinct cumulus oxide occurrences (those enclosed in olivine crystals and those enclosed in pyroxene), which exhibit slightly different but overlapping mineral compositions. The origin of both oxide morphologies is thought to be a single crystallization event with some oxides being incorporated into olivine while other oxides were able to accumulate as interstitial crystals. It is this stage of accumulation and solidification of the interstitial melt which contributes to the shifting of the compositions of the oxides to that observed in the BM oxides (an enrichment in either Fe or Mg+Ti relative to IM oxides). The subsolidus shift of BM oxide compositions is a function of the local geochemistry as there is a strong correlation between relative element abundance increases and decreases in pyroxene and oxides. IM oxides closely reflect the chemical changes observed in olivine however, it is unclear whether IM oxides are reflecting primary magma compositional changes or merely a function of subsolidus equilibrium within the olivine crystal. Extensive changes are not thought to have occurred in the magma chamber as there are no large compositional breaks in the vertical profiles and the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ remains uniform in nature for the extent of drill hole WM98-05.

5.6 Mineral Chemistry Summary

Mineral chemistry (olivine, pyroxene and oxides) observed throughout the Seagull Intrusion exhibit a very narrow range of compositions. However, compositional variations are observed in all minerals at the base of the intrusion to more Fe-rich end members thought to be related to the assimilation of lithologies with elevated Fe-content relative to the Seagull Intrusion as a whole. Variation in mineral chemistries are also observed at the top of the intrusion but are more gradational and related to Fe-enrichment due to fractionation within the magmatic system. Smaller mineral chemistry variations are observed in the vertical sections through the ultramafic portion of the intrusion with olivine reflecting primary magmatic conditions and the changes with time. Pyroxene mineral chemistry dominantly reflects the state of interstitial melt in the intrusion. However, cumulate orthopyroxene occurring in the intrusion is similar to olivine in composition and reflects original conditions. Oxides (both IM and BM) occurring throughout the intrusion reflect one crystallizing phase with subsolidus re-equilibrium with their respective host mineral. The use of mineral chemistry in identifying controls on mineralization is limited to olivine. Olivine mineral chemistries indicate a more primitive magma composition in proximity to mineralization occurring in both drill holes this is interpreted to be a refreshing of the magma chamber with new, primitive magma.

CHAPTER 6
WHOLE ROCK GEOCHEMISTRY

6.1 Objective

Whole rock geochemistry was used to grossly classify the lithologies present in conjunction with petrographic observations (see Chapter 4). A combination of major elements and trace elements were also used to investigate the degree of fractionation, evolution and magmatic history of the Seagull Intrusion.

6.2 Previous Work

Available geochemical data for the Seagull Intrusion prior to this study consisted of whole rock analyses acquired by property operators Avalon Ventures followed by East West Resources Inc., as well as geochemical sampling carried out by the Ontario Geological Survey in two different studies: "Geological and lithogeochemical data from mafic-ultramafic bodies in Ontario as a guide to exploration for platinum group element (PGE) deposits" (Operation Treasure Hunt) (Vaillancourt et al., 2002) and sampling conducted under the Lake Nipigon Regional Geoscience Initiative with data published in Miscellaneous Report number 115 "Northern Black Sturgeon River – Disraeli Lake area, Nipigon Embayment, northwestern Ontario; lithogeochemical, assay and compilation data" by Hart and Magyarosi (2004).

6.3 Geochemical Sampling

Geochemical sampling was carried out to investigate vertical and lateral variations in major and trace elements with intensive sampling undertaken in drill hole WM00-01 (see Appendix A for complete list of sampling locations). Sample selection was based on assay results provided by East West Resource Corporation in conjunction with visual inspection of the core to ensure selection of representative samples of all lithologies (Chapter 4). Sample selection was carried out to minimize the effects of alteration. Sixty-one samples were analysed by ICP-AES, including five samples of the cross-cutting Nipigon Sill and two of the basement observed in drill hole WM00-01 (see Appendix A). A subset of seventeen samples (fifteen samples from the Seagull Intrusion and two from the Nipigon Sill) were analysed for major and trace elements by XRF and ICP-MS, covering a wider lateral but similar vertical extent (Fig. 6.1).

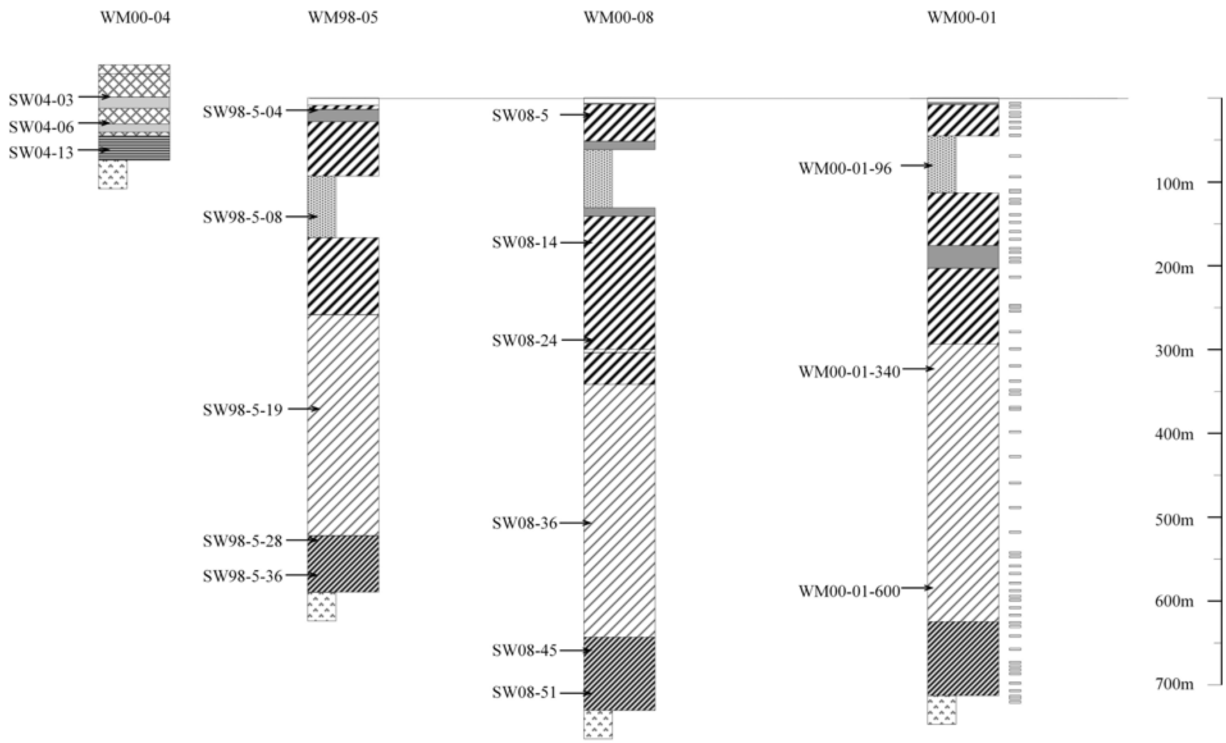

Figure 6.1 Cross section through Seagull Intrusion showing distribution of whole rock analyses by XRF and ICP-MS and location of samples analysed by ICP-AES in drill hole WM00-01. Legend is the same as in Figure 4.2

6.4 Results

6.4.1 Major Elements

Whole rock geochemistry analyses are listed in Appendix E. Figure 6.2 shows variation of selected elements against MgO abundance to monitor the degree of differentiation. The main feature exhibited by the diagrams is the linear relationship between some elements as a result of olivine and oxide cumulate formation (Co, Cr, Ni). More mobile elements K, Na and P exhibit a more scattered distribution, but still show broadly coherent trends indicating alteration has not significantly affected element abundances. Zirconium and zinc exhibit poor correlation with MgO. Zr exhibits a wide range at higher MgO values becoming better defined at lower MgO contents reflecting possible assimilation in the lower ultramafic section of the intrusion. Sphalerite was observed in the intrusion associated with alteration veins leading to a random distribution of this element. The Harker diagrams probably exhibit the combination of fractionation trends, from a composition of high Mg with low Ca, Al, Ti to a composition with elevated Ca, Al, Ti with a substantial decrease in Mg content, and the geochemical effects of cumulate mineralogy in a magmatic system consisting of a range of lithologies.

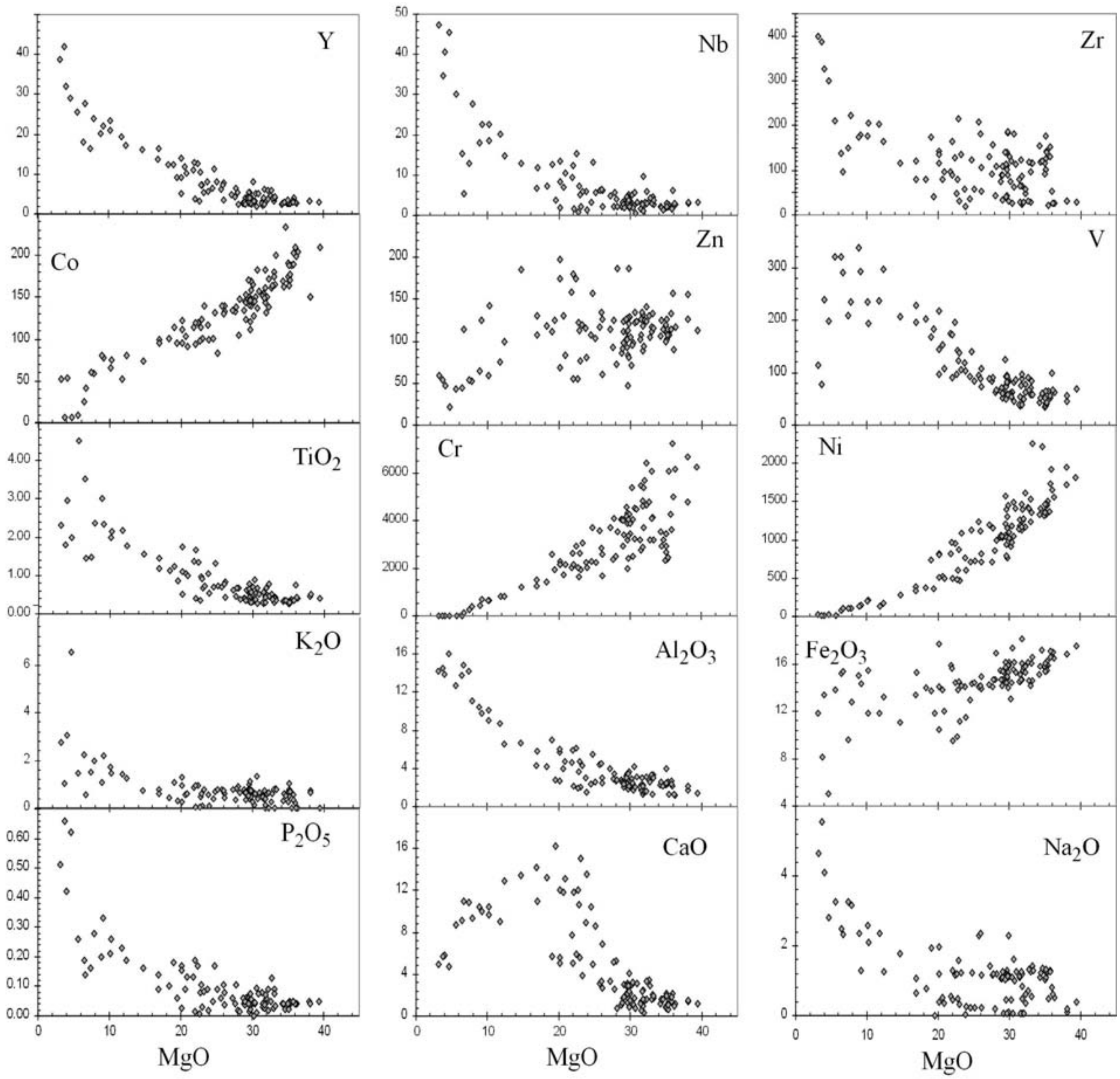

Figure 6.2 Harker variation diagrams of whole rock analysis from Seagull Intrusion excluding Nipigon Sills and basement lithologies. With additional data from Vaillancourt et al. (2002) and Hart and Magyarosi (2004).

Major element variation is greatest in samples taken from surface outcrops while the major element variation observed in drill core is quite limited. Drill hole WM00-01 exhibits limited variability in major element concentrations. The largest variations are observed in the basal section of the drill hole (Figs. 6.3 and 6.4) where elevated TiO_2, Al_2O_3, CaO, Na_2O, and SiO_2

are observed in close proximity with the basal contact (716 m to 700 m). Abundance of these elements exhibit a sharp decrease within 16 m of the basal contact, followed by a much more gradual decrease (matched with an increase in MgO and to a much smaller degree Fe_2O_3) up to 540 m at which point the other elements exhibit continuous low values. Low values of TiO_2, Al_2O_3, CaO, Na_2O, and SiO_2 and constant Fe_2O_3 and MgO are maintained up to a depth of 196 m. The monotonous sequence is terminated by a sharp increase in CaO at 196 m, a moderate increase in SiO_2 and sharp decreases in the content of Fe_2O_3 and MgO. This narrow deviation (approximately 6 m) is the result of the presence of a narrow pyroxenite body (see Chapter 4). Above this, CaO drops to approximately previous levels, Fe_2O_3 content increases to levels marginally above what was observed over the interval of 540 m to 196 m and SiO_2 exhibits the largest increase in abundance and maintains this concentration for the rest of the drill hole. MgO exhibits a small increase but remains lower in concentration than that observed in the main body (540 m to 196 m) for the rest of the hole until the highest sample (6 m). Al_2O_3, TiO_2 and Na_2O do not exhibit any significant change at 196 m (pyroxenite) and Al_2O_3 and Na_2O continue to the top of the drill hole without any deviation in abundance. Above the pyroxenite body (196 m) TiO_2 exhibits a slow increase in abundance until the top. K_2O exhibits a sharp decrease in abundance at the pyroxenite body (196 m) followed by a steady increase above the pyroxenite until the contact with the intrusive Nipigon Sill. Above the sill (30 m) some element abundances begin to exhibit irregular patterns characterised by sharp increases and decreases in abundance. This saw tooth pattern is most apparent in the large ion lithophile elements (particularly K and Ca) while the other elements (Si, Al, Ti) do not exhibit the same pattern probably related to alteration in the upper portion of the intrusion. The highest sample from the drill hole (6.0 m) exhibits Fe, Mg and Ca values which appear anomalous compared to adjacent samples with sharp decreases observed in Fe and Mg and a sharp increase in Ca.

Both the Nipigon Sill, which cross cuts the Seagull Intrusion, and basement lithologies display distinct compositions (see Figs. 6.3 and 6.4). Basement metasedimentary lithologies exhibit a high abundance of SiO_2, Al_2O_3, K_2O, and Na_2O relative to the intrusion and low abundances of Fe_2O_3, MgO, TiO_2 and CaO. The Nipigon Sill exhibits similar SiO_2 and Fe_2O_3 contents to the adjacent lithologies in the Seagull Intrusion; however, it is characterised by elevated values of CaO, Na_2O, Al_2O_3 and TiO_2 in conjunction with lower MgO.

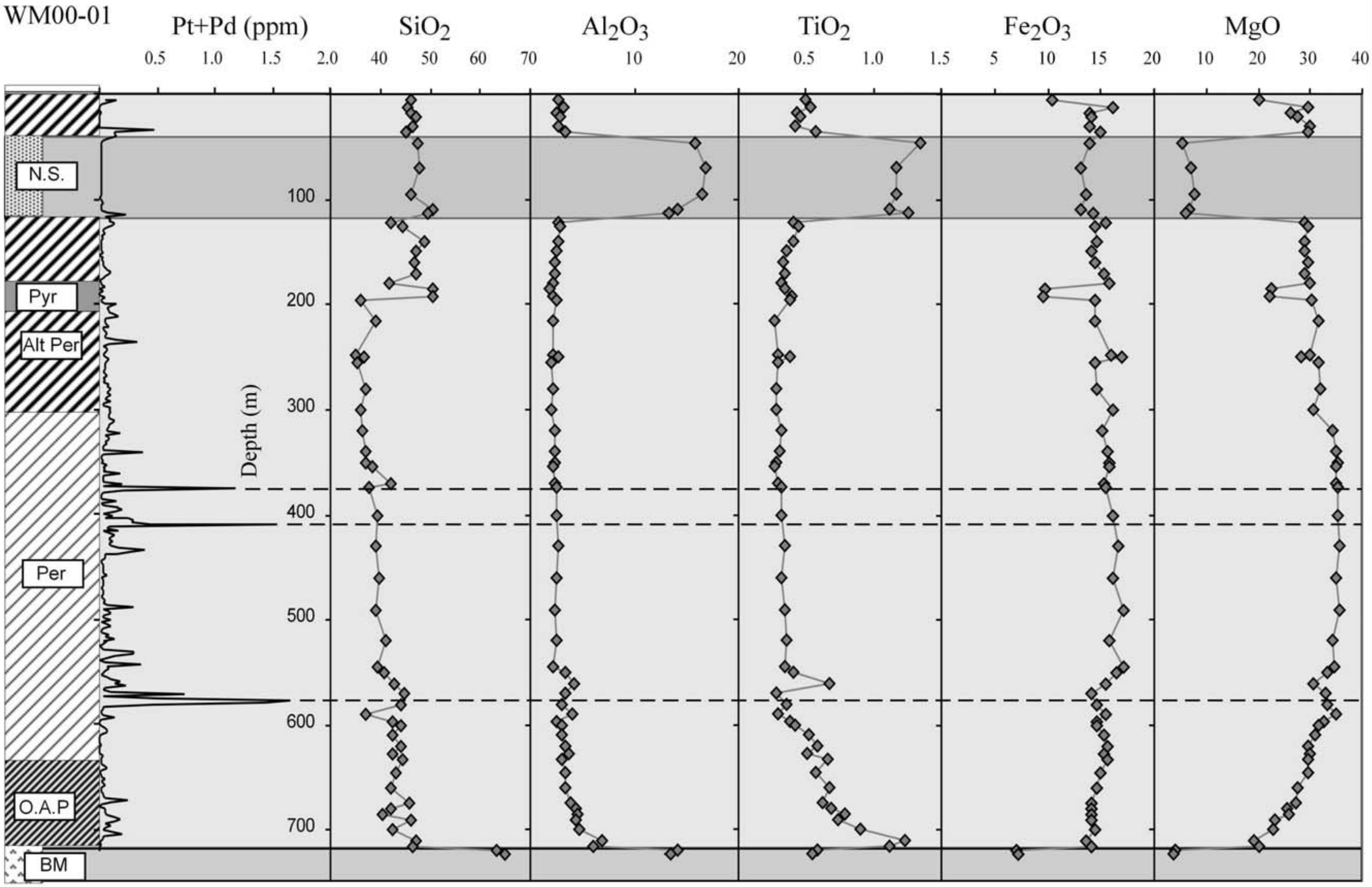

Figure 6.3 Distribution of major elements as Wt% oxide and total PGE (ppm) (Pt+Pd) from drill hole WM00-01. Nipigon Sill and basement are shaded darker grey. Legend O.A.P. - Olivine amphibole pyroxenite, Per - peridotite, Alt Per - altered peridotite, Pyr - pyroxenite, N.S. - Nipigon Sill, BM - basement

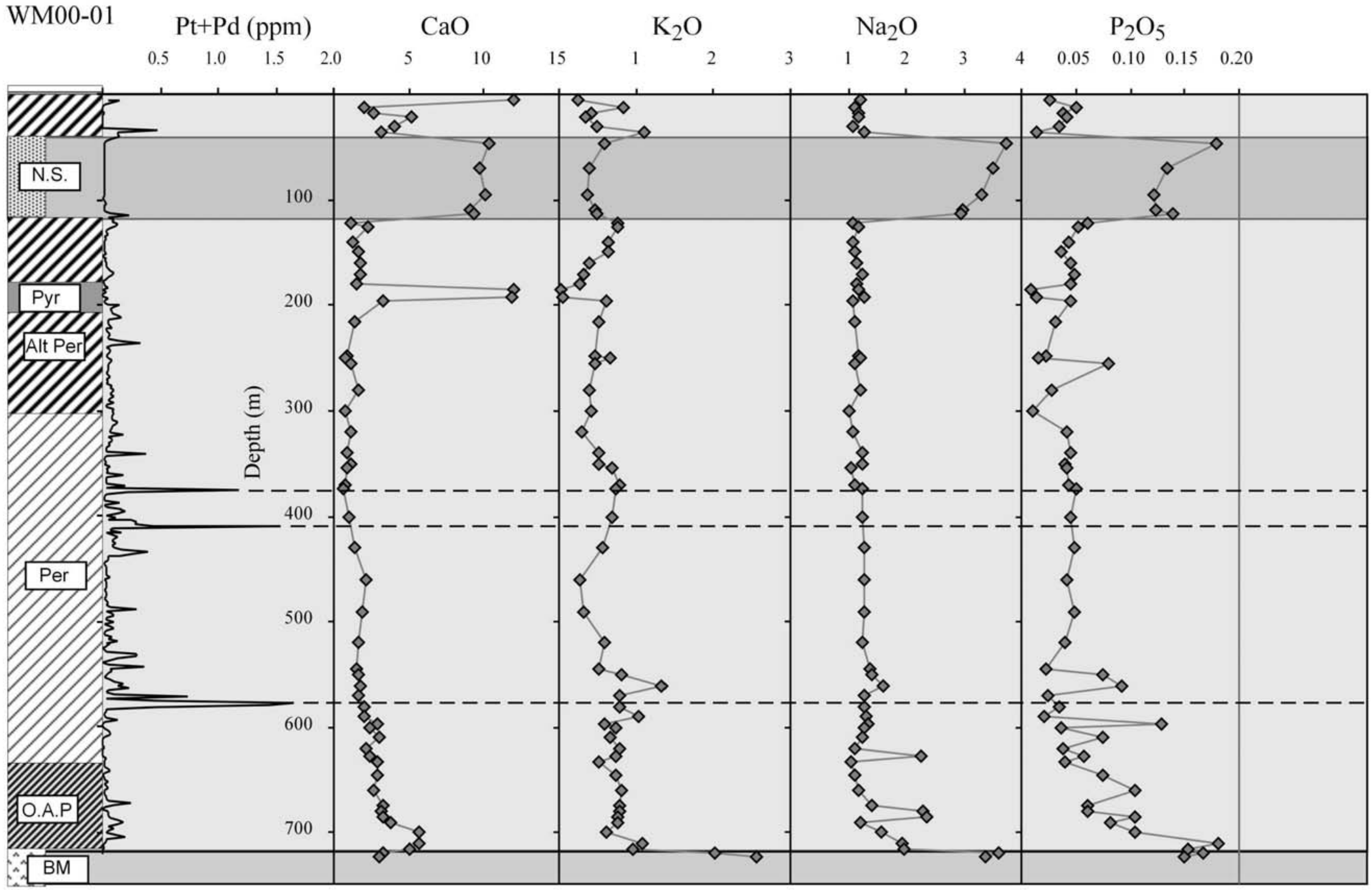

Figure 6.4 Distribution of major elements as Wt% oxide and total PGE (ppm) (Pt+Pd) from drill hole WM00-01. Nipigon Sill and basement are shaded darker grey. Legend O.A.P. - olivine amphibole pyroxenite, Per - Peridotite, Alt Per - Altered peridotite, Pyr - Pyroxenite, N.S. - Nipigon Sill, and BM - basement

6.4.2 Trace Elements

Trace element data from the Seagull Intrusion are given in Appendix D. The Seagull Intrusion exhibits a mineralogical control due to the crystal fractionation of olivine and the effect of trapped liquid on the distribution of trace elements in the intrusion as exhibited in Figure 6.5. On a plot of Y versus Zr (Fig. 6.5A) there is a linear trend paralleling the trend recognized as a control line of plagioclase and olivine, given the low abundance of plagioclase in the rocks, suggests that olivine is the dominant control. In Figure 6.5B the geochemical data also plot on a trend paralleling the plagioclase, apatite and olivine control line. On this plot clinopyroxene and orthopyroxene control lines are also very similar in nature to that of plagioclase, olivine and apatite, mineralogy suggests olivine is the dominant control. The plot of Nb versus Zr exhibits a greater spread in data not the linear distributions observed in the previous two plots (Fig 6.5C). This is consistent with the scattered distribution of Zr observed in Figure 6.2 and probably related to variations in clinopyroxene and orthopyroxene abundance.

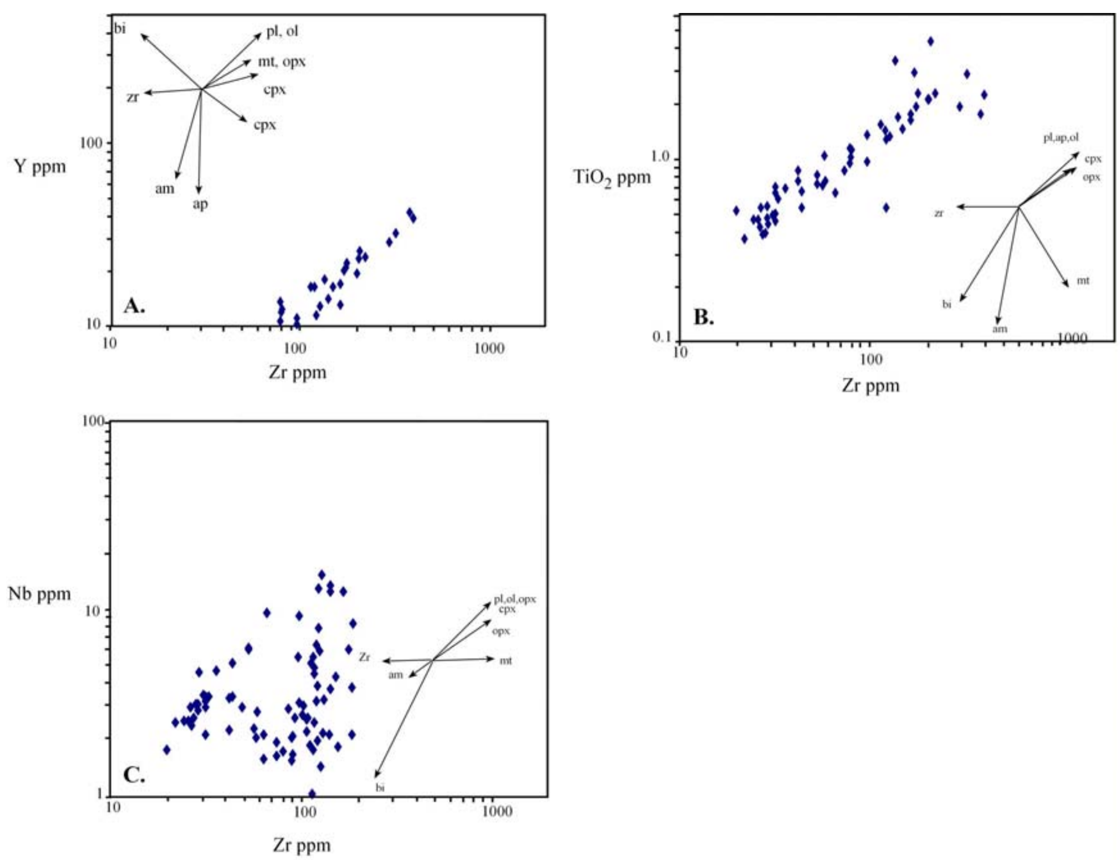

Figure 6.5 Geochemical data from the Seagull Intrusion with additional data from Hart and Magyarosi (2004). A). Y versus Zr with mineral control trend lines shown. B). TiO_2 versus Zr with mineral control lines. C). Nb versus Zr with mineral control lines. Modified from Pearce and Norry (1979). Ol-olivine, cpx- clinopyroxene, opx- orthopyroxene, pl- plagioclase, ap- apatite, mt- magnetite, am- amphibole, bi- biotite and zr- zircon.

Trace elements from the Seagull Intrusion are presented below in primitive mantle normalised diagrams. Primitive mantle normalised element patterns from the Seagull Intrusion (with additional data from Hart and Magyarosi (2004) exhibit similar patterns throughout the intrusion. However trace element geochemistry data can be used to identify 5 distinctive geochemical units within the Seagull Intrusion (Fig. 6.6). These are the Basal Unit, Basal-Main Unit (BM), Main Unit, Main-Top Unit (MT) and Top Unit. Samples collected and utilized in the defining of units are shown in Figure 6.6.

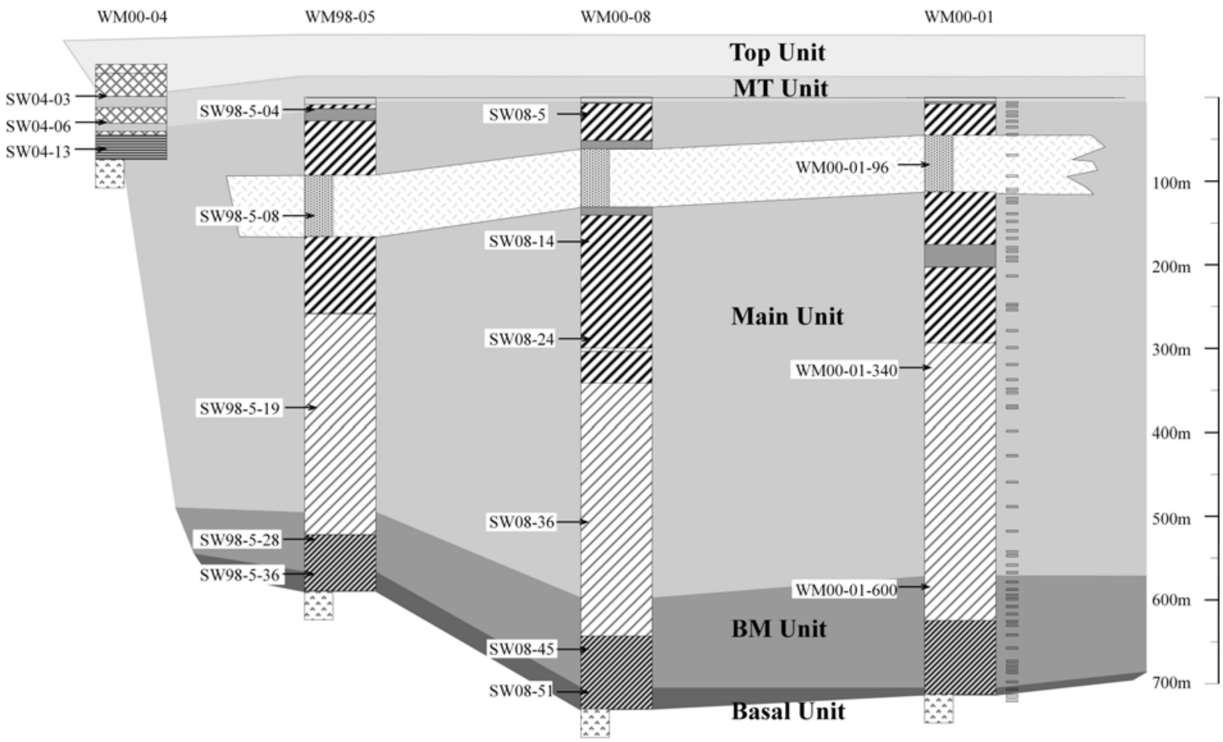

Figure 6.6 Cross section through Seagull Intrusion showing location of samples analysed by ICP-MS for trace elements and rare earth elements. Major unit subdivisions shown by shading. Distance between WM00-04 and WM98-05 not to scale. Legend is the same as in Figure 4.2.

The lowest total abundance of trace element abundance is observed in the Main Unit which occurs in the centre section of the intrusion (see Fig. 6.6) and is defined by the samples SW01-8-36, SW01-8-24, SW01-8-14, SW8-05, SW98-5-19, SW98-5-04, WM00-01-600 and additional samples from Hart and Magyarosi (2004). Mineralogically it is dominated by cumulate olivine and poikilitic pyroxene (see Chapter 4). The primitive mantle normalised pattern of the Main Unit is characterised by light rare earth element enrichment over middle heavy rare earth elements (La/Sm_{cn} = 0.78 to 1.83) and middle rare earth element enrichment over heavy (Gd/Yb_{cn} = 2.09 to 3.73) and a negative Eu anomaly (Eu/Eu^*_{cn} = 0.42 to 0.93: see Fig. 6.7).

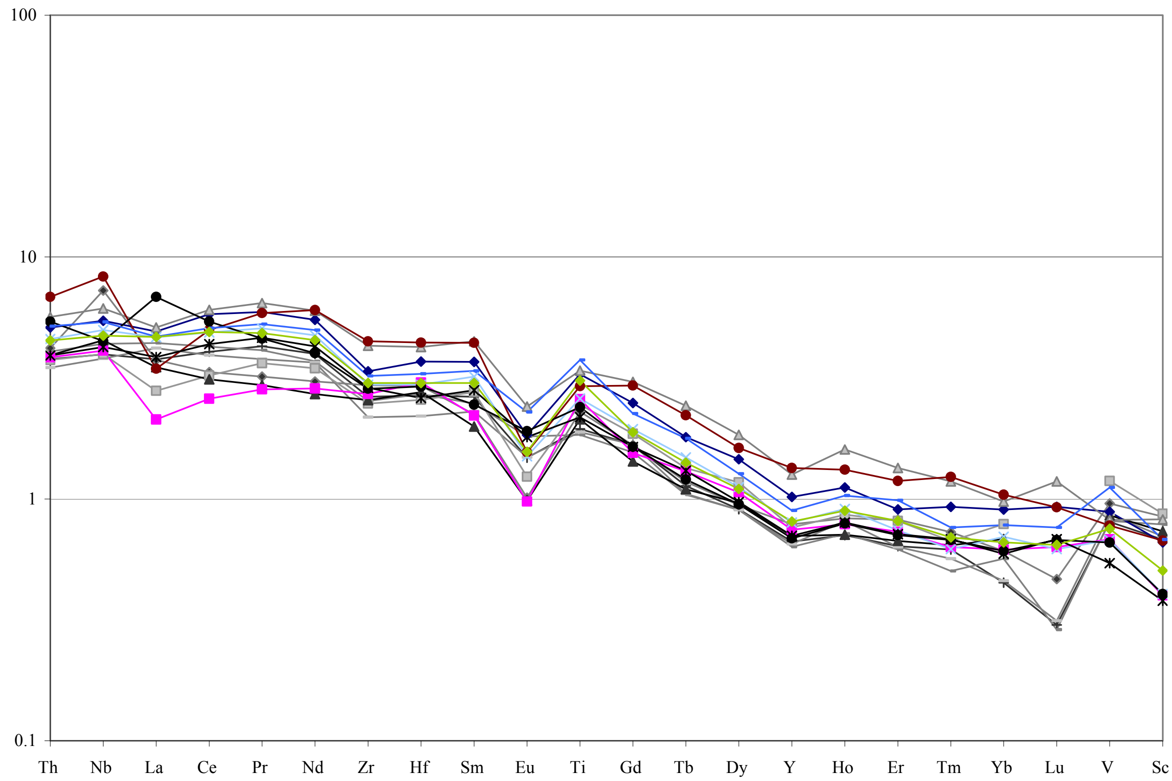

Figure 6.7. Primitive mantle normalised multi-element diagram of the Main Unit of Seagull Intrusion. With additional data from Hart and Magyarosi (2004). Normalising values of McDonough and Sun (1995).

A similar primitive mantle normalised pattern is observed in the BM Unit, however it exhibits an increase in total trace element abundance. The BM unit is found below the Main Unit (see Fig. 6.6) and is characterised by the samples SW98-5-28, SW08-45 and WM00-01-600. Lithogically this unit is characterised by cumulus olivine with poikilitic clinopyroxene and increasing abundances of amphibole and micas. The primitive mantle normalised pattern shown in Figure 6.8 are more LREE enriched than the Main Unit (La/Sm_{cn} = 1.98 to 5.21) and a middle REE enrichment over heavy REEs (Gd/Yb_{cn} = 3.28 to 3.49) with an slight Eu anomaly occurring in one sample. Nb and Th exhibit both positive and negative anomalies. Positive Nb anomalies appear similar to those observed in the Main Unit, while the negative Nb anomaly is similar to those observed in the Basal Unit.

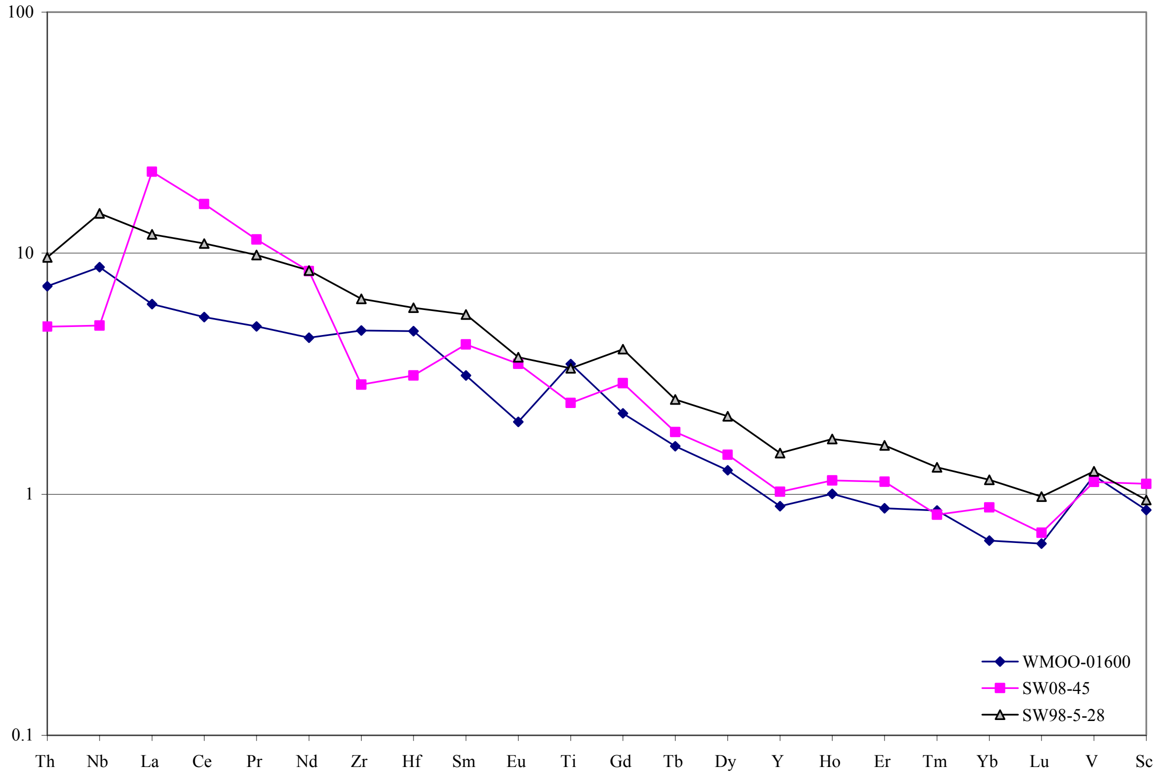

Figure 6.8. Primitive mantle normalised multi-element diagram of the BM Unit of the Seagull Intrusion. Normalising values of McDonough and Sun (1995)

The Basal Unit exhibits a similar primitive mantle normalised diagram as the previous two units; however, total trace element abundances are higher than the previous two units. The Basal Unit is found at the base of the intrusion (Fig. 6.6) and is defined by the samples SW98-5-36, SW08-51 and additional samples from Hart and Magyarosi (2004). The Basal Unit is characterised by a primitive mantle normalised pattern shown in Figure 6.9. It exhibits a light REE enrichment over middle REE (La/Sm_{cn} = 2.63 to 3.13) and a middle REE enrichment over heavy REEs (Gd/Yb_{cn} = 3.39 to 3.71) and subtle negative Eu anomalies (Eu/Eu^*_{cn} = 0.76 to 0.98) in some samples but negative anomalies of Th and Nb occurring in all. The Basal Unit primitive mantle normalised diagram is similar in pattern to Quetico metasedimentary rocks and Sibley metasedimentary rocks (Fig. 6.12) both of which exhibit negative Nb anomalies.

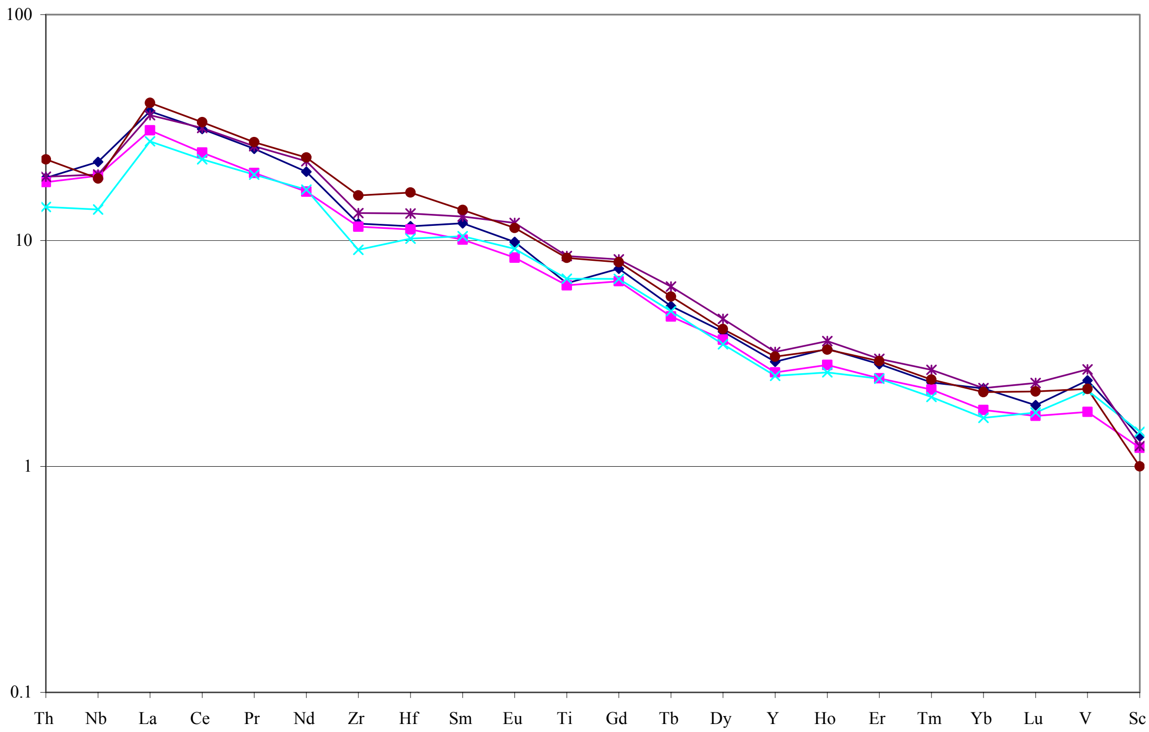

Figure 6.9. Primitive mantle normalised multi-element diagram of the Basal Unit of the Seagull Intrusion. With additional data from Hart and Magyarosi (2004). Normalising values of McDonough and Sun (1995)

The MT Unit located above the Main Unit (see Fig. 6.6) and is defined by surface samples from Hart and Magyarosi (2004). It is characterised by primitive mantle normalised patterns similar to the previous three suites; however, has total trace element abundances greater than those observed in the Main Unit and the Basal Unit but similar in abundance to the BM Unit. The MT Unit exhibits a light REE enrichment over middle REE (La/Sm_{cn} = 1.14 to 3.45) and a middle REE enrichment over heavy REEs (Gd/Yb_{cn} = 3.02 to 3.65) and both positive and negative Eu anomalies (Eu/Eu^*_{cn} 0.53 to 1.09) occurring in some samples but negative anomalies of Th, Nb, Zr and Y occurring in all samples (Fig. 6.10).

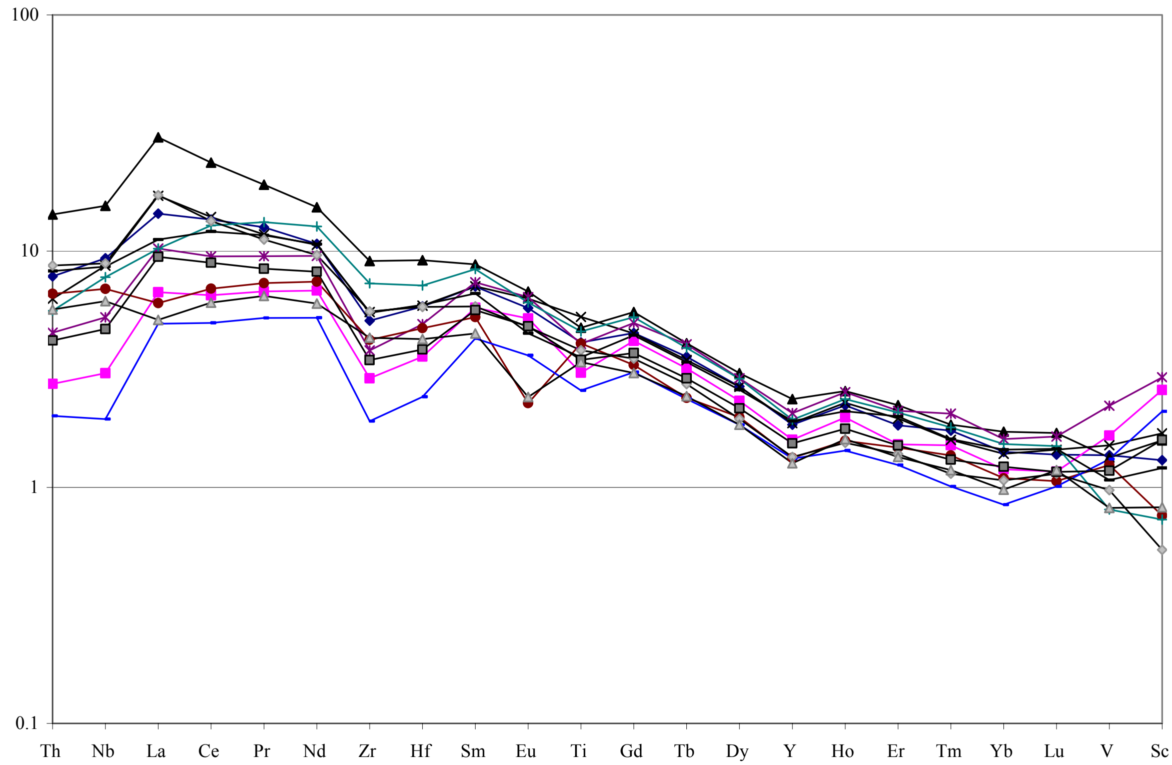

Figure 6.10. Primitive mantle normalised multi-element diagram of the MT Unit of the Seagull Intrusion. Data from Hart and Magyarosi (2004). Normalising values of McDonough and Sun (1995).

The last trace element unit described from the Seagull Intrusion is the Top unit. This unit is represented by samples from drill hole WM00-04 (SW04-03, SW04-06 and SW04-13) and surface samples from Hart and Magyarosi (2004). Lithogically this unit is characterised by cumulate pyroxene (orthopyroxene and clinopyroxene) and olivine with poikilitic feldspar. The primitive mantle normalised pattern shown in Figure 6.11 exhibits the highest total REE abundance observed in the Seagull Intrusion and is characterised by light REE enrichment over middle REE (La/Sm_{cn} = 1.21 to 3.28) and a middle REE enrichment over heavy REEs (Gd/Yb_{cn} = 3.15 to 3.53). Negative anomalies are observed in Th, Nb, Zr, Hf, Ti and Y.

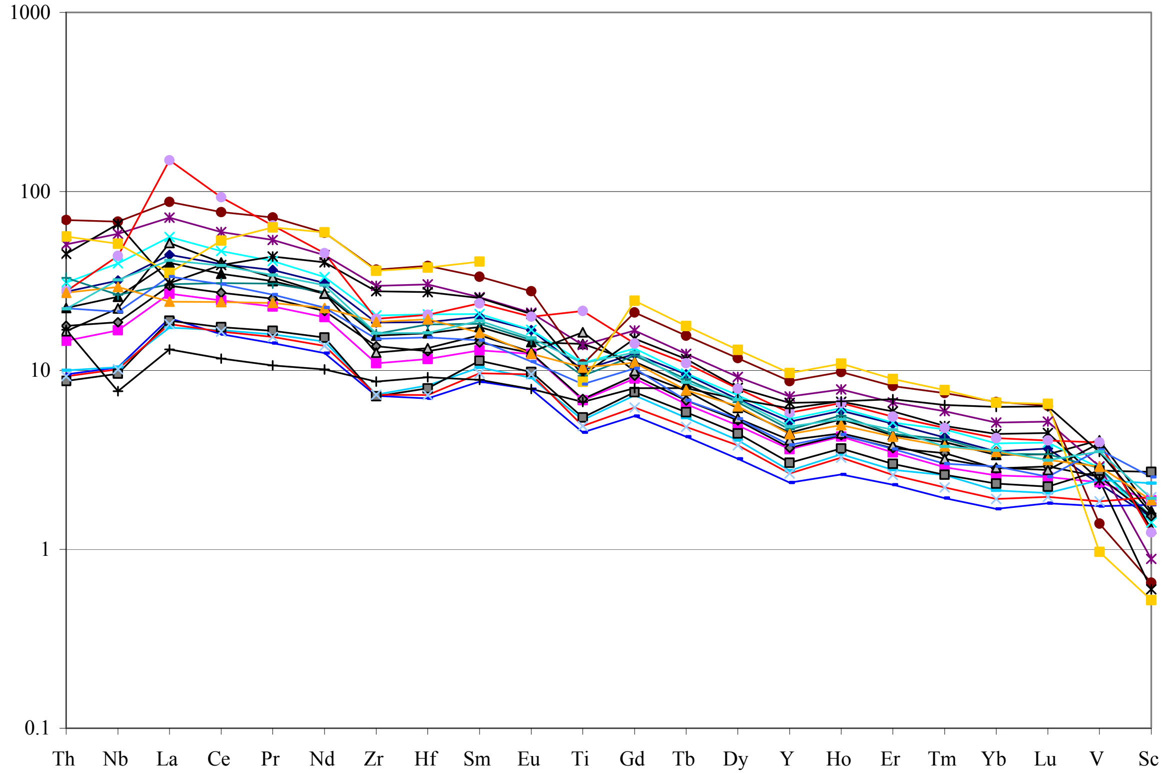

Figure 6.11 Primitive mantle normalised multi-element diagram of the Top Unit of the Seagull Intrusion. Additional data from Hart and Magyarosi (2004). Normalising values of McDonough and Sun (1995)

The cumulative REE patterns are shown in Figure 6.12 and exhibit similar forms and trends with extensive overlap between the units.

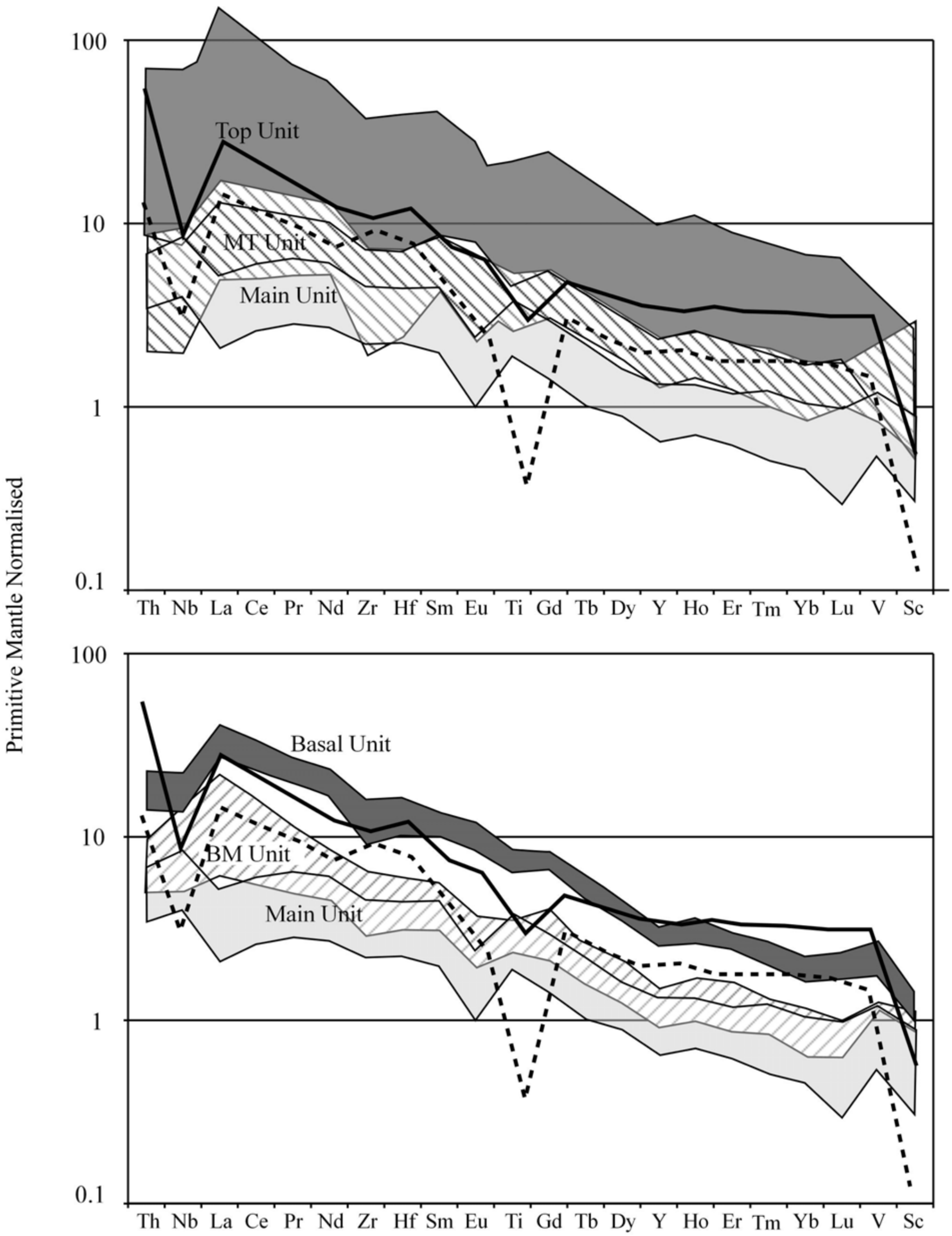

Figure 6.12 Primitive mantle normalised diagram fields of the five units of the Seagull Intrusion.With Sibley (dashed line) and Quetico metasedimentary rocks (solid line) shown. Additional data from Hart and Magyarosi (2004).

6.4.3Radiogenic Isotopes

Isotopic analyses were carried out on 7 samples from the Seagull Intrusion (see Fig. 6.13 and Chapter 2 for sample locations). Isotope work was carried out to assess the degree of crustal contamination occurring in the Seagull Intrusion. Analyses of Rb-Sr and Sm-Nd were carried out at Carleton University, Ottawa, following the analytical procedure outlined in Chapter 2. The data for Rb-Sr analyses is shown in Table 6.1 and Sm-Nd analyses in Table 6.2.

Table 6.1 Results of Rb-Sr isotope analyses

Sample	**Sr (ppm)**	**Rb (ppm)**	**$^{87}Sr/^{86}Sr$ (±0.00002)**	**$^{87}Rb/^{86}Sr$**
SW04-06	303	19	0.70713	0.181
SW08-51	343	32	0.70772	0.270
SW98-5-19	53	21	0.74380	1.153
SW98-5-28	69	26	0.73876	1.096
SW98-5-36	424	29	0.70622	0.198
WM00-01-340	59	19	0.73060	0.936
WM00-01-600	74	32	0.72994	1.257

Table 6.2 Results of Sm-Nd isotope analyses

Sample	**Nd (ppm)**	**Sm (ppm)**	**$^{143}Nd/^{144}Nd$ (±0.000018)**	**$^{147}Sm/^{144}Nd$**
SW04-06	31.7	7.07	0.51205	0.1346
SW08-51	20.7	4.17	0.51188	0.1215
SW98-5-19	2.97	0.73	0.51220	0.1486
SW98-5-28	9.12	2.00	0.51196	0.1325
SW98-5-36	25.1	4.83	0.51185	0.1163
WM00-01-340	3.81	0.83	0.51215	0.1317
WM00-01-600	7.31	1.70	0.51216	0.1406

The data modelled to an age of 1115Ma, as an approximate time of emplacement of the Seagull Intrusion, produces negative ε_{Nd} values ranging from -0.2 to -4.0 (±0.5 ε units) with the general trend of increasing values (less negative) away from the margins of the intrusion (Fig. 6.14B). Initial $^{87}Sr/^{86}Sr_{(1115Ma)}$ produces quite a wide range of values for the samples analyzed, ranging from a low of 0.70340 to a high of 0.72126. For comparison additional data for the Quetico Subprovince and the Sibley Group were utilized. Isotopic analyses of these two lithologies in close proximity to the Seagull Intrusion are not available. However, published and unpublished data are assumed to be representative of the rock units. Data for the Quetico Subprovince rocks is a combination of metasedimentary rocks and anatectic melts from Pan et al., (1999) and Henry et al., (1998). Isotopic data on the Sibley Group metasedimentary rocks is very limited with only two analyses (Samples 03MR4; siltstone and 03MR5; mudstone; Metsaranta, unpublished data). Both the Quetico and Sibley samples produce negative ε_{Nd} values for ages of 1115Ma, the model age of the Seagull Intrusion. With the Quetico samples ranging from values -16 to -23 and the two Sibley samples falling around -5. Initial $^{87}Sr/^{86}Sr_{(1115Ma)}$ for the Quetico samples exhibits a narrower range than that observed in Seagull Intrusion with values between 0.701678 and 0.715596, and the Sibley metasedimentary rocks having values of 0.71999 and 0.75039.

For comparison all samples from the Seagull Intrusion, Quetico Subprovince and Sibley Group Metasediments were plotted on a $^{143}Nd/^{144}Nd$ versus $^{87}Sr/^{86}Sr$ graph (Fig. 6.13). All three units define distinct fields, with Seagull Intrusion samples plotting in the upper left hand corner of the graph, Sibley Group metasedimentary rocks exhibit a higher $^{87}Sr/^{86}Sr$ but a lower $^{143}Nd/^{144}Nd$ ratio. Quetico metasedimentary rocks exhibit the lowest $^{143}Nd/^{144}Nd$, but similar $^{87}Sr/^{86}Sr$ values as observed for the Seagull Intrusion.

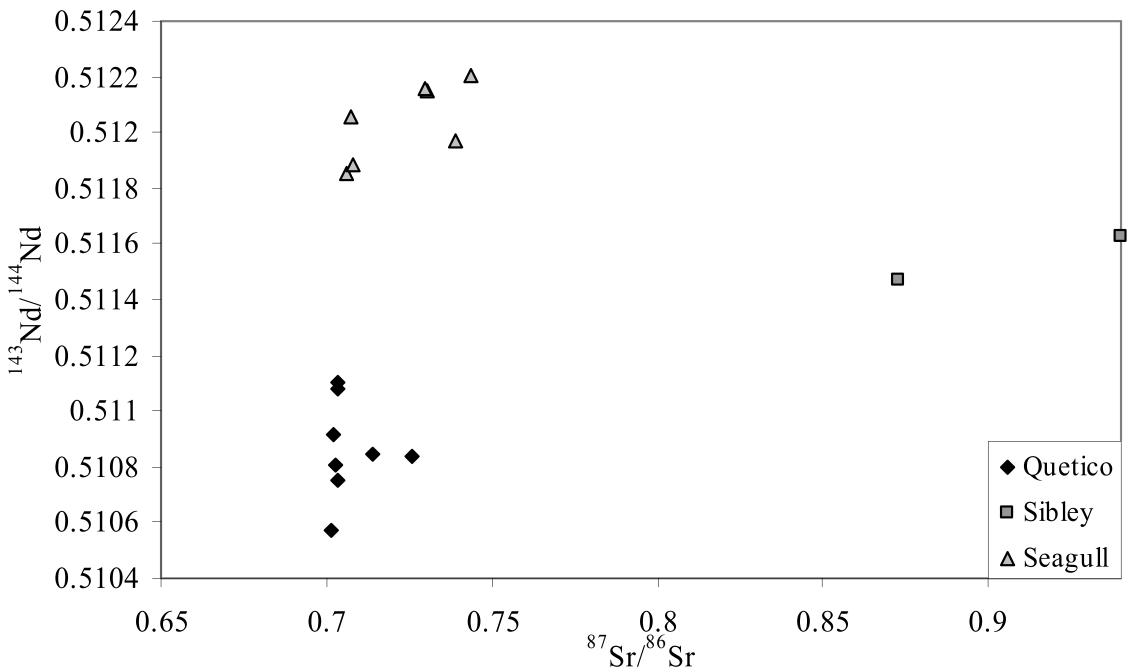

Figure 6.13 $^{143}Nd/^{144}Nd$ versus $^{87}Sr/^{86}Sr$ of the Seagull Intrusion with additional data from Pan et al. (1999) and unpublished data from Metsaranta (2004).

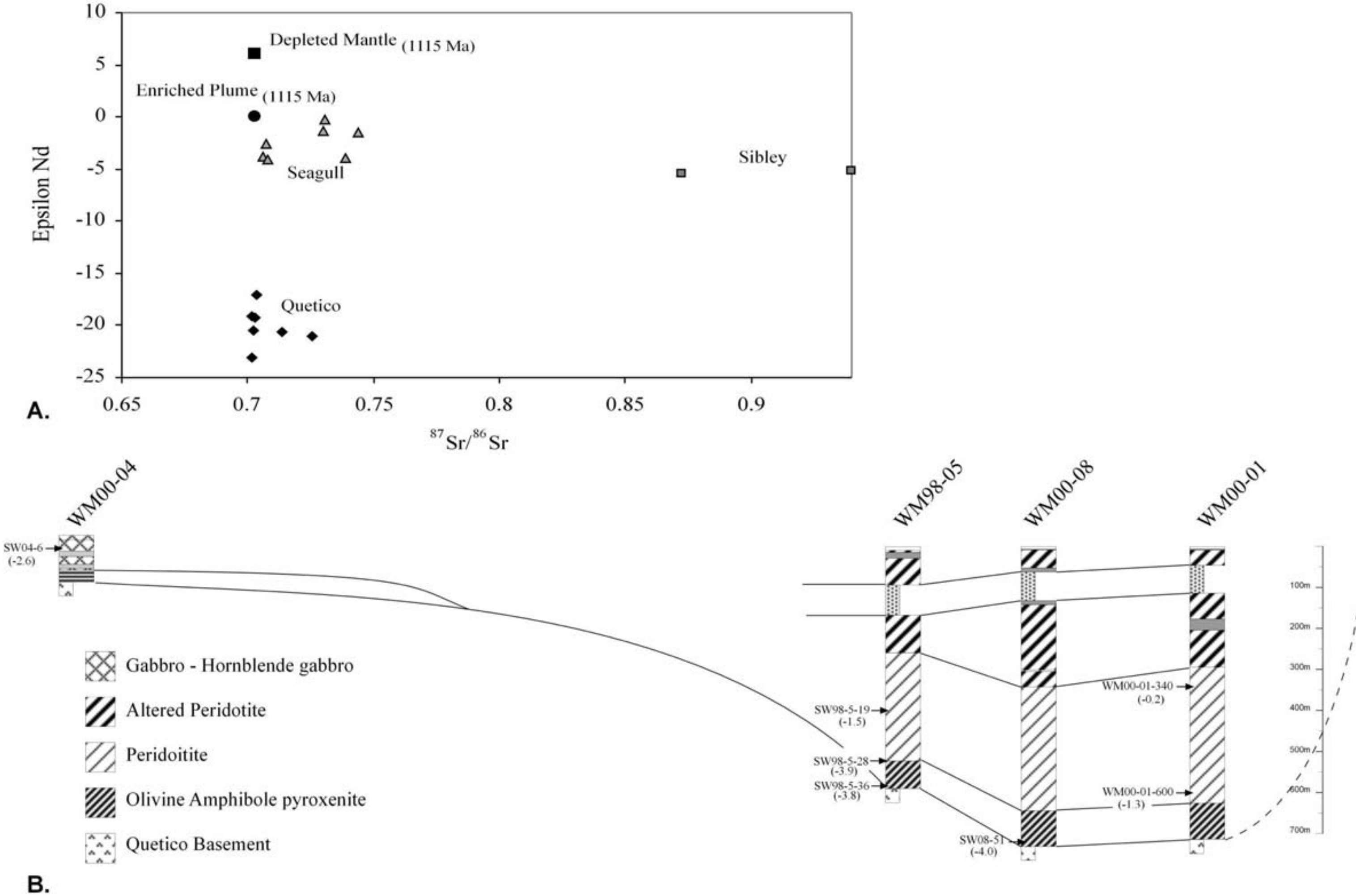

Figure 6.14. **A**. Epsilon Nd versus $^{87}Sr/^{87}Sr$ with analysis from Seagull Intrusion (this sudy), Sibely Group Metasediments (unpublished data R. Menstuarnta, 2004) and Quetico Subprovince (Pan et al., 1999; Henry et al., 1998). With Depleted mantle source and enriched plume source value from Shirey et al. (1994) . **B**. Cross-section through Seagull Intrusion with isotope sample locations shown and Epsilon Nd values in brackets below sample number.

6.5 Discussion

The major element profiles exhibit very little variability with stratigraphic position (Figs. 6.3 and 6.4) and appear to be homogenous as a thin pyroxenite layer/lens occurring at ~196 m is the only substantial change in major element abundance. Subtle and smaller changes are apparent in the major element profiles. The top of the drill hole above the pyroxenite exhibits a subtle increase in SiO_2 and TiO_2 without any significant change in the other elements. This increase perhaps marks the start of the mafic units from the differentiation of an ultramafic magma, being observed at the top of the drill hole and continuing on into the surface samples as they are more mafic than those observed in the drill hole.

The basal region of the intrusion also exhibits major element variation in the form of decreasing SiO_2, Al_2O_3, TiO_2, CaO, Na_2O and increasing MgO and Fe_2O_3 abundances away from the basal contact. Samples within 6m of the contact exhibit this trend much more strongly than the next ~100 m interval. Decreasing element abundance away from the basal contact parallels the major element abundance observed in the basement lithology. SiO_2, Al_2O_3, K_2O and Na_2O all have elevated abundance in the basement relative to the abundance of these elements in the main body of the Seagull Intrusion and exhibit decreases away from the basement contact. While Fe_2O_3 and MgO are in lower relative abundance in the basement lithology than the main body of the intrusion and exhibit increases away from the basement contact, indicating assimilation may have been significant in the basal section of the intrusion. Trace elements from the Main Unit through the BM Unit and Basal Unit are also consistent with contamination effects in the basal region of the intrusion and with a trapped liquid component due to rapid cooling at the margin. The Basal Unit exhibits a Th, Nb and La similar to those observed in the Sibley Group and Quetico Metasediments as both have well defined negative Nb anomalies. The Nb anomaly apparent in the Basal Unit (Fig. 6.9) and decreases in size with height above the basal contact as observed in the BM Unit until the is no longer apparent in the Main Unit.

Assimilation of local contaminants is supported by the isotope systems Sm-Nd and Rb-Sr. Isotope analyses from the Seagull Intrusion as shown in Figure 6.13A are assumed to be a product of mixing of at least three end-members. Potential end members consist of a primary magmatic source, the Sibley Group metasedimentary rocks and the Quetico Subprovince (as the intrusion is shown to cross cut the latter two).

The source area for the magmas generating the Seagull Intrusion is suspected to be a plume source (Shirey et al., 1994). However, the most isotopically primitive samples from the Seagull Intrusion plot below values calculated for depleted mantle (+6 ε_{Nd}) and a value of 0 ε_{Nd} for an enriched plume source at 1100 Ma (Shirey et al. 1994; Fig. 6.14A). The negative ε_{Nd} of the Seagull Intrusion precludes it from being uncontaminated and require the addition of an older crustal component. Both the Sibley Group and Quetico metasedimentary rocks exhibit lower ε_{Nd} (see Fig. 6.14A) and are viable contaminants as they are closely associated with the intrusion (see Chapter 4). Quetico metasedimentary rocks appear to occur as one end-member, along a mixing line between a depleted mantle source, the Seagull Intrusion and Quetico metasedimentary rocks (Fig. 6.14A).

The extent of contamination within the Seagull Intrusion is variable as samples that are closest to the basal contact exhibit the larger negative ε_{Nd} (Fig. 6.14B) indicating that they have been more contaminated by Quetico rocks, while samples in the centre of the intrusion exhibit higher ε_{Nd} values indicating less contamination. The variation within the intrusion may be a function of the initial magmas into the chamber are moderately contaminated by Quetico rocks, a product of transport of magma to shallow crustal levels. This is followed by the stabilization and the decease of thermal erosion in the magma conduits resulting in less contamination as described by Lesher and Arndt (1995) and Sylvester et al. (1997) occurring in the middle and upper portions of the intrusion.

The homogenous nature of mineral chemistry observed (olivine, pyroxene and oxides: see Chapter 5) indicates that minerals have undergone limited fractionation. However, the strong correlations between MgO and other major elements (Fig. 6.2) over a range of MgO values (0-40 wt%) suggest an incremental change occurring throughout the intrusion caused by something other than fractionation. The distribution and abundance of cumulate minerals relative to a trapped liquid component is likely the controlling factor on the major elements and also on trace elements as observed in Figure 6.6 where select incompatible rare earth elements plot along mineral control lines. In Figure 6.6 the control lines for feldspar, olivine and pyroxene are similar in direction however, the petrological work indicates that olivine is the dominant mineral.

This strong mineral control on element distribution influences the primitive mantle normalised trace element plots. All lithologies sampled from the Seagull Intrusion have a broadly similar primitive mantle normalised pattern. Which are generally characterised by a light REE enrichment over middle REE (La/Sm_{cn} = 0.78 to 5.21) and a middle REE enrichment over heavy REEs (Gd/Yb_{cn} = 2.09 to 3.71). Europium, Nb and Th anomalies are noted in some of the units.

Europium is incorporated into the crystal structure of feldspar as it crystallizes in a magmatic system. It is possible that feldspar was crystallizing and being removed from the system perhaps accumulating at the top of a magma chamber. The resulting lithologies at the base would have inherited this negative Eu anomaly. Feldspar rich units formed as a result of crystal accumulation are not observed in the Seagull Intrusion; however, a top contact has not been observed and it is probable that weathering and glaciation has removed the upper portion of the original intrusion.

Niobium and thorium anomalies occur in the Basal Unit, BM Unit and weakly in the Main Unit and are thought to be a function of contamination given the correlation between $^{143}Nd/^{144}Nd$ and the two elements (Figs. 6.15A and B).

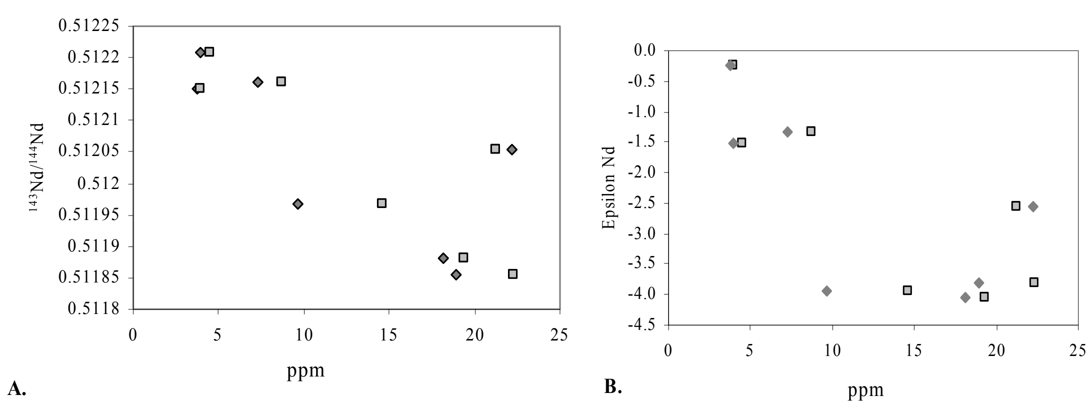

Figure 6.15 A) $^{143}Nd/^{144}Nd$ versus Th (grey diamonds) and Nb (grey squares) primitive mantle normalised. B) Epsilon Nd versus Th (grey diamonds) and Nb (grey squares) primitive mantle normalised from the Seagull Intrusion. Normalising values of McDonough and Sun (1995).

The division of the intrusion into five units defined by the trace elements as shown in Fig. 6.6 was based on total trace element abundance and the vertical distribution of the samples as the primitive mantle normalised patterns are similar as a result of the evolution of the Seagull Intrusion being dominated by cumulate olivine. The resulting primitive mantle patterns reflect the abundance of mineral phases present as simple fractionation typically results in higher absolute abundances of the trace elements without drastically affecting the slope of the pattern.

The Main Unit (Fig. 6.6) is dominated by peridotites to dunites and is the most primitive lithology observed. It also exhibits the lowest degree of contamination based on isotope work. Consequently, this section of the intrusion is interpreted to be the most primitive and uncontaminated lithology in the Seagull Intrusion. This unit is not the first to have developed as it is found above the BM and Basal Units. The primitive nature of the Main Unit is thought to have formed as a result of continued crystallization and accumulation of olivine from an increasingly less contaminated magma as a by product of continued injection through the same conduit (Lesher and Arndt, 1995 and Sylvester et al., 1997). This unit also is characterised by a negative Eu anomaly, and thought to be a result of feldspar crystallizing and being removed from the system, depleting Eu in the system. The units found below the Main Unit are characterised by increasing abundances of total trace elements. The BM Unit and Basal Unit (Fig. 6.6) exhibit increasing degrees of contamination based on isotopes, along with increasing total trace element abundance. Modelling of the REE abundances occurring in the bottom two units, using the Main Unit as a starting composition for the magma has shown that, a primitive mantle normalised pattern similar to the Basal Unit can be produced utilizing the mineralogy observed in the basal section of the intrusion and the assimilation of ~15% contaminant followed by 20% crystallization of the contaminated magma. The contaminants utilized were Sibley metasedimentary rocks and Quetico metasedimentary rocks with both producing similar results. Based on trace elements it is unknown the true contaminant as the primitive mantle normalised patterns of Sibley Group metasedimentary rocks, and Quetico metasedimentary rocks are similar (Fig. 6.12) however the isotopic evidence would support Quetico metasedimentary rocks as being the dominant contaminant. The trace element units observed above the Main Unit (Fig. 6.6) exhibit similar patterns of increasing total trace element abundance as observed in the BM and Basal units, while exhibiting a change in dominant mineralogy. The MT and Top Units are characterised by more mafic lithologies with cumulate pyroxene becoming dominant and abundant feldspar indicating the trace metal abundance change is consistent with fractionation to a more evolved component of the system and can be modelled as such with 80% crystallization of a magma with a starting composition of the Main Unit and pyroxene, feldspar, olivine and oxides crystallizing.

6.6 Conclusions

Major and trace element analyses of whole rock samples from the Seagull Intrusion indicate the lower ultramafic section observed in drill holes WM00-01, WM98-05, and WM01-08 is very homogenous in nature and does not exhibit any substantial geochemical change. This homogeneity is thought to be a function of a stable magmatic system. The upper section of the Seagull Intrusion (surface outcrops) exhibits a wider distribution of major and trace element abundances, the result of fractionation to more mafic lithologies occurring in the upper sections of the system. Isotopic data indicate that the intrusion is contaminated with older crustal material probably Quetico metasedimentary rocks. The extent of contamination is greatest near the base of intrusion and decreases away from the contact. It is this contamination which is responsible for the mineralization observed in some drill holes at the basal contact. Assimilation of metasedimentary lithologies and the sulfur contained within, lead to sulfur saturation and the segregation of an immiscible sulfide melt in the basal region. Mineralization occurring higher in drill hole WM00-01 however does not exhibit similar characteristics as it is contained within the monotonous homogenous ultramafic sequence and in such formed by a different methodology.

CHAPTER 7
MINERALIZATION

7.1 Introduction

Significant mineralization in the Seagull Intrusion occurs in two forms. The first form of mineralization being found along the basal contact of the intrusion, and the second form of mineralization occurring some distance (greater than 100 m) above the base of the intrusion. Understanding these two areas hosting mineralization is critical to the development of models for ore deposit genesis.

7.2 Objective

Initial sampling carried out by property operators focussed on surface samples and regolith overlying the intrusion and exhibited elevated metal values. Mineralization (Ni, Cu, Pt and Pd) associated with visible sulphide was first intersected in drill core in 1998 by Avalon Ventures (see Chapter 2). Additional drilling further delineated sporadic mineralization along the base of the intrusion in the deeper sections of the intrusion (Fig. 7.1). As well as spikes of Pt, Pd, Ni and Cu occurring at various locations above the basal contact (Fig. 7.1) Mineralized zones where looked at to further the understand the relationship between the two areas of mineralization.

7.3 Previous Work

Mineralization recognized in the Seagull Intrusion as of 2002 is described in Chapter 2 and summarized as 1) insitu weathering producing a PGE enriched regolith above the intrusion (Osmani and Rees, 1998a) 2) magnetite PGE-rich reef type found in the upper ~65m of the intrusion (Pettigrew, 2002) and 3) basal mineralization formed by sulphide segregation (Osmani and Rees, 1998a).

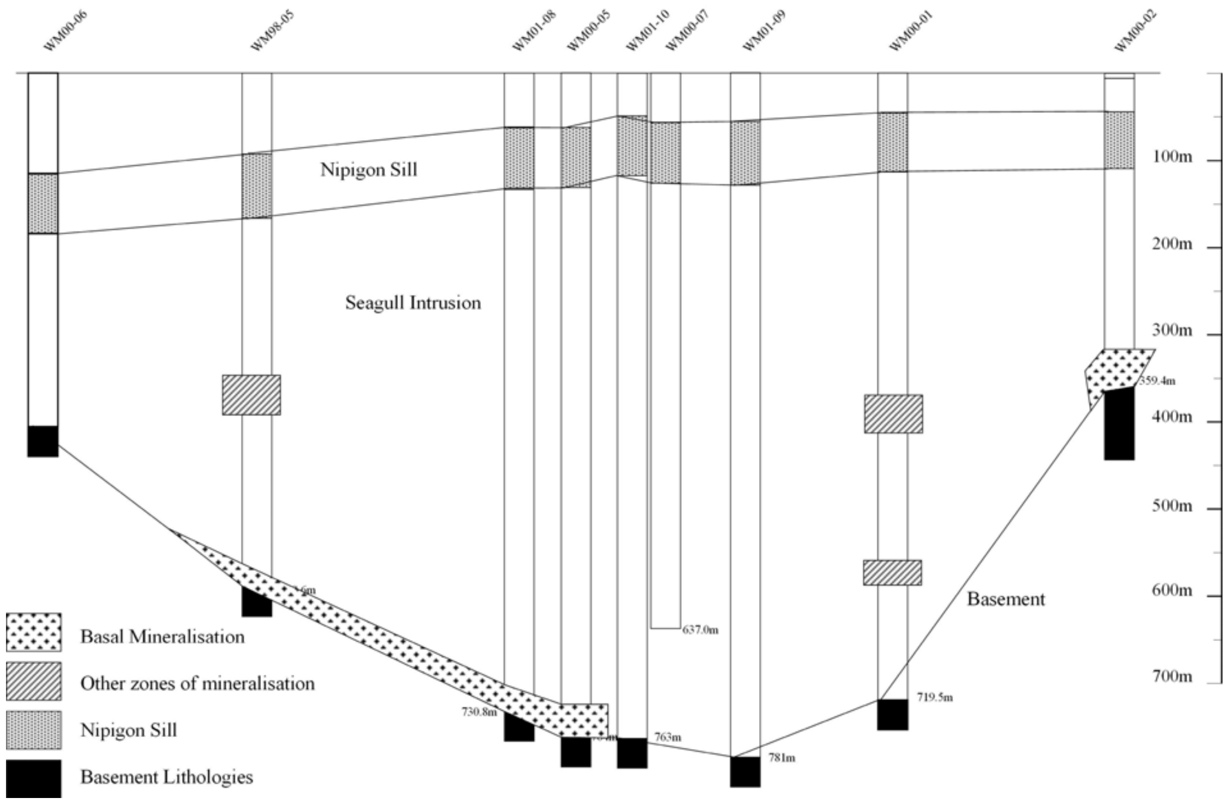

Figure 7.1 Cross section though Seagull Intrusion (see Fig. 2.2 for drill hole locations and cross section line) with major lithologies shown and zones of identified mineralization as of 2002.

Additional work looking at sulphide saturation in drill hole WM00-01 was carried out by Kissin (2003) who concluded that requirements for sulphide saturation had been met a number of times in the Seagull Intrusion as observed in drill hole WM00-01 (10 m interval at the base of the intrusion, at 580 m, 140 m and 120 m) with an immiscible sulphide melt forming at 420 m and 580 m resulting in mineralization at these latter two intervals.

7.4 Results

Mineralization in the Seagull intrusion occurs in a number of settings; however, the focus of work, was on mineralization occurring at the base of the intrusion (Fig. 7.1) and mineralization previously recognized as “other zones of mineralization” (Fig. 7.1). This current work along with work carried out by the Lake Nipigon Region Geoscience Initiative (Hart 2004) has renewed interest in the intrusion as a result of the recognition of a laterally continuous mineralized zone which was previously only recognised in drill holes WM00-01 (the lower zone) and WM98-05 as ‘other mineralization’ (Fig. 7.1). Infill sampling carried out from drill holes WM00-05, WM00-07, WM01-08, WM01-09, and WM01-10 supports the development of a mineralized zone in the Seagull Intrusion at ~ 400 to 580m below the surface (Fig. 7.2). It is this zone (RGB Zone) and basal mineralization which are the focus of this chapter.

This study has focussed on the silicate mineralogy, petrology, whole rock analyses on drill holes WM00-01, WM98-05 and WM01-09 however in light of the RGB Zone the importance of the other drill holes becomes apparent, and consequently additional metal (Pt, Pd) data of mineralized zones from East West Resources Inc. will be used from drill holes WM00-05, WM00-07, WM01-08 and WM01-10 (Fig. 2.2 for location).

7.4.1 Platinum Group Elements

Platinum group elements show enrichment in a number of zones in the Seagull Intrusion with the most metal-rich zones being near the basal contact and the RGB Zone (Fig. 7.2). Significant basal mineralization (Pt+Pd >474 ppb; derived from applying a cutting factor of the average of Pt and Pd values from the drill hole) does not occur in all drill holes which intersect the basal contact. Drill holes with basal mineralization examined in this study are WM98-05, WM00-05, WM01-08, and WM00-02. Drill holes WM00-01, WM01-09 and WM01-10 do not contain any significant basal mineralization and hole WM01-07 did not intersect the basal contact (Fig. 7.2). The resulting distribution shows the western side of the intrusion containing basal mineralization while the eastern side does not contain significant mineralization along the cross section line. Drill hole WM00-02 contains basal mineralization; however, the basal contact is at a considerable higher elevation within the intrusion compared to the other drill holes (Fig. 7.2).

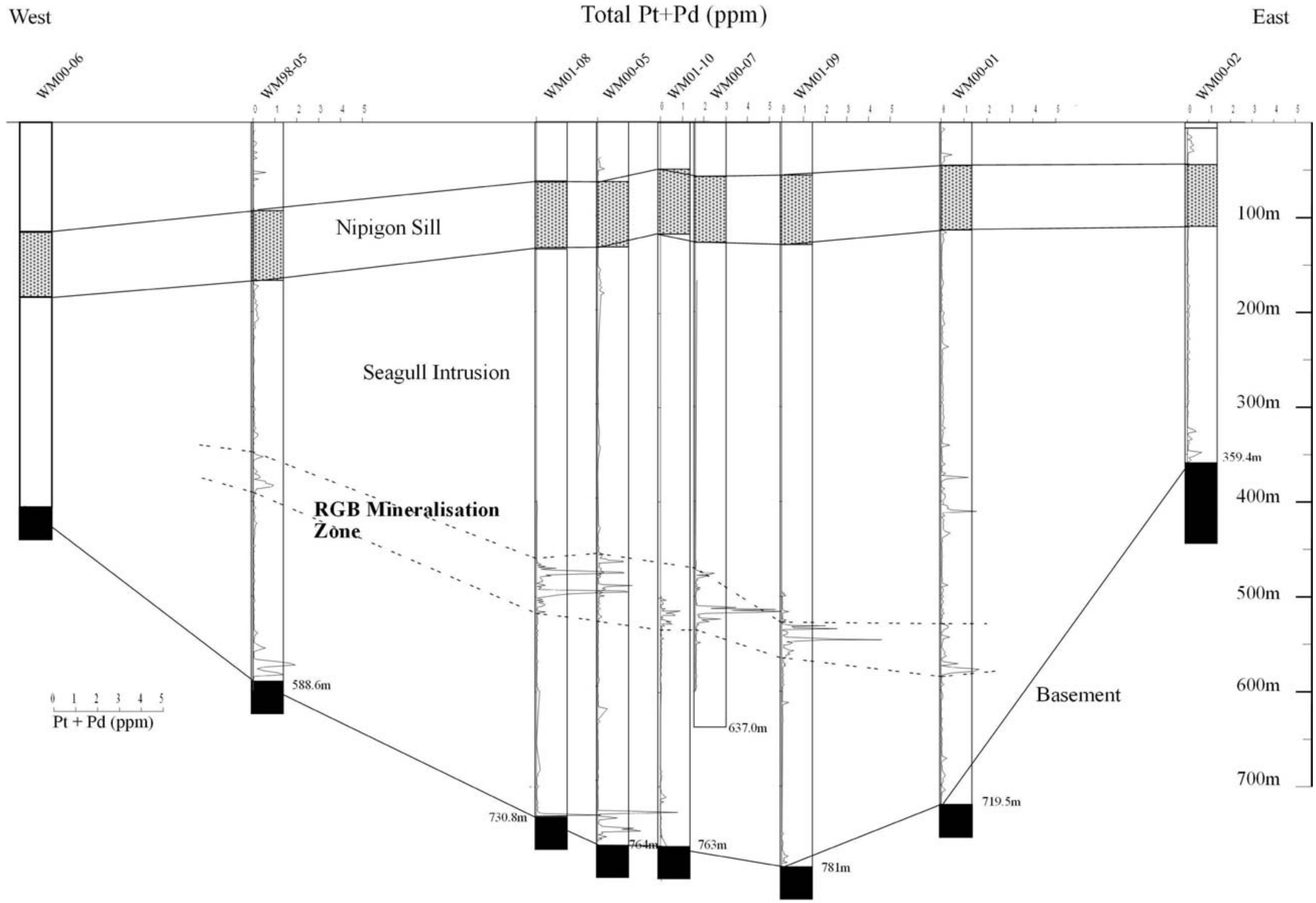

Figure 7.2 Cross section through the Seagull Intrusion along line 1, from Figure 2.2, with total PGE (Pt+Pd) ppm plotted versus depth below surface.

The RGB Zone has currently been intersected in drill holes WM00-01, WM01-09, WM01-07, WM01-10, WM00-05, WM01-08 and WM98-05 (Fig. 7.2). The zone varies in width from a maximum of 74 m in drill hole WM98-05 to a minimum of 8 m in drill hole WM00-01, with an average width of ~38 m. The maximum width occurring in drill hole WM98-05 may be larger than the actual mineralized zone as sampling was carried out at a 2 m resolution in this hole and WM00-01, while the other drill holes were sampled at a 1 metre resolution providing a much finer control on distribution of platinum and palladium. With the 1 m sampling it becomes apparent that the RGB Zone consist of at least two mineralized horizons, possibly three (Fig. 7.3).

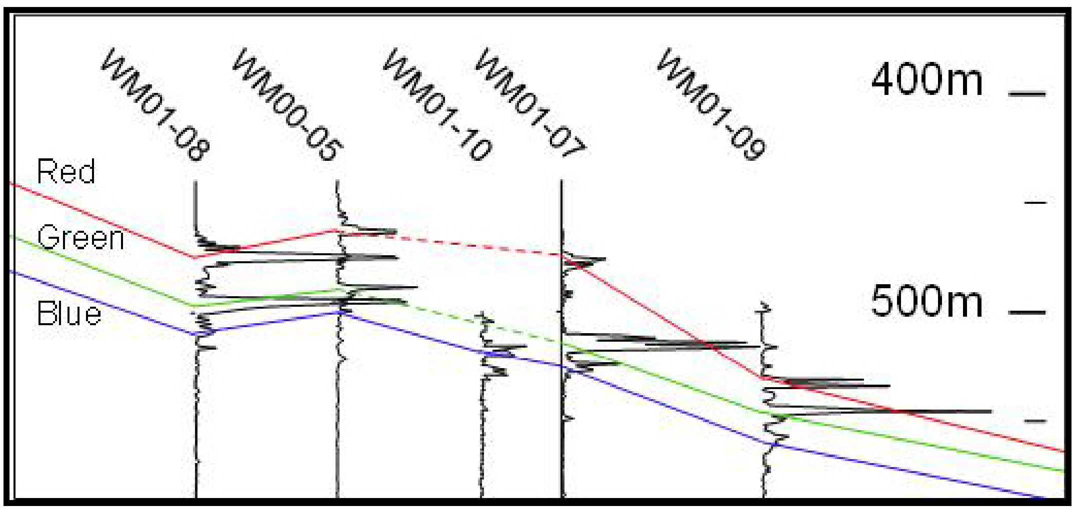

Figure 7.3 Expanded view of the RGB Zone with Red Horizon, Green Horizon and Blue Horizon shown.

The three horizons are defined by peak PGE values (Pt+Pd) over an interval with a vertical spacing greater than 2 m between the next peak PGE value. Based on this, two well defined peaks are observed (Red horizon and Green horizon) with a smaller peak occurring underneath (Blue horizon). Mineralized horizons occur as thin usually less than 2 m wide zones (>1000 ppb Pt+Pd) with a narrow less mineralized area immediately above and below. Horizons are sub-parallel and are consistent relative to each other in terms of PGE abundance (Green Horizon has the highest abundance followed by Red Horizon then Blue Horizon). Drill hole WM01-10 is the exception to this with only minor mineralization occurring, correlated with the Blue Horizon. Well defined horizons are not present in drill holes WM00-01 and WM98-05; however, as mentioned previously this may be a function of sample resolution rather than the horizons not being continuous.

7.4.2 Nickel

Comprehensive analyses for nickel was carried out on drill holes WM00-01, WM00-02, and WM98-05 (Fig. 7.4) by Avalon Ventures and East West Resources. Ni contents of the Seagull Intrusion are relatively constant, averaging ~1000ppm from the three drill holes, reflecting the dominance of Ni partitioning into olivine. However, a number of Ni spikes can be seen above the background of ~1000 ppm Ni, all correlating with known Pt and Pd mineralization (Figs. 7.2 and 7.3). Drill holes with detailed Ni analyses allow for a more in-depth look at mineralization and magmatic processes. All the drill holes (WM00-01, WM98-05, WM01-08, WM00-05, WM01-10, WM00-07 and WM01-09) except WM00-02 exhibit trends of increasing Ni-content up from the basal contact or basal mineralization if present. This trend decreases in intensity to a relatively constant value until mineralization of the RGB zone occurs where Ni peaks are observed in all drill holes (Fig. 7.4). Above this there appears to be two different trends. The first, observed in drill holes WM98-05 and WM00-02, exhibits a relatively constant abundance of Ni in the intrusion through to the upper levels of the drill hole. The second trend is observed in drill holes WM00-01 and WM00-05 and shows decreasing Ni abundance stratigraphically upwards. Drill hole WM00-01 exhibits two cycles of decreasing Ni abundance, each on the scale of 150 to 200 m with the transition between the two marked by zones of Pt and Pd mineralization (Fig. 7.2). Drill hole WM00-05 only exhibits a gross trend of decreasing abundance; however, the assay sampling resolution in the upper sections of WM00-05 is very coarse (10-50 m) and may obscure trends with a smaller wavelength as observed in WM00-01.

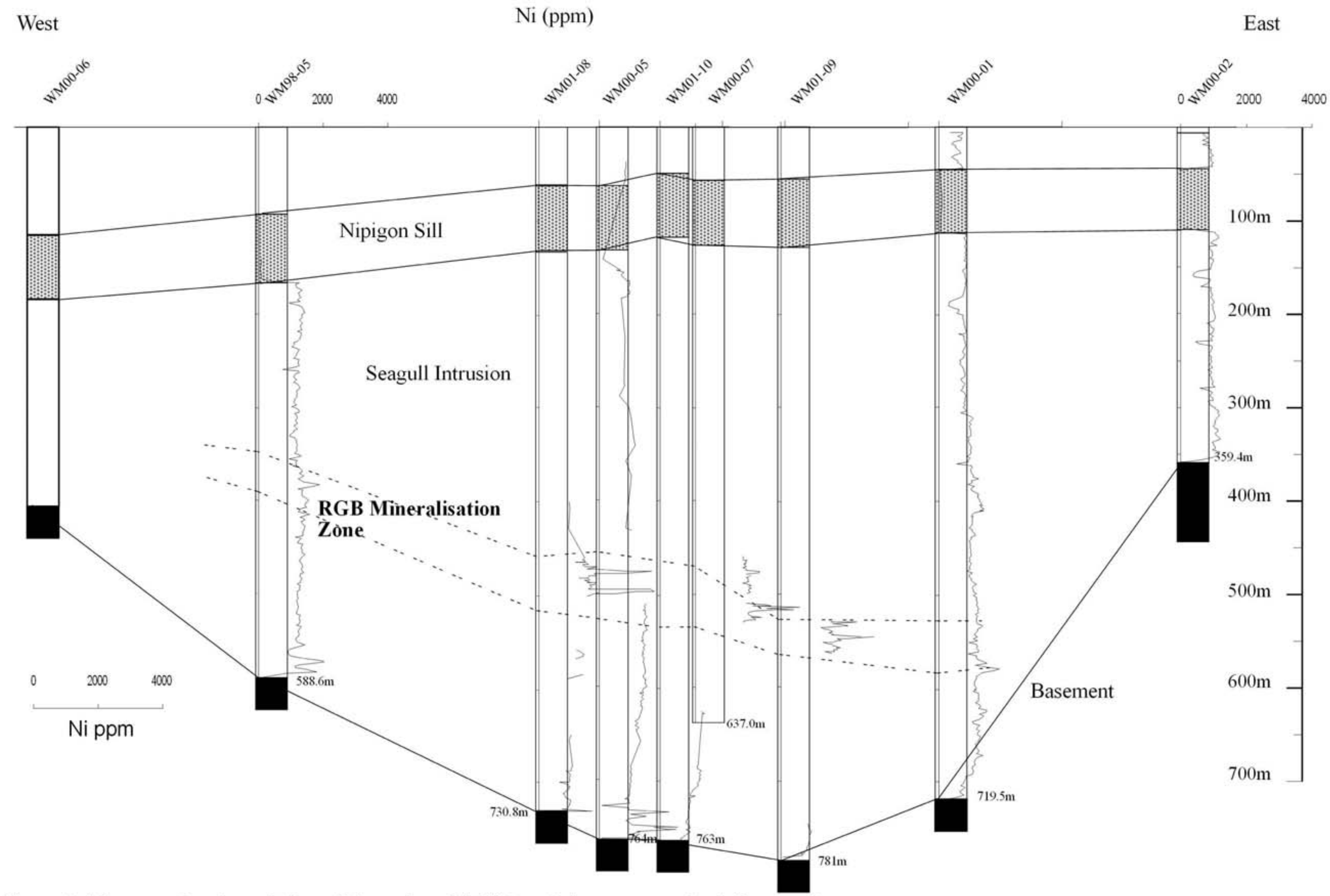

Figure 7.4 Cross section through Seagull Intrusion with Ni (ppm) shown versus depth from surface.

7.4.3 Copper

Comprehensive analyses of copper by assay carried out by Avalon Ventures and East West Resources Inc, on the drill holes WM00-01, WM00-02, and WM98-05 are shown in Figure 7.6. Elevated contents of Cu in the Seagull Intrusion correlate closely with zones of mineralization (Fig. 7.5). Average Cu contents for the three drill holes is ~70 ppm providing a background value while mineralized zones can contain up to 6880 ppm (WM01-08). In addition to the main mineralized zones (basal mineralization and the RGB Horizon), a number of other smaller peaks can be observed (drill hole WM00-01) that correlate with small peaks in Pt+Pd (less than the threshold for significant mineralization ~300 ppb: Fig. 7.2). Enrichment or depletion trends are not as apparent with Cu values as with Ni.

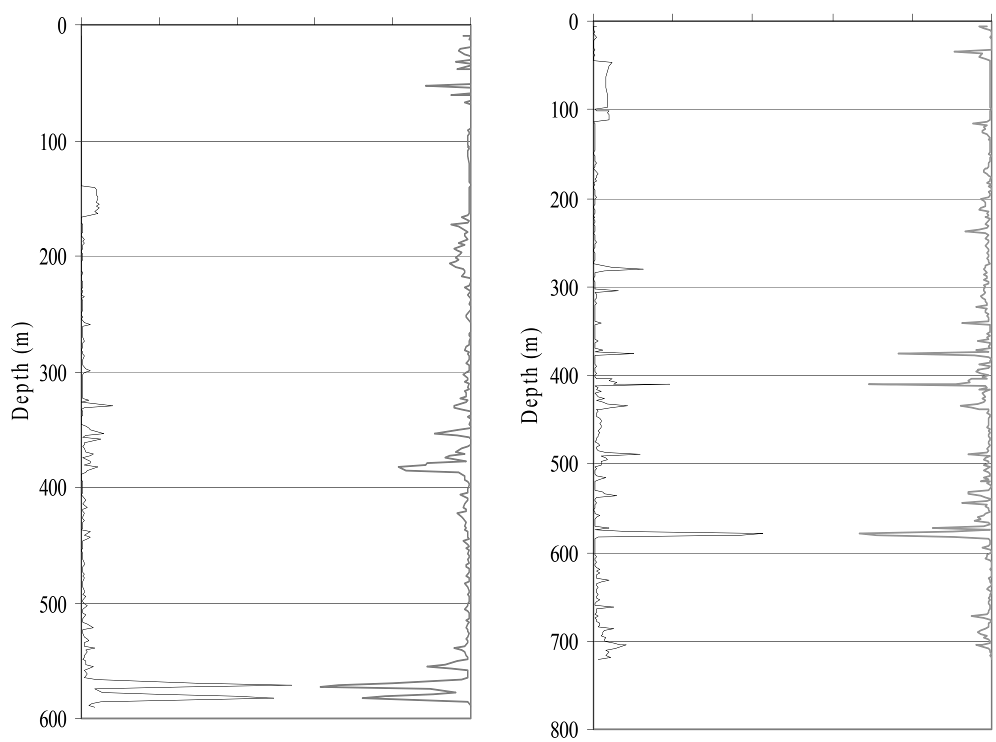

Figure 7.5 Copper (profiles on left) and total PGE (profiles on right) from drill hole WM98-05 (left) and WM00-01 (right) Note: vertical scale is not the same in both

As observed with nickel there is a decrease in Cu abundance up from the basal contact to the mineralization of the RGB Horizon in both drill holes. Above this values are low except where mineralization occurs and there is a sharp spike.

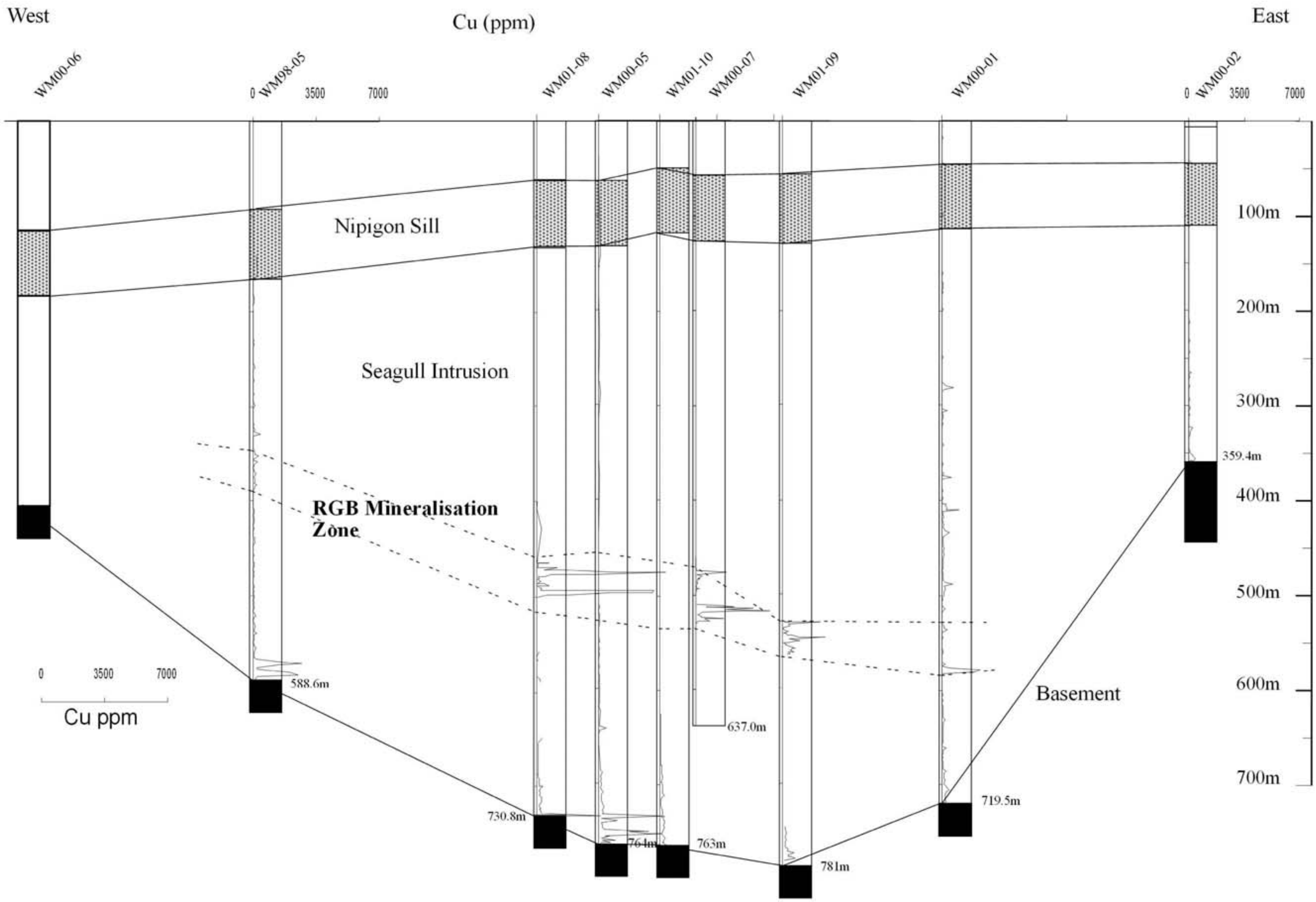

Figure 7.6. Cross section through Seagull Intrusion with Cu (ppm) shown versus depth from surface.

7.4.4 Chromium

Chromium is found throughout the intrusion in varying abundance (Fig. 7.7) with an average abundance of approximately 380 ppm from drill holes WM98-05, WM00-01 and WM00-02. Drill holes WM00-01, WM00-05 and WM98-05 exhibit trends of decreasing Cr content away from the basal contact (Fig. 7.7). Followed by the main part of the intrusion which has a relatively constant value with the exception of sharp spikes occurring in all drill holes. At the scale of assaying carried out there is no apparent correlation between drill holes of peaks in chromium abundance, which would be indicative of oxide layers. Chromite ($FeCr_2O_4$) was not observed in the Seagull Intrusion but elevated Cr is carried in the spinel throughout the intrusion (see Chapter 5). Primary cumulate oxide layers were not observed in the Seagull Intrusion, rather disseminated grains occur in all phases.

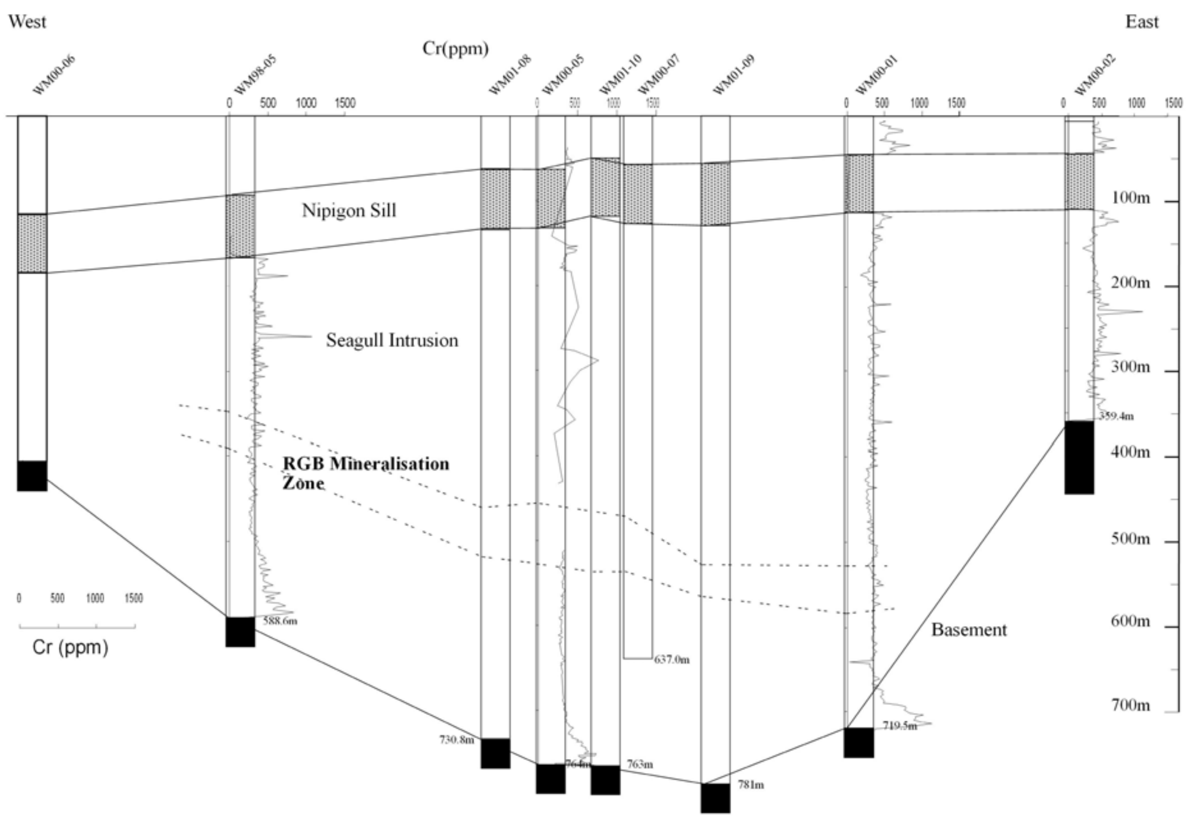

Figure 7.7 Cross section through Seagull Intrusion with Cr(ppm) shown versus depth from surface.

7.5 Native Metals, Sulphides and Platinum Group Mineralogy

Mineral phases identified through SEM work are listed in Tables 7.1, 7.2 and 7.3. Minerals and metals of economic significance (Ni, Cu, PGE and Au) where identified in a number samples from the Seagull Intrusion. Base metal sulphides (Table 7.1) vary in their distribution, pyrite was found throughout the intrusion where as Fe-Ni-Cu sulphides (Fig. 7.8a through f) were only identified in zones of known mineralization. Within these mineralized zones, in close association with Fe-Ni-Cu sulphides (dominantly in contact with or contained within) were found the platinum group minerals (Table 7.2) (Fig. 7.8c, d, e). Native metals were found in two settings. 1) Au and Ag were found as isolated grains along narrow alteration veins in samples which were not identified as being from mineralized areas; and 2) Native Cu was found both as isolated grains in narrow alteration veins, but more commonly as a cross cutting phase with Fe-Ni-Cu sulphides in samples from mineralized zones and occasionally cross cutting oxides as shown in Fig.7.8f.

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Table 7.1 Base Metal Minerals

Mineral	**Formula**
Pyrite	FeS_2
Bravolite	$(Ni,Fe,Co)S_2$
Cubanite	$CuFe_2S_3$
Millerite	NiS
Sphalerite	ZnS
Pyrrhotite	$Fe_{1-x}S$
Fukuchilite	$(Cu,Fe)S_2$
Bogdanovite	$(Au,Te,Pb)_3(Cu,Fe)$
Rucklidgerite	$(BiPb)_3Te_4$
Idaite	Cu_3FeS_4

Table 7.2 Platinum Group Minerals

Mineral	**Formula**
Polarite	Pd(Bi,Pb)
Sobolevskite	Pd(Bi,Te)
Mertieite	$Pd_8(Sb,As)_3$
Telluropalladinite	Pd_9Te_4
Testibiopalladite	PdTe(Sb,Te)
Sperrylite	$PtAs_2$

Table 7.3 Native Metals

Metal	
Copper	Cu
Gold	Au
Silver	Ag

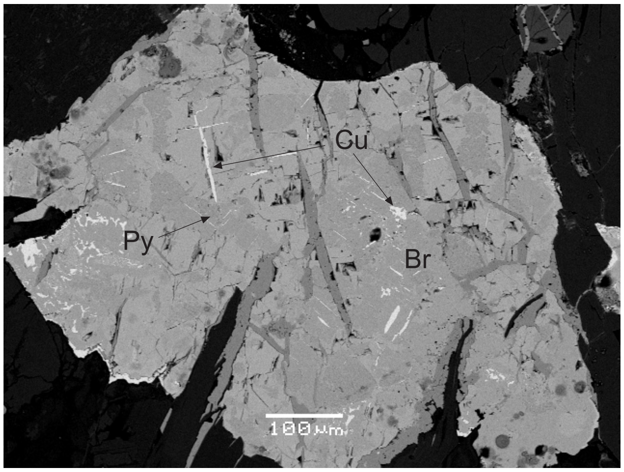


Figure 7.8a. SEM electron back scatter image of sulfide grain from sample SW98-05-32. Drill hole WM98-05, 570.50m depth. Br- Bravolite, Py- Pyrite, Cu - Copper

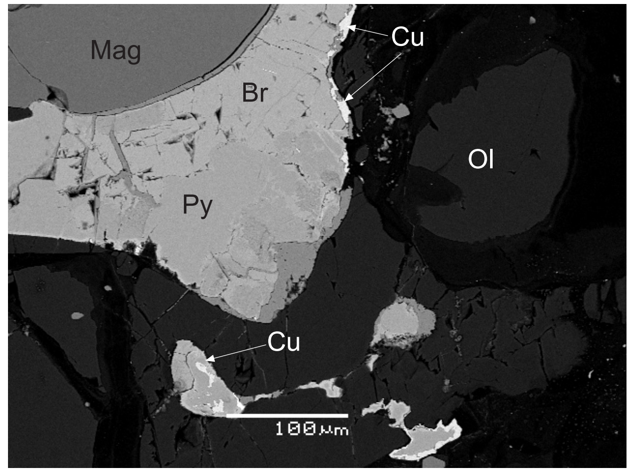


Figure 7.8b. SEM electron back scatter image of sulfide grain from sample SW98-05-32. Drill hole WM98-05, 570.50m depth. Br- Bravolite, Py- Pyrite, Cu - Copper, Mag- Magnetite, Ol- Olivine

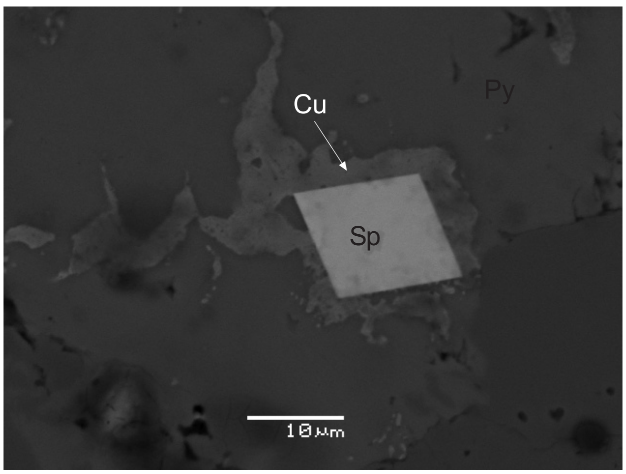


Figure 7.8c. SEM electron back scatter image of PGM grain from sample SW98-05-33. Drill hole WM98-05, 573.0m depth. Py- Pyrite, Cu - Copper, Sp- Sperrylite

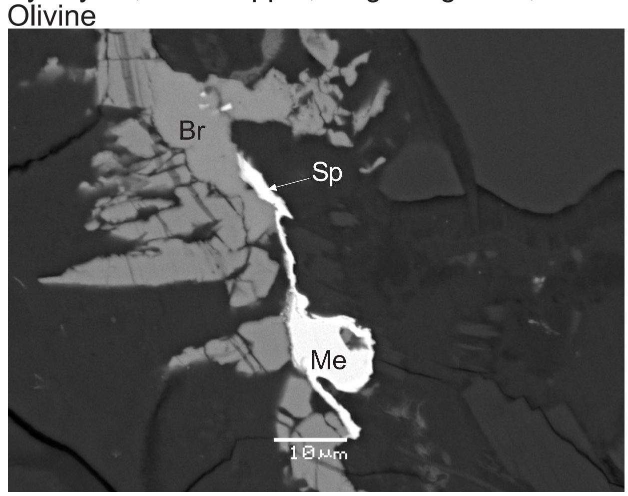


Figure 7.8d. SEM electron back scatter image of PGM grain from sample SW00-22. Drill hole WM00-01, 376.92m depth. Br- Bravolite, Sp- Sperrylite, Me-Mertieite

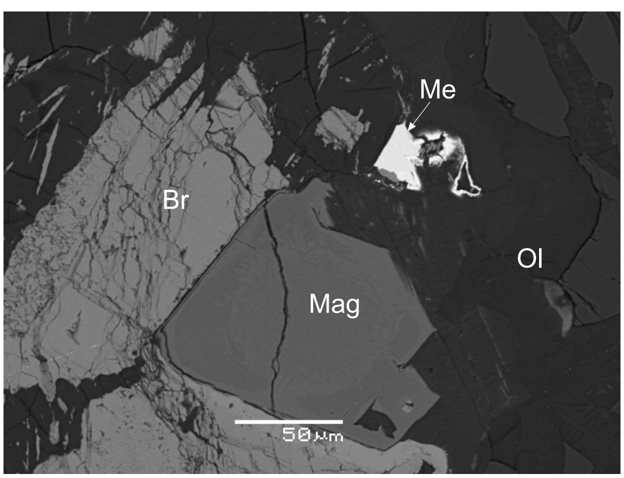


Figure 7.8e. SEM electron back scatter image of PGM grain from sample SW00-22. Drill hole WM00-01, 376.92m depth. Me- Mertieite, Br- Bravolite, Mag-magnetite, Ol- olivine

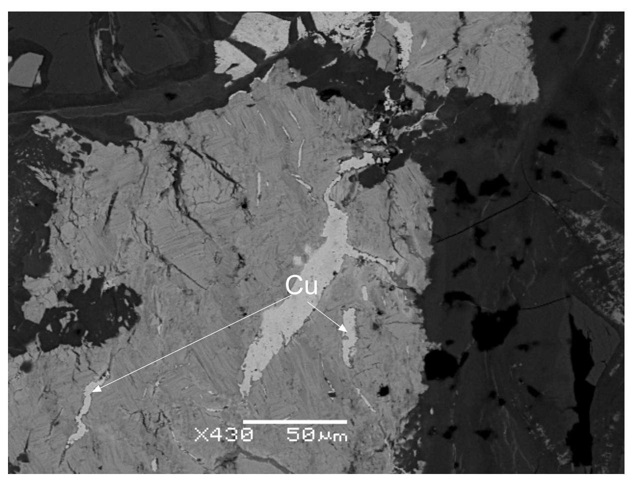


Figure 7.8f. SEM electron back scatter image of Oxide grain with copper cross cutting, from sample SW00-33. Drill hole WM00-01, 585.50m depth.

7.6 Metal Abundance

PGE contents of mineralized zones are in part a function of initial metal contents and the R-factor (Barnes et al., 1993). The R factor reflects the amount of sulphide which interacts with a silicate melt; a low R-factor is characteristic of abundant sulphide interacting with the silicate melt, with effective removal of metals from the silicate melt but less enriched sulphides as a final product, whereas a high R-factor, is characterised by small amounts of sulphide interacting with silicate melt resulting in the partial removal of metals and an enriched sulphide. A graphical method of assessing R-factors was developed by Barnes et al. (1993; Fig. 7.9) utilizing the difference in partition coefficient between Cu and that of Pd, to quantify the degree of enrichment in the sulphides. Cu and Pd values from mineralized zones in the Seagull Intrusion are plotted with all the data points falling between R values of 1,000 to 100,000 and the majority of points (all but 4 of 26 data points) falling between the range of 1,000 to 10,000. There does not appear to be any consistent difference in R factor between the three different mineralization zones plotted (Basal, Red horizon and Green horizon). This wide range in R factors suggested by Figure 7.9 contradicts plots in Figure 7.10 which shows samples from mineralized zones plotted against S ppm with R factor lines of 100 and 100,000 plotted on the graphs of Au, Pd, Pt, Ir and Rh as determined by Barnes and Maier (2002). Mineralized zones exhibit R values around 100,000 as most data point occur around this line with the exception of Ir and Rh which exhibit a wider range in distribution, with Ir occurring above and below an R value of 100000 and Rh occurring below the 100,000 value. The strong correlation between metals (Cu, Pt, Pd and Au) and sulphur becomes visible in Figure 7.10 with four of the metals exhibiting a positive correlation. The exceptions are is Ni which exhibits a strong olivine control on its distribution and Ir-Rh which exhibits a considerable amount of scatter.

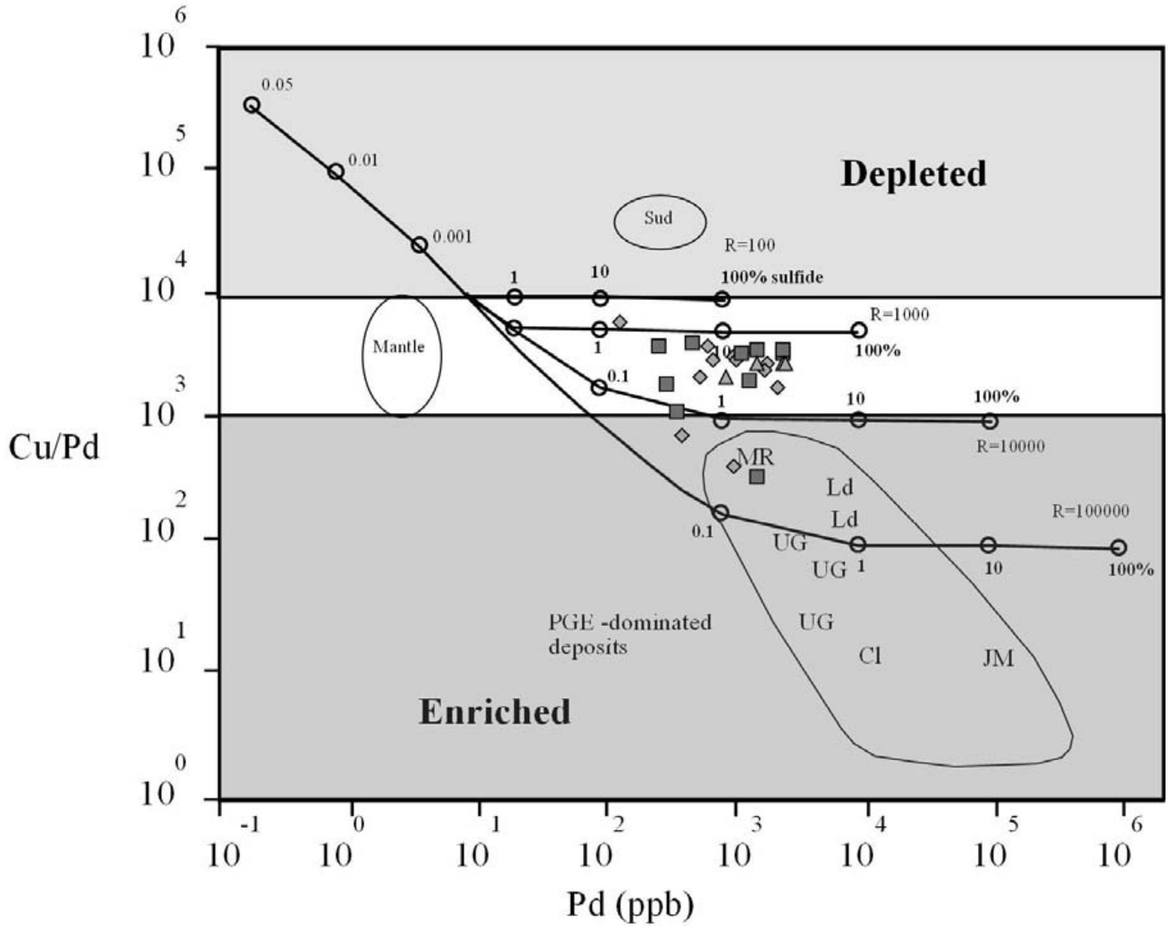


Figure 7.9 Cu/Pd vs Pd. Basal mineralization plotted as diamonds, Green horizon plotted as triangles and Red horizon as squares. Other data points from Barnes et al. (1993). (Sud = Sudbury deposit, MR and UG2 = Merensky Reef and UG-2 Bushveld Complex, Ld = Roby Zone, Lac des Iles, JM = J-M Reef Stillwater. Modified after Barnes et al. (1993).

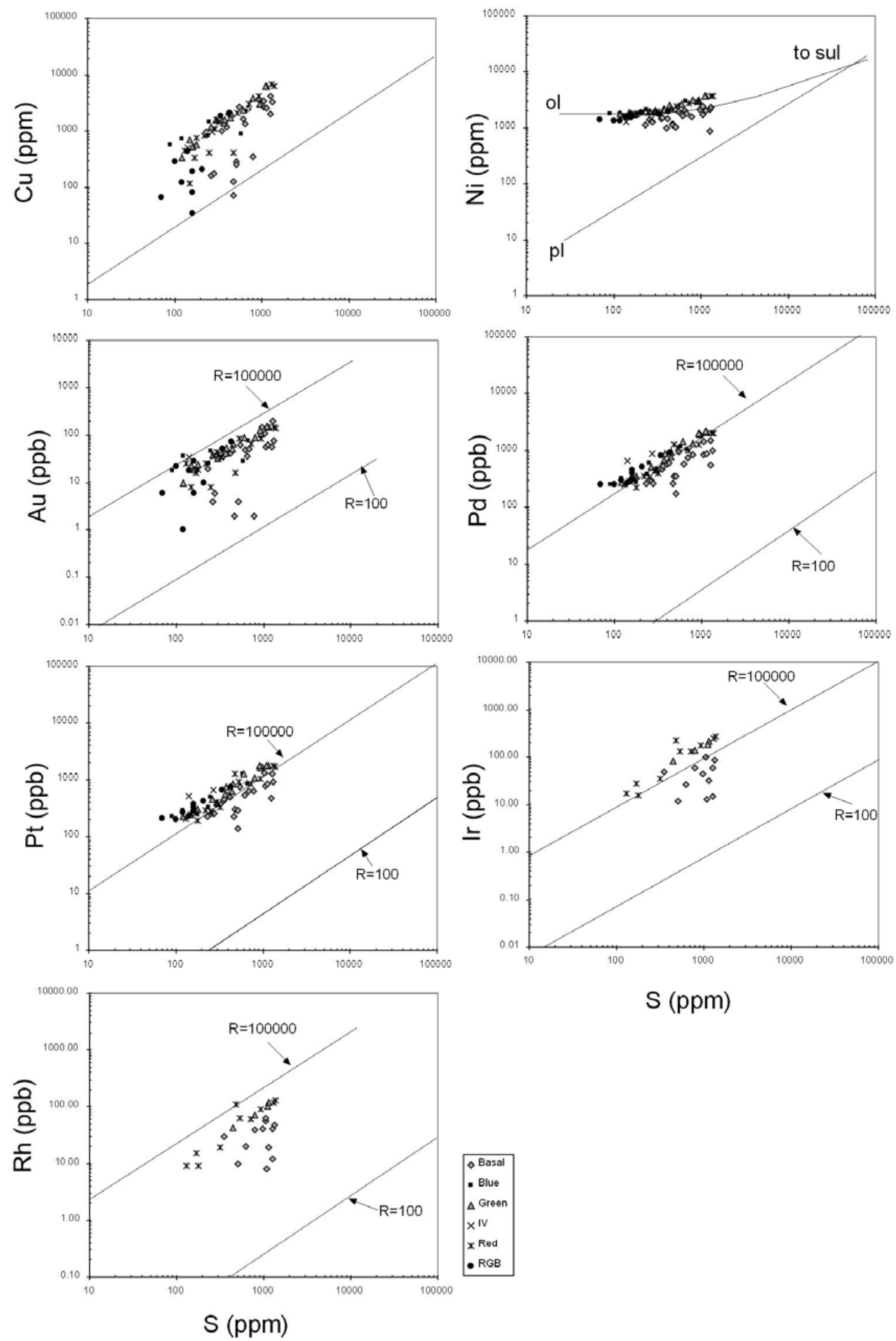


Figure 7.10 Plots of Cu, Ni, Au, Pd, Pt, Ir and Rh versus S from mineralized zones in the Seagull Intrusion. Pl-plagioclase, ol-olivine and to sul- development of immiscible sulphide.

7.7 Mantle Normalised Metal Patterns

Mantle normalised metal plots (Os, Ir, Ru, Rh, Pt, Pd, Au, Ni and Cu) as described by Barnes et al. (1987) can be informative in the understanding of igneous processes which affect Ni-Cu-PGE deposits and the classification of deposit types. Twenty six samples from drill holes WM01-08, WM01-09, WM00-03 and WM00-05 were analyzed by East West Resources Inc., for all noble metals Os, Ir, Ru, Rh in addition to Pt and Pd. The resultant normalised data are plotted in Figure 7.11. The overall patterns exhibit enrichment over mantle from approximately 1 for Ni to approximately 1000 for Cu with a relatively constant slope for the noble metals. All data exhibit a very similar pattern, however basal mineralization exhibits the most fractionation with Pd/Ir_{mn} values ranging between 8-41, with Red and Green horizons Pd/Ir_{mn} values falling between 6-15. Ni/Ir_{mn} values for all samples are very similar with values ranging from 0.21 to 2.12. Cu/Pd_{mn} values however exhibit a more fractionated trend with values averaging approximately 4. Gold and Ru appear to be low relative to Ir-Rh and Pd- Cu on either side in the metal normalised diagrams in all samples analysed.

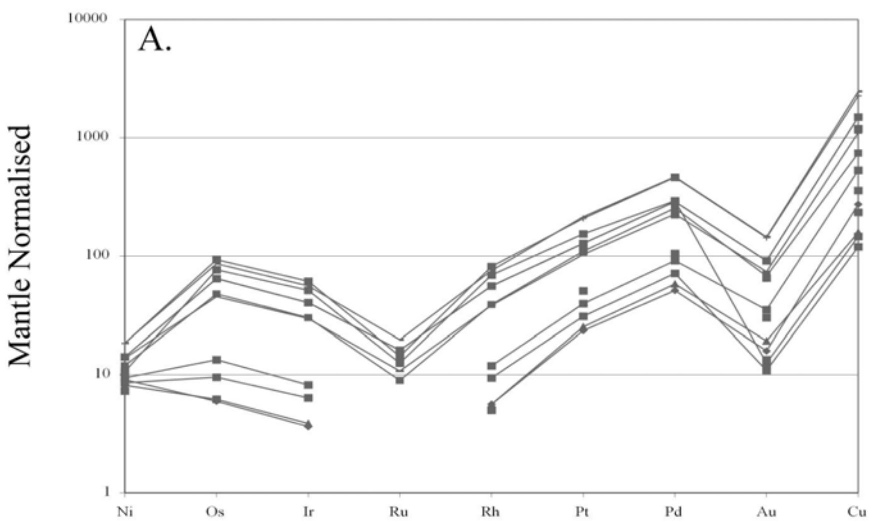


Figure 7.11A. Mantle normalised metal plot of the Red Horizon. Normalisation values from Barnes et al. (1987).

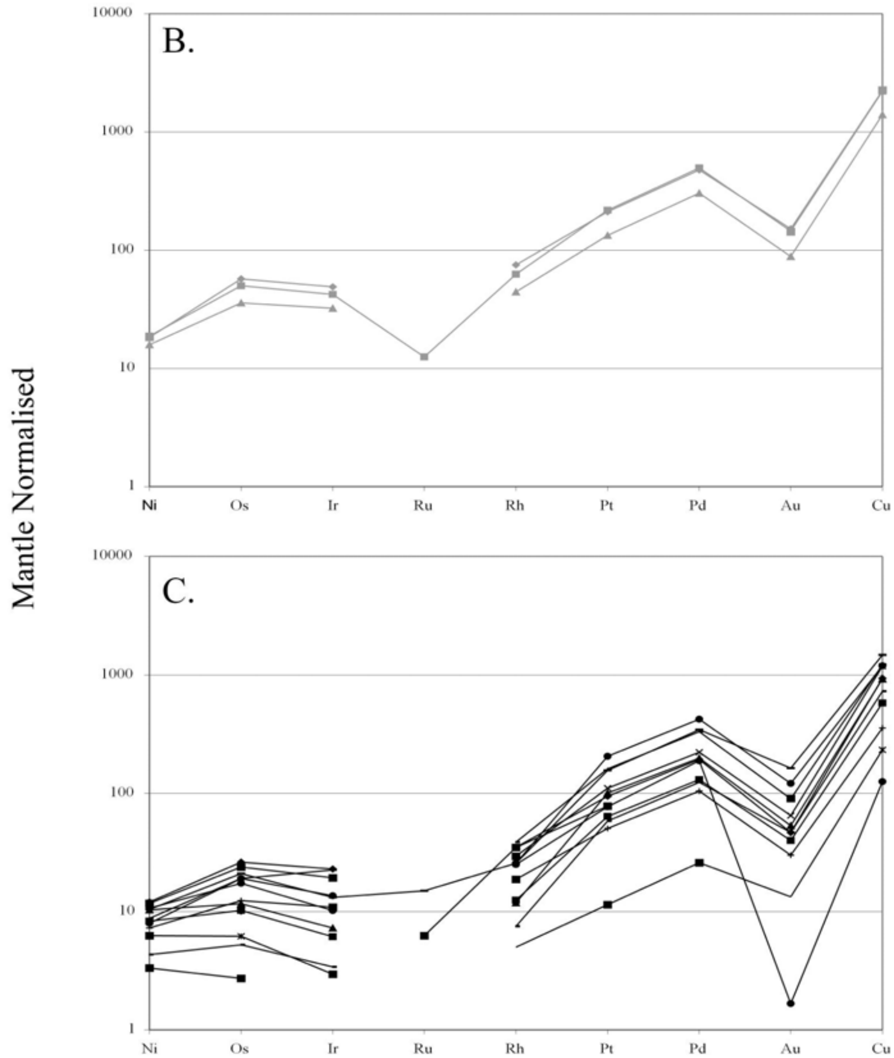


Figure 7.11 Mantle normalised metal plots. B. Green Horizon, C. Basal Mineralisation. Normalisation values from Barnes et al. (1987).

7.8 Discussion

Economic mineralization in the Seagull Intrusion consists of two stages of mineralization. The first being primary orthomagmatic mineralization created by primary sulphide saturation and second a later hydrothermal over print responsible for the native copper, gold and silver as these metals are observed in alteration veins and in crosscutting relationships with Fe-Ni-Cu sulphides. The strong positive correlation between Cu, Au, Pt and Pd with sulphide (Fig. 7.10) suggests that primary mineralization occurring in the Seagull Intrusion is controlled by sulphide exsolution from a silicate magma. Sulphide control of the distribution of metals indicates that sulphur saturation occurred at multiple levels in the Seagull Intrusion (Kissin, 2003) and at that point the immiscible sulphide melt circulated in the silicate melt partitioning chalcophile elements into the sulphide melt (Naldrett, 1989). The duration of sulphide saturation occurring in the Seagull Intrusion is thought to be limited even though R factors deduced from graphical means (Figs. 7.9 and 7.10) exhibit a range from 1,000 to 100,000. Cu/Pd versus Pd is unable to accurately portray R factors because of the strong enrichment of Cu observed in the intrusion as native Cu (Fig. 7.9). With Cu as the nominator an enrichment of Cu in the system will raise the Cu/Pd ratio and lower the apparent R factor. A more accurate representation of an R factor for the observed mineralized horizons is derived from Figure 7.10 which is not affected by copper enrichment and indicates an R-factor of ~100000. This high value is further supported by two other observations; the low abundance of sulphide minerals (commonly less than 2% in mineralized zones) observed in the Seagull Intrusion and secondly the fact that the distribution of nickel appears to be dominated by olivine (Fig. 7.10) The latter point may be a function of the low sulphur content as the partitioning coefficient of Ni is smaller than that of Cu and much smaller than those of Au and the PGE's.

Table 7.4 Partition coefficients (minimum and maximum) for sulphide liquid-silicate liquid (Barnes and Maier, 1999)

Os	Ir	Ru	Rh	Pt	Pd	Au	Ni	Cu
230	1800	2400	27000	1400	2900	110	315	913
30000	450000	35000	-	36000	88000	16000	1070	1383

If sulphur abundance was low, resulting in the sequestering of the PGEs and Cu but, insufficient to remove substantial amounts of Ni from the melt, resulting in Ni going into olivine. This is supported by the small to negligible changes in Ni-content of olivine throughout the intrusion as observed by microprobe data (see Chapter 5). An igneous system that is enriched in Ni and only reaches sulphur saturation for a limited time will not drastically change the Ni abundance in the melt or the Ni content of the olivine crystallizing from the melt.

The second stage of mineralization is a hydrothermal overprint responsible for the abundant native copper observed in alteration veins and cross cutting primary igneous mineralogy along with lesser amounts of gold and silver. In systems which contain a hydrothermal component there is a fractionation between platinum and palladium (e.g. Lac des Iles, where the deposits is dominantly Pd; Watkinson et al., 2002) as palladium is more mobile in fluids. The hydrothermal mineralization is not thought to have been responsible for the PGE mineralization in the Seagull Intrusion or to have extensively modified the primary mineralization as the platinum to palladium ratio is very close to 1 (Figure 7.12).

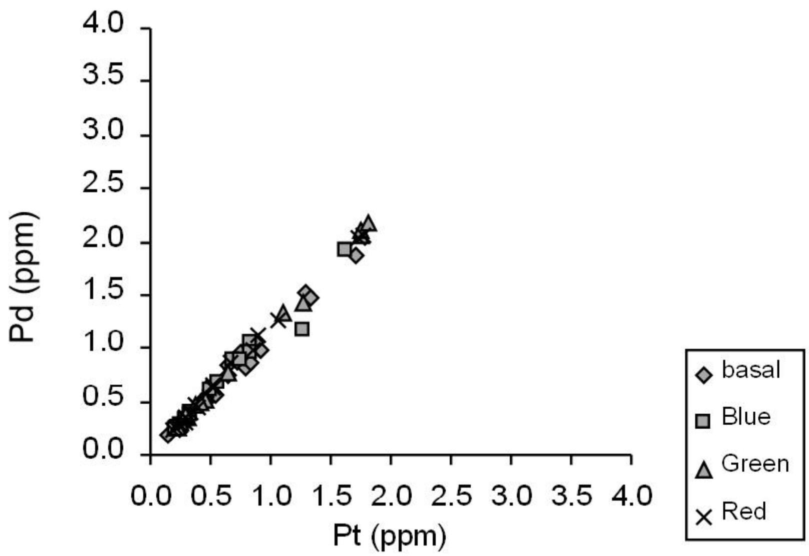


Figure 7.12 Platinum versus palladium of the basal, Blue, Green and Red mineralization zones of the Seagull Intrusion from East West Resources assay data.

Mineralization is thought to have developed by similar processes of sulphide saturation in the basal zone and the RGB zone as the normalised metal ratios (Fig. 7.11A, B, C) do not exhibit any significant variability from one zone of mineralization to another. The resultant shape and slope of the normalised metal pattern (Fig. 7.13) does not fit well into a single classification but rather appears to fall between two groups described by Barnes et al. (1987) high-Mg basalts and flood basalts. A comparison of Seagull data with high mg Basalts shows a good correlation with most metals however an enrichment in Os and Ir and a depletion of Au contrasts with the field defined Fred's Flow (komatiitic basalt) and the Katiniq deposit (Cape Smith Fold Belt) which form the maximum and minimum (not all shown) values of this field. The second group, flood basalt field is defined by sulphides from the Noril'sk deposit and Insizwa Complex (Fig. 7.13: Barnes et al., 1987). The plot is again similar in slope; however, a number of metal abundances from Seagull Intrusion deviate. Highly elevated Os and Ir over the defined field and Au exhibits a depletion; however, the fractionation of Pd over Cu as observed in flood basalts is not observed in the Seagull data.

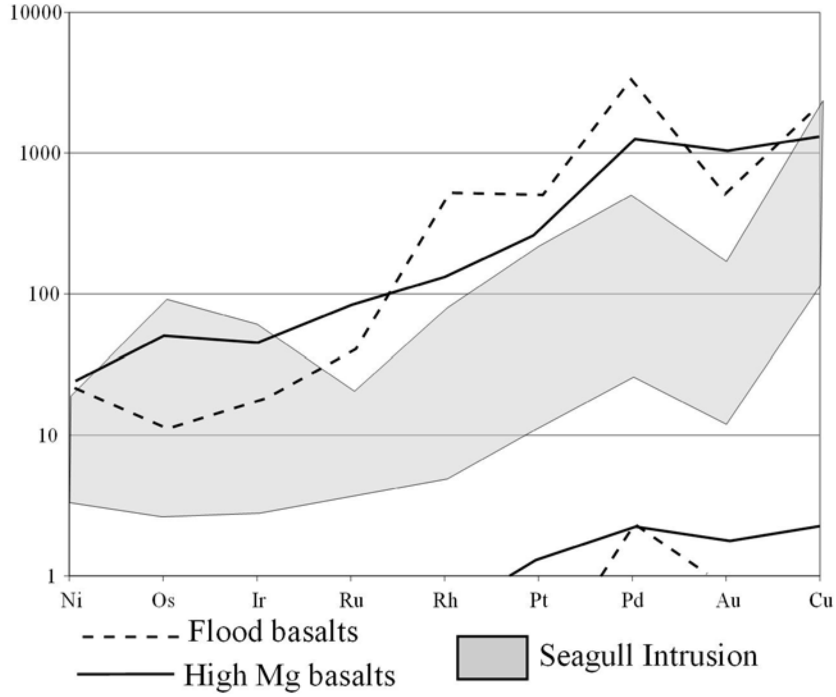


Figure 7.13 Mantle normalised metal plot from Seagull Intrusion with ranges of flood basalts and high Mg basalts shown (Barnes et al., 1987).

The pattern obtained from the mineralization zones in the Seagull Intrusion perhaps are most similar to those of high Mg-basalts (Fig. 7.13) aside from the lower Au values which may be a product of removal of gold from the system by late stage fluids which did not remove copper or palladium. Further comparison with reef type deposits Bushveld Complex (UG2, Merensky Reef) and Stillwater Complex (JM Reef) illuminates the vast difference in metal abundances in these deposits relative to Seagull Intrusion as the reefs are highly enriched in Pt, Pd and Au relative to other metals (Ni, Os, Ir, Ru, Rh, Cu; Figure 7.14).

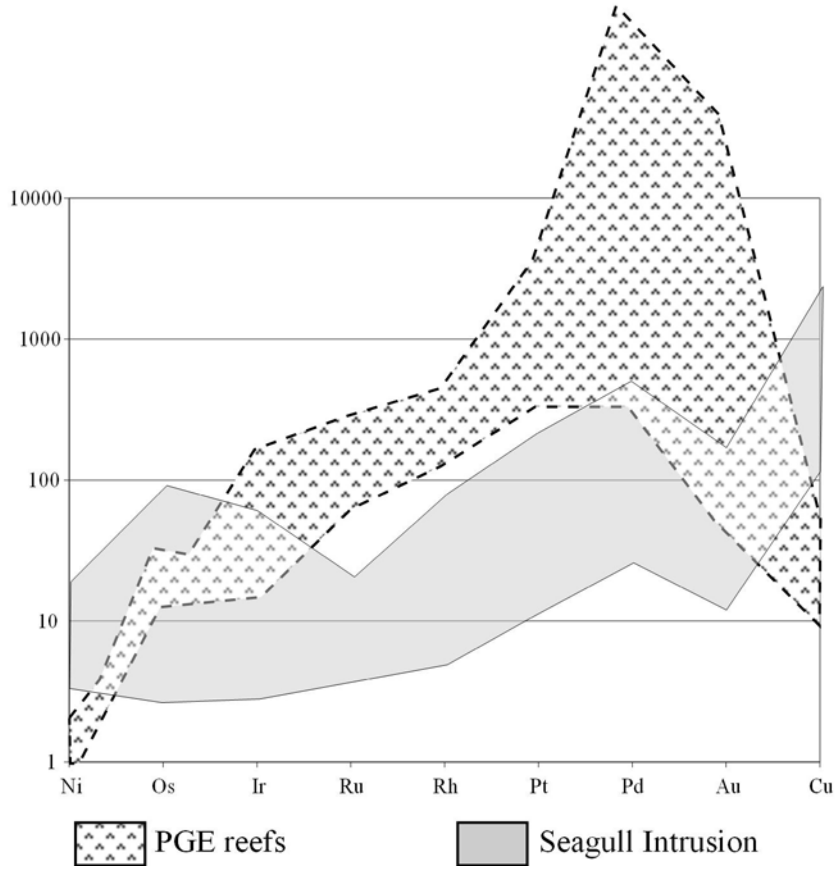


Figure 7.14 Mantle normalised metal plot from Seagull Intrusion with a field defined by Bushveld and Stillwater Pt-Pd Reef deposits. Modified from Barnes et al. (1987).

7.9 Conclusion

Mineralized zones in the Seagull Intrusion consist of two important morphologies. The first is basal mineralization which is found along or in close proximity to the basal contact (Figs. 7.2, 7.4 and 7.5). The second morphology of mineralization is that of the RGB Horizon occurring between 100 and 150m above the basal contact of the intrusion (Figs. 7.2, 7.4 and 7.5). Both of these mineralized areas exhibit strong correlations of Ni, Cu, Pt and Pd with sulphur and exhibit similar mantle normalised metal plots indicating a similar control on the distribution of metals in the two mineralized zones. The role of sulphur in the systems is vital to concentrate metals, however the extent of sulphur interaction within the intrusion is unclear with R-factors ranging from values of 1,000 to 100,000. However, the presence of abundant native Cu now in the system may be acting to lower the apparent R-factor determined in Figure 7.8. As a low R-factor (1,000) is unlikely because of a low abundance of visible sulphide minerals in the mineralized zones and the fact that a preponderance of Ni occurs in olivine and was not removed from the silicate melt by the development of an extensive sulphide melt in the system.

CHAPTER 8
CONCLUSION AND MINERALIZATION MODEL

8.1 Introduction

The application of a number of different techniques (petrology, mineral chemistry, major element geochemistry, trace element abundance, isotopes and metal abundances) have been applied to the lithologies and mineralized zones recognised in the Seagull Intrusion with a wide range of results and conclusions. It is the mineralization model which unifies all observations into a comprehensive understanding of the intrusion and its mineralization.

8.2 Chapter Summaries

Data presented in Chapters 2 through 7 permit the following generalisations regarding Seagull Intrusion and the Ni-Cu-PGE mineralization.

8.2.1 Petrography

The lithological units observed in the Seagull Intrusion are dominated by cumulus olivine with post cumulus poikilitic pyroxene, and such the volumetric majority of lithologies observed are best modally described as peridotites. The lithologies observed in the Seagull Intrusion exhibit a fractionation from ultramafic lithologies (dunites, peridotites, pyroxenites) in drill core to mafic lithologies (feldspar-pyroxenites, olivine gabbros, gabbros) observed in surface outcrops.

8.2.2 Mineral Chemistry

Olivine mineral chemistry indicates the Seagull Intrusion (as observed in drill hole WM00-01 and WM98-05) is very homogenous in nature, only exhibiting minor variations in compositions. With one interval indicating a more primitive magma associated mineralization. Olivine mineral chemistry from surface outcrops indicate a certain degree of fractionation has occurred over the interval between the last olivine analysed in drill core and the surface samples.

Pyroxene mineral chemistry from drill core exhibit a very homogeneous composition. Clinopyroxene exhibits little chemical variation within the interstitial melt as there is little variation to be observed vertically in the two drill holes. Oxide mineral chemistry is homogenous in composition. With both groups of oxides (those found as chadacrysts in pyroxene and those found as chadacrysts in olivine) exhibiting subsolidus re-equilibrium with their respective host minerals. Providing limited use to understanding primary igneous processes.

8.2.3 Whole Rock Geochemistry

Major elements indicate the ultramafic section of the intrusion is a homogeneous sequence. With geochemical variations only occurring in the basal section and where there are pyroxenite lithologies in the upper section. The mafic section of the intrusion exhibits more variability than the ultramafic section but a continual fractionation sequence. Trace elements are also consistent with the Seagull Intrusion being a homogenous sequence with the distribution of trace elements being controlled by the cumulate mineralogy. An increase in trace elements abundance is observed towards the top of the Seagull Intrusion.

Sm-Nd and Rb-Sr isotopes indicate the Seagull Intrusion magma was contaminated with older crustal material. The degree of contamination is greatest along the basal contact decreasing upwards supporting basal sulphur saturation caused by contamination. The source of contamination is proposed to be Quetico metasedimentary rocks.

8.2.4 Metal abundances

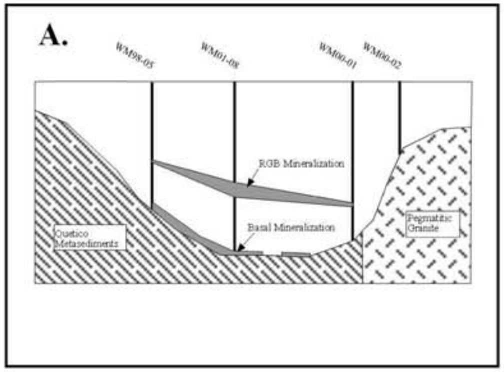
The Seagull Intrusion contains two mineralized zones, a basal mineralized zone occurring along the basal contact or within close proximity and a second mineralized zone RGB occurring 100 to 150 m above the basal contact. The RGB zone is encountered in 7 drill holes and is assumed to be continuous between the drill holes. The RGB zone is further subdivide into 3 distinct horizons; Red Horizon, Green Horizon and Blue Horizon which appear sub parallel to each other and consistent in relative metal abundance to each other. Mantle normalised metal plots of the Seagull Intrusion appear similar in nature to high Mg-basalts and flood basalt patterns rather than reef type patterns which are characteristic of mineralization occurring above the base. While still exhibiting low R-Factors which are not characteristic of mineralization associated with flood basalts of high Mg basalts.

8.3 The Model

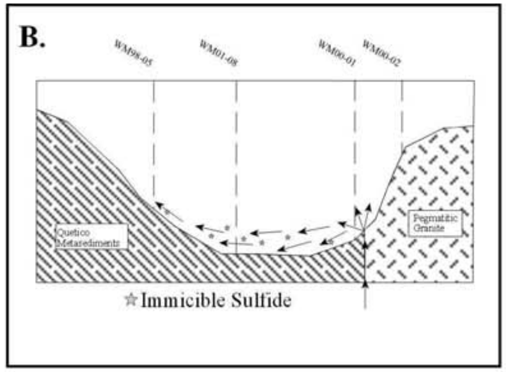
Mineralization identified in the Seagull Intrusion occurs in two forms as described in Chapter 7, Basal mineralization and the RGB Zone. Basal mineralization has been interpreted to be an immiscible sulphide segregation from the intrusion (Osmani and Rees 1998a, R. Middleton, pers. com., 2002) indicating the requirements for sulphur saturation were met during the formation of this zone as suggested by Kissin (2003). Sulphur saturation occurring at the base of the Seagull Intrusion was proposed to be caused by magma contamination from assimilation of Quetico metasedimentary rocks. Isotopic analyses (Chapter 5) support this idea, as the isotopes indicate a decreasing effect of contamination away from the contact. The extent of interaction between a developing sulphide melt and silicate magma in the basal region is thought to be limited, as high R-factors are observed and Ni abundances (Fig. 7.4) only exhibit an increase in abundance for approximately 70 m above the base before Ni abundances become consistent. This indicates that a sulphide melt only depleted Ni in the basal 70 m or so. This maybe a function of an initial emplacement of magma along the base becoming contaminated and the subsequent development of mineralized zones along the base. Basal mineralization of significant quantity does not occur in all drill holes (as indicated in Fig. 7.2, 7.4 and 7.5) this patchy distribution of mineralization is observed in other deposits (e.g., Raglan deposits: Lesher and Keays, 2002) where it is attributed in part to basal topography, magma flow dynamics and local contamination. The limited number of drill holes intersecting the basal contact limits interpretation. However, between drill holes WM00-01 and WM00-02 there is a drastic change in basal topography correlating with a change in basal lithology (Quetico metasedimentary rocks in WM00-01 and pegmatitic granites in WM00-02) with the more significant mineralization occurring west of this boundary (Fig. 7.1).

The RGB Zone is more enigmatic in formation; however, the RGB zone reaches sulphur saturation in WM00-01 as a single interval at 580 m (Kissin, 2003) with associated mineralization (Fig. 7.2 and Table 2.5). However this single interval contrasts with the mineralization occurring in drill holes WM01-09, WM00-07, WM01-10, WM00-05 and WM01-08, where mineralization occurs as several of discrete zones (subdivided into Red horizon, Green horizon and Blue horizon; Fig. 7.3) suggesting that the development of each horizon (Red, Green and Blue) was induced by separate sulphur saturation stages in the magma during the crystallization history.

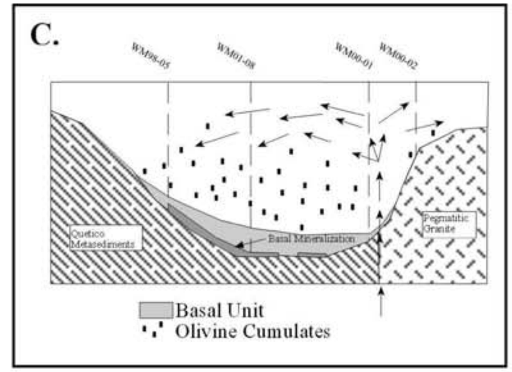
The formation of the RGB Zone is thought to be a function of continual input of magma into a magma chamber which is accumulating olivine with episodic sulphide saturation events possibly caused by a hotter more primitive magma inducing interaction with conduit wall rocks and contaminating the magma. If there is a fault between drill holes WM00-01 and WM00-02 which acts as a conduit for incoming magma, upwelling magma above this will spread out laterally, and at times reach sulphur saturation followed by a settling out of immiscible sulphide liquid to the present level of crystal accumulation on the floor (Fig. 8.1D). Parallelism between the RGB mineralization zone and olivine mineral chemistry zones (Chapter 5, Fig. 5.10) supports the sequential filling of a magma chamber with sulphides accumulating as horizons during the crystallization history of the Seagull Intrusion.



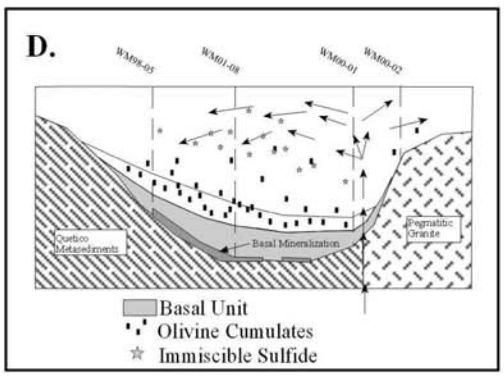
Schematic cross section through Seagull Intrusion with four drill holes with the basal and RGB mineralisation shown.



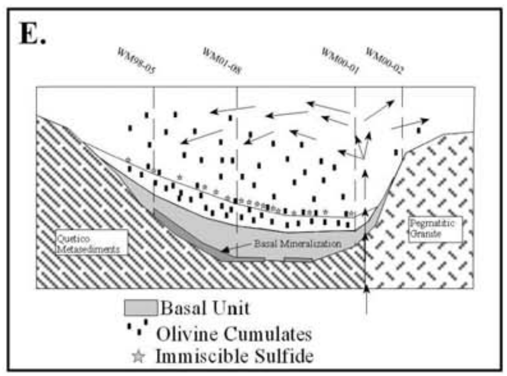
Initial injection of magma and sulphur saturation in the Seagull Intrusion responsible for basal mineralisation.



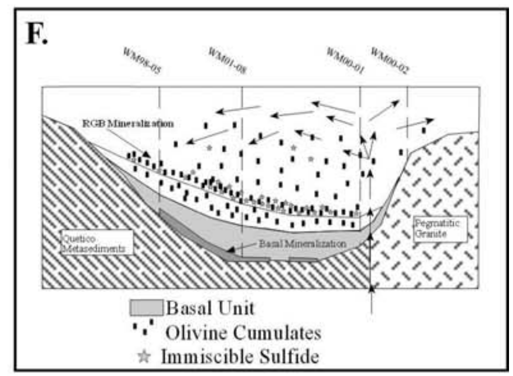
Continued influx of magma with the development of cumulate lithologies



Sulphur saturation and the rain out of sulphide droplets along with cumulate minerals to the current floor level (developement of a mineralised horizon)



Continued crystalisation above first horizon



The start of sulphur saturation and the development of a second horizon.

Figure 8.1 Schematic model of the development of Basal and RGB zone mineralisation in the Seagull Intrusion

The cause of sulphur saturation responsible for the development of the RGB zone is poorly understood. There is no visible apparent textural change, rare earth chemistry does not change at the resolution sampled nor does whole rock geochemistry, however olivine mineral chemistry in both drill holes WM00-01 and WM98-05 becomes more primitive in composition (Fig. 5.10) near the sulphide mineralization indicating a possible influx of new more primitive magma, but this does not directly contribute to sulphur saturation unless new hotter magma assimilates additional wall rock and incorporates more sulphur (Lesher and Campbell, 1993).

8.4 Conclusions

Mineralization of economic importance in the Seagull Intrusion occurs in two distinct settings, but are generated by similar processes. Mineralization is classified into basal mineralization and RGB Zone mineralization. Basal mineralization occurs at or in close proximity to the bottom footwall contact of the intrusion. Mineralization however does not occur in all drill holes which intersect the basal contact possibly as a result of differences in basal topography, basement lithologies or flow dynamics. RGB Zone mineralization occurs as a continuous zone of mineralization through seven drill holes (Fig. 7.2) varying in distance from the footwall contact from approximately 140 m to approximately 270 m but remaining sub-parallel to the basal contact with a relatively constant dip to the east. This observed dip parallels the olivine mineral units described in drill holes WM98-05 and WM00-01 supporting a layered nature and orthomagmatic model for the mineralization observed in the Seagull Intrusion. Further subdivision of the RGB zone into horizons (Red, Green and Blue) which are separated from each other by 2 to 40 m of un-mineralized rock do not exhibit a fractionation of PGE and maintain the relative abundance of PGE in each horizon. This suggests that each horizon represents a distinct sulphur saturation phase of the Seagull Intrusion. Sulphur saturation occurring in the Seagull Intrusion is thought to be limited in nature resulting in the production of mineralization that is rich in PGE's and Cu (more chalcophile) but low in Ni (less chalcophile). Without the removal of Ni from the system by prolonged sulphur saturation, olivine accommodates much of it giving high background values and only small to negligible changes in the Ni content of olivine when sulphur saturation does occurs. The cause of sulphur saturation is unknown, but may be related to the injection of new hotter more primitive magma into the chamber causing further assimilation of wall rocks to occur, reaching sulphur saturation and a rainout of immiscible sulphide droplets.

8.5 Future Work

A general study of the lithologies, whole rock geochemistry, isotopes and mineralized zones has been completed. Further work on the Seagull Intrusion could be carried out as a number of questions remain to be resolved.

- Distribution of basal mineralization zones (as drilling continues) and whether the distribution of these potentially economic zones is controlled by local basement lithology, basal structural control, or magma dynamics.

- Ni contents in olivine at a finer resolution in conjunction with detailed sulphur over the RGB Horizon may provide illumination on the role of sulphur and Ni in the intrusion as this mineralized zone was forming.

- The predominance of cumulate olivine provides a unique opportunity to examine crystal size distribution and magmatic fabrics in the intrusion with possible relation to mineralized zones. This may contribute to our understanding of magma chamber dynamics.

- Additional isotope work (Sm-Nd, Pb) would further elucidate the role of contamination and assimilation in the formation of the Seagull Intrusion.

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Appendix A

Sample intervals for drill holes WM00-01, WM98-05, WM01-08, WM00-04 and location of surface samples.

Sample locations, lithology, geochemical, SEM, Microprobe, and isotope work carried out on drill hole WM00-01.

Depth	Thin Section	SEM						
(m)		O	P	Ox	Geochem	MP	Iso	Lithology
5.62	SW01-01		8	4				Olivine Websterite
6.00					AES			Olivine Websterite
6.46	SW01-02		5	21				Olivine Websterite
9.10	SW01-03							Altered Peridotite
12.10					AES			Altered Peridotite
18.20					AES			Altered Peridotite
22.00					AES			Altered Peridotite
30.00					AES			Altered Peridotite
36.00					AES			Altered Peridotite
44.90	SW01-04							Altered Peridotite
46.00					AES			Nipigon Sill (olivine) gabbro - gabbronorite
52.10	SW01-05		7	5				Nipigon Sill (olivine) gabbro - gabbronorite
70.00					AES			Nipigon Sill (olivine) gabbro - gabbronorite
93.50	SW01-06	8	9	8				Nipigon Sill (olivine) gabbro - gabbronorite
96.00					AES/MS/XRF			Nipigon Sill (olivine) gabbro - gabbronorite
100.00					AES			Nipigon Sill (olivine) gabbro - gabbronorite
110.00					AES			Nipigon Sill (olivine) gabbro - gabbronorite
113.00					AES			Nipigon Sill (olivine) gabbro - gabbronorite
115.00	SW01-07							Altered Peridotite
122.00					AES			Altered Peridotite
126.00					AES			Altered Peridotite
138.40	SW01-08							Altered Peridotite
140.00					AES			Altered Peridotite
150.00					AES			Altered Peridotite
160.00					AES			Altered Peridotite
165.30	SW01-09	21	3	19				Altered Peridotite
170.00					AES			Altered Peridotite
180.00					AES			Altered Peridotite
186.00					AES			Websterite
188.50	SW01-10		7					Websterite
192.00					AES			Altered Peridotite
196.00					AES			Altered Peridotite
215.00					AES			Altered Peridotite
219.30	SW01-11	20	4	17				Altered Peridotite
222.80	SW01-12							Altered Peridotite
237.80	SW01-13	22	21					Altered Peridotite
248.00					AES			Altered Peridotite
250.30	SW01-14							Altered Peridotite
256.00					AES			Altered Peridotite

Depth (m)	Thin Section	O	P	Ox	Geochem	MP	Iso	Lithology
259.20	SW01-15							Altered Peridotite
280.00					AES			Altered Peridotite
292.20	SW01-16		4	2				Completely Altered, unknown protolith
296.40	SW01-17	22		22				Peridotite: Lherzolite - Dunite
300.00					AES			Peridotite: Lherzolite - Dunite
320.00					AES			Peridotite: Lherzolite - Dunite
331.00	SW01-18		7	10				Peridotite: Lherzolite - Dunite
332.39	SW01-19	17		20		Yes		Peridotite: Lherzolite - Dunite
340.00					AES/MS/XRF		Yes	Peridotite: Lherzolite - Dunite
350.10					AES			Peridotite: Lherzolite - Dunite
354.49	SW01-20	17		34				Peridotite: Lherzolite - Dunite
355.00					AES			Peridotite: Lherzolite - Dunite
370.00					AES			Peridotite: Lherzolite - Dunite
374.00					AES			Peridotite: Lherzolite - Dunite
376.92	SW01-22	17		32		Yes		Peridotite: Lherzolite - Dunite
386.50	SW01-21	23		24				Peridotite: Lherzolite - Dunite
400.00					AES			Peridotite: Lherzolite - Dunite
430.00					AES			Peridotite: Lherzolite - Dunite
435.00	SW01-23	30	8	21				Peridotite: Lherzolite - Dunite
448.00	SW01-24	18	7	21				Peridotite: Lherzolite - Dunite
460.00					AES			Peridotite: Lherzolite - Dunite
477.70	SW01-25	17	4	20		Yes		Peridotite: Lherzolite - Dunite
490.00					AES			Peridotite: Lherzolite - Dunite
499.00	SW01-26	20	5	15				Peridotite: Lherzolite - Dunite
520.00					AES			Peridotite: Lherzolite - Dunite
530.80	SW01-27	14	7	24				Peridotite: Lherzolite - Dunite
545.00					AES			Peridotite: Lherzolite - Dunite
550.00					AES			Peridotite: Lherzolite - Dunite
560.00					AES			Peridotite: Lherzolite - Dunite
570.00					AES			Peridotite: Lherzolite - Dunite
571.70	SW01-28	16	4	23				Peridotite: Lherzolite - Dunite
573.40	SW01-29	18	12	13		Yes		Peridotite: Lherzolite - Dunite
574.35	SW01-30	16	12	16				Peridotite: Lherzolite - Dunite
577.79	SW01-31	16	6	19				Peridotite: Lherzolite - Dunite
580.00					AES			Peridotite: Lherzolite - Dunite
583.70	SW01-32	15	4	20		Yes		Peridotite: Lherzolite - Dunite
585.50	SW01-33	16		16				Peridotite: Lherzolite - Dunite
590.40					AES			Peridotite: Lherzolite - Dunite
596.00					AES			Peridotite: Lherzolite - Dunite
600.00					AES/MS/XRF		Yes	Peridotite: Lherzolite - Dunite
603.70	SW01-34	16	11	20				Peridotite: Lherzolite - Dunite
610.00					AES			Peridotite: Lherzolite - Dunite
620.00					AES			Peridotite: Lherzolite - Dunite
628.00					AES			Peridotite: Lherzolite - Dunite
632.00					AES			O.A.P. – O.P.A.
645.00					AES			O.A.P. – O.P.A.
647.00	SW01-35	14		24		Yes		O.A.P. – O.P.A.

Depth (m)	Thin Section	O	P	Ox	Geochem	MP	Iso	Lithology
660.00					AES			O.A.P. – O.P.A.
665.00	SW01-36	13	4	19				O.A.P. – O.P.A.
675.00					AES			O.A.P. – O.P.A.
680.00					AES			O.A.P. – O.P.A.
685.00					AES			O.A.P. – O.P.A.
690.00					AES			O.A.P. – O.P.A.
693.00	SW01-37	4	7	16				O.A.P. – O.P.A.
700.00					AES			O.A.P. – O.P.A.
704.00	SW01-38	3	8	38				O.A.P. – O.P.A.
708.70	SW01-39							O.A.P. – O.P.A.
710.00					AES			O.A.P. – O.P.A.
713.60	SW01-40	12	9	19				O.A.P. – O.P.A.
716.00					AES			O.A.P. – O.P.A.
718.40	SW01-41		15	11				Basement Hornfels
719.60					AES			Quetico Metasediments
723.00					AES			Quetico Metasediments

Samples numbers for ICP-AES have the prefix SW00-01- followed by the depth.
AES = ICP-AES
MS = ICP MS
MP = Microprobe
Iso = Isotope (Rb-Sr, Sm-Nd)
O.A.P.-O.P.A. = Olivine amphibole pyroxenite – Olivine pyroxene amphibolite.
O = Olivine (number of point analyses)
P = Pyroxene (number of point analyses)
Ox = Oxide (number of point analyses)

Sample locations, lithology, geochemical, SEM, Microprobe, and isotope work carried out on drill hole WM98-05.

Depth (m)	Thin Section	SEM Analyses O	P	Ox	Geochem	MP	Iso	Lithology
9.50	SW98-5-01							Altered Peridotite
17.62	SW98-5-02	1	2	19				Olivine Websterite
25.10	SW98-5-03		14	18				Olivine Websterite
31.00	SW98-5-04				Ms			Altered Peridotite
54.10	SW98-5-05							Altered Peridotite
87.10	SW98-5-06							Altered Peridotite
97.00	SW98-5-07	9	8					Nipigon Sill (olivine) gabbro - gabbronorite
161.10	SW98-5-08	16	12		Ms			Nipigon Sill (olivine) gabbro - gabbronorite
189.00	SW98-5-09	8		15				Altered Peridotite
193.00	SW98-5-10	6	7	21				Altered Peridotite
248.00	SW98-5-11							Altered Peridotite
258.00	SW98-5-12							Altered Peridotite
291.03	Slab							Altered Peridotite
311.02	SW98-5-13	14	3	20				Peridotite: Lherzolite- Dunite
323.00	SW98-5-14	12	6	18				Peridotite: Lherzolite- Dunite
348.00	SW98-5-15	16	8	14				Peridotite: Lherzolite- Dunite
355.65	SW98-5-16		1	27				Peridotite: Lherzolite- Dunite
376.20	SW98-5-17							Peridotite: Lherzolite- Dunite
382.60	SW98-5-18	26	13	36				Peridotite: Lherzolite- Dunite
387.00	SW98-5-19	12	4	16	Ms		Yes	Peridotite: Lherzolite- Dunite
394.00	SW98-5-20	13	5	20				Peridotite: Lherzolite- Dunite
407.00	SW98-5-21	13	2	20				Peridotite: Lherzolite- Dunite
423.00	SW98-5-22	22	2	22				Peridotite: Lherzolite- Dunite
475.02	SW98-5-23	13	5	15				Peridotite: Lherzolite- Dunite
484.10	SW98-5-24	11	3	10				Peridotite: Lherzolite- Dunite
489.13	SW98-5-25	22		2				Peridotite: Lherzolite- Dunite
495.03	SW98-5-26	15	9	11				Peridotite: Lherzolite- Dunite
520.90	SW98-5-27	8	8	5				Peridotite: Lherzolite- Dunite
544.40	SW98-5-28	2	3	8	Ms		Yes	O.A.P.-O.P.A.
556.00	SW98-5-29							O.A.P.-O.P.A.
556.04	SW98-5-30	1	4	16				O.A.P.-O.P.A.
564.00	SW98-5-31	13	7	16				O.A.P.-O.P.A.
570.50	SW98-5-32	10	7	15				O.A.P.-O.P.A.
573.00	SW98-5-33	12	10	13				O.A.P.-O.P.A.
578.04	SW98-5-34	13	10	13				O.A.P.-O.P.A.
582.14	SW98-5-35	12	4	16				O.A.P.-O.P.A.
586.00	SW98-5-36	3	5	20	Ms		Yes	O.A.P.-O.P.A.
593.00	SW98-5-37							Quetico Metasediments
607.00	SW98-5-38							Quetico Metasediments

AES = ICP-AES
MS = ICP MS
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Iso = Isotope (Rb-Sr, Sm-Nd)
O.A.P.-O.P.A. = Olivine amphibole pyroxenite – Olivine pyroxene amphibolite.

O = Olivine (number of point analyses)
P = Pyroxene (number of point analyses)
Ox = Oxide (number of point analyses)

Sample locations, lithology, geochemical, SEM, Microprobe, and isotope work carried out on drill hole WM01-08.

Depth (m)	Thin Section	SEM Analysis O	P	Ox	Geochem	MP	Iso	Lithology
6.50	SW08-01							Websterite
8.70	SW08-02							Altered Peridotite
16.00	SW08-03							Altered Peridotite
23.50	SW08-04							Altered Peridotite
37.00	SW08-05				Ms			Altered Peridotite
49.80	SW08-06							Altered Peridotite
53.90	SW08-07							Websterite
107.90	SW08-08							Nipigon Sill (olivine) gabbro - gabbronorite
126.90	SW08-09							Nipigon Sill (olivine) gabbro - gabbronorite
137.10	SW08-10							Websterite
145.30	SW08-11							Altered Peridotite
157.00	SW08-12							Altered Peridotite
173.25	SW08-13							Altered Peridotite
189.60	SW08-14				Ms			Altered Peridotite
210.60	SW08-15							Altered Peridotite
232.40	SW08-16							Altered Peridotite
253.50	SW08-17							Altered Peridotite
262.40	SW08-18							Altered Peridotite
265.00	SW08-19							Altered Peridotite
273.20	SW08-20							Altered Peridotite
296.00	SW08-21							Altered Peridotite
303.50	SW08-22							Peridotite: Lherzolite - Dunite
303.70	SW08-23							Peridotite: Lherzolite - Dunite
304.70	SW08-24				Ms			Altered Peridotite
326.90	SW08-25							Altered Peridotite
356.80	SW08-26							Peridotite: Lherzolite - Dunite
367.50	SW08-27							Peridotite: Lherzolite - Dunite
382.10	SW08-28							Peridotite: Lherzolite - Dunite
409.70	SW08-29							Peridotite: Lherzolite - Dunite
438.30	SW08-30							Peridotite: Lherzolite - Dunite
469.00	SW08-31							Peridotite: Lherzolite - Dunite
474.00	SW08-32	8	5	11				Peridotite: Lherzolite - Dunite
483.10	SW08-33							Peridotite: Lherzolite - Dunite
494.20	SW08-34							Peridotite: Lherzolite - Dunite
511.30	SW08-35							Peridotite: Lherzolite - Dunite
523.90	SW08-36				Ms			Peridotite: Lherzolite - Dunite
535.60	SW08-37							Peridotite: Lherzolite - Dunite
555.80	SW08-38							Peridotite: Lherzolite - Dunite

Depth (m)	Thin section	O	P	Ox	Geochem	MP	Iso	Lithology
576.80	SW08-39							Peridotite: Lherzolite - Dunite
602.60	SW08-40							Peridotite: Lherzolite - Dunite
617.30	SW08-41							Peridotite: Lherzolite - Dunite
632.60	SW08-42							Peridotite: Lherzolite - Dunite
654.10	SW08-43							O.A.P.-O.P.A.
666.90	SW08-44							O.A.P.-O.P.A.
676.90	SW08-45				Ms			O.A.P.-O.P.A.
693.50	SW08-46							O.A.P.-O.P.A.
698.60	SW08-47							O.A.P.-O.P.A.
700.00	SW08-48							O.A.P.-O.P.A.
705.70	SW08-49							O.A.P.-O.P.A.
718.60	SW08-50	6	4	6				O.A.P.-O.P.A.
727.20	SW08-51				Ms		Yes	O.A.P.-O.P.A.
731.60	SW08-52							Quetico Metasediments
733.70	SW08-53							Quetico Metasediments

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O.A.P.-O.P.A. = Olivine amphibole pyroxenite – Olivine pyroxene amphibolite.

O = Olivine (number of point analyses)
P = Pyroxene (number of point analyses)
Ox = Oxide (number of point analyses)

Sample locations, lithology, geochemical, SEM, Microprobe, and isotope work carried out on drill hole WM00-04.

Depth (m)	Thin section	SEM Analysis O	P	Ox	Feld	Geochem	MP	Iso	Lithology
0.30	SW04-01								Hornblende Gabbro
7.20	SW04-02								Hornblende Gabbro
14.70	SW04-03		11	1	4	MS			Gabbro
21.60	SW04-04								Gabbro
25.70	SW04-05								Gabbro
51.10	SW04-06		10		7	MS		Yes	Plagioclase bearing Pyroxenite
52.60	SW04-07								Gabbro
61.20	SW04-08								Gabbro
68.20	SW04-09								Gabbro
72.90	SW04-10		8		4				Plagioclase bearing Pyroxenite
77.00	SW04-11								Plagioclase bearing Pyroxenite
80.70	SW04-12								Gabbro
87.40	SW04-13					MS			Hornblende Gabbro
92.90	SW04-14								Basement: Archean Metasediments
118.30	SW04-15								Basement: Archean Metasediments

MS = ICP MS
MP = Microprobe
Iso = Isotope (Rb-Sr, Sm-Nd)

O = Olivine (number of point analyses)
P = Pyroxene (number of point analyses)
Ox = Oxide (number of point analyses)
Feld = Feldspar (number of point analyses)

Sample locations, lithology, geochemical, SEM, Microprobe, and isotope work carried out on surface samples.

			SEM Analysis					
Thin Section	Easting	Northing	O	P	Ox	Feld	Geochem	Lithology
SI-03-01	357561	5427444	9	15	1	9		Olivine Gabbro
SI-03-02	357561	5427444						Completely altered
SI-03-03	357561	5427444	18	13	2	8		Olivine Gabbro
SI-03-04	357449	5427756	18	12	1	6		Olivine Gabbro
SI-03-05	357367	5428460						Olivine Gabbro
SI-03-06	357453	5430990						Olivine Gabbro
SI-03-07	357276	5431529						Olivine Websterite
SI-03-08	357877	5432068	9	5		4		Plagioclase bearing Pyroxenite
SI-03-09	359387	5432414	12	9	4	8		Olivine Gabbro
SI-03-11	359647	5432451	14	11	3	8		Olivine Gabbro
SI-03-12	359647	5432451		20		15		Olivine Gabbro
SI-03-13	359647	5432451		8		9		Gabbro

MS = ICP MS
MP = Microprobe
Iso = Isotope (Rb-Sr, Sm-Nd)

O = Olivine (number of point analyses)
P = Pyroxene (number of point analyses)
Ox = Oxide (number of point analyses)
Feld = Feldspar (number of point analyses)

Appendix B

Olivine mineral chemistry from drill holes WM00-01 and WM98-05 and surface samples.

DDH: WM01-01		Thin Section: SW01-06			Depth: 93.50m	
		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5
Atomic	**Mg**	0.90	0.91	0.92	0.89	0.94
	Fe	1.06	1.05	1.03	1.08	1.03
	Ni	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.02	1.03	1.01	1.01
	Ca	0.01	0.00	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.97	1.97	1.95	1.98	1.97
	%Fosterite	45.89	46.45	47.26	45.07	47.77
Oxide %	**MgO**	20.30	20.63	20.53	19.88	21.26
	FeO	42.66	42.40	40.83	43.20	41.44
	NiO	0.00	0.00	0.00	0.00	0.00
	SiO2	34.12	34.25	34.10	33.74	34.19
	CaO	0.34	0.00	0.00	0.35	0.27
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	97.42	97.28	95.46	97.17	97.15
	Ni (ppm)	0	0	0	0	0

DDH: WM01-01 Thin Section: SW01-09 Depth: 165.30m

		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.63	1.66	1.65	1.65	1.63	1.64	1.65
	Fe	0.35	0.35	0.34	0.34	0.33	0.34	0.35	0.34
	Ni	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Si	1.00	1.01	1.00	1.00	1.01	1.01	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.98	2.00	1.99	1.99	1.97	1.98	2.00
	%Fosterite	82.53	82.28	82.93	82.71	83.31	82.73	82.54	82.83
Oxide %	**MgO**	41.04	43.85	44.29	43.99	43.76	43.28	44.08	44.86
	FeO	15.49	16.83	16.25	16.39	15.63	16.11	16.62	16.57
	NiO	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00
	SiO2	37.07	40.35	39.90	39.92	39.81	40.07	40.56	40.48
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	93.61	101.02	100.44	100.30	99.59	99.46	101.26	101.90
	Ni (ppm)	0	0	0	0	3000	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15
Atomic	**Mg**	1.66	1.66	1.65	1.64	1.65	1.64	1.66
	Fe	0.34	0.34	0.35	0.35	0.35	0.34	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.00	1.99	2.00	2.01	1.99	2.01
	%Fosterite	82.88	82.91	82.59	82.41	82.37	82.78	82.83
Oxide %	**MgO**	42.55	43.83	44.18	43.58	44.23	44.19	42.34
	FeO	15.67	16.11	16.60	16.58	16.88	16.39	15.64
	NiO	0.00	0.00	0.00	0.00	0.00	0.47	0.00
	SiO2	38.21	39.51	40.09	39.51	39.81	40.22	37.80
	CaO	0.00	0.00	0.00	0.27	0.21	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.43	99.45	100.86	99.94	101.13	101.27	95.78
	Ni (ppm)	0	0	0	0	0	3700	0

DDH: WM01-01 Thin Section: SW01-11 Depth: 219.30m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.64	1.64	1.67	1.65	1.66	1.68	1.67
	Fe	0.36	0.34	0.35	0.34	0.35	0.34	0.33	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	1.01	1.00	1.00	1.00	1.00	0.99	1.00
	Ca	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.01	1.99	1.99	2.01	2.00	1.99	2.01	2.00
	%Fosterite	82.24	82.71	82.24	83.08	82.28	83.18	83.67	83.46
Oxide %	**MgO**	43.23	44.36	42.20	44.66	44.31	44.49	44.34	43.93
	FeO	16.65	16.53	16.25	16.21	17.01	16.04	15.43	15.52
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	38.76	40.63	38.53	39.81	40.11	40.15	39.11	39.15
	CaO	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.64	101.71	96.98	100.68	101.43	100.69	98.87	98.59
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.65	1.66	1.67	1.67	1.65	1.66	1.66	1.65
	Fe	0.34	0.34	0.34	0.35	0.35	0.35	0.34	0.34
	Ni	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Si	1.01	1.00	0.99	0.99	1.00	0.99	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	2.00	2.01	2.02	2.01	2.01	2.00	1.99
	%Fosterite	82.97	83.02	82.92	82.76	82.72	82.59	82.95	82.77
Oxide %	**MgO**	43.41	43.71	44.04	44.23	44.84	44.09	43.90	43.90
	FeO	15.89	15.94	16.17	16.43	16.70	16.57	16.08	16.29
	NiO	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
	SiO2	39.62	39.19	39.04	39.21	40.30	39.36	39.43	39.88
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.92	98.84	99.26	99.87	102.19	100.03	99.40	100.06
	Ni (ppm)	0	0	0	0	2700	0	0	0

		Olivine 17	Olivine 18
Atomic	**Mg**	1.67	1.66
	Fe	0.34	0.35
	Ni	0.00	0.00
	Si	1.00	1.00
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.00	2.01
	%Fosterite	83.14	82.67
Oxide %	**MgO**	44.67	44.23
	FeO	16.15	16.53
	NiO	0.00	0.00
	SiO2	39.92	39.53
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	100.74	100.29
	Ni (ppm)	0	0

DDH: WM01-01 Thin Section: SW01-13 Depth: 237.80m

		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.65	1.65	1.63	1.65	1.66	1.64	1.65
	Fe	0.33	0.35	0.34	0.34	0.35	0.35	0.34	0.34
	Ni	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.00	1.00	1.01	1.00	0.99	1.00	1.01
	Ca	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	2.00	1.98	2.00	2.02	2.00	1.99
	%Fosterite	83.11	82.66	82.82	82.67	82.72	82.80	82.66	82.92
Oxide %	**MgO**	43.07	43.08	43.46	43.18	42.59	43.85	43.96	43.75
	FeO	15.61	16.11	16.07	16.13	15.86	16.24	16.44	16.07
	NiO	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	39.23	39.17	39.32	39.79	38.34	39.02	39.92	39.90
	CaO	0.00	0.00	0.29	0.18	0.22	0.31	0.28	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.35	98.36	99.15	99.29	97.01	99.41	100.60	99.71
	Ni (ppm)	3500	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.63	1.63	1.64	1.64	1.64	1.62	1.63	1.63
	Fe	0.35	0.35	0.35	0.32	0.35	0.35	0.35	0.34
	Ni	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.00	1.01	1.01	1.00	1.01	1.01	1.01
	Ca	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.99	1.99	1.97	1.99	1.97	1.98	1.98
	%Fosterite	82.36	82.28	82.52	83.51	82.43	82.41	82.52	82.66
Oxide %	**MgO**	42.45	42.78	43.65	41.14	41.47	43.93	42.30	42.02
	FeO	16.21	16.43	16.48	14.49	15.76	16.71	15.98	15.71
	NiO	0.00	0.37	0.00	0.00	0.00	0.00	0.19	0.20
	SiO2	39.30	39.30	39.92	37.80	37.91	40.99	39.09	38.70
	CaO	0.18	0.00	0.00	0.17	0.22	0.21	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.14	98.88	100.05	93.60	95.37	101.84	97.56	96.63
	Ni (ppm)	0	2900	0	0	0	0	1500	1600

		Olivine 17	Olivine 18	Olivine 19	Olivine 20	Olivine 21	Olivine 22	Olivine 23
Atomic	**Mg**	1.65	1.64	1.64	1.64	1.63	1.64	1.63
	Fe	0.35	0.35	0.34	0.34	0.34	0.34	0.34
	Ni	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Si	1.00	1.01	1.00	1.00	1.01	1.00	1.01
	Ca	0.00	0.00	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.98	2.00	1.99	1.99	1.99	1.98
	%Fosterite	82.55	82.46	82.74	82.65	82.68	82.85	82.87
Oxide %	**MgO**	43.15	41.74	44.39	42.65	41.92	42.98	43.53
	FeO	16.26	15.82	16.51	15.97	15.66	15.86	16.04
	NiO	0.00	0.00	0.37	0.00	0.00	0.00	0.00
	SiO2	39.23	38.31	40.37	38.87	38.51	39.19	40.15
	CaO	0.00	0.00	0.31	0.28	0.28	0.27	0.15
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.65	95.88	101.94	97.77	96.37	98.30	99.88
	Ni (ppm)	0	0	2900	0	0	0	0

DDH: WM01-01 Thin Section: SW01-17 Depth: 296.40m

		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.67	1.66	1.68	1.66	1.67	1.68	1.66	1.67
	Fe	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	Si	1.01	1.01	1.00	1.01	1.01	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.98	2.00	1.99	1.99	2.00	2.00	1.99
	%Fosterite	83.76	83.87	84.11	83.73	83.85	84.10	83.68	83.87
Oxide %	**MgO**	44.36	44.56	44.99	45.29	43.71	44.29	43.83	43.53
	FeO	15.34	15.27	15.15	15.68	15.01	14.92	15.23	14.92
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.31
	SiO2	39.90	40.43	40.00	40.80	39.41	39.32	39.26	39.13
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.59	100.26	100.15	101.77	98.13	98.54	98.84	97.89
	Ni (ppm)	0	0	0	0	0	0	4100	2400

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.67	1.66	1.68	1.67	1.67	1.66	1.67	1.65
	Fe	0.33	0.32	0.32	0.32	0.32	0.32	0.31	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Si	1.00	1.01	1.00	1.00	1.00	1.01	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.98	2.00	1.99	1.99	1.97	1.98	1.97
	%Fosterite	83.37	83.97	83.84	84.00	83.89	83.97	84.13	83.91
Oxide %	**MgO**	44.16	44.99	45.34	45.69	43.45	44.67	43.61	42.88
	FeO	15.71	15.31	15.58	15.52	14.87	15.21	14.67	14.65
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
	SiO2	39.56	40.65	40.18	40.92	38.85	40.73	39.26	39.28
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.42	100.95	101.09	102.13	97.17	100.61	97.54	97.22
	Ni (ppm)	0	0	0	0	0	0	0	3200

		Olivine 17	Olivine 18	Olivine 19	Olivine 20	Olivine 21
Atomic	**Mg**	1.67	1.65	1.65	1.66	1.67
	Fe	0.32	0.32	0.32	0.32	0.32
	Ni	0.00	0.00	0.00	0.01	0.00
	Si	1.01	1.01	1.01	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.98	1.97	1.98	1.99
	%Fosterite	84.09	83.58	83.91	84.01	83.78
Oxide %	**MgO**	43.00	43.78	44.61	44.84	44.03
	FeO	14.50	15.34	15.25	15.22	15.19
	NiO	0.00	0.00	0.00	0.31	0.00
	SiO2	38.85	39.96	40.75	40.58	39.56
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	96.35	99.08	100.61	100.95	98.78
	Ni (ppm)	0	0	0	2400	0

DDH: WM01-01 Thin Section: SW01-19 Depth: 332.39m

		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.69	1.69	1.70	1.70	1.70	1.71	1.71	1.69
	Fe	0.33	0.33	0.34	0.33	0.33	0.33	0.33	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	0.99	0.99	0.98	0.98	0.99	0.98	0.98	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.02	2.03	2.03	2.03	2.04	2.04	2.03
	%Fosterite	83.66	83.55	83.42	83.69	83.65	83.80	83.79	83.33
Oxide %	**MgO**	45.11	45.40	45.07	44.92	44.72	45.64	44.51	43.96
	FeO	15.71	15.94	15.97	15.61	15.58	15.72	15.35	15.68
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00
	SiO2	39.32	39.53	38.98	38.81	38.74	39.13	38.10	38.04
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.13	100.88	100.02	99.34	99.05	100.49	98.28	97.68
	Ni (ppm)	0	0	0	0	0	0	2500	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.70	1.70	1.70	1.69	1.69	1.70	1.70	1.68
	Fe	0.35	0.34	0.33	0.32	0.34	0.34	0.33	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.98	0.99	0.99	0.99	0.98	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.03	2.03	2.02	2.03	2.04	2.03	2.00
	%Fosterite	83.09	83.38	83.69	83.96	83.23	83.51	83.74	83.81
Oxide %	**MgO**	45.35	44.11	44.71	45.22	45.39	45.89	44.79	44.06
	FeO	16.45	15.67	15.53	15.40	16.30	16.15	15.50	15.17
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	38.91	38.12	38.81	39.47	39.60	39.51	38.87	39.04
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.72	97.90	99.04	100.09	101.29	101.54	99.16	98.27
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 17	Olivine 18
Atomic	**Mg**	1.70	1.71
	Fe	0.34	0.33
	Ni	0.00	0.00
	Si	0.98	0.98
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.04	2.03
	%Fosterite	83.55	83.87
Oxide %	**MgO**	44.62	45.60
	FeO	15.66	15.63
	NiO	0.00	0.00
	SiO2	38.36	39.19
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	98.64	100.43
	Ni (ppm)	0	0

DDH: WM01-01 Thin Section: SW01-20 Depth: 354.49m

		Olivine 1	Olivine2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.70	1.72	1.69	1.70	1.70	1.69	1.69	1.72
	Fe	0.34	0.33	0.34	0.33	0.34	0.34	0.33	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.97	0.99	0.98	0.98	0.98	0.99	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.05	2.03	2.03	2.04	2.03	2.03	2.05
	%Fosterite	83.44	83.70	83.36	83.57	83.39	83.33	83.61	83.63
Oxide %	**MgO**	45.14	45.80	45.39	45.01	45.82	45.80	45.50	46.37
	FeO	15.97	15.90	16.15	15.77	16.27	16.34	15.90	16.18
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	38.81	38.79	39.45	38.94	39.34	39.62	39.49	39.19
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.91	100.49	100.98	99.71	101.43	101.76	100.90	101.74
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15
Atomic	**Mg**	1.71	1.69	1.69	1.70	1.70	1.61	1.70
	Fe	0.34	0.34	0.33	0.33	0.34	0.32	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	0.98	0.98	0.99	0.98	0.98	1.03	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.05	2.03	2.02	2.03	2.03	1.94	2.03
	%Fosterite	83.43	83.34	83.63	83.78	83.46	83.62	83.58
Oxide %	**MgO**	46.12	45.29	45.14	45.26	45.45	44.81	45.26
	FeO	16.33	16.13	15.75	15.62	16.06	15.64	15.85
	NiO	0.00	0.00	0.00	0.00	0.00	0.38	0.00
	SiO2	39.21	39.19	39.26	39.04	39.26	42.66	39.19
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.66	100.61	100.14	99.92	100.77	103.49	100.30
	Ni (ppm)	0	0	0	0	0	3000	0

DDH: WM01-01 Thin Section: SW01-21 Depth: 386.50m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.67	1.66	1.64	1.67	1.67	1.65	1.67
	Fe	0.31	0.33	0.33	0.34	0.32	0.31	0.32	0.32
	Ni	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
	Si	1.02	1.00	1.00	1.01	1.00	1.01	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.97	1.99	1.99	1.97	1.99	1.99	1.98	1.99
	%Fosterite	84.11	83.68	83.23	82.98	83.95	84.11	83.62	84.09
Oxide %	**MgO**	43.51	42.82	43.30	43.28	44.31	44.69	44.48	44.31
	FeO	14.65	14.88	15.55	15.82	15.10	15.05	15.53	14.95
	NiO	0.00	0.00	0.00	0.00	0.31	0.36	0.00	0.51
	SiO2	39.86	38.36	39.11	39.90	39.86	40.22	40.58	39.81
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.02	96.06	97.96	99.00	99.57	100.32	100.59	99.58
	Ni (ppm)	0	0	0	0	2400	2800	0	4000

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.68	1.66	1.65	1.67	1.65	1.67	1.66	1.66
	Fe	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
	Ni	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01
	Si	1.00	1.00	1.01	1.01	1.01	1.00	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	1.98	1.99	1.97	1.99	1.99	1.99
	%Fosterite	84.02	83.80	83.55	84.14	83.92	83.74	83.87	83.73
Oxide %	**MgO**	44.96	43.83	44.48	43.38	44.21	43.35	44.29	43.50
	FeO	15.25	15.10	15.61	14.58	15.10	15.00	15.18	15.06
	NiO	0.00	0.39	0.34	0.00	0.00	0.00	0.38	0.32
	SiO2	40.13	39.45	40.69	38.96	40.41	38.96	40.05	39.15
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.33	98.78	101.11	96.91	99.73	97.31	99.90	98.03
	Ni (ppm)	0	3100	2700	0	0	0	3000	2500

		Olivine 17	Olivine 18	Olivine 19	Olivine 20	Olivine 21	Olivine 22	Olivine 23
Atomic	**Mg**	1.67	1.67	1.65	1.66	1.66	1.68	1.68
	Fe	0.30	0.31	0.32	0.32	0.31	0.31	0.33
	Ni	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Si	1.01	1.01	1.02	1.01	1.01	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.99	1.97	1.98	1.98	1.99	2.00
	%Fosterite	84.63	84.20	83.75	83.89	84.18	84.42	83.71
Oxide %	**MgO**	44.64	43.78	43.90	44.11	44.01	44.49	43.86
	FeO	14.45	14.64	15.18	15.10	14.74	14.64	15.22
	NiO	0.00	0.00	0.00	0.00	0.32	0.00	0.00
	SiO2	40.18	39.32	40.37	40.05	39.83	39.58	38.98
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.26	97.74	99.44	99.26	98.91	98.71	98.06
	Ni (ppm)	0	0	0	0	2500	0	0

DDH: WM01-01 Thin Section: SW01-22A Depth: 376.92m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.72	1.68	1.70	1.69	1.68	1.69	1.71	1.70
	Fe	0.30	0.33	0.33	0.33	0.31	0.31	0.29	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	1.00	0.99	0.99	1.00	1.00	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.01	2.00	2.03	2.01	1.99	2.00	2.01	2.02
	%Fosterite	85.33	83.75	83.78	83.84	84.23	84.43	85.33	83.99
Oxide %	**MgO**	47.46	45.24	45.07	45.19	44.34	45.75	47.41	44.76
	FeO	14.55	15.64	15.55	15.53	14.79	15.04	14.52	15.21
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	40.88	40.22	39.11	39.68	39.49	40.37	41.07	39.00
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.89	101.10	99.73	100.40	98.63	101.16	103.01	98.96
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10
Atomic	**Mg**	1.68	1.67
	Fe	0.32	0.33
	Ni	0.00	0.01
	Si	1.00	1.00
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.00	2.01
	%Fosterite	84.01	83.50
Oxide %	**MgO**	45.35	44.28
	FeO	15.39	15.59
	NiO	0.00	0.34
	SiO2	40.13	39.36
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	100.87	99.58
	Ni (ppm)	0	2700

DDH: WM01-01 Thin Section: SW01-23 Depth:435.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.64	1.65	1.64	1.64	1.66	1.66	1.65	1.66
	Fe	0.34	0.34	0.35	0.34	0.34	0.34	0.35	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.01	1.00	1.01	1.00	1.00	1.00	1.00
	Ca	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	1.99	1.98	2.01	2.01	2.00	2.01
	%Fosterite	82.70	82.75	82.60	82.63	83.13	83.18	82.69	83.05
Oxide %	**MgO**	43.10	42.20	42.83	42.78	43.15	43.65	43.78	43.48
	FeO	16.07	15.68	16.08	16.03	15.61	15.73	16.34	15.82
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	39.41	38.46	39.17	39.32	38.49	38.94	39.64	38.83
	CaO	0.00	0.00	0.25	0.18	0.21	0.28	0.00	0.15
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.57	96.35	98.34	98.32	97.45	98.60	99.76	98.29
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.64	1.64	1.63	1.65	1.66	1.64	1.65	1.64
	Fe	0.34	0.34	0.34	0.34	0.34	0.34	0.35	0.35
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Si	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00
	Ca	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.98	1.97	1.99	2.00	2.00	2.01	2.00
	%Fosterite	82.87	82.74	82.96	83.02	82.93	82.70	82.44	82.47
Oxide %	**MgO**	42.57	42.63	43.00	43.13	42.52	42.98	43.60	43.43
	FeO	15.68	15.85	15.75	15.72	15.61	16.03	16.56	16.45
	NiO	0.00	0.00	0.00	0.00	0.00	0.34	0.13	0.00
	SiO2	38.87	39.17	39.79	39.23	38.34	39.00	39.11	39.49
	CaO	0.14	0.22	0.14	0.25	0.00	0.27	0.00	0.18
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.26	97.88	98.68	98.34	96.46	98.62	99.39	99.56
	Ni (ppm)	0	0	0	0	0	2700	1000	0

		Olivine 17	Olivine 18	Olivine 19	Olivine 20	Olivine 21	Olivine 22	Olivine 23	Olivine 24
Atomic	**Mg**	1.65	1.65	1.65	1.65	1.64	1.66	1.65	1.66
	Fe	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.35
	Ni	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00
	Si	1.00	1.00	1.00	1.00	1.00	1.00	1.01	0.99
	Ca	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.01	2.01	2.01	1.99	1.99	2.00	1.99	2.02
	%Fosterite	82.63	82.64	82.68	82.88	82.84	82.98	83.01	82.80
Oxide %	**MgO**	44.38	42.72	43.48	43.93	42.88	43.43	43.23	44.03
	FeO	16.63	15.99	16.24	16.17	15.84	15.88	15.77	16.30
	NiO	0.32	0.33	0.38	0.00	0.33	0.00	0.00	0.00
	SiO2	39.92	38.53	39.21	39.86	39.04	39.06	39.34	39.15
	CaO	0.17	0.20	0.18	0.15	0.00	0.00	0.21	0.31
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.42	97.76	99.49	100.11	98.09	98.37	98.56	99.78
	Ni (ppm)	2500	2600	3000	0	2600	0	0	0

DDH: WM01-01		Thin Section: SW01-23			Depth:435.00m	
		Olivine 25	Olivine 26	Olivine 27	Olivine 28	Olivine 29
Atomic	**Mg**	1.64	1.67	1.65	1.64	1.66
	Fe	0.33	0.34	0.35	0.33	0.34
	Ni	0.00	0.00	0.01	0.01	0.00
	Si	1.01	0.99	1.00	1.01	1.00
	Ca	0.01	0.01	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	2.02	2.00	1.99	2.00
	%Fosterite	83.09	83.01	82.68	83.15	82.95
Oxide %	**MgO**	43.33	43.68	44.04	43.28	43.83
	FeO	15.72	15.94	16.44	15.63	16.06
	NiO	0.00	0.00	0.42	0.42	0.00
	SiO2	39.62	38.61	39.79	39.62	39.45
	CaO	0.24	0.20	0.00	0.17	0.15
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	98.91	98.43	100.70	99.12	99.49
	Ni (ppm)	0	0	3300	3300	0

DDH: WM01-01 Thin Section: SW01-24 Depth:448.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.66	1.66	1.65	1.65	1.65	1.68	1.66	1.66
	Fe	0.35	0.33	0.35	0.35	0.32	0.33	0.35	0.33
	Ni	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01
	Si	1.00	1.00	1.00	1.00	1.01	0.99	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.99	2.00	2.01	1.98	2.01	2.01	2.00
	%Fosterite	82.64	83.19	82.50	82.56	83.62	83.79	82.50	83.38
Oxide %	**MgO**	43.83	44.08	43.41	43.83	43.07	43.43	43.30	43.58
	FeO	16.42	15.88	16.42	16.51	15.04	14.97	16.38	15.49
	NiO	0.00	0.00	0.00	0.36	0.33	0.32	0.00	0.32
	SiO2	39.34	39.77	39.19	39.36	39.13	38.23	38.70	39.17
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.59	99.72	99.02	100.05	97.56	96.95	98.38	98.56
	Ni (ppm)	0	0	0	2800	2600	2500	0	2500

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.65	1.66	1.65	1.66	1.65	1.66	1.67	1.66
	Fe	0.35	0.34	0.34	0.34	0.34	0.33	0.33	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	1.00	1.00	1.01	1.00	1.01	1.01	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.00	1.99	2.00	1.99	1.99	2.01	1.99
	%Fosterite	82.54	82.92	83.12	82.97	83.04	83.45	83.31	83.17
Oxide %	**MgO**	43.40	43.98	43.20	43.10	44.03	44.58	43.50	43.23
	FeO	16.36	16.15	15.64	15.77	16.03	15.76	15.53	15.59
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00
	SiO2	39.30	39.60	39.23	38.66	40.11	40.22	38.61	38.96
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.06	99.72	98.08	97.53	100.17	100.55	98.00	97.78
	Ni (ppm)	0	0	0	0	0	0	2800	0

		Olivine 17	Olivine 18
Atomic	**Mg**	1.67	1.64
	Fe	0.34	0.34
	Ni	0.00	0.00
	Si	1.00	1.01
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.00	1.98
	%Fosterite	83.24	82.62
Oxide %	**MgO**	44.29	43.45
	FeO	15.90	16.29
	NiO	0.00	0.00
	SiO2	39.51	40.03
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	99.71	99.76
	Ni (ppm)	0	0

DDH: WM01-01 Thin Section: SW01-25 Depth:477.70m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.65	1.66	1.66	1.66	1.64	1.68	1.66
	Fe	0.36	0.36	0.36	0.37	0.36	0.36	0.36	0.36
	Ni	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	0.99	0.99	0.99	0.99	1.00	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.02	2.02	2.02	2.02	2.00	2.04	2.02
	%Fosterite	81.97	82.26	82.26	81.93	82.26	82.12	82.16	82.42
Oxide %	**MgO**	43.46	43.83	42.77	43.56	43.76	43.05	44.91	43.20
	FeO	17.05	16.85	16.44	17.12	16.83	16.71	17.38	16.43
	NiO	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	38.74	39.09	38.14	38.81	38.76	38.96	39.15	38.29
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.67	100.17	97.35	99.49	99.35	98.72	101.44	97.92
	Ni (ppm)	3300	3200	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.65	1.65	1.66	1.66	1.65	1.92	1.66	1.64
	Fe	0.36	0.35	0.35	0.36	0.36	0.41	0.36	0.36
	Ni	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Si	0.99	1.00	0.99	0.99	1.00	0.83	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.01	2.01	2.02	2.01	2.33	2.02	2.00
	%Fosterite	82.27	82.29	82.68	82.02	82.05	82.21	82.13	82.04
Oxide %	**MgO**	43.93	43.07	43.76	43.90	43.68	43.83	42.97	43.08
	FeO	16.88	16.52	16.34	17.15	17.03	16.90	16.66	16.81
	NiO	0.42	0.00	0.43	0.00	0.00	0.00	0.00	0.00
	SiO2	39.21	38.89	39.04	38.94	39.34	28.45	38.29	39.32
	CaO	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.44	98.65	99.58	99.98	100.05	89.19	97.92	99.22
	Ni (ppm)	3300	0	3400	0	0	0	0	0

		Olivine 17
Atomic	**Mg**	1.65
	Fe	0.35
	Ni	0.00
	Si	1.00
	Ca	0.00
	Mn	0.00
	Total Cation	2.01
	%Fosterite	82.37
Oxide %	**MgO**	43.63
	FeO	16.65
	NiO	0.00
	SiO2	39.13
	CaO	0.00
	MnO	0.00
	Total	99.40
	Ni (ppm)	0

DDH: WM01-01 Thin Section: SW01-26 Depth:499.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.71	1.71	1.67	1.68	1.70	1.69	1.68	1.70
	Fe	0.33	0.33	0.34	0.35	0.33	0.34	0.35	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Si	0.98	0.98	0.99	0.99	0.99	0.99	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.04	2.01	2.03	2.03	2.03	2.04	2.03
	%Fosterite	83.91	83.85	82.95	82.89	83.64	83.45	82.69	83.88
Oxide %	**MgO**	43.78	45.01	42.95	44.74	43.40	43.76	44.21	44.16
	FeO	14.96	15.45	15.73	16.47	15.13	15.48	16.49	15.13
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
	SiO2	37.31	38.34	38.21	39.06	37.65	38.04	38.44	38.27
	CaO	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.19	98.93	96.89	100.27	96.18	97.28	99.15	97.93
	Ni (ppm)	0	0	0	0	0	0	0	2900

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.70	1.68	1.68	1.67	1.67	1.66	1.68	1.68
	Fe	0.33	0.34	0.34	0.34	0.35	0.35	0.34	0.35
	Ni	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00
	Si	0.99	0.99	0.98	1.00	0.99	0.99	0.99	0.98
	Ca	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	2.03	2.03	2.00	2.02	2.02	2.03	2.04
	%Fosterite	83.74	83.00	83.07	83.21	82.76	82.52	82.96	82.64
Oxide %	**MgO**	45.07	43.31	44.36	44.64	43.83	44.89	43.83	43.71
	FeO	15.61	15.81	16.12	16.06	16.27	16.96	16.04	16.36
	NiO	0.00	0.33	0.00	0.00	0.00	0.37	0.31	0.00
	SiO2	39.02	37.97	38.68	39.83	38.64	39.71	38.34	37.99
	CaO	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.70	97.43	99.37	100.53	98.74	101.92	98.51	98.07
	Ni (ppm)	0	2600	0	0	0	2900	2400	0

		Olivine 17	Olivine 18	Olivine 19	Olivine 20
Atomic	**Mg**	1.69	1.69	1.67	1.67
	Fe	0.35	0.34	0.35	0.34
	Ni	0.00	0.01	0.00	0.01
	Si	0.98	0.98	0.99	0.99
	Ca	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.04	2.02	2.02
	%Fosterite	82.78	83.12	82.86	83.18
Oxide %	**MgO**	43.93	44.91	44.86	43.40
	FeO	16.29	16.26	16.54	15.64
	NiO	0.00	0.32	0.00	0.32
	SiO2	38.08	38.94	39.66	38.38
	CaO	0.00	0.00	0.00	0.28
	MnO	0.00	0.00	0.00	0.00
	Total	98.29	100.42	101.06	98.02
	Ni (ppm)	0	2500	0	2500

DDH: WM01-01 Thin Section: SW01-27 Depth:530.80m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.69	1.68	1.67	1.68	1.68	1.72	1.68	1.67
	Fe	0.35	0.33	0.36	0.34	0.35	0.33	0.35	0.34
	Ni	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
	Si	0.98	0.99	0.98	0.99	0.98	0.97	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.02	2.03	2.02	2.03	2.05	2.03	2.01
	%Fosterite	82.71	83.66	82.28	83.13	82.89	83.88	82.96	83.03
Oxide %	**MgO**	44.21	44.71	44.31	44.89	45.14	46.80	44.74	44.84
	FeO	16.48	15.57	17.01	16.24	16.61	16.03	16.38	16.34
	NiO	0.00	0.41	0.00	0.00	0.31	0.00	0.00	0.00
	SiO2	38.10	39.23	38.85	39.26	39.43	39.38	39.09	39.98
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.79	99.92	100.17	100.38	101.48	102.21	100.20	101.16
	Ni (ppm)	0	3200	0	0	2400	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14
Atomic	**Mg**	1.69	1.68	1.69	1.66	1.67	1.68
	Fe	0.34	0.33	0.33	0.35	0.33	0.34
	Ni	0.00	0.01	0.00	0.00	0.00	0.00
	Si	0.99	0.99	0.99	0.99	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.02	2.02	2.01	2.01	2.02
	%Fosterite	83.39	83.42	83.44	82.66	83.31	82.97
Oxide %	**MgO**	44.92	44.54	44.54	44.54	44.71	45.29
	FeO	15.95	15.79	15.76	16.66	15.97	16.57
	NiO	0.00	0.33	0.00	0.00	0.00	0.00
	SiO2	39.26	39.28	38.91	39.68	39.75	39.88
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.13	99.94	99.22	100.89	100.42	101.73
	Ni (ppm)	0	2600	0	0	0	0

DDH: WM01-01 Thin Section: SW01-28 Depth:571.70m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.68	1.68	1.69	1.68	1.70	1.68	1.67	1.68
	Fe	0.32	0.33	0.32	0.33	0.32	0.32	0.33	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Si	1.00	1.00	0.99	1.00	0.99	0.99	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.01	2.01	2.01	2.02	2.01	2.00	2.01
	%Fosterite	84.07	83.69	83.89	83.62	84.06	83.76	83.57	83.53
Oxide %	**MgO**	45.14	45.37	44.53	44.87	44.64	44.46	44.59	44.66
	FeO	15.25	15.76	15.25	15.67	15.09	15.36	15.63	15.70
	NiO	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
	SiO2	39.98	40.15	39.04	39.79	38.94	39.32	39.77	39.28
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.37	101.29	98.81	100.33	98.67	99.60	99.99	99.63
	Ni (ppm)	0	0	0	0	0	3600	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.68	1.70	1.70	1.69	1.68	1.69	1.69	1.66
	Fe	0.33	0.31	0.31	0.31	0.32	0.32	0.32	0.33
	Ni	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	Si	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.01	2.01	2.01	2.00	2.02	2.02	2.02	2.00
	%Fosterite	83.70	84.57	84.79	84.32	83.91	84.10	84.14	83.65
Oxide %	**MgO**	44.89	44.81	45.93	44.74	45.47	44.48	44.41	45.21
	FeO	15.58	14.58	14.69	14.83	15.54	14.99	14.92	15.75
	NiO	0.00	0.00	0.00	0.00	0.46	0.33	0.66	0.38
	SiO2	39.75	39.28	39.98	39.41	39.96	38.74	38.89	40.58
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.22	98.66	100.61	98.98	101.43	98.54	98.89	101.92
	Ni (ppm)	0	0	0	0	3600	2600	5200	3000

DDH: WM01-01 Thin Section: SW01-29 Depth:573.40m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.72	1.73	1.70	1.72	1.71	1.71	1.72	1.71
	Fe	0.31	0.31	0.31	0.31	0.30	0.32	0.31	0.31
	Ni	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00
	Si	0.98	0.98	0.99	0.98	0.99	0.98	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00
	Total Cation	2.03	2.05	2.02	2.04	2.02	2.05	2.03	2.03
	%Fosterite	84.70	84.61	84.48	84.70	84.94	84.37	84.95	84.50
Oxide %	**MgO**	46.32	47.01	45.69	46.52	46.70	47.15	47.53	47.05
	FeO	14.91	15.25	14.96	14.97	14.76	15.57	15.01	15.39
	NiO	0.00	0.00	0.00	0.34	0.00	0.42	0.33	0.00
	SiO2	39.51	39.66	39.66	39.51	40.37	40.05	40.48	40.37
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.27	0.00	0.00	0.32	0.28	0.00	0.00
	Total	100.74	102.19	100.31	101.35	102.15	103.46	103.35	102.80
	Ni (ppm)	0	0	0	2700	0	3300	2600	0

DD

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.69	1.73	1.72	1.74	1.72	1.72	1.71	1.71
	Fe	0.32	0.30	0.31	0.30	0.31	0.32	0.33	0.32
	Ni	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00
	Si	0.99	0.98	0.98	0.98	0.99	0.98	0.98	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.04	2.03	2.04	2.03	2.04	2.04	2.03
	%Fosterite	84.20	85.10	84.69	85.17	84.84	84.43	83.88	84.26
Oxide %	**MgO**	46.48	47.13	46.96	46.93	46.58	45.90	45.55	45.12
	FeO	15.55	14.70	15.13	14.56	14.83	15.09	15.61	15.03
	NiO	0.36	0.52	0.00	0.00	0.00	0.38	0.00	0.00
	SiO2	40.54	39.81	39.96	39.53	39.79	38.91	38.96	38.57
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.18	102.17	102.05	101.03	101.21	100.29	100.12	98.72
	Ni (ppm)	2800	4100	0	0	0	3000	0	0

		Olivine 17	Olivine 18
Atomic	**Mg**	1.69	1.71
	Fe	0.33	0.33
	Ni	0.01	0.00
	Si	0.99	0.98
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.03	2.04
	%Fosterite	83.71	83.96
Oxide %	**MgO**	45.35	45.47
	FeO	15.73	15.49
	NiO	0.36	0.00
	SiO2	39.49	38.76
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	100.94	99.72
	Ni (ppm)	2800	0

DDH: WM01-01 Thin Section: SW01-30 Depth:574.35m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.67	1.69	1.68	1.69	1.69	1.68	1.70	1.70
	Fe	0.32	0.32	0.33	0.33	0.33	0.32	0.31	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Si	1.00	1.00	1.00	0.99	0.99	1.00	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	2.01	2.01	2.03	2.02	2.01	2.02	2.01
	%Fosterite	83.86	84.29	83.71	83.53	83.64	84.12	84.55	84.33
Oxide %	**MgO**	43.85	44.82	43.94	45.02	44.34	44.79	44.91	44.64
	FeO	15.04	14.90	15.25	15.82	15.46	15.08	14.63	14.78
	NiO	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00
	SiO2	39.17	39.34	38.79	39.13	38.59	39.49	38.98	38.87
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.06	99.06	97.98	99.97	98.40	99.72	98.51	98.29
	Ni (ppm)	0	0	0	0	0	2800	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.67	1.67	1.69	1.68	1.69	1.67	1.69	1.68
	Fe	0.32	0.32	0.33	0.32	0.32	0.32	0.32	0.33
	Ni	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01
	Si	1.00	1.00	0.99	0.99	0.99	1.00	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.00	2.03	2.01	2.01	2.00	2.02	2.02
	%Fosterite	83.85	83.75	83.69	84.07	83.97	83.73	84.00	83.50
Oxide %	**MgO**	45.22	44.76	45.82	45.21	44.91	44.36	44.71	45.04
	FeO	15.53	15.48	15.91	15.27	15.28	15.36	15.18	15.86
	NiO	0.46	0.00	0.59	0.45	0.36	0.00	0.00	0.42
	SiO2	40.20	40.00	39.88	39.86	39.43	39.68	39.02	39.68
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.41	100.24	102.19	100.78	99.97	99.40	98.91	101.01
	Ni (ppm)	3600	0	4600	3500	2800	0	0	3300

DDH: WM01-01 Thin Section: SW01-31 Depth:577.79m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.69	1.68	1.71	1.68	1.69	1.69	1.69	1.70
	Fe	0.34	0.33	0.33	0.33	0.32	0.34	0.32	0.33
	Ni	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00
	Si	0.98	1.00	0.98	0.99	0.99	0.99	0.99	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	2.01	2.03	2.02	2.02	2.03	2.02	2.03
	%Fosterite	83.40	83.67	83.93	83.43	83.88	83.42	83.99	83.79
Oxide %	**MgO**	45.35	45.55	45.32	45.75	45.11	45.67	45.21	46.05
	FeO	16.09	15.85	15.46	16.20	15.45	16.18	15.36	15.88
	NiO	0.41	0.00	0.00	0.31	0.47	0.00	0.46	0.00
	SiO2	39.45	40.30	38.96	40.20	39.36	39.71	39.64	39.68
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.30	101.71	99.74	102.45	100.39	101.56	100.67	101.61
	Ni (ppm)	3200	0	0	2400	3700	0	3600	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.70	1.70	1.71	1.70	1.69	1.71	1.70	1.69
	Fe	0.33	0.33	0.32	0.32	0.33	0.33	0.34	0.34
	Ni	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00
	Si	0.99	0.98	0.98	0.99	0.99	0.98	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	2.03	2.04	2.03	2.02	2.04	2.04	2.02
	%Fosterite	83.77	83.71	84.24	84.22	83.52	83.85	83.42	83.39
Oxide %	**MgO**	44.81	45.07	45.01	45.90	45.82	44.89	45.64	45.26
	FeO	15.48	15.63	15.01	15.34	16.12	15.41	16.17	16.07
	NiO	0.00	0.00	0.55	0.39	0.00	0.00	0.33	0.00
	SiO2	38.70	38.87	38.34	39.71	39.90	38.53	39.26	39.60
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.98	99.57	98.90	101.34	101.84	98.83	101.39	100.92
	Ni (ppm)	0	0	4300	3100	0	0	2600	0

		Olivine 17	Olivine 18	Olivine 19
Atomic	**Mg**	1.71	1.70	1.69
	Fe	0.33	0.34	0.34
	Ni	0.00	0.01	0.00
	Si	0.98	0.98	0.99
	Ca	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total Cation	2.04	2.04	2.02
	%Fosterite	83.85	83.42	83.39
Oxide %	**MgO**	44.89	45.64	45.26
	FeO	15.41	16.17	16.07
	NiO	0.00	0.33	0.00
	SiO2	38.53	39.26	39.60
	CaO	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	98.83	101.39	100.92
	Ni (ppm)	0	2600	0

DDH: WM01-01 Thin Section: SW01-32 Depth:583.70m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.66	1.66	1.67	1.66	1.67	1.65	1.67	1.67
	Fe	0.33	0.34	0.33	0.34	0.34	0.34	0.33	0.34
	Ni	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
	Si	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.00	2.01	2.01	2.01	2.01	2.00	2.01
	%Fosterite	83.38	83.10	83.27	83.13	83.23	82.74	83.29	83.10
Oxide %	**MgO**	43.41	44.06	44.01	44.21	43.28	43.51	43.46	43.68
	FeO	15.43	15.98	15.76	15.99	15.54	16.18	15.54	15.84
	NiO	0.00	0.00	0.39	0.31	0.38	0.41	0.00	0.00
	SiO2	38.98	39.58	39.17	39.56	38.49	39.11	38.91	38.83
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.82	99.62	99.34	100.06	97.69	99.21	97.92	98.34
	Ni (ppm)	0	0	3100	2400	3000	3200	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 1:	Olivine 14	Olivine 15
Atomic	**Mg**	1.66	1.65	1.67	1.67	1.66	1.66	1.66
	Fe	0.33	0.34	0.33	0.34	0.33	0.34	0.34
	Ni	0.00	0.01	0.01	0.01	0.00	0.00	0.01
	Si	1.00	1.00	1.00	0.99	1.01	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.99	2.00	2.02	1.99	2.00	2.01
	%Fosterite	83.24	83.00	83.42	83.24	83.43	83.01	83.21
Oxide %	**MgO**	43.41	43.36	44.06	43.81	43.53	43.94	44.16
	FeO	15.58	15.84	15.61	15.72	15.41	16.03	15.89
	NiO	0.00	0.31	0.34	0.41	0.00	0.00	0.33
	SiO2	38.98	39.41	39.38	38.74	39.32	39.41	39.47
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.97	98.91	99.39	98.68	98.26	99.38	99.85
	Ni (ppm)	0	2400	2700	3200	0	0	2600

DDH: WM01-01 Thin Section: SW01-33 Depth:585.50m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.67	1.69	1.68	1.68	1.67	1.67	1.67	1.68
	Fe	0.32	0.34	0.33	0.34	0.34	0.34	0.34	0.33
	Ni	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Si	1.00	0.98	0.98	0.99	0.99	0.99	1.00	0.99
	Ca	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.04	2.03	2.02	2.01	2.01	2.00	2.02
	%Fosterite	83.79	83.16	83.57	83.16	82.90	83.23	83.20	83.41
Oxide %	**MgO**	43.55	44.94	44.41	44.01	43.55	43.66	43.70	44.23
	FeO	15.01	16.22	15.57	15.89	16.02	15.68	15.73	15.68
	NiO	0.32	0.00	0.41	0.00	0.00	0.00	0.00	0.00
	SiO2	38.89	38.91	38.70	38.66	38.64	38.70	39.04	38.83
	CaO	0.20	0.24	0.21	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.97	100.31	99.29	98.56	98.20	98.05	98.47	98.74
	Ni (ppm)	2500	0	3200	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.68	1.68	1.67	1.66	1.66	1.67	1.66	1.68
	Fe	0.34	0.33	0.35	0.34	0.34	0.34	0.34	0.34
	Ni	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.01
	Si	0.99	0.99	0.98	1.00	1.00	0.99	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.02	2.03	2.01	2.00	2.02	2.00	2.02
	%Fosterite	83.09	83.36	82.58	82.91	83.18	83.15	82.83	83.29
Oxide %	**MgO**	44.01	44.24	43.85	44.11	44.34	44.51	44.01	44.08
	FeO	15.97	15.75	16.49	16.21	15.98	16.08	16.26	15.76
	NiO	0.00	0.46	0.36	0.36	0.00	0.41	0.00	0.36
	SiO2	38.81	38.96	38.36	39.41	39.90	39.41	39.64	38.81
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.78	99.40	99.05	100.08	100.22	100.40	99.91	99.00
	Ni (ppm)	0	3600	2800	2800	0	3200	0	2800

		Olivine 17
Atomic	**Mg**	1.68
	Fe	0.31
	Ni	0.01
	Si	1.00
	Ca	0.00
	Mn	0.00
	Total Cation	2.00
	%Fosterite	84.44
Oxide %	**MgO**	43.48
	FeO	14.28
	NiO	0.48
	SiO2	38.64
	CaO	0.00
	MnO	0.00
	Total	96.88
	Ni (ppm)	3800

DDH: WM01-01 Thin Section: SW01-34 Depth:603.70m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.63	1.61	1.62	1.64	1.60	1.60	1.60	1.61
	Fe	0.35	0.34	0.35	0.35	0.36	0.37	0.36	0.36
	Ni	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.00
	Si	1.01	1.02	1.01	1.00	1.02	1.01	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.96	1.98	1.99	1.96	1.98	1.97	1.97
	%Fosterite	82.25	82.54	82.20	82.60	81.50	81.26	81.60	81.68
Oxide %	**MgO**	42.93	42.40	42.42	42.98	40.88	40.99	42.17	42.37
	FeO	16.52	15.99	16.38	16.15	16.54	16.85	16.96	16.94
	NiO	0.00	0.36	0.00	0.38	0.00	0.41	0.36	0.00
	SiO2	39.83	40.07	39.43	39.32	38.91	38.57	39.68	39.83
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.29	98.82	98.22	98.83	96.34	96.83	99.17	99.15
	Ni (ppm)	0	2800	0	3000	0	3200	2800	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 1	Olivine 15	Olivine 16
Atomic	**Mg**	1.60	1.63	1.62	1.62	1.70	1.60	1.65	1.61
	Fe	0.35	0.35	0.36	0.36	0.27	0.35	0.33	0.36
	Ni	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
	Si	1.02	1.01	1.01	1.01	1.01	1.02	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.96	1.98	1.99	1.98	1.97	1.96	1.97	1.97
	%Fosterite	81.95	82.22	81.58	81.87	86.31	82.19	83.46	81.71
Oxide %	**MgO**	41.82	41.77	42.42	42.49	45.47	41.94	42.90	41.95
	FeO	16.42	16.11	17.07	16.78	12.85	16.20	15.15	16.74
	NiO	0.00	0.00	0.46	0.00	0.00	0.36	0.00	0.00
	SiO2	39.68	38.70	39.36	39.49	40.30	39.68	39.41	39.38
	CaO	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.92	96.58	99.31	98.75	98.63	98.40	97.46	98.08
	Ni (ppm)	0	0	3600	0	0	2800	0	0

DDH: WM01-01 Thin Section: SW01-35 Depth:647.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.60	1.60	1.61	1.61	1.62	1.60	1.58	1.59
	Fe	0.37	0.36	0.34	0.36	0.36	0.36	0.37	0.36
	Ni	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Si	1.01	1.02	1.02	1.01	1.01	1.02	1.02	1.02
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.97	1.96	1.96	1.97	1.98	1.97	1.95	1.97
	%Fosterite	81.43	81.58	82.47	81.72	81.93	81.59	81.01	81.42
Oxide %	**MgO**	41.32	42.05	41.67	41.18	42.80	41.91	41.24	42.17
	FeO	16.80	16.93	15.79	16.42	16.83	16.85	17.24	17.15
	NiO	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.42
	SiO2	39.02	39.83	39.34	38.59	39.86	39.62	39.77	40.07
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.48	98.82	96.80	96.18	99.48	98.38	98.25	99.81
	Ni (ppm)	2600	0	0	0	0	0	0	3300

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14
Atomic	**Mg**	1.61	1.60	1.60	1.60	1.61	1.61
	Fe	0.36	0.36	0.36	0.36	0.37	0.37
	Ni	0.00	0.01	0.00	0.01	0.00	0.00
	Si	1.01	1.02	1.02	1.02	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.97	1.96	1.97	1.98	1.97
	%Fosterite	81.58	81.41	81.63	81.40	81.26	81.44
Oxide %	**MgO**	42.05	42.42	41.66	41.41	42.52	42.47
	FeO	16.93	17.26	16.71	16.87	17.48	17.25
	NiO	0.00	0.45	0.00	0.34	0.00	0.00
	SiO2	39.21	40.22	39.49	39.34	39.64	39.88
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.20	100.35	97.86	97.96	99.64	99.60
	Ni (ppm)	0	3500	0	2700	0	0

DDH: WM01-01 Thin Section: SW01-36 Depth:665.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.60	1.61	1.64	1.60	1.59	1.60	1.60	1.62
	Fe	0.37	0.38	0.35	0.36	0.37	0.36	0.36	0.34
	Ni	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	Si	1.02	1.00	1.00	1.02	1.02	1.01	1.02	1.02
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.97	2.00	2.00	1.97	1.96	1.97	1.96	1.96
	%Fosterite	81.24	80.79	82.54	81.52	81.31	81.66	81.57	82.57
Oxide %	**MgO**	42.09	42.37	44.19	42.47	42.25	41.57	42.42	41.91
	FeO	17.33	17.96	16.66	17.16	17.32	16.65	17.08	15.77
	NiO	0.00	0.00	0.34	0.00	0.34	0.64	0.00	0.00
	SiO2	39.98	39.19	40.07	40.11	40.30	39.23	40.22	39.41
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.40	99.52	101.27	99.74	100.22	98.09	99.72	97.08
	Ni (ppm)	0	0	2700	0	2700	5000	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13
Atomic	**Mg**	1.60	1.61	1.59	1.59	1.59
	Fe	0.36	0.35	0.37	0.36	0.36
	Ni	0.00	0.00	0.01	0.00	0.01
	Si	1.02	1.02	1.02	1.02	1.02
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.96	1.95	1.96	1.95	1.96
	%Fosterite	81.69	82.18	81.17	81.45	81.39
Oxide %	**MgO**	42.14	40.88	42.20	41.89	41.37
	FeO	16.84	15.80	17.46	17.01	16.87
	NiO	0.00	0.00	0.39	0.00	0.32
	SiO2	39.94	38.79	40.33	40.18	39.43
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	98.92	95.46	100.38	99.07	97.99
	Ni (ppm)	0	0	3100	0	2500

DDH: WM01-01 Thin Section: SW01-37 Depth:693.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4
Atomic	**Mg**	1.63	1.66	1.63	1.67
	Fe	0.39	0.38	0.38	0.40
	Ni	0.00	0.00	0.00	0.00
	Si	0.99	0.98	0.99	0.96
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.04	2.02	2.07
	%Fosterite	80.70	81.25	81.01	80.62
Oxide %	**MgO**	44.79	45.01	44.38	44.77
	FeO	19.09	18.51	18.54	19.18
	NiO	0.00	0.00	0.00	0.00
	SiO2	40.65	39.73	40.11	38.55
	CaO	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	104.53	103.25	103.03	102.51
	Ni (ppm)	0	0	0	0

DDH: WM01-01 Thin Section: SW01-38 Depth:708.70m

		Olivine 1	Olivine 2	Olivine 3
Atomic	**Mg**	1.58	1.62	1.68
	Fe	0.44	0.38	0.34
	Ni	0.00	0.00	0.00
	Si	0.99	1.00	0.99
	Ca	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total Cation	2.02	2.00	2.02
	%Fosterite	78.09	80.90	83.04
Oxide %	**MgO**	40.16	41.92	43.38
	FeO	20.08	17.64	15.80
	NiO	0.00	0.00	0.00
	SiO2	38	39	38
	CaO	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	97.88	98.28	97.26
	Ni (ppm)	0.00	0.00	0.00

DDH: WM01-01 Thin Section: SW01-40 Depth:713.60m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.70	1.70	1.55	1.55	1.54	1.56	1.55	1.55
	Fe	0.33	0.32	0.46	0.47	0.49	0.46	0.46	0.43
	Ni	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00
	Si	0.98	0.98	0.99	0.98	0.99	0.99	0.99	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	2.03	2.02	2.03	2.03	2.02	2.02	1.99
	%Fosterite	83.51	84.11	76.95	76.69	76.04	77.03	77.12	78.21
Oxide %	**MgO**	45.84	45.70	40.64	40.55	39.65	40.15	40.38	41.46
	FeO	16.13	15.39	21.70	21.97	22.27	21.34	21.36	20.58
	NiO	0.00	0.48	0.00	0.32	0.00	0.00	0.47	0.00
	SiO2	39.66	39.47	38.74	38.34	37.76	38.08	38.29	40.03
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.63	101.04	101.09	101.17	99.68	99.57	100.50	102.07
	Ni (ppm)	0	3800	0	2500	0	0	3700	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12
Atomic	**Mg**	1.59	1.58	1.55	1.51
	Fe	0.41	0.43	0.43	0.48
	Ni	0.00	0.00	0.01	0.00
	Si	1.00	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Cation	2.00	2.01	1.99	1.99
	%Fosterite	79.42	78.76	78.24	75.83
Oxide %	**MgO**	41.95	41.52	40.61	39.04
	FeO	19.37	19.97	20.13	22.18
	NiO	0.00	0.00	0.43	0.00
	SiO2	39.30	39.02	39.23	38.61
	CaO	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	100.63	100.51	100.41	99.83
	Ni (ppm)	0	0	3400	0

DDH: WM98-05 Thin Section: SW98-5-02 Depth:17.62m

		Olivine 1
Atomic	**Mg**	1.69
	Fe	0.36
	Ni	0.00
	Si	0.98
	Ca	0.00
	Mn	0.00
	Total Cation	2.05
	%Fosterite	82.61
Oxide %	**MgO**	45.89
	FeO	17.21
	NiO	0.00
	SiO2	39.56
	CaO	0.00
	MnO	0.00
	Total	102.65
	Ni (ppm)	0

)H: WM98-05 Thin Section: SW98-5-07 Depth:97.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	0.98	0.92	1.04	1.06	1.03	1.20	0.99	1.04
	Fe	1.00	1.08	1.05	0.95	0.99	0.82	1.04	0.98
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.00	0.95	1.00	0.99	0.99	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	2.00	2.10	2.01	2.02	2.03	2.02	2.01
	%Fosterite	49.49	45.97	49.80	52.86	50.95	59.33	48.79	51.44
Oxide %	**MgO**	23.46	21.67	26.30	25.36	23.73	29.48	23.37	24.58
	FeO	42.70	45.41	47.27	40.31	40.72	36.02	43.72	41.35
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	35.73	35.28	35.75	35.43	33.91	36.07	34.91	35.17
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.89	102.36	109.31	101.09	98.36	101.58	101.99	101.09
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9
Atomic	**Mg**	0.98
	Fe	1.04
	Ni	0.00
	Si	0.99
	Ca	0.00
	Mn	0.00
	Total Cation	2.02
	%Fosterite	48.60
Oxide %	**MgO**	22.42
	FeO	42.26
	NiO	0.00
	SiO2	33.59
	CaO	0.00
	MnO	0.00
	Total	98.27
	Ni (ppm)	0

DDH: WM98-05 Thin Section: SW98-5-08 Depth:161.10m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.26	1.12	1.30	1.16	1.22	1.32	1.05	0.76
	Fe	0.71	0.86	0.68	0.83	0.78	0.67	0.97	1.23
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.01	1.01	1.01	1.00	1.00	0.99	1.00
	Ca	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	1.98	1.98	2.00	1.99	2.02	1.99
	%Fosterite	63.93	56.50	65.79	58.30	61.11	66.22	52.14	38.20
Oxide %	**MgO**	31.84	26.86	32.90	27.64	29.42	32.59	25.54	17.38
	FeO	32.02	36.87	30.50	35.25	33.37	29.63	41.79	50.12
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	37.82	35.92	38.14	35.92	35.94	36.90	35.75	34.16
	CaO	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.99	99.65	101.55	98.81	98.73	99.12	103.07	101.67
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	0.90	0.63	1.25	1.23	1.32	0.88	1.02	0.81
	Fe	1.10	1.35	0.77	0.79	0.70	1.13	0.97	1.19
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.00	1.01	0.99	0.99	0.99	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.98	2.02	2.02	2.02	2.00	2.00	2.00
	%Fosterite	44.96	31.60	61.80	60.77	65.17	43.87	51.24	40.48
Oxide %	**MgO**	20.21	13.37	31.01	30.40	32.78	20.31	24.21	17.94
	FeO	44.11	51.58	34.17	34.98	31.24	46.33	41.08	47.02
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	33.61	32.18	36.52	36.45	36.75	34.36	35.38	33.16
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.94	97.12	101.70	101.83	100.77	101.00	100.67	98.12
	Ni (ppm)	0	0	0	0	0	0	0	0

DDH: WM98-05 Thin Section: SW98-5-09 Depth:189.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.71	1.72	1.71	1.70	1.69	1.71	1.70	1.71
	Fe	0.34	0.35	0.34	0.34	0.34	0.35	0.34	0.34
	Ni	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00
	Si	0.97	0.97	0.98	0.98	0.99	0.97	0.98	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.05	2.07	2.04	2.05	2.03	2.06	2.04	2.05
	%Fosterite	83.55	83.15	83.56	83.51	83.39	83.19	83.23	83.21
Oxide %	**MgO**	46.28	46.47	46.08	46.20	45.75	46.25	45.70	45.72
	FeO	16.25	16.79	16.16	16.26	16.25	16.66	16.42	16.44
	NiO	0.32	0.00	0.00	0.36	0.00	0.32	0.00	0.00
	SiO2	39.32	39.02	39.34	39.43	39.81	39.17	39.41	38.94
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.17	102.28	101.58	102.25	101.81	102.40	101.52	101.10
	Ni (ppm)	2500	0	0	2800	0	2500	0	0

DDH: WM98-05 Thin Section: SW98-5-10 Depth:193.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6
Atomic	**Mg**	1.69	1.72	1.71	1.72	1.68	1.71
	Fe	0.34	0.32	0.34	0.33	0.33	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.98	0.98	0.98	0.99	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	2.04	2.05	2.05	2.01	2.03
	%Fosterite	83.41	84.18	83.49	83.84	83.45	83.98
Oxide %	**MgO**	45.57	46.00	44.03	46.57	44.11	46.23
	FeO	16.16	15.41	15.52	16.00	15.59	15.72
	NiO	0	0	0	0	0	0
	SiO2	39.51	39.21	37.44	39.38	39.00	39.71
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.24	100.63	96.98	101.95	98.70	101.66
	Ni (ppm)	0.00	0.00	0.00	0.00	0.00	0.00

DDH: WM98-05 Thin Section: SW98-5-13 Depth:311.02m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.65	1.63	1.66	1.66	1.65	1.65	1.63
	Fe	0.34	0.34	0.35	0.34	0.35	0.34	0.34	0.34
	Ni	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Si	1.01	1.00	1.01	1.00	0.99	1.01	1.00	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	1.99	2.01	2.01	1.99	2.00	1.97
	%Fosterite	82.98	82.73	82.12	82.77	82.58	82.87	82.82	82.64
Oxide %	**MgO**	44.61	44.61	44.03	44.24	44.23	44.96	44.86	44.29
	FeO	16.31	16.60	17.08	16.42	16.63	16.57	16.58	16.58
	NiO	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.00
	SiO2	40.67	40.54	40.50	39.64	39.45	41.01	40.50	40.97
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.59	101.74	101.91	100.61	100.31	102.54	101.94	101.84
	Ni (ppm)	0	0	2400	2400	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14
Atomic	**Mg**	1.64	1.63	1.64	1.64	1.63	1.65
	Fe	0.35	0.33	0.34	0.35	0.34	0.34
	Ni	0.00	0.00	0.01	0.00	0.00	0.01
	Si	1.00	1.02	1.01	1.00	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.97	1.98	1.99	1.98	2.00
	%Fosterite	82.44	82.97	82.98	82.46	82.56	82.69
Oxide %	**MgO**	43.51	43.90	42.95	43.81	43.30	43.94
	FeO	16.52	16.06	15.71	16.61	16.30	16.40
	NiO	0.00	0.00	0.38	0.00	0.00	0.38
	SiO2	39.60	40.78	39.51	39.81	40.00	39.88
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.63	100.73	98.55	100.23	99.60	100.61
	Ni (ppm)	0	0	3000	0	0	3000

DDH: WM98-05 Thin Section: SW98-5-14 Depth:323.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.74	1.71	1.72	1.73	1.70	1.74	1.73	1.74
	Fe	0.33	0.33	0.33	0.33	0.31	0.32	0.33	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.96	0.98	0.97	0.97	0.99	0.97	0.97	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.07	2.05	2.05	2.06	2.02	2.06	2.06	2.05
	%Fosterite	84.19	83.64	83.93	84.16	84.48	84.52	83.92	84.62
Oxide %	**MgO**	47.51	45.16	46.91	47.21	44.38	47.29	47.03	47.38
	FeO	15.90	15.75	16.02	15.84	14.54	15.44	16.07	15.35
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	39.15	38.42	39.56	39.47	38.55	39.26	39.43	39.62
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.56	99.32	102.49	102.52	97.46	101.99	102.53	102.35
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12
Atomic	**Mg**	1.73	1.68	1.73	1.75
	Fe	0.31	0.35	0.33	0.34
	Ni	0.01	0.00	0.00	0.00
	Si	0.97	0.98	0.97	0.96
	Ca	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Catior	2.05	2.04	2.06	2.09
	%Fosterite	84.83	82.63	83.96	83.89
Oxide %	**MgO**	47.58	44.51	47.44	47.58
	FeO	15.17	16.67	16.16	16.29
	NiO	0.41	0.00	0.00	0.00
	SiO2	39.86	38.57	39.79	38.66
	CaO	0.00	0.36	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	103.01	100.12	103.39	102.52
	Ni (ppm)	3200	0	0	0

DDH: WM98-05 Thin Section: SW98-5-15 Depth:348.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.71	1.72	1.70	1.71	1.70	1.70	1.70	1.71
	Fe	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.34
	Ni	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Si	0.97	0.97	0.98	0.97	0.98	0.98	0.97	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.05	2.06	2.05	2.06	2.05	2.05	2.06	2.05
	%Fosterite	83.46	83.48	83.21	83.48	83.13	82.94	82.81	83.27
Oxide %	**MgO**	45.97	46.50	45.72	45.55	45.11	46.02	45.11	45.98
	FeO	16.24	16.40	16.44	16.07	16.31	16.88	16.69	16.47
	NiO	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00
	SiO2	39.04	39.26	39.04	38.59	38.55	39.47	38.36	39.04
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.25	102.16	101.20	100.62	99.97	102.37	100.15	101.49
	Ni (ppm)	0	0	0	3200	0	0	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.70	1.70	1.70	1.72	1.72	1.72	1.70	1.71
	Fe	0.34	0.36	0.35	0.35	0.34	0.35	0.35	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	0.98	0.97	0.97	0.97	0.97	0.97	0.97	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.04	2.06	2.05	2.07	2.06	2.07	2.06	2.06
	%Fosterite	83.36	82.59	82.97	83.01	83.39	83.06	82.85	83.33
Oxide %	**MgO**	45.77	45.49	44.58	46.20	45.97	45.93	46.35	46.25
	FeO	16.29	17.10	16.31	16.85	16.33	16.70	17.10	16.49
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00
	SiO2	39.32	38.85	38.04	38.72	38.55	38.61	39.47	39.19
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.38	101.43	98.92	101.77	100.84	101.25	103.26	102.31
	Ni (ppm)	0	0	0	0	0	0	2700	0

DDH: WM98-05 Thin Section: SW98-5-18 Depth:382.60m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.64	1.67	1.66	1.65	1.67	1.65	1.66	1.65
	Fe	0.37	0.36	0.38	0.37	0.36	0.36	0.37	0.38
	Ni	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00
	Si	0.99	0.99	0.98	0.99	0.98	0.99	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.02	2.03	2.03	2.02	2.04	2.01	2.03	2.02
	%Fosterite	81.57	82.36	81.51	81.70	82.30	81.92	81.91	81.30
Oxide %	**MgO**	42.67	43.05	44.61	43.68	45.01	43.60	44.11	43.58
	FeO	17.19	16.44	18.04	17.44	17.25	17.15	17.37	17.87
	NiO	0.38	0.00	0.00	0.36	0.48	0.00	0.00	0.00
	SiO2	38.46	37.82	39.47	39.15	39.28	39.11	39.11	39.00
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.70	97.31	102.12	100.63	102.02	99.85	100.58	100.45
	Ni (ppm)	3000	0	0	2800	3800	0	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.66	1.65	1.67	1.65	1.64	1.63	1.65	1.64
	Fe	0.37	0.37	0.37	0.37	0.35	0.37	0.37	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	0.99	0.98	0.99	1.00	1.00	0.99	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.03	2.02	2.03	2.02	1.99	2.00	2.02	1.97
	%Fosterite	81.79	81.51	81.92	81.76	82.28	81.66	81.50	82.90
Oxide %	**MgO**	43.46	44.39	44.14	44.39	43.13	43.30	44.14	43.71
	FeO	17.25	17.95	17.37	17.65	16.56	17.33	17.86	16.07
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	38.46	39.62	38.83	39.51	39.41	39.45	39.62	40.39
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.18	101.96	100.34	101.56	99.10	100.08	101.62	100.17
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 1	Olivine 1!	Olivine 19	Olivine 20	Olivine 21	Olivine 22	Olivine 23	Olivine 24
Atomic	**Mg**	1.64	1.63	1.65	1.63	1.63	1.65	1.63	1.63
	Fe	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.36
	Ni	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
	Si	1.00	1.01	1.00	1.01	1.01	1.00	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	1.97	2.00	1.99	1.98	2.00	1.99	1.99
	%Fosterite	82.30	82.84	82.60	82.62	82.40	82.56	82.61	82.01
Oxide %	**MgO**	44.49	44.77	45.06	44.33	43.96	45.22	44.39	44.66
	FeO	17.06	16.53	16.92	16.62	16.74	17.03	16.66	17.46
	NiO	0.00	0.00	0.00	0.61	0.00	0.00	0.39	0.00
	SiO2	40.35	41.40	40.86	40.84	40.50	40.86	40.80	41.07
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.90	102.70	102.83	102.40	101.20	103.12	102.24	103.19
	Ni (ppm)	0	0	0	4800	0	0	3100	0

DDH: WM98-05 Thin Section: SW98-5-18 Depth:382.60m

		Olivine 2	Olivine 26
Atomic	**Mg**	1.65	1.63
	Fe	0.35	0.36
	Ni	0.01	0.00
	Si	1.00	1.01
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Catior	2.01	1.98
	%Fosterite	82.39	81.98
Oxide %	**MgO**	44.61	43.76
	FeO	16.99	17.15
	NiO	0.37	0.00
	SiO2	40.24	40.41
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	102.21	101.32
	Ni (ppm)	2900	0

DDH: WM98-05 Thin Section: SW98-5-19 Depth:387.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.75	1.72	1.70	1.72	1.70	1.71	1.71	1.73
	Fe	0.35	0.34	0.34	0.34	0.35	0.33	0.34	0.33
	Ni	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Si	0.95	0.97	0.98	0.97	0.98	0.98	0.98	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.11	2.06	2.04	2.06	2.04	2.05	2.05	2.05
	%Fosterite	83.32	83.68	83.21	83.46	83.06	83.82	83.54	84.13
Oxide %	**MgO**	47.31	46.55	46.32	45.37	45.93	45.95	47.26	45.87
	FeO	16.88	16.18	16.66	16.03	16.70	15.81	16.60	15.43
	NiO	0.38	0.00	0.00	0.00	0.00	0.41	0.00	0.00
	SiO2	38.19	39.02	39.90	38.19	39.45	39.06	40.28	38.59
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.76	101.75	102.87	99.59	102.08	101.23	104.14	99.89
	Ni (ppm)	3000	0	0	0	0	3200	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12
Atomic	**Mg**	1.70	1.71	1.70	1.70
	Fe	0.34	0.34	0.34	0.34
	Ni	0.00	0.00	0.01	0.00
	Si	0.98	0.98	0.97	0.98
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Catior	2.04	2.05	2.05	2.04
	%Fosterite	83.24	83.25	83.26	83.41
Oxide %	**MgO**	45.95	46.17	45.89	45.79
	FeO	16.49	16.56	16.44	16.24
	NiO	0.00	0.00	0.33	0.00
	SiO2	39.45	39.38	39.09	39.23
	CaO	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	101.89	102.11	101.74	101.26
	Ni (ppm)	0	0	2600	0

DDH: WM98-05 Thin Section: SW98-5-20 Depth:394.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.65	1.65	1.65	1.67	1.66	1.65	1.65
	Fe	0.33	0.33	0.33	0.35	0.32	0.33	0.34	0.34
	Ni	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	Si	1.01	1.01	1.00	1.00	1.00	1.00	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.98	1.98	1.99	2.00	2.00	2.00	1.99	1.99
	%Fosterite	83.16	83.35	83.40	82.51	84.00	83.36	82.83	83.11
Oxide %	**MgO**	44.48	45.59	45.42	44.53	44.67	45.07	44.04	45.55
	FeO	16.06	16.24	16.12	16.83	15.17	16.04	16.27	16.51
	NiO	0.00	0.00	0.55	0.00	0.32	0.38	0.00	0.00
	SiO2	40.69	41.46	41.22	40.09	39.77	40.52	40.07	41.33
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.22	103.28	103.31	101.44	99.93	102.02	100.39	103.39
	Ni (ppm)	0	0	4300	0	2500	3000	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13
Atomic	**Mg**	1.67	1.66	1.66	1.64	1.72
	Fe	0.35	0.33	0.35	0.34	0.32
	Ni	0.01	0.01	0.01	0.00	0.00
	Si	0.99	1.00	0.99	1.01	0.98
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.02	2.00	2.01	1.99	2.04
	%Fosterite	82.81	83.27	82.74	82.73	84.28
Oxide %	**MgO**	44.74	45.30	46.00	44.72	48.32
	FeO	16.56	16.22	17.11	16.65	16.07
	NiO	0.32	0.32	0.33	0.00	0.00
	SiO2	39.68	40.67	41.12	40.88	41.27
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	101.30	102.51	104.56	102.25	105.66
	Ni (ppm)	2500	2500	2600	0	0

DDH: WM98-05 Thin Section: SW98-5-21 Depth:407.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.73	1.72	1.72	1.70	1.70	1.70	1.72	1.70
	Fe	0.31	0.32	0.32	0.35	0.34	0.35	0.34	0.34
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.98	0.98	0.98	0.98	0.98	0.97	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.04	2.04	2.04	2.05	2.04	2.05	2.06	2.03
	%Fosterite	84.72	84.44	84.28	83.07	83.45	83.12	83.44	83.49
Oxide %	**MgO**	47.33	47.46	46.83	46.13	46.32	46.15	45.93	45.22
	FeO	15.22	15.59	15.57	16.76	16.38	16.71	16.25	15.94
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	40.09	40.24	39.79	39.56	39.68	39.56	38.66	39.13
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.64	103.29	102.19	102.45	102.38	102.42	100.84	100.29
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13
Atomic	**Mg**	1.71	1.74	1.70	1.71	1.73
	Fe	0.35	0.32	0.34	0.34	0.35
	Ni	0.00	0.00	0.00	0.00	0.00
	Si	0.97	0.97	0.98	0.98	0.96
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.06	2.06	2.04	2.04	2.08
	%Fosterite	83.18	84.51	83.29	83.48	83.06
Oxide %	**MgO**	46.22	46.08	44.89	46.15	46.03
	FeO	16.66	15.05	16.06	16.27	16.74
	NiO	0.00	0.00	0.00	0.00	0.00
	SiO2	39.06	38.34	38.64	39.41	38.25
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	101.94	99.47	99.58	101.83	101.02
	Ni (ppm)	0	0	0	0	0

DDH: WM98-05 Thin Section: SW98-5-22 Depth:423.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.67	1.67	1.65	1.64	1.67	1.66	1.66	1.68
	Fe	0.32	0.32	0.34	0.35	0.32	0.33	0.34	0.32
	Ni	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	Si	1.00	1.01	1.00	1.01	1.00	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	1.99	1.99	1.99	1.99	1.99	2.00	2.01
	%Fosterite	83.76	83.85	82.81	82.59	83.91	83.51	83.19	84.22
Oxide %	**MgO**	44.82	45.42	44.43	45.09	45.14	45.69	45.82	45.49
	FeO	15.49	15.59	16.44	16.94	15.43	16.08	16.51	15.19
	NiO	0.37	0.00	0.00	0.00	0.00	0.00	0.42	0.38
	SiO2	39.92	40.80	40.30	41.20	40.35	41.07	41.10	40.13
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.60	101.81	101.17	103.24	100.91	102.84	103.84	101.20
	Ni (ppm)	2900	0	0	0	0	0	3300	3000

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.64	1.67	1.66	1.66	1.65	1.66	1.66	1.66
	Fe	0.34	0.35	0.35	0.34	0.35	0.34	0.33	0.32
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	0.99	1.00	1.00	1.00	1.00	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.98	2.02	2.01	2.00	2.00	2.00	1.99	1.98
	%Fosterite	83.03	82.62	82.62	82.83	82.61	82.95	83.34	83.90
Oxide %	**MgO**	44.87	45.79	45.32	44.74	44.39	45.74	45.70	45.57
	FeO	16.35	17.17	16.99	16.53	16.66	16.76	16.29	15.59
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	41.14	40.37	40.50	40.15	40.07	41.01	41.35	41.16
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.36	103.33	102.81	101.43	101.12	103.51	103.34	102.32
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 1	Olivine 1{	Olivine 19	Olivine 20	Olivine 21	Olivine 22
Atomic	**Mg**	1.67	1.67	1.65	1.64	1.66	1.66
	Fe	0.33	0.31	0.34	0.34	0.34	0.35
	Ni	0.00	0.00	0.00	0.01	0.00	0.01
	Si	1.00	1.01	1.00	1.00	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	1.99	1.99	1.99	2.00	2.02
	%Fosterite	83.58	84.24	82.85	82.73	82.95	82.48
Oxide %	**MgO**	45.01	44.87	45.49	45.12	43.75	45.98
	FeO	15.76	14.96	16.79	16.79	16.03	17.41
	NiO	0.00	0.00	0.00	0.34	0.00	0.31
	SiO2	40.33	40.24	41.22	41.16	39.30	40.84
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.09	100.08	103.50	103.41	99.07	104.54
	Ni (ppm)	0	0	0	2700	0	2400

DDH: WM98-05 Thin Section: SW98-5-23 Depth:475.02m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.64	1.65	1.64	1.64	1.63	1.63	1.63	1.66
	Fe	0.33	0.32	0.33	0.34	0.33	0.35	0.34	0.34
	Ni	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Si	1.01	1.01	1.01	1.01	1.02	1.01	1.02	1.00
	Ca	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.98	1.97	1.98	1.99	1.96	1.98	1.97	1.99
	%Fosterite	83.05	83.61	83.13	82.93	83.14	82.56	82.95	82.99
Oxide %	**MgO**	43.71	43.94	44.14	44.01	44.44	43.55	43.78	44.08
	FeO	15.90	15.36	15.97	16.15	16.07	16.40	16.04	16.11
	NiO	0.00	0.00	0.50	0.32	0.00	0.00	0.00	0.00
	SiO2	40.24	40.26	40.48	40.13	41.35	40.18	40.56	39.79
	CaO	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.05	99.57	101.08	100.61	101.86	100.13	100.38	99.98
	Ni (ppm)	0	0	3900	2500	0	0	0	0

		Olivine 9	Olivine 1(	Olivine 11	Olivine 12	Olivine 13
Atomic	**Mg**	1.64	1.65	1.63	1.63	1.65
	Fe	0.35	0.34	0.34	0.35	0.35
	Ni	0.00	0.00	0.01	0.00	0.00
	Si	1.01	1.01	1.01	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.99	1.99	1.97	1.98	2.00
	%Fosterite	82.61	82.86	82.86	82.51	82.62
Oxide %	**MgO**	43.86	44.34	42.95	44.03	44.14
	FeO	16.45	16.35	15.84	16.63	16.56
	NiO	0.00	0.00	0.33	0.00	0.00
	SiO2	40.11	40.35	39.94	40.56	39.96
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	100.43	101.04	99.06	101.22	100.66
	Ni (ppm)	0	0	2600	0	0

DDH: WM98-05 Thin Section: SW98-5-24 Depth:484.10m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.64	1.68	1.65	1.66	1.67	1.66	1.67	1.67
	Fe	0.36	0.36	0.36	0.36	0.35	0.36	0.36	0.36
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Si	1.00	0.98	0.99	0.99	0.99	0.99	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	2.03	2.01	2.02	2.02	2.02	2.03	2.02
	%Fosterite	82.18	82.46	82.17	82.21	82.70	82.19	82.32	82.40
Oxide %	**MgO**	44.48	44.08	43.36	43.93	43.75	43.73	44.48	42.77
	FeO	17.19	16.71	16.78	16.94	16.31	16.89	17.03	16.29
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00
	SiO2	40.39	38.59	38.94	39.15	38.57	39.06	39.09	37.87
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.05	99.38	99.08	100.02	98.63	99.68	100.90	96.92
	Ni (ppm)	0	0	0	0	0	0	2400	0

		Olivine 9	Olivine 1(	Olivine 11
Atomic	**Mg**	1.68	1.68	1.65
	Fe	0.34	0.35	0.35
	Ni	0.00	0.00	0.01
	Si	0.99	0.99	0.99
	Ca	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total Catior	2.02	2.03	2.01
	%Fosterite	83.16	82.82	82.47
Oxide %	**MgO**	44.53	43.96	44.71
	FeO	16.07	16.26	16.94
	NiO	0.00	0.00	0.42
	SiO2	39.11	38.44	40.11
	CaO	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	99.70	98.67	102.18
	Ni (ppm)	0	0	3300

DDH: WM98-05 Thin Section: SW98-5-25 Depth:489.13m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.66	1.67	1.68	1.67	1.66	1.66	1.67	1.65
	Fe	0.33	0.33	0.35	0.34	0.34	0.34	0.35	0.34
	Ni	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.00	0.99	0.99	1.00	1.00	1.00	0.99	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	2.01	2.02	2.00	2.01	2.01	2.02	1.99
	%Fosterite	83.35	83.32	82.74	83.07	82.96	83.00	82.86	82.96
Oxide %	**MgO**	44.38	45.35	43.66	45.22	43.41	43.93	44.84	44.89
	FeO	15.80	16.18	16.24	16.43	15.90	16.04	16.53	16.44
	NiO	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	39.92	40.15	38.38	40.39	38.74	39.23	39.51	40.82
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.09	102.06	98.28	102.04	98.06	99.21	100.88	102.15
	Ni (ppm)	0	2900	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.66	1.68	1.68	1.67	1.66	1.67	1.67	1.66
	Fe	0.33	0.32	0.32	0.32	0.32	0.33	0.33	0.33
	Ni	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01
	Si	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	2.00	2.00	1.98	2.00	1.99	1.99
	%Fosterite	83.47	84.10	84.04	83.93	83.70	83.61	83.70	83.61
Oxide %	**MgO**	45.32	44.91	44.06	44.16	43.81	43.90	43.98	43.99
	FeO	16.00	15.13	14.91	15.08	15.21	15.34	15.27	15.37
	NiO	0.00	0.00	0.00	0.37	0.00	0.43	0.00	0.34
	SiO2	40.80	40.11	39.23	39.47	39.77	39.21	39.41	39.66
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.12	100.15	98.21	99.08	98.79	98.88	98.65	99.37
	Ni (ppm)	0	0	0	2900	0	3400	0	2700

		Olivine 17	Olivine 18	Olivine 19	Olivine 20	Olivine 21	Olivine 22
Atomic	**Mg**	1.66	1.66	1.68	1.67	1.66	1.66
	Fe	0.33	0.33	0.35	0.32	0.34	0.34
	Ni	0.00	0.00	0.00	0.01	0.00	0.00
	Si	1.00	1.00	0.99	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	2.00	2.03	1.99	2.00	2.00
	%Fosterite	83.36	83.25	82.72	83.84	83.16	83.18
Oxide %	**MgO**	44.14	44.51	44.48	43.93	43.33	44.14
	FeO	15.71	15.97	16.56	15.09	15.64	15.91
	NiO	0.00	0.00	0.00	0.37	0.00	0.00
	SiO2	39.83	39.92	38.98	39.45	38.83	39.56
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.69	100.39	100.01	98.84	97.80	99.61
	Ni (ppm)	0	0	0	2900	0	0

DDH: WM98-05 Thin Section: SW98-5-26 Depth:495.03m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.69	1.68	1.67	1.68	1.67	1.68	1.58	1.69
	Fe	0.34	0.33	0.34	0.33	0.33	0.33	0.35	0.32
	Ni	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Si	0.98	1.00	1.00	1.00	1.00	1.00	1.04	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.04	2.00	2.01	2.01	2.00	2.00	1.92	2.02
	%Fosterite	83.24	83.65	83.01	83.65	83.66	83.68	81.97	83.94
Oxide %	**MgO**	45.69	45.39	44.87	45.98	45.35	45.22	40.61	46.23
	FeO	16.40	15.81	16.38	16.02	15.79	15.72	15.93	15.77
	NiO	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00
	SiO2	39.49	40.35	40.03	40.58	40.56	40.09	39.90	40.43
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.58	101.55	101.28	102.58	102.13	101.03	96.44	102.44
	Ni (ppm)	0	0	0	0	3400	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 1:	Olivine 13	Olivine 14	Olivine 15
Atomic	**Mg**	1.69	1.67	1.67	1.68	1.68	1.70	1.67
	Fe	0.32	0.34	0.36	0.34	0.34	0.34	0.35
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	1.00	0.98	0.99	0.99	0.98	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.02	2.01	2.04	2.03	2.02	2.04	2.02
	%Fosterite	83.96	83.16	82.18	83.07	83.15	83.16	82.83
Oxide %	**MgO**	46.53	45.77	44.81	45.30	45.75	44.36	44.86
	FeO	15.85	16.52	17.32	16.45	16.53	16.02	16.57
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	40.56	40.69	39.21	39.58	40.24	38.08	39.53
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.94	102.98	101.34	101.34	102.52	98.46	100.96
	Ni (ppm)	0	0	0	0	0	0	0

DDH: WM98-05 Thin Section: SW98-5-27 Depth:520.90m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.66	1.67	1.64	1.65	1.73	1.75	1.74
	Fe	0.34	0.34	0.34	0.34	0.35	0.33	0.31	0.32
	Ni	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
	Si	1.00	1.00	0.99	1.01	1.00	0.97	0.97	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	2.01	2.01	1.99	2.00	2.06	2.06	2.06
	%Fosterite	82.80	83.06	83.23	82.66	82.32	84.06	84.85	84.50
Oxide %	**MgO**	45.12	44.04	45.45	44.61	43.85	47.08	48.21	46.96
	FeO	16.71	16.02	16.33	16.69	16.79	15.91	15.35	15.36
	NiO	0.31	0.47	0.31	0.39	0.00	0.00	0.00	0.00
	SiO2	41.03	39.45	40.37	40.88	39.53	39.23	39.83	39.02
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.17	99.98	102.45	102.57	100.17	102.23	103.39	101.34
	Ni (ppm)	2400	3700	2400	3100	0	0	0	0

DDH: WM98-05 Thin Section: SW98-5-28 Depth:544.40m

		Olivine 1	Olivine 2
Atomic	**Mg**	1.71	1.71
	Fe	0.34	0.34
	Ni	0.00	0.00
	Si	0.97	0.97
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	2.05	2.05
	%Fosterite	83.22	83.41
Oxide %	**MgO**	45.17	45.40
	FeO	16.24	16.09
	NiO	0.00	0.00
	SiO2	38.34	38.57
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	99.74	100.07
	Ni (ppm)	0	0

DDH: WM98-05 Thin Section: SW98-5-30 Depth:556.04m

		Olivine 1
Atomic	**Mg**	1.64
	Fe	0.39
	Ni	0.01
	Si	0.98
	Ca	0.00
	Mn	0.00
	Total Cation	2.04
	%Fosterite	80.85
Oxide %	**MgO**	45.29
	FeO	19.12
	NiO	0.32
	SiO2	40.24
	CaO	0.00
	MnO	0.00
	Total	104.96
	Ni (ppm)	2500

DDH: WM98-05 Thin Section: SW98-5-31 Depth:564.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.60	1.64	1.64	1.62	1.61	1.59	1.61	1.62
	Fe	0.40	0.36	0.34	0.37	0.39	0.42	0.39	0.38
	Ni	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
	Si	1.00	1.00	1.01	1.00	1.00	0.99	0.99	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.99	1.99	2.00	2.00	2.01	2.01	2.00
	%Fosterite	79.79	82.17	82.65	81.23	80.34	78.98	80.45	81.05
Oxide %	**MgO**	42.77	42.45	44.23	42.78	41.82	41.87	43.02	43.45
	FeO	19.31	16.42	16.54	17.63	18.24	19.86	18.63	18.11
	NiO	0.00	0.00	0.00	0.31	0.00	0.00	0.33	0.00
	SiO2	39.81	38.83	40.48	39.49	38.74	39.06	39.53	39.90
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.89	97.70	101.25	100.21	98.81	100.80	101.51	101.46
	Ni (ppm)	0	0	0	2400	0	0	2600	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 1.	Olivine 13
Atomic	**Mg**	1.63	1.57	1.56	1.64	1.62
	Fe	0.40	0.40	0.39	0.35	0.36
	Ni	0.00	0.00	0.00	0.00	0.01
	Si	0.99	1.01	1.03	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.03	1.97	1.95	1.99	1.99
	%Fosterite	80.09	79.70	79.92	82.37	81.70
Oxide %	**MgO**	42.65	42.27	40.56	43.53	43.63
	FeO	18.90	19.19	18.17	16.61	17.42
	NiO	0.00	0.00	0.00	0.00	0.55
	SiO2	38.53	40.63	39.79	39.62	40.37
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	100.08	102.09	98.52	99.76	101.96
	Ni (ppm)	0	0	0	0	4300

DDH: WM98-05 Thin Section: SW98-5-32 Depth:570.50m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.59	1.58	1.64	1.58	1.61	1.60	1.59	1.60
	Fe	0.40	0.40	0.35	0.38	0.36	0.37	0.39	0.38
	Ni	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Si	1.00	1.01	1.01	1.02	1.01	1.01	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.98	1.99	1.97	1.98	1.98	1.97	1.98
	%Fosterite	79.87	79.60	82.45	80.64	81.59	81.12	80.38	80.89
Oxide %	**MgO**	41.77	41.79	44.24	41.54	43.31	42.42	42.45	42.82
	FeO	18.77	19.09	16.79	17.78	17.42	17.60	18.47	18.04
	NiO	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00
	SiO2	39.28	39.86	40.56	39.79	40.56	39.88	40.48	40.11
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.82	100.74	101.59	99.53	101.30	99.90	101.40	100.97
	Ni (ppm)	0	0	0	3300	0	0	0	0

		Olivine 9	Olivine 10
Atomic	**Mg**	1.62	1.62
	Fe	0.36	0.36
	Ni	0.00	0.00
	Si	1.01	1.01
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Cation	1.98	1.97
	%Fosterite	81.67	81.97
Oxide %	**MgO**	43.80	43.99
	FeO	17.52	17.25
	NiO	0.00	0.00
	SiO2	40.60	41.12
	CaO	0.00	0.00
	MnO	0.00	0.00
	Total	101.92	102.36
	Ni (ppm)	0	0

DDH: WM98-05 Thin Section: SW98-5-33 Depth:573.00m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.61	1.60	1.61	1.63	1.62	1.64	1.61	1.61
	Fe	0.37	0.38	0.38	0.35	0.36	0.35	0.37	0.38
	Ni	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Si	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.98	1.98	1.97	1.98	1.98	1.99	1.98
	%Fosterite	81.32	80.68	81.02	82.47	81.98	82.47	81.21	80.92
Oxide %	**MgO**	43.38	43.28	41.31	43.10	43.07	43.93	42.87	42.54
	FeO	17.77	18.47	17.25	16.33	16.88	16.65	17.68	17.88
	NiO	0.32	0.00	0.00	0.00	0.32	0.00	0.00	0.00
	SiO2	40.33	40.90	38.70	39.96	39.90	40.39	39.83	39.81
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.79	102.66	97.26	99.39	100.16	100.97	100.38	100.23
	Ni (ppm)	2500	0	0	0	2500	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12
Atomic	**Mg**	1.65	1.64	1.60	1.63
	Fe	0.35	0.36	0.36	0.37
	Ni	0.00	0.00	0.00	0.00
	Si	1.00	1.00	1.02	1.00
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Cation	2.01	2.00	1.97	2.00
	%Fosterite	82.42	82.00	81.53	81.65
Oxide %	**MgO**	43.58	44.74	43.05	43.17
	FeO	16.57	17.51	17.38	17.29
	NiO	0.00	0.00	0.00	0.00
	SiO2	39.13	40.50	40.63	39.36
	CaO	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	99.28	102.75	101.06	99.82
	Ni (ppm)	0	0	0	0

DDH: WM98-05 Thin Section: SW98-5-34 Depth:578.04m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.58	1.60	1.58	1.59	1.63	1.62	1.63	1.63
	Fe	0.41	0.39	0.40	0.39	0.36	0.37	0.37	0.40
	Ni	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00
	Si	1.00	1.00	1.01	1.00	1.00	1.00	1.00	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.00	1.99	1.98	1.99	1.99	1.99	2.00	2.03
	%Fosterite	79.44	80.36	79.83	80.20	81.86	81.58	81.47	80.32
Oxide %	**MgO**	42.14	43.07	42.17	42.05	44.11	43.36	42.85	43.13
	FeO	19.44	18.76	18.99	18.51	17.42	17.46	17.37	18.83
	NiO	0.39	0.00	0.00	0.33	0.00	0.00	0.32	0.00
	SiO2	39.83	40.30	40.03	39.43	40.45	39.96	39.17	38.68
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.80	102.13	101.19	100.33	101.98	100.78	99.71	100.65
	Ni (ppm)	3100	0	0	2600	0	0	2500	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 1[illegible]	Olivine 13
Atomic	**Mg**	1.63	1.63	1.62	1.66	1.62
	Fe	0.38	0.37	0.39	0.36	0.41
	Ni	0.00	0.01	0.00	0.00	0.00
	Si	0.99	0.99	0.99	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.01	2.01	2.02	2.02	2.03
	%Fosterite	81.26	81.59	80.46	82.00	79.80
Oxide %	**MgO**	43.71	44.29	42.90	43.81	41.95
	FeO	17.97	17.82	18.58	17.15	18.94
	NiO	0.00	0.33	0.00	0.00	0.00
	SiO2	39.68	40.18	39.13	38.96	38.10
	CaO	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	101.37	102.62	100.61	99.92	98.99
	Ni (ppm)	0	2600	0	0	0

DDH: WM98-05 Thin Section: SW98-5-35 Depth:582.14m

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.60	1.61	1.60	1.59	1.59	1.56	1.63	1.65
	Fe	0.39	0.35	0.39	0.40	0.38	0.44	0.36	0.35
	Ni	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Si	1.01	1.02	1.01	1.01	1.01	1.00	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.98	1.96	1.99	1.99	1.98	2.00	1.99	2.00
	%Fosterite	80.59	81.93	80.23	79.78	80.92	77.87	81.92	82.71
Oxide %	**MgO**	42.37	42.70	42.50	42.12	42.92	40.89	42.34	43.80
	FeO	18.19	16.79	18.67	19.03	18.04	20.71	16.66	16.33
	NiO	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00
	SiO2	39.83	40.30	39.96	39.83	40.58	39.19	39.02	39.58
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.39	99.79	101.13	100.98	101.91	100.80	98.02	99.70
	Ni (ppm)	0	0	0	0	2900	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12
Atomic	**Mg**	1.61	1.60	1.59	1.59
	Fe	0.37	0.38	0.40	0.41
	Ni	0.01	0.01	0.00	0.00
	Si	1.01	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Cation	1.99	1.99	1.99	2.00
	%Fosterite	81.10	80.72	79.70	79.65
Oxide %	**MgO**	43.45	43.27	42.97	40.64
	FeO	18.05	18.42	19.50	18.51
	NiO	0.42	0.37	0.00	0.00
	SiO2	40.58	40.39	40.58	38.08
	CaO	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	102.50	102.45	103.05	97.24
	Ni (ppm)	3300	2900	0	0

DDH: WM98-05 Thin Section: SW98-5-36 Depth:586.00m

		Olivine 1	Olivine 2	Olivine 3
Atomic	**Mg**	1.80	1.76	1.75
	Fe	0.29	0.30	0.32
	Ni	0.00	0.00	0.00
	Si	0.96	0.97	0.97
	Ca	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total Cation	2.09	2.06	2.07
	%Fosterite	85.96	85.24	84.66
Oxide %	**MgO**	49.23	47.38	47.71
	FeO	14.33	14.63	15.41
	NiO	0.00	0.00	0.00
	SiO2	39.06	38.89	39.30
	CaO	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	102.63	100.90	102.42
	Ni (ppm)	0	0	0

Surface		Sample:Sur-01							
		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.43	1.41	1.36	1.36	1.40	1.37	1.36	1.39
	Fe	0.62	0.62	0.67	0.68	0.64	0.67	0.67	0.64
	Ni	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.98	0.99	0.98	0.98	0.98	0.98	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	2.05	2.03	2.03	2.04	2.04	2.04	2.03	2.03
	%Fosterite	69.80	69.51	67.10	66.81	68.64	67.01	66.90	68.37
Oxide %	**MgO**	35.94	35.37	33.98	34.36	35.37	34.38	33.91	35.17
	FeO	27.71	27.66	29.69	30.43	28.80	30.17	29.91	29.01
	NiO	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	36.62	36.88	36.73	36.86	36.82	36.73	36.52	37.16
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.27	100.27	100.40	101.65	100.99	101.28	100.34	101.34
	Ni (ppm)	0	2800	0	0	0	0	0	0

		Olivine 9
Atomic	**Mg**	1.38
	Fe	0.66
	Ni	0.00
	Si	0.98
	Ca	0.00
	Mn	0.00
	Total Cation	2.04
	%Fosterite	67.76
Oxide %	**MgO**	34.36
	FeO	29.14
	NiO	0.00
	SiO2	36.48
	CaO	0.00
	MnO	0.00
	Total	99.97
	Ni (ppm)	0

Surface Sample:Sur-03

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.36	1.32	1.34	1.33	1.33	1.29	1.28	1.31
	Fe	0.65	0.68	0.66	0.68	0.66	0.71	0.71	0.68
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.00	1.00	1.00	0.99	1.01	1.00	1.01	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.01	2.00	2.00	2.01	1.99	2.00	1.99	1.99
	%Fosterite	67.65	65.94	67.03	66.06	66.72	64.66	64.12	65.63
Oxide %	**MgO**	34.23	32.10	33.95	33.38	32.47	32.20	31.23	31.67
	FeO	29.18	29.56	29.76	30.57	28.87	31.38	31.15	29.56
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	37.52	36.11	37.74	37.20	36.65	37.14	36.67	36.26
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.93	97.78	101.44	101.15	97.98	100.72	99.04	97.50
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.29	1.30	1.34	1.37	1.35	1.29	1.32	1.33
	Fe	0.71	0.69	0.66	0.63	0.66	0.70	0.68	0.68
	Ni	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Si	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	2.00	2.00	2.00	2.01	1.99	2.01	2.01
	%Fosterite	64.57	65.30	67.15	68.57	67.19	64.75	65.86	66.22
Oxide %	**MgO**	31.28	32.92	33.22	34.06	33.83	32.59	32.87	33.38
	FeO	30.59	31.18	28.97	27.83	29.45	31.62	30.37	30.35
	NiO	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
	SiO2	35.98	37.63	36.88	37.22	37.25	37.82	36.99	37.29
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.85	101.73	99.07	99.48	100.52	102.03	100.23	101.02
	Ni (ppm)	0	0	0	2900	0	0	0	0

		Olivine 17
Atomic	**Mg**	1.29
	Fe	0.72
	Ni	0.00
	Si	0.99
	Ca	0.00
	Mn	0.00
	Total Catior	2.01
	%Fosterite	64.07
Oxide %	**MgO**	31.59
	FeO	31.58
	NiO	0.00
	SiO2	36.33
	CaO	0.00
	MnO	0.00
	Total	99.50
	Ni (ppm)	0

Surface Sample:Sur-04

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.41	1.38	1.43	1.40	1.41	1.41	1.42	1.42
	Fe	0.60	0.63	0.62	0.63	0.64	0.64	0.58	0.62
	Ni	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.99	1.00	0.97	0.99	0.98	0.98	1.00	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.01	2.01	2.05	2.02	2.05	2.04	2.00	2.04
	%Fosterite	70.08	68.76	69.88	69.03	68.83	68.85	71.03	69.66
Oxide %	**MgO**	35.39	33.83	36.27	35.17	35.64	35.82	35.17	36.32
	FeO	26.93	27.40	27.87	28.14	28.77	28.89	25.58	28.20
	NiO	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	37.31	36.37	36.75	37.14	36.86	37.16	36.84	37.42
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.95	97.60	100.89	100.45	101.26	101.87	97.59	101.93
	Ni (ppm)	2600	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.40	1.36	1.40	1.41	1.42	1.43	1.42	1.41
	Fe	0.64	0.66	0.65	0.64	0.60	0.63	0.63	0.62
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	0.98	0.99	0.98	0.98	0.99	0.97	0.98	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.04	2.02	2.05	2.05	2.02	2.05	2.05	2.03
	%Fosterite	68.85	67.38	68.19	68.95	70.06	69.42	69.24	69.48
Oxide %	**MgO**	35.72	34.71	35.62	35.82	36.23	34.87	35.54	36.12
	FeO	28.80	29.95	29.62	28.75	27.61	27.39	28.15	28.28
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	37.14	37.46	37.05	36.84	37.78	35.49	36.56	37.46
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.66	102.12	102.29	101.41	101.62	97.75	100.25	101.85
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 17
Atomic	**Mg**	1.40
	Fe	0.63
	Ni	0.00
	Si	0.98
	Ca	0.00
	Mn	0.00
	Total Catior	2.03
	%Fosterite	68.83
Oxide %	**MgO**	35.31
	FeO	28.50
	NiO	0.00
	SiO2	37.03
	CaO	0.00
	MnO	0.00
	Total	100.83
	Ni (ppm)	0

Surface		Sample:Sur-08							
		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.47	1.46	1.48	1.47	1.49	1.46	1.47	1.49
	Fe	0.49	0.49	0.48	0.49	0.48	0.50	0.49	0.48
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.97	1.95	1.97	1.96	1.96	1.96	1.95	1.97
	%Fosterite	74.95	74.68	75.46	74.85	75.79	74.52	75.15	75.85
Oxide %	**MgO**	38.39	37.83	39.24	37.88	38.42	37.94	38.04	38.87
	FeO	22.87	22.86	22.75	22.68	21.88	23.13	22.42	22.06
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	39.47	39.60	40.03	39.19	39.17	39.43	39.51	39.45
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.73	100.29	102.01	99.75	99.48	100.50	99.98	100.38
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9
Atomic	**Mg**	1.48
	Fe	0.49
	Ni	0.00
	Si	1.01
	Ca	0.00
	Mn	0.00
	Total Catior	1.97
	%Fosterite	75.22
Oxide %	**MgO**	37.26
	FeO	21.88
	NiO	0.00
	SiO2	37.97
	CaO	0.00
	MnO	0.00
	Total	97.12
	Ni (ppm)	0

Surface		Sample:Sur-09							
		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.26	1.24	1.24	1.21	1.21	1.20	1.16	1.18
	Fe	0.72	0.74	0.77	0.79	0.79	0.81	0.84	0.87
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.01	1.01	1.00	1.00	1.00	0.99	1.00	0.98
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.98	1.99	2.00	1.99	2.00	2.01	2.00	2.05
	%Fosterite	63.56	62.56	61.75	60.57	60.44	59.76	57.99	57.49
Oxide %	**MgO**	30.81	30.03	29.40	28.87	29.60	29.42	28.41	27.89
	FeO	31.49	32.03	32.46	33.50	34.54	35.31	36.69	36.77
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	36.82	36.22	35.34	35.79	36.35	36.33	36.60	34.42
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.12	98.28	97.20	98.16	100.49	101.06	101.70	99.08
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11
Atomic	**Mg**	1.22	1.20	1.21
	Fe	0.78	0.81	0.80
	Ni	0.00	0.00	0.00
	Si	1.00	0.99	1.00
	Ca	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total Catior	2.00	2.01	2.01
	%Fosterite	60.90	59.83	60.06
Oxide %	**MgO**	29.78	28.84	29.75
	FeO	34.09	34.52	35.26
	NiO	0.00	0.00	0.00
	SiO2	36.58	35.53	36.65
	CaO	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	100.46	98.89	101.66
	Ni (ppm)	0	0	0

Surface Sample:Sur-11

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.34	1.33	1.31	1.34	1.38	1.31	1.27	1.33
	Fe	0.65	0.67	0.68	0.66	0.64	0.69	0.74	0.69
	Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.99	2.00	1.99	2.00	2.02	2.00	2.01	2.01
	%Fosterite	67.55	66.36	65.72	67.13	68.49	65.56	63.11	65.92
Oxide %	**MgO**	32.52	32.39	32.42	33.78	34.13	32.32	31.41	33.05
	FeO	27.85	29.27	30.14	29.49	27.99	30.27	32.73	30.46
	NiO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	36.22	36.33	37.10	37.50	36.48	36.77	36.88	36.90
	CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.59	97.98	99.66	100.77	98.60	99.37	101.02	100.42
	Ni (ppm)	0	0	0	0	0	0	0	0

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14
Atomic	**Mg**	1.39	1.38	1.35	1.34	1.30	1.33
	Fe	0.62	0.62	0.66	0.66	0.72	0.66
	Ni	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.00	1.00	1.00	1.00	0.99	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.01	2.00	2.01	2.00	2.02	1.99
	%Fosterite	68.99	69.11	67.32	66.85	64.47	67.03
Oxide %	**MgO**	35.17	34.94	33.78	33.66	32.90	33.88
	FeO	28.19	27.84	29.23	29.76	32.32	29.71
	NiO	0.00	0.00	0.00	0.00	0.00	0.00
	SiO2	37.63	37.54	37.07	37.52	37.42	38.06
	CaO	0.00	0.00	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.99	100.32	100.08	100.94	102.63	101.64
	Ni (ppm)	0	0	0	0	0	0

Microprobe Analyses

Drill Hole: WM00-01 Sample:SW01-19

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	Mg	1.58	1.65	1.60	1.59	1.61	1.61	1.60	1.59
	Fe	0.33	0.36	0.34	0.33	0.34	0.33	0.34	0.34
	Ni	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Si	1.03	0.99	1.03	1.03	1.02	1.02	1.02	1.03
	Ca	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cation	1.93	2.02	1.95	1.93	1.96	1.95	1.95	1.94
	%Fosterite	82.56	82.30	82.49	82.65	82.58	83.00	82.39	82.35
Oxide %	MgO	42.05	42.98	42.70	42.10	42.44	42.95	42.62	42.05
	FeO	15.84	16.48	16.16	15.76	15.95	15.68	16.24	16.07
	NiO	0.27	0.20	0.22	0.22	0.20	0.20	0.18	0.19
	SiO2	40.88	38.31	40.90	40.92	40.03	40.75	40.71	40.71
	CaO	0.21	0.24	0.26	0.20	0.22	0.19	0.25	0.22
	MnO	0.20	0.18	0.22	0.20	0.16	0.15	0.18	0.19
	Total	99.46	98.40	100.46	99.40	98.99	99.92	100.17	99.43
	Ni (ppm)	2106	1574	1721	1703	1558	1534	1397	1483

Drill Hole: WM00-01 Sample: SW01-22

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.67	1.62	1.63	1.62	1.64	1.63	1.61	1.65
	Fe	0.33	0.33	0.33	0.32	0.33	0.33	0.33	0.33
	Ni	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01
	Si	0.99	1.02	1.01	1.03	1.01	1.01	1.02	1.00
	Ca	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.02	1.97	1.98	1.95	1.98	1.97	1.95	2.00
	%Fosterite	83.36	83.18	83.01	83.63	83.14	83.38	83.08	83.11
Oxide %	**MgO**	43.99	43.31	43.55	43.13	43.00	43.22	42.73	43.22
	FeO	15.66	15.62	15.89	15.05	15.54	15.36	15.52	15.66
	NiO	0.23	0.27	0.22	0.32	0.27	0.26	0.25	0.28
	SiO2	38.94	40.48	40.35	40.82	39.47	39.98	40.48	39.19
	CaO	0.24	0.24	0.24	0.24	0.21	0.19	0.21	0.26
	MnO	0.18	0.25	0.18	0.20	0.22	0.22	0.20	0.20
	Total	99.23	100.17	100.42	99.76	98.71	99.23	99.39	98.80
	Ni (ppm)	1784	2153	1705	2513	2141	2064	1994	2199

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14
Atomic	**Mg**	1.65	1.69	1.69	1.70	1.69	1.69
	Fe	0.32	0.33	0.33	0.33	0.33	0.33
	Ni	0.00	0.01	0.01	0.00	0.01	0.00
	Si	1.01	0.98	0.99	0.98	0.98	0.98
	Ca	0.00	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	1.98	2.04	2.03	2.04	2.03	2.03
	%Fosterite	83.92	83.59	83.78	83.74	83.61	83.56
Oxide %	**MgO**	43.78	45.01	44.96	45.12	45.12	44.79
	FeO	14.95	15.75	15.52	15.62	15.77	15.71
	NiO	0.22	0.26	0.31	0.23	0.29	0.22
	SiO2	39.92	38.85	39.19	38.85	39.09	38.87
	CaO	0.01	0.22	0.29	0.25	0.24	0.23
	MnO	0.14	0.00	0.00	0.00	0.00	0.00
	Total	99.01	100.09	100.26	100.06	100.52	99.82
	Ni (ppm)	1708	2049	2439	1777	2308	1715

Drill Hole: WM00-01 Sample:SW01-25

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.65	1.64	1.61	1.64	1.62	1.68	1.68	1.69
	Fe	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.33
	Ni	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
	Si	0.99	1.01	1.02	1.00	1.01	0.98	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.01	1.98	1.97	2.00	1.97	2.03	2.02	2.03
	%Fosterite	82.32	82.97	82.42	82.78	82.55	83.20	83.48	83.57
Oxide %	**MgO**	43.38	43.45	42.55	43.50	42.95	44.29	44.01	44.54
	FeO	16.61	15.90	16.18	16.13	16.18	15.94	15.53	15.61
	NiO	0.18	0.20	0.19	0.18	0.19	0.29	0.19	0.28
	SiO2	39.04	39.90	40.09	39.45	40.07	38.59	38.74	38.81
	CaO	0.17	0.13	0.15	0.15	0.15	0.13	0.10	0.15
	MnO	0.27	0.25	0.16	0.17	0.23	0.00	0.00	0.00
	Total	99.66	99.82	99.33	99.59	99.78	99.25	98.58	99.38
	Ni (ppm)	1446	1579	1510	1451	1504	2303	1514	2166

		Olivine 9	Olivine 10	Olivine 11	Olivine 12
Atomic	**Mg**	1.68	1.68	1.69	1.69
	Fe	0.33	0.33	0.33	0.34
	Ni	0.00	0.00	0.00	0.00
	Si	0.99	0.99	0.98	0.98
	Ca	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00
	Total Catior	2.03	2.02	2.04	2.04
	%Fosterite	83.46	83.57	83.53	83.11
Oxide %	**MgO**	44.28	44.46	44.81	44.39
	FeO	15.64	15.58	15.75	16.08
	NiO	0.23	0.20	0.17	0.24
	SiO2	38.64	38.89	38.74	38.38
	CaO	0.15	0.11	0.17	0.17
	MnO	0.00	0.00	0.00	0.00
	Total	98.94	99.25	99.64	99.26
	Ni (ppm)	1819	1606	1349	1863

Drill Hole: WM00-01 Sample:SW01-29

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.64	1.65	1.65	1.69	1.64	1.66	1.66	1.72
	Fe	0.32	0.31	0.32	0.32	0.32	0.33	0.32	0.34
	Ni	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Si	1.01	1.02	1.01	0.99	1.01	1.00	1.01	0.97
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Total Catior	1.97	1.97	1.98	2.03	1.98	2.00	1.99	2.06
	%Fosterite	83.64	84.20	83.84	83.96	83.63	83.58	83.76	83.53
Oxide %	**MgO**	43.81	43.91	44.09	43.50	43.83	43.78	43.90	45.54
	FeO	15.27	14.69	15.15	14.81	15.30	15.34	15.17	16.00
	NiO	0.24	0.27	0.27	0.26	0.27	0.30	0.28	0.33
	SiO2	40.45	40.41	40.11	37.84	40.30	39.41	39.77	38.34
	CaO	0.17	0.10	0.10	0.12	0.16	0.12	0.09	0.05
	MnO	0.24	0.22	0.22	0.17	0.24	0.17	0.18	0.00
	Total	100.19	99.61	99.96	96.71	100.09	99.10	99.38	100.26
	Ni (ppm)	1875	2106	2150	2064	2097	2330	2170	2620

Drill Hole: WM00-01 Sample:SW01-32

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.66	1.62	1.67	1.68	1.65	1.64	1.65	1.63
	Fe	0.33	0.33	0.31	0.34	0.32	0.34	0.33	0.34
	Ni	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	Si	0.99	1.02	1.00	0.98	1.01	1.00	1.01	1.01
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Total Catior	2.01	1.97	2.00	2.04	1.98	1.99	1.99	1.98
	%Fosterite	83.27	82.89	84.28	83.03	83.83	83.00	83.34	82.81
Oxide %	**MgO**	43.60	43.18	44.53	44.04	44.04	43.68	43.94	43.50
	FeO	15.62	15.89	14.81	16.04	15.14	15.95	15.66	16.09
	NiO	0.20	0.22	0.27	0.25	0.29	0.26	0.26	0.25
	SiO2	38.83	40.41	39.66	38.38	40.26	39.77	40.03	40.00
	CaO	0.15	0.11	0.11	0.10	0.12	0.12	0.10	0.09
	MnO	0.19	0.22	0.19	0.16	0.17	0.17	0.29	0.17
	Total	98.59	100.03	99.56	98.97	100.04	99.95	100.28	100.11
	Ni (ppm)	1601	1741	2100	1933	2314	2035	2012	1973

		Olivine 9	Olivine 10	Olivine 11	Olivine 12	Olivine 13	Olivine 14	Olivine 15	Olivine 16
Atomic	**Mg**	1.65	1.64	1.65	1.69	1.67	1.70	1.69	1.69
	Fe	0.34	0.33	0.33	0.32	0.33	0.32	0.32	0.32
	Ni	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01
	Si	1.00	1.01	1.00	0.99	1.00	0.99	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Catior	2.00	1.98	1.99	2.01	2.00	2.02	2.02	2.02
	%Fosterite	82.90	83.32	83.13	84.12	83.63	84.34	84.03	83.93
Oxide %	**MgO**	43.17	43.45	43.88	44.54	43.66	45.54	44.69	44.76
	FeO	15.88	15.50	15.88	14.99	15.23	15.08	15.14	15.27
	NiO	0.27	0.23	0.27	0.28	0.22	0.27	0.31	0.28
	SiO2	39.15	39.79	39.90	39.06	38.96	39.41	39.04	38.98
	CaO	0.11	0.12	0.11	0.03	0.00	0.08	0.00	0.00
	MnO	0.22	0.20	0.22	0.00	0.00	0.00	0.00	0.00
	Total	98.79	99.30	100.25	98.90	98.07	100.38	99.18	99.28
	Ni (ppm)	2098	1825	2098	2200	1700	2156	2411	2185

		Olivine 17	Olivine 18
Atomic	**Mg**	1.71	1.69
	Fe	0.31	0.31
	Ni	0.01	0.00
	Si	0.99	0.99
	Ca	0.00	0.00
	Mn	0.00	0.00
	Total Catior	2.02	2.01
	%Fosterite	84.65	84.35
Oxide %	**MgO**	45.49	44.69
	FeO	14.70	14.78
	NiO	0.27	0.22
	SiO2	39.19	39.06
	CaO	0.00	0.02
	MnO	0.00	0.00
	Total	99.65	98.77
	Ni (ppm)	2118	1706

Drill Hole: WM00-01 Sample:SW01-35

		Olivine 1	Olivine 2	Olivine 3	Olivine 4	Olivine 5	Olivine 6	Olivine 7	Olivine 8
Atomic	**Mg**	1.62	1.62	1.61	1.64	1.61	1.63	1.65	1.66
	Fe	0.35	0.36	0.37	0.37	0.38	0.36	0.35	0.36
	Ni	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01
	Si	1.01	1.00	1.00	0.99	1.00	1.00	0.99	0.99
	Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00
	Total Catior	1.98	2.00	1.99	2.02	2.00	2.00	2.01	2.03
	%Fosterite	82.28	81.78	81.39	81.52	81.09	81.87	82.33	82.35
Oxide %	**MgO**	42.68	42.87	41.97	42.65	41.84	42.77	43.25	43.75
	FeO	16.39	17.02	17.11	17.24	17.39	16.88	16.54	16.71
	NiO	0.26	0.25	0.28	0.18	0.27	0.23	0.28	0.29
	SiO2	39.81	39.38	39.02	38.29	38.83	39.11	38.91	38.68
	CaO	0.14	0.09	0.13	0.14	0.10	0.08	0.17	0.00
	MnO	0.19	0.22	0.30	0.26	0.22	0.25	0.00	0.00
	Total	99.48	99.84	98.81	98.76	98.65	99.32	99.15	99.43
	Ni (ppm)	2013	1954	2194	1444	2113	1842	2194	2270

Appendix C

Pyroxene mineral chemistry from drill holes WM00-01, WM98-05, WM00-04 and surface samples.

Drill hole: WM00-01

Thin section: SW01-01 Depth: 5.62m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.96	0.94	0.93	0.96	0.93	0.95	0.90
	Al	0.02	0.02	0.03	0.02	0.03	0.03	0.01
	Ti	0.01	0.01	0.02	0.02	0.02	0.02	0.01
	Fe	0.16	0.16	0.18	0.17	0.19	0.19	0.17
	Si	1.96	1.96	1.95	1.94	1.95	1.94	1.98
	Ca	0.82	0.84	0.83	0.83	0.81	0.81	0.85
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.48	17.50	16.88	17.66	16.82	17.18	16.35
	Al2O3	1.08	1.11	1.34	1.04	1.44	1.42	0.62
	TiO2	0.42	0.47	0.57	0.57	0.58	0.62	0.30
	FeO	5.30	5.20	5.84	5.54	5.98	6.07	5.44
	SiO2	53.18	54.10	52.82	53.27	52.46	52.52	53.72
	CaO	20.72	21.77	20.97	21.16	20.26	20.54	21.56
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.79	0.41	0.51	0.60	0.41	0.37	0.00
	Total	98.97	100.56	98.94	99.84	97.94	98.71	98.00
	Cr ppm	7893	4092	5116	5993	4092	3654	0
	% En	49.45	48.52	47.91	49.09	48.41	48.60	46.85
	% Fs	8.41	8.09	9.30	8.65	9.66	9.64	8.75
	% Wo	42.14	43.40	42.79	42.26	41.93	41.76	44.40

		Pyroxene 8	Pyroxene 9
Atomic	Mg	0.95	0.94
	Al	0.02	0.03
	Ti	0.01	0.01
	Fe	0.16	0.18
	Si	1.96	1.95
	Ca	0.82	0.83
	Na	0.00	0.00
Wt %	MgO	17.33	16.78
	Al2O3	1.06	1.36
	TiO2	0.38	0.28
	FeO	5.33	5.58
	SiO2	53.46	51.79
	CaO	20.74	20.47
	Na2O	0.00	0.00
	Cr2O3	0.60	0.61
	Total	98.89	96.89
	Cr ppm	5993	6139
	% En	49.20	48.47
	% Fs	8.48	9.05
	% Wo	42.31	42.49

Drill hole: WM00-01
Thin section: SW01-02 Depth: 6.46m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	0.84	1.11	0.86	0.90	0.87
	Al	0.04	0.03	0.03	0.00	0.03
	Ti	0.02	0.00	0.01	0.00	0.00
	Fe	0.18	0.13	0.20	0.11	0.19
	Si	1.98	2.07	1.97	2.01	1.98
	Ca	0.83	0.51	0.83	0.92	0.84
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	15.49	20.73	15.75	16.95	15.97
	Al2O3	1.70	1.32	1.17	0.00	1.49
	TiO2	0.65	0.00	0.48	0.00	0.00
	FeO	5.98	4.26	6.59	3.71	6.19
	SiO2	54.19	57.91	53.85	56.09	53.85
	CaO	21.14	13.31	21.18	23.91	21.42
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00
	Total	99.15	97.53	99.03	100.66	98.92
	Cr ppm	0	0	0	0	0
	% En	45.50	63.43	45.43	46.80	45.84
	% Fs	9.86	7.31	10.66	5.74	9.96
	% Wo	44.64	29.26	43.91	47.46	44.20

Drill hole: WM00-01
Thin section: SW01-05 Depth: 52.10m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.63	0.55	0.80	0.76	0.65	0.43	0.79
	Al	0.03	0.02	0.03	0.04	0.03	0.01	0.05
	Ti	0.02	0.02	0.01	0.02	0.01	0.01	0.02
	Fe	0.60	0.64	0.66	0.46	0.82	1.05	0.36
	Si	1.90	1.90	1.90	1.92	1.88	1.84	1.93
	Ca	0.59	0.63	0.33	0.61	0.30	0.28	0.70
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	11.61	9.90	14.64	14.11	11.84	7.86	14.59
	Al2O3	1.36	1.02	1.45	2.12	1.23	0.68	2.25
	TiO2	0.63	0.55	0.42	0.57	0.37	0.37	0.62
	FeO	19.67	20.76	21.75	15.32	26.48	34.11	11.67
	SiO2	51.86	51.41	52.09	53.14	50.62	50.02	53.14
	CaO	15.01	15.94	8.47	15.89	7.51	7.01	18.02
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.14	99.58	98.83	101.15	98.04	100.04	100.29
	Cr ppm	0	0	0	0	0	0	0
	% En	34.72	30.00	44.47	41.35	36.89	24.54	42.81
	% Fs	33.01	35.29	37.06	25.18	46.28	59.73	19.20
	% Wo	32.27	34.71	18.48	33.47	16.83	15.73	37.99

Drill hole: WM00-01
Thin section: SW01-06 Depth: 93.50m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.82	0.95	0.84	0.97	0.93	0.89	0.85
	Al	0.02	0.00	0.03	0.03	0.00	0.04	0.00
	Ti	0.01	0.00	0.02	0.02	0.00	0.02	0.00
	Fe	0.69	0.66	0.53	0.48	0.67	0.33	0.52
	Si	1.83	1.85	1.89	1.89	1.90	1.91	1.91
	Ca	0.28	0.23	0.49	0.44	0.26	0.69	0.56
	Na	0.18	0.19	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	15.51	18.51	15.36	17.03	17.06	16.35	15.87
	Al2O3	0.72	0.00	1.36	1.45	0.00	2.10	0.00
	TiO2	0.50	0.00	0.60	0.55	0.00	0.55	0.00
	FeO	23.29	22.82	17.20	15.25	21.93	10.91	17.20
	SiO2	51.41	53.68	51.34	49.74	52.18	52.69	53.01
	CaO	7.40	6.18	12.51	10.91	6.74	17.74	14.43
	Na2O	5.16	5.76	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.98	106.94	98.37	94.93	97.92	100.34	100.51
	Cr ppm	0	0	0	0	0	0	0
	% En	45.75	51.76	45.17	50.95	49.87	46.42	44.22
	% Fs	38.55	35.81	28.38	25.58	35.96	17.38	26.89
	% Wo	15.70	12.43	26.45	23.47	14.17	36.20	28.89

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11
Atomic	Mg	0.47	1.12	0.49	1.17
	Al	0.08	0.02	0.08	0.00
	Ti	0.00	0.01	0.00	0.00
	Fe	1.02	0.53	1.00	0.52
	Si	1.87	1.92	1.87	1.92
	Ca	0.14	0.22	0.15	0.19
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	7.45	21.16	7.93	22.20
	Al2O3	3.21	1.04	3.31	0.00
	TiO2	0.00	0.23	0.00	0.00
	FeO	28.51	17.79	28.66	17.73
	SiO2	43.71	54.19	44.88	54.34
	CaO	3.08	5.81	3.33	5.09
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00
	Total	85.95	100.22	88.11	99.36
	Cr ppm	0	0	0	0
	% En	29.03	59.92	30.03	62.01
	% Fs	62.35	28.26	60.91	27.77
	% Wo	8.63	11.82	9.07	10.22

Drill hole: WM00-01
Thin section: SW01-09 Depth: 165.30m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.93	0.95	0.93
	Al	0.03	0.01	0.03
	Ti	0.02	0.01	0.01
	Fe	0.13	0.13	0.14
	Si	1.95	1.97	1.98
	Ca	0.88	0.88	0.83
	Na	0.00	0.00	0.00
Wt %	MgO	17.66	17.25	17.40
	Al2O3	1.27	0.53	1.21
	TiO2	0.68	0.28	0.50
	FeO	4.52	4.19	4.77
	SiO2	55.26	53.05	55.04
	CaO	23.28	22.16	21.46
	Na2O	0.00	0.00	0.00
	Cr2O3	0.42	0.58	0.63
	Total	103.09	98.06	101.01
	Cr ppm	4239	5846	6285
	% En	47.83	48.54	49.00
	% Fs	6.86	6.62	7.54
	% Wo	45.32	44.84	43.46

Drill hole: WM00-01
Thin section: SW01-10 Depth: 188.50m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.97	0.98	1.00	1.00	0.98	0.97	0.96
	Al	0.03	0.02	0.03	0.02	0.02	0.02	0.03
	Ti	0.02	0.01	0.02	0.02	0.02	0.02	0.02
	Fe	0.16	0.15	0.15	0.17	0.17	0.16	0.17
	Si	1.93	1.95	1.93	1.93	1.93	1.95	1.93
	Ca	0.82	0.83	0.82	0.81	0.82	0.83	0.82
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.63	17.94	18.06	18.31	17.56	17.81	17.53
	Al2O3	1.53	1.00	1.23	1.02	1.02	0.89	1.57
	TiO2	0.78	0.50	0.75	0.57	0.73	0.55	0.78
	FeO	5.22	4.95	4.99	5.52	5.49	5.06	5.66
	SiO2	52.33	53.01	52.13	52.50	51.90	53.10	52.39
	CaO	20.67	20.97	20.57	20.41	20.53	21.02	20.79
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.45	0.26	0.48	0.44	0.51	0.45	0.50
	Total	98.61	98.65	98.21	98.77	97.75	98.87	99.22
	Cr ppm	4531	2631	4823	4385	5116	4531	4969
	% En	49.78	50.13	50.67	50.75	49.61	49.82	49.17
	% Fs	8.27	7.76	7.86	8.58	8.71	7.93	8.91
	% Wo	41.95	42.11	41.48	40.67	41.68	42.25	41.92

Drill hole: WM00-01
Thin section: SW01-11 Depth: 219.30m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	0.94	0.93	0.96	0.95
	Al	0.03	0.03	0.02	0.02
	Ti	0.02	0.02	0.02	0.02
	Fe	0.16	0.16	0.15	0.15
	Si	1.95	1.95	1.96	1.96
	Ca	0.83	0.84	0.83	0.84
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	17.50	16.55	18.03	16.98
	Al2O3	1.45	1.34	1.02	1.06
	TiO2	0.78	0.58	0.72	0.67
	FeO	5.33	5.09	5.16	4.70
	SiO2	54.10	51.84	54.74	51.86
	CaO	21.59	20.85	21.62	20.72
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00
	Total	100.75	96.25	101.28	95.98
	Cr ppm	0	0	0	0
	% En	48.60	48.12	49.44	49.21
	% Fs	8.30	8.31	7.94	7.63
	% Wo	43.10	43.57	42.62	43.16

Drill hole: WM00-01
Thin section: SW01-16 Depth: 292.20m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	0.92	0.98	0.97	0.95
	Al	0.06	0.03	0.02	0.07
	Ti	0.04	0.01	0.01	0.04
	Fe	0.18	0.15	0.10	0.19
	Si	1.90	1.95	1.97	1.88
	Ca	0.84	0.83	0.89	0.81
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	16.85	18.19	18.32	17.48
	Al2O3	2.87	1.19	0.81	3.02
	TiO2	1.42	0.43	0.27	1.53
	FeO	5.85	4.98	3.40	6.06
	SiO2	51.56	54.15	55.47	51.56
	CaO	21.23	21.60	23.52	20.81
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.31	0.00	0.58	0.48
	Total	100.08	100.54	102.38	100.94
	Cr ppm	3069	0	5846	4823
	% En	47.61	49.82	49.35	48.78
	% Fs	9.28	7.65	5.13	9.49
	% Wo	43.11	42.53	45.52	41.73

Drill hole: WM00-01
Thin section: SW01-18 Depth: 331.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.86	0.81	0.82	0.83	0.82	0.83	0.80
	Al	0.00	0.02	0.00	0.02	0.02	0.00	0.08
	Ti	0.00	0.01	0.00	0.01	0.02	0.00	0.05
	Fe	0.09	0.17	0.16	0.17	0.15	0.09	0.21
	Si	2.02	2.01	2.01	1.99	2.00	2.03	1.91
	Ca	0.97	0.86	0.91	0.89	0.89	0.98	0.84
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.38	15.07	15.19	15.27	15.26	15.70	14.34
	Al2O3	0.00	0.96	0.00	1.00	1.10	0.00	3.85
	TiO2	0.00	0.43	0.00	0.45	0.57	0.00	1.74
	FeO	2.89	5.63	5.43	5.43	5.02	2.95	6.78
	SiO2	57.06	55.73	55.47	54.66	55.62	56.95	51.02
	CaO	25.72	22.33	23.42	22.95	23.14	25.69	21.04
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.05	100.17	99.51	99.76	100.70	101.29	98.78
	Cr ppm	0	0	0	0	0	0	0
	% En	44.90	43.97	43.31	43.87	43.96	43.84	43.11
	% Fs	4.45	9.22	8.68	8.75	8.11	4.61	11.43
	% Wo	50.65	46.81	48.00	47.38	47.93	51.54	45.46

Drill hole: WM00-01
Thin section: SW01-23 Depth: 435.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.94	0.94	0.95	0.96	0.95	0.96	0.94
	Al	0.03	0.03	0.00	0.04	0.04	0.03	0.03
	Ti	0.02	0.02	0.01	0.02	0.03	0.02	0.02
	Fe	0.16	0.14	0.17	0.16	0.16	0.15	0.16
	Si	1.94	1.95	1.96	1.93	1.92	1.95	1.94
	Ca	0.85	0.86	0.84	0.84	0.86	0.84	0.85
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.15	16.95	17.43	17.76	17.03	17.50	17.13
	Al2O3	1.53	1.21	0.11	1.81	1.66	1.23	1.28
	TiO2	0.62	0.57	0.43	0.68	0.93	0.55	0.77
	FeO	5.04	4.48	5.62	5.42	5.16	4.85	5.13
	SiO2	52.65	52.50	53.55	53.16	51.56	52.95	53.03
	CaO	21.46	21.46	21.58	21.53	21.49	21.41	21.52
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.76	0.83	0.83	0.70	0.67	0.77	0.70
	Total	99.21	98.00	99.55	101.07	98.51	99.25	99.57
	Cr ppm	7600	8331	8331	7016	6723	7746	7016
	% En	48.43	48.58	48.29	48.96	48.15	49.14	48.29
	% Fs	7.99	7.20	8.74	8.38	8.18	7.64	8.12
	% Wo	43.57	44.22	42.97	42.66	43.67	43.22	43.60

Drill hole: WM00-01

Thin section: SW01-24 Depth: 448.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.94	0.93	0.94	0.96	0.95	0.94	0.94
	Al	0.05	0.03	0.03	0.02	0.03	0.03	0.03
	Ti	0.03	0.01	0.02	0.01	0.02	0.02	0.02
	Fe	0.16	0.15	0.15	0.15	0.15	0.15	0.15
	Si	1.93	1.97	1.96	1.95	1.95	1.94	1.95
	Ca	0.83	0.83	0.83	0.83	0.84	0.84	0.84
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.05	16.78	17.33	17.86	17.63	17.33	17.33
	Al2O3	2.14	1.34	1.25	1.17	1.28	1.55	1.36
	TiO2	0.90	0.53	0.55	0.55	0.65	0.73	0.83
	FeO	5.03	4.73	4.86	4.89	4.93	5.07	4.93
	SiO2	52.03	52.73	53.78	54.27	53.74	53.14	53.53
	CaO	20.83	20.67	21.27	21.65	21.53	21.37	21.41
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.79	0.77	0.96	0.86	1.01	0.82	0.83
	Total	98.76	97.57	100.00	101.25	100.77	100.01	100.22
	Cr ppm	7893	7746	9647	8623	10085	8185	8331
	% En	48.93	48.94	49.03	49.39	49.15	48.78	48.84
	% Fs	8.10	7.75	7.72	7.58	7.71	8.00	7.79
	% Wo	42.98	43.32	43.25	43.02	43.15	43.22	43.37

Drill hole: WM00-01

Thin section: SW01-25 Depth: 477.70m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	0.92	0.94	0.96	0.94
	Al	0.06	0.03	0.03	0.03
	Ti	0.03	0.02	0.01	0.02
	Fe	0.17	0.16	0.15	0.15
	Si	1.90	1.93	1.93	1.94
	Ca	0.86	0.85	0.87	0.85
	Na	0.02	0.00	0.00	0.00
Wt %	MgO	16.37	17.23	17.15	16.91
	Al2O3	2.53	1.51	1.30	1.59
	TiO2	0.97	0.73	0.47	0.63
	FeO	5.42	5.34	4.82	4.82
	SiO2	50.57	52.39	51.43	52.28
	CaO	21.46	21.70	21.72	21.31
	Na2O	0.47	0.00	0.00	0.00
	Cr2O3	0.58	0.99	0.85	0.89
	Total	98.38	99.90	97.73	98.45
	Cr ppm	5846	9939	8477	8916
	% En	46.99	48.10	48.35	48.41
	% Fs	8.72	8.36	7.63	7.75
	% Wo	44.29	43.54	44.01	43.84

Drill hole: WM00-01
Thin section: SW01-26 Depth: 499.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	0.97	0.94	0.98	0.98	0.95
	Al	0.03	0.04	0.02	0.02	0.03
	Ti	0.02	0.02	0.01	0.01	0.01
	Fe	0.15	0.14	0.15	0.15	0.14
	Si	1.93	1.93	1.94	1.94	1.95
	Ca	0.84	0.86	0.83	0.85	0.85
	Na	0.01	0.00	0.00	0.02	0.00
Wt %	MgO	17.91	16.60	17.86	17.64	16.95
	Al2O3	1.36	1.85	1.10	0.77	1.28
	TiO2	0.65	0.82	0.53	0.48	0.52
	FeO	4.82	4.49	4.85	4.68	4.54
	SiO2	52.88	50.94	52.99	52.18	51.49
	CaO	21.59	21.13	21.21	21.46	21.10
	Na2O	0.36	0.00	0.00	0.57	0.00
	Cr2O3	0.92	0.69	0.82	0.82	0.88
	Total	100.50	96.51	99.36	98.61	96.76
	Cr ppm	9208	6870	8185	8185	8770
	% En	49.57	48.39	49.85	49.43	48.90
	% Fs	7.49	7.34	7.59	7.36	7.35
	% Wo	42.94	44.27	42.55	43.21	43.75

Drill hole: WM00-01
Thin section: SW01-27 Depth: 530.80m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	1.00	0.99	0.98	0.91	0.95	1.66	0.96
	Al	0.03	0.03	0.03	0.08	0.03	0.00	0.04
	Ti	0.02	0.02	0.01	0.05	0.02	0.00	0.02
	Fe	0.14	0.15	0.14	0.17	0.16	0.29	0.15
	Si	1.94	1.93	1.95	1.88	1.93	1.92	1.93
	Ca	0.79	0.81	0.83	0.85	0.84	0.05	0.83
	Na	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.21	18.44	18.04	16.60	17.35	32.30	17.23
	Al2O3	1.61	1.44	1.27	3.72	1.55	0.00	1.95
	TiO2	0.67	0.75	0.53	1.77	0.80	0.00	0.72
	FeO	4.45	5.12	4.48	5.44	5.11	10.11	4.91
	SiO2	52.65	53.87	53.87	51.21	52.56	55.69	51.58
	CaO	19.92	21.14	21.42	21.67	21.20	1.22	20.71
	Na2O	0.47	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.77	0.98	0.83	0.73	0.95	0.29	0.63
	Total	98.75	101.74	100.44	101.15	99.51	99.61	97.72
	Cr ppm	7746	9793	8331	7308	9500	2923	6285
	% En	51.99	50.51	50.19	47.12	48.94	83.15	49.41
	% Fs	7.13	7.87	6.99	8.67	8.08	14.60	7.91
	% Wo	40.89	41.62	42.83	44.22	42.98	2.25	42.68

Drill hole: WM00-01
Thin section: SW01-28 Depth: 571.70m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	0.96	0.97	0.95	0.94
	Al	0.04	0.03	0.02	0.03
	Ti	0.02	0.02	0.02	0.02
	Fe	0.14	0.14	0.13	0.15
	Si	1.93	1.95	1.96	1.94
	Ca	0.86	0.84	0.85	0.86
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	17.33	17.94	17.38	17.03
	Al2O3	1.61	1.21	1.00	1.53
	TiO2	0.83	0.70	0.68	0.72
	FeO	4.40	4.55	4.19	4.67
	SiO2	52.16	53.68	53.40	52.16
	CaO	21.56	21.65	21.49	21.63
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.80	0.69	0.85	0.88
	Total	98.69	100.41	98.99	98.61
	Cr ppm	8039	6870	8477	8770
	% En	49.10	49.77	49.40	48.39
	% Fs	6.99	7.09	6.69	7.44
	% Wo	43.91	43.15	43.91	44.17

Drill hole: WM00-01
Thin section: SW01-29 Depth: 573.40m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	1.74	0.98	0.95	0.99	1.00	1.03	0.94
	Al	0.00	0.02	0.05	0.03	0.03	0.03	0.06
	Ti	0.00	0.01	0.02	0.02	0.01	0.02	0.03
	Fe	0.26	0.14	0.14	0.14	0.14	0.15	0.15
	Si	1.93	1.97	1.93	1.95	1.94	1.92	1.91
	Ca	0.00	0.83	0.84	0.81	0.83	0.82	0.86
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	34.44	18.24	17.50	18.39	18.52	18.79	16.65
	Al2O3	0.00	0.72	2.10	1.34	1.61	1.30	2.51
	TiO2	0.00	0.47	0.87	0.57	0.50	0.63	1.05
	FeO	9.12	4.55	4.76	4.55	4.45	4.91	4.86
	SiO2	56.84	54.68	53.03	53.78	53.42	52.37	50.72
	CaO	0.00	21.53	21.65	20.86	21.20	20.99	21.18
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.35	0.67	0.75	0.72	0.61	0.77	0.73
	Total	100.76	100.87	100.64	100.21	100.31	99.77	97.71
	Cr ppm	3508	6723	7454	7162	6139	7746	7308
	% En	87.07	50.29	48.97	51.17	51.09	51.29	48.12
	% Fs	12.93	7.04	7.48	7.11	6.89	7.53	7.88
	% Wo	0.00	42.67	43.55	41.72	42.02	41.18	44.00

Drill hole: WM00-01
Thin section: SW01-29 Depth: 573.40m

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12
Atomic	Mg	0.97	0.91	0.93	0.96	1.58
	Al	0.03	0.06	0.08	0.06	0.05
	Ti	0.02	0.04	0.04	0.03	0.00
	Fe	0.14	0.17	0.17	0.16	0.38
	Si	1.94	1.90	1.87	1.90	1.88
	Ca	0.84	0.85	0.86	0.85	0.01
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.25	16.63	16.47	17.26	30.21
	Al2O3	1.21	2.99	3.40	2.57	2.57
	TiO2	0.68	1.45	1.50	1.17	0.00
	FeO	4.59	5.47	5.48	5.12	12.84
	SiO2	51.62	51.51	49.52	51.11	53.48
	CaO	20.71	21.39	21.31	21.35	0.34
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.95	0.64	0.63	0.75	0.44
	Total	97.01	100.09	98.31	99.33	99.88
	Cr ppm	9500	6431	6285	7454	4385
	% En	49.69	47.42	47.24	48.65	80.23
	% Fs	7.42	8.74	8.82	8.10	19.13
	% Wo	42.88	43.84	43.94	43.25	0.64

Drill hole: WM00-01
Thin section: SW01-30 Depth: 574.35m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.96	0.95	0.93	0.96	0.97	1.64	1.62
	Al	0.02	0.02	0.04	0.02	0.03	0.00	0.01
	Ti	0.01	0.02	0.03	0.03	0.02	0.01	0.00
	Fe	0.13	0.14	0.14	0.13	0.14	0.28	0.29
	Si	1.97	1.96	1.94	1.96	1.95	1.95	1.95
	Ca	0.84	0.83	0.85	0.81	0.83	0.03	0.04
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.46	17.53	16.93	17.11	17.81	31.23	31.74
	Al2O3	1.02	1.15	1.68	0.81	1.36	0.00	0.53
	TiO2	0.48	0.63	1.10	1.18	0.67	0.22	0.00
	FeO	4.21	4.62	4.63	4.23	4.48	9.60	9.98
	SiO2	53.12	54.08	52.50	51.92	53.27	55.34	56.99
	CaO	21.13	21.46	21.55	19.97	21.31	0.80	0.97
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.82	0.79	0.77	0.80	0.82	0.00	0.29
	Total	98.24	100.27	99.17	96.03	99.71	97.18	100.50
	Cr ppm	8185	7893	7746	8039	8185	0	2923
	% En	49.88	49.31	48.35	50.57	49.98	83.98	83.45
	% Fs	6.74	7.29	7.42	7.02	7.05	14.48	14.72
	% Wo	43.38	43.40	44.23	42.41	42.98	1.54	1.82

Drill hole: WM00-01
Thin section: SW01-30 Depth: 574.35m

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11
Atomic	Mg	1.65	1.61	1.65	1.63
	Al	0.01	0.01	0.00	0.00
	Ti	0.01	0.00	0.00	0.00
	Fe	0.28	0.32	0.32	0.30
	Si	1.92	1.93	1.94	1.94
	Ca	0.04	0.03	0.00	0.02
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	30.98	31.44	32.80	31.97
	Al2O3	0.47	0.74	0.00	0.00
	TiO2	0.43	0.00	0.00	0.00
	FeO	9.40	11.09	11.23	10.54
	SiO2	53.95	56.07	57.68	56.69
	CaO	1.05	0.80	0.00	0.62
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.23	0.22	0.00	0.00
	Total	96.52	100.36	101.71	99.82
	Cr ppm	2339	2192	0	0
	% En	83.71	82.23	83.89	83.42
	% Fs	14.26	16.27	16.11	15.42
	% Wo	2.04	1.50	0.00	1.15

Drill hole: WM00-01
Thin section: SW01-31 Depth: 577.79m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6
Atomic	Mg	0.97	1.00	0.98	1.62	1.59	1.66
	Al	0.04	0.03	0.03	0.00	0.00	0.00
	Ti	0.03	0.01	0.02	0.00	0.00	0.00
	Fe	0.14	0.14	0.14	0.35	0.36	0.29
	Si	1.94	1.93	1.93	1.93	1.91	1.94
	Ca	0.83	0.83	0.82	0.00	0.03	0.02
	Na	0.02	0.03	0.03	0.00	0.00	0.00
Wt %	MgO	17.79	17.89	18.16	31.33	31.21	32.80
	Al2O3	1.66	1.27	1.51	0.00	0.00	0.00
	TiO2	0.93	0.47	0.85	0.00	0.00	0.00
	FeO	4.58	4.50	4.72	12.12	12.75	10.38
	SiO2	53.18	51.41	53.20	55.51	55.90	57.06
	CaO	21.24	20.71	21.11	0.00	0.95	0.64
	Na2O	0.57	0.70	0.77	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.96	96.95	100.33	98.96	100.81	100.88
	Cr ppm	0	0	0	0	0	0
	% En	49.94	50.68	50.46	82.17	79.93	83.92
	% Fs	7.21	7.16	7.36	17.83	18.32	14.90
	% Wo	42.85	42.16	42.17	0.00	1.75	1.18

Drill hole: WM00-01
Thin section: SW01-32 Depth: 583.70m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	0.95	0.92	1.55	1.62
	Al	0.03	0.05	0.00	0.01
	Ti	0.02	0.03	0.00	0.01
	Fe	0.15	0.16	0.34	0.30
	Si	1.95	1.92	1.95	1.94
	Ca	0.84	0.86	0.04	0.04
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	17.48	16.58	29.73	31.28
	Al2O3	1.23	2.29	0.00	0.32
	TiO2	0.65	1.08	0.00	0.23
	FeO	4.86	5.08	11.69	10.24
	SiO2	53.20	51.90	55.75	55.92
	CaO	21.30	21.65	1.06	1.05
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.80	0.80	0.51	0.00
	Total	99.52	99.38	98.75	99.04
	Cr ppm	8039	8039	5116	0
	% En	49.22	47.39	80.23	82.80
	% Fs	7.68	8.15	17.70	15.21
	% Wo	43.10	44.46	2.06	2.00

Drill hole: WM00-01
Thin section: SW01-34 Depth: 603.70m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	0.91	0.94	0.93	0.92	0.93	0.89
	Al	0.03	0.03	0.02	0.02	0.04	0.03	0.04
	Ti	0.02	0.02	0.01	0.02	0.02	0.02	0.02
	Fe	0.15	0.16	0.15	0.15	0.14	0.15	0.16
	Si	1.96	1.96	1.98	1.97	1.95	1.95	1.94
	Ca	0.84	0.83	0.82	0.83	0.85	0.84	0.86
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.83	16.63	17.03	17.28	16.73	16.86	16.22
	Al2O3	1.47	1.38	1.04	0.96	1.66	1.23	1.89
	TiO2	0.62	0.75	0.48	0.60	0.90	0.65	0.83
	FeO	4.79	5.15	4.75	5.13	4.68	4.93	5.27
	SiO2	53.76	53.23	53.59	54.57	52.86	52.69	52.65
	CaO	21.55	21.07	20.75	21.55	21.60	21.23	21.81
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.76	0.85	0.69	0.73	0.83	0.86	0.73
	Total	99.78	99.05	98.33	100.83	99.28	98.45	99.41
	Cr ppm	7600	8477	6870	7308	8331	8623	7308
	% En	48.09	47.98	49.21	48.48	47.96	48.34	46.53
	% Fs	7.67	8.33	7.70	8.08	7.53	7.92	8.49
	% Wo	44.24	43.69	43.09	43.45	44.51	43.73	44.98

Drill hole: WM00-01
Thin section: SW01-34 Depth: 603.70m

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11
Atomic	Mg	0.92	1.55	1.57	1.53
	Al	0.03	0.02	0.00	0.02
	Ti	0.02	0.00	0.00	0.01
	Fe	0.16	0.34	0.31	0.32
	Si	1.96	1.96	1.98	1.93
	Ca	0.83	0.00	0.00	0.06
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	16.70	29.73	29.77	29.45
	Al2O3	1.47	0.94	0.00	1.04
	TiO2	0.68	0.00	0.00	0.53
	FeO	5.16	11.53	10.45	10.81
	SiO2	53.08	56.09	55.84	55.37
	CaO	20.90	0.00	0.00	1.54
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.75	0.00	0.00	0.31
	Total	98.74	98.30	96.05	99.04
	Cr ppm	7454	0	0	3069
	% En	48.24	82.14	83.55	80.42
	% Fs	8.36	17.86	16.45	16.55
	% Wo	43.40	0.00	0.00	3.02

Drill hole: WM00-01
Thin section: SW01-36 Depth: 665.00m

		Pyroxene 1
Atomic	Mg	0.93
	Al	0.03
	Ti	0.02
	Fe	0.15
	Si	1.96
	Ca	0.85
	Na	0.00
Wt %	MgO	16.93
	Al2O3	1.36
	TiO2	0.58
	FeO	4.79
	SiO2	52.97
	CaO	21.46
	Na2O	0.00
	Cr2O3	0.76
	Total	98.85
	Cr ppm	7600
	% En	48.32
	% Fs	7.66
	% Wo	44.02

Drill hole: WM00-01
Thin section: SW01-37 Depth: 693.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.97	0.98	1.07	1.02	1.00	0.92	0.95
	Al	0.23	0.23	0.19	0.24	0.22	0.31	0.24
	Ti	0.13	0.12	0.06	0.05	0.09	0.12	0.13
	Fe	0.26	0.26	0.24	0.27	0.24	0.29	0.26
	Si	1.75	1.74	1.80	1.78	1.77	1.72	1.78
	Ca	0.46	0.45	0.45	0.48	0.46	0.51	0.47
	Na	0.11	0.15	0.14	0.11	0.15	0.00	0.00
Wt %	MgO	17.33	17.36	19.29	18.16	17.94	15.47	16.40
	Al2O3	10.34	10.26	8.62	11.00	9.98	13.08	10.37
	TiO2	4.47	4.07	2.02	1.70	3.20	3.99	4.40
	FeO	8.32	8.17	7.63	8.50	7.82	8.77	8.09
	SiO2	46.47	45.74	48.37	47.17	47.24	43.17	45.78
	CaO	11.43	11.11	11.24	11.78	11.57	11.92	11.38
	Na2O	3.10	4.02	3.91	3.09	4.25	0.00	0.00
	Cr2O3	0.48	0.50	0.56	0.28	0.45	0.00	0.00
	Total	101.94	101.22	101.62	101.68	102.45	96.40	96.43
	Cr ppm	4823	4969	5554	2777	4531	0	0
	% En	57.35	58.01	60.95	57.84	58.55	53.42	56.33
	% Fs	15.45	15.31	13.53	15.19	14.32	16.99	15.59
	% Wo	27.19	26.68	25.52	26.97	27.14	29.58	28.08

Drill hole: WM00-01
Thin section: SW01-38 Depth: 704.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	0.93	0.99	0.84	1.62	1.57
	Al	0.00	0.02	0.08	0.00	0.00
	Ti	0.01	0.01	0.10	0.00	0.00
	Fe	0.13	0.15	0.22	0.35	0.38
	Si	1.98	1.97	1.84	1.93	1.93
	Ca	0.91	0.79	0.84	0.00	0.00
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.88	17.25	14.89	31.61	30.26
	Al2O3	0.00	1.02	3.59	0.00	0.00
	TiO2	0.25	0.32	3.50	0.00	0.00
	FeO	4.19	4.76	6.92	12.12	12.89
	SiO2	53.48	51.15	48.37	55.92	55.54
	CaO	23.04	19.07	20.54	0.00	0.00
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00
	Total	97.85	93.57	97.82	99.65	98.69
	Cr ppm	0	0	0	0	0
	% En	47.16	51.29	44.40	82.30	80.71
	% Fs	6.57	7.94	11.58	17.70	19.29
	% Wo	46.27	40.77	44.02	0.00	0.00

Drill hole: WM00-01
Thin section: SW01-40 Depth: 713.60m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	1.53	1.53	1.53	0.89	0.95	0.85	0.86
	Al	0.00	0.00	0.00	0.05	0.02	0.07	0.07
	Ti	0.00	0.00	0.01	0.03	0.02	0.04	0.04
	Fe	0.39	0.40	0.38	0.19	0.16	0.21	0.21
	Si	1.93	1.92	1.93	1.91	1.94	1.89	1.87
	Ca	0.03	0.03	0.04	0.83	0.83	0.85	0.84
	Na	0.00	0.00	0.00	0.05	0.06	0.00	0.05
Wt %	MgO	29.78	29.40	29.37	16.15	17.68	15.26	15.52
	Al2O3	0.00	0.00	0.00	2.12	1.11	3.10	3.12
	TiO2	0.00	0.00	0.25	1.02	0.57	1.43	1.57
	FeO	13.53	13.64	12.88	6.09	5.31	6.84	6.81
	SiO2	55.88	55.24	55.02	51.62	54.00	50.64	50.12
	CaO	0.70	0.83	1.04	20.90	21.46	21.16	21.10
	Na2O	0.00	0.00	0.00	1.50	1.66	0.00	1.39
	Cr2O3	0.31	0.00	0.00	0.76	0.45	0.56	0.32
	Total	100.20	99.10	98.55	100.15	102.24	98.98	99.95
	Cr ppm	3069	0	0	7600	4531	5554	3216
	% En	78.63	78.10	78.66	46.70	48.99	44.48	44.98
	% Fs	20.04	20.32	19.35	9.87	8.26	11.19	11.06
	% Wo	1.33	1.58	1.99	43.44	42.75	44.33	43.95

Drill hole: WM00-01
Thin section: SW01-41 Depth: 718.40m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	1.54	1.41	1.60	1.61	1.43	1.54	1.52
	Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fe	0.39	0.51	0.35	0.38	0.48	0.39	0.42
	Si	1.93	1.91	1.93	1.91	1.92	1.93	1.91
	Ca	0.00	0.00	0.02	0.00	0.00	0.00	0.03
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	30.58	27.30	31.46	31.71	27.46	30.46	29.78
	Al2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	FeO	13.88	17.72	12.38	13.26	16.61	13.82	14.85
	SiO2	57.23	55.09	56.52	56.18	55.15	56.88	55.86
	CaO	0.00	0.00	0.56	0.00	0.00	0.00	0.83
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.69	100.10	100.91	101.15	99.22	101.16	101.31
	Cr ppm	0	0	0	0	0	0	0
	% En	79.70	73.31	81.07	80.99	74.67	79.72	76.95
	% Fs	20.30	26.69	17.89	19.01	25.33	20.28	21.52
	% Wo	0.00	0.00	1.04	0.00	0.00	0.00	1.53

Drill hole: WM98-05

Thin section: SW98-5-02 Depth: 17.62m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.94	1.00	1.02	1.01	1.00	0.97	0.97
	Al	0.07	0.03	0.03	0.03	0.04	0.04	0.03
	Ti	0.02	0.02	0.01	0.01	0.01	0.02	0.02
	Fe	0.18	0.18	0.16	0.16	0.17	0.17	0.17
	Si	1.92	1.93	1.93	1.93	1.93	1.93	1.93
	Ca	0.80	0.79	0.79	0.81	0.80	0.81	0.81
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.53	18.57	18.84	18.19	18.74	18.31	18.44
	Al2O3	3.08	1.62	1.34	1.19	1.87	1.76	1.47
	TiO2	0.85	0.60	0.45	0.47	0.52	0.72	0.77
	FeO	5.94	5.81	5.38	5.29	5.62	5.75	5.78
	SiO2	53.18	53.55	53.31	52.13	54.15	53.97	54.49
	CaO	20.82	20.43	20.34	20.46	20.83	21.20	21.27
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.37	0.45	0.73	0.50	0.48	0.66	0.56
	Total	101.77	101.04	100.39	98.22	102.21	102.36	102.77
	Cr ppm	3654	4531	7308	4969	4823	6577	5554
	% En	48.93	50.86	51.64	50.73	50.83	49.79	49.88
	% Fs	9.31	8.93	8.27	8.27	8.55	8.77	8.77
	% Wo	41.77	40.21	40.09	41.00	40.62	41.44	41.35

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12	Pyroxene 13	Pyroxene 14
Atomic	Mg	1.00	0.99	1.03	1.00	1.02	0.98	0.97
	Al	0.04	0.03	0.02	0.02	0.03	0.04	0.03
	Ti	0.01	0.02	0.01	0.01	0.01	0.02	0.02
	Fe	0.17	0.17	0.16	0.17	0.16	0.19	0.17
	Si	1.93	1.94	1.95	1.94	1.93	1.92	1.94
	Ca	0.79	0.80	0.77	0.79	0.79	0.80	0.81
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.32	18.51	18.72	18.82	19.19	18.41	18.19
	Al2O3	1.70	1.36	0.98	1.10	1.61	1.98	1.40
	TiO2	0.48	0.60	0.35	0.50	0.53	0.83	0.70
	FeO	5.49	5.57	5.26	5.80	5.31	6.19	5.78
	SiO2	52.76	54.04	52.61	54.74	53.95	53.50	54.38
	CaO	20.13	20.81	19.43	20.89	20.51	20.76	21.20
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.45	0.50	0.50	0.48	0.54	0.41	0.38
	Total	99.34	101.38	97.85	102.34	101.65	102.09	102.03
	Cr ppm	4531	4969	4969	4823	5408	4092	3800
	% En	51.07	50.58	52.53	50.74	51.98	50.02	49.61
	% Fs	8.59	8.54	8.28	8.78	8.08	9.43	8.84
	% Wo	40.34	40.87	39.19	40.48	39.94	40.55	41.55

Drill hole: WM98-05

Thin section: SW98-5-02 Depth: 17.62m

		Pyroxene 15	Pyroxene 16	Pyroxene 17	Pyroxene 18	Pyroxene 19
Atomic	Mg	0.99	0.98	1.01	1.02	0.98
	Al	0.05	0.04	0.02	0.03	0.03
	Ti	0.03	0.01	0.01	0.01	0.02
	Fe	0.17	0.17	0.17	0.16	0.18
	Si	1.91	1.93	1.94	1.94	1.93
	Ca	0.80	0.81	0.80	0.79	0.80
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.09	18.44	19.04	18.90	18.57
	Al2O3	2.25	1.70	1.13	1.38	1.51
	TiO2	0.95	0.42	0.42	0.43	0.60
	FeO	5.60	5.76	5.58	5.25	6.07
	SiO2	52.03	53.97	54.74	53.65	54.30
	CaO	20.32	21.03	21.00	20.43	20.86
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.50	0.67	0.56	0.56	0.51
	Total	99.73	102.00	102.47	100.60	102.43
	Cr ppm	4969	6723	5554	5554	5116
	% En	50.49	50.13	51.09	51.75	50.23
	% Fs	8.76	8.79	8.41	8.06	9.21
	% Wo	40.75	41.09	40.51	40.19	40.55

Drill hole: WM98-05

Thin section: SW98-5-03 Depth: 25.10m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.97	0.92	0.94	0.92	0.97	0.96	0.96
	Al	0.02	0.04	0.03	0.00	0.00	0.00	0.03
	Ti	0.01	0.02	0.01	0.00	0.00	0.00	0.01
	Fe	0.17	0.17	0.16	0.09	0.06	0.07	0.15
	Si	1.95	1.95	1.95	2.00	1.99	2.00	1.97
	Ca	0.80	0.84	0.83	0.94	0.94	0.94	0.80
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.11	17.08	17.43	17.46	18.51	17.91	17.45
	Al2O3	1.06	1.72	1.42	0.00	0.00	0.00	1.36
	TiO2	0.52	0.60	0.48	0.00	0.00	0.00	0.47
	FeO	5.78	5.52	5.22	3.07	2.16	2.30	4.91
	SiO2	54.57	53.76	53.76	56.54	56.46	55.77	53.03
	CaO	20.86	21.55	21.42	24.78	24.78	24.58	20.09
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.26	0.66	0.56	0.28	0.23	0.00	0.57
	Total	101.16	100.89	100.29	102.14	102.14	100.57	97.88
	Cr ppm	2631	6577	5554	2777	2339	0	5700
	% En	49.83	47.89	48.74	47.20	49.31	48.57	50.36
	% Fs	8.92	8.68	8.19	4.66	3.23	3.50	7.96
	% Wo	41.26	43.43	43.06	48.14	47.46	47.92	41.69

Drill hole: WM98-05
Thin section: SW98-5-03 Depth: 25.10m

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12	Pyroxene 13	Pyroxene 14
Atomic	Mg	0.96	0.94	0.95	0.93	0.97	0.88	0.93
	Al	0.00	0.01	0.01	0.00	0.00	0.07	0.03
	Ti	0.00	0.00	0.00	0.00	0.00	0.04	0.02
	Fe	0.09	0.11	0.08	0.11	0.05	0.19	0.17
	Si	1.99	1.98	1.99	2.00	2.00	1.90	1.95
	Ca	0.93	0.92	0.94	0.91	0.96	0.85	0.82
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.88	17.51	17.48	17.66	18.84	16.23	17.54
	Al2O3	0.00	0.42	0.55	0.00	0.00	3.33	1.38
	TiO2	0.00	0.00	0.00	0.00	0.00	1.37	0.68
	FeO	3.02	3.65	2.55	3.55	1.71	6.15	5.83
	SiO2	55.58	55.32	54.62	56.43	57.55	52.65	54.70
	CaO	24.09	23.91	24.12	23.91	25.87	22.02	21.59
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.23	0.00	0.00	0.37	0.47
	Total	100.57	100.82	99.55	101.56	103.97	102.11	102.20
	Cr ppm	0	0	2339	0	0	3654	4677
	% En	48.46	47.65	48.22	47.94	49.07	45.71	48.29
	% Fs	4.60	5.58	3.94	5.41	2.50	9.71	9.00
	% Wo	46.94	46.77	47.83	46.65	48.43	44.57	42.71

Drill hole: WM98-05
Thin section: SW98-5-7 Depth: 97.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.90	0.77	0.59	0.94	0.93	0.92	1.05
	Al	0.03	0.04	0.02	0.02	0.04	0.07	0.02
	Ti	0.01	0.02	0.02	0.00	0.02	0.02	0.01
	Fe	0.65	0.47	0.50	0.67	0.56	0.37	0.64
	Si	1.86	1.87	1.89	1.90	1.85	1.94	1.86
	Ca	0.33	0.67	0.81	0.23	0.42	0.52	0.23
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.72	13.83	10.76	17.26	17.03	17.26	20.08
	Al2O3	1.30	1.98	1.08	1.06	1.89	3.38	0.81
	TiO2	0.52	0.75	0.62	0.00	0.68	0.60	0.37
	FeO	21.38	15.06	16.42	22.06	18.41	12.36	21.74
	SiO2	51.51	49.82	51.71	52.20	50.55	54.36	52.99
	CaO	8.59	16.61	20.75	5.95	10.82	13.68	6.16
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.02	98.06	101.33	98.53	99.38	101.65	102.15
	Cr ppm	0	0	0	0	0	0	0
	% En	47.92	40.42	30.85	50.90	48.48	50.72	54.71
	% Fs	34.38	24.70	26.40	36.50	29.40	20.38	33.23
	% Wo	17.70	34.88	42.75	12.60	22.13	28.90	12.06

Drill hole: WM98-05
Thin section: SW98-5-8 Depth: 161.10m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	0.83	0.86	0.89	0.84	0.93	0.95
	Al	0.02	0.05	0.05	0.04	0.03	0.02	0.04
	Ti	0.02	0.02	0.02	0.40	0.02	0.02	0.01
	Fe	0.48	0.39	0.37	0.01	0.57	0.62	0.39
	Si	1.94	1.89	1.90	1.83	1.88	1.86	1.90
	Ca	0.40	0.68	0.68	0.57	0.44	0.34	0.58
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.21	15.37	15.46	17.33	15.75	17.18	17.78
	Al2O3	1.10	2.38	2.06	1.89	1.57	1.13	1.89
	TiO2	0.63	0.85	0.67	15.28	0.78	0.67	0.40
	FeO	16.17	12.77	11.69	0.23	19.17	20.40	13.07
	SiO2	54.34	52.05	50.96	53.03	52.46	51.36	52.80
	CaO	10.45	17.38	16.94	15.48	11.57	8.86	15.17
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.90	100.81	97.78	103.24	101.30	99.61	101.10
	Cr ppm	0	0	0	0	0	0	0
	% En	50.93	43.88	45.20	60.63	45.24	49.10	49.37
	% Fs	26.84	20.46	19.19	0.45	30.88	32.71	20.36
	% Wo	22.23	35.66	35.62	38.91	23.88	18.19	30.27

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12
Atomic	Mg	0.99	0.94	0.86	0.78	1.12
	Al	0.03	0.03	0.05	0.04	0.00
	Ti	0.01	0.02	0.02	0.02	0.00
	Fe	0.37	0.66	0.45	0.46	0.59
	Si	1.92	2.00	1.87	1.88	1.90
	Ca	0.55	0.00	0.60	0.66	0.21
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.24	16.19	15.90	14.08	21.38
	Al2O3	1.47	1.27	2.21	2.00	0.00
	TiO2	0.40	0.68	0.68	0.85	0.00
	FeO	12.22	20.26	14.92	14.91	19.89
	SiO2	52.80	51.47	51.47	50.64	53.91
	CaO	14.22	0.00	15.34	16.51	5.54
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00
	Total	99.35	89.87	100.53	98.99	100.72
	Cr ppm	0	0	0	0	0
	% En	51.65	58.74	45.06	41.03	58.54
	% Fs	19.41	41.26	23.72	24.38	30.56
	% Wo	28.93	0.00	31.23	34.59	10.91

Drill hole: WM98-05
Thin section: SW98-5-10 Depth: 193.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	1.02	0.98	0.98	0.98	1.01	0.99	1.01
	Al	0.03	0.04	0.03	0.02	0.03	0.03	0.03
	Ti	0.02	0.02	0.02	0.02	0.01	0.02	0.02
	Fe	0.15	0.16	0.15	0.15	0.15	0.15	0.15
	Si	1.94	1.93	1.94	1.94	1.94	1.94	1.95
	Ca	0.78	0.81	0.81	0.82	0.81	0.81	0.78
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	18.87	17.78	18.11	18.03	18.19	18.37	18.89
	Al2O3	1.49	1.68	1.55	1.15	1.28	1.23	1.28
	TiO2	0.72	0.82	0.77	0.75	0.50	0.63	0.72
	FeO	4.84	5.03	5.00	4.91	4.86	5.12	5.07
	SiO2	53.65	52.03	53.80	53.31	52.07	53.85	54.30
	CaO	20.18	20.44	20.85	20.88	20.29	21.02	20.30
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.76	0.92	0.76	0.80	0.86	0.76	0.69
	Total	100.51	98.70	100.84	99.83	98.06	100.98	101.24
	Cr ppm	7600	9208	7600	8039	8623	7600	6870
	% En	52.30	50.37	50.44	50.37	51.24	50.55	52.00
	% Fs	7.52	8.00	7.82	7.70	7.68	7.90	7.83
	% Wo	40.19	41.63	41.74	41.93	41.07	41.55	40.17

Drill hole: WM98-05
Thin section: SW98-5-13 Depth: 311.02m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.85	0.87	0.88
	Al	0.11	0.08	0.07
	Ti	0.05	0.04	0.04
	Fe	0.17	0.17	0.17
	Si	1.88	1.91	1.92
	Ca	0.84	0.84	0.85
	Na	0.02	0.00	0.00
Wt %	MgO	15.24	15.90	16.19
	Al2O3	5.03	3.82	3.12
	TiO2	1.84	1.43	1.30
	FeO	5.53	5.48	5.52
	SiO2	49.89	52.22	52.80
	CaO	20.86	21.31	21.95
	Na2O	0.44	0.00	0.00
	Cr2O3	0.69	0.75	0.83
	Total	99.52	100.91	101.71
	Cr ppm	6870	7454	8331
	% En	45.71	46.37	46.16
	% Fs	9.31	8.97	8.83
	% Wo	44.98	44.66	45.00

Drill hole: WM98-05
Thin section: SW98-5-14 Depth: 323.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6
Atomic	Mg	0.93	0.97	1.01	0.97	0.93	0.94
	Al	0.11	0.08	0.05	0.06	0.11	0.11
	Ti	0.06	0.04	0.03	0.03	0.06	0.06
	Fe	0.19	0.17	0.16	0.15	0.18	0.19
	Si	1.84	1.89	1.90	1.91	1.84	1.84
	Ca	0.81	0.82	0.82	0.82	0.82	0.80
	Na	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.58	17.76	18.49	17.74	16.88	17.43
	Al2O3	5.14	3.55	2.42	2.82	5.27	5.06
	TiO2	2.22	1.35	0.95	1.03	2.29	2.20
	FeO	6.02	5.44	5.07	4.98	5.92	6.28
	SiO2	49.03	51.60	51.77	51.90	49.80	50.72
	CaO	20.20	20.79	20.99	20.81	20.78	20.60
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.20	0.00	0.54	0.60	0.00	0.25
	Total	99.40	100.50	100.23	99.88	100.94	102.54
	Cr ppm	2046	0	5408	5993	0	2485
	% En	48.09	49.67	50.77	50.00	48.05	48.75
	% Fs	9.80	8.54	7.81	7.87	9.45	9.85
	% Wo	42.11	41.79	41.42	42.13	42.50	41.40

Drill hole: WM98-05
Thin section: SW98-5-15 Depth:348.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.99	1.00	0.97	1.70	0.96	0.94	1.70
	Al	0.03	0.03	0.05	0.00	0.05	0.06	0.00
	Ti	0.02	0.01	0.02	0.00	0.03	0.03	0.00
	Fe	0.16	0.16	0.16	0.32	0.16	0.16	0.31
	Si	1.93	1.94	1.91	1.90	1.92	1.91	1.92
	Ca	0.82	0.79	0.83	0.02	0.82	0.82	0.00
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.98	18.03	17.46	33.10	17.43	16.86	33.83
	Al2O3	1.19	1.28	2.15	0.00	2.17	2.83	0.00
	TiO2	0.68	0.48	0.82	0.00	1.00	1.17	0.00
	FeO	5.06	5.16	5.15	11.06	5.08	5.21	10.88
	SiO2	52.20	52.20	51.11	55.09	51.90	51.34	56.73
	CaO	20.76	19.91	20.62	0.62	20.64	20.67	0.00
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.56	0.85	0.80	0.28	0.67	0.77	0.00
	Total	98.42	97.91	98.12	100.14	98.89	98.86	101.45
	Cr ppm	5554	8477	8039	2777	6723	7746	0
	% En	50.30	51.17	49.65	83.27	49.64	48.68	84.71
	% Fs	7.94	8.21	8.21	15.61	8.12	8.44	15.29
	% Wo	41.76	40.62	42.14	1.11	42.24	42.88	0.00

Drill hole: WM98-05
Thin section: SW98-5-16 Depth:355.65m

		Pyroxene 1
Atomic	Mg	0.97
	Al	0.05
	Ti	0.02
	Fe	0.16
	Si	1.92
	Ca	0.82
	Na	0.00
Wt %	MgO	17.73
	Al2O3	2.31
	TiO2	0.90
	FeO	5.20
	SiO2	52.11
	CaO	20.95
	Na2O	0.00
	Cr2O3	0.64
	Total	99.83
	Cr ppm	6431
	% En	49.66
	% Fs	8.17
	% Wo	42.17

Drill hole: WM98-05
Thin section: SW98-5-18 Depth:382.60m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.93	0.94	0.94	0.93	0.94	1.56	1.58
	Al	0.04	0.03	0.03	0.03	0.04	0.03	0.01
	Ti	0.02	0.02	0.01	0.02	0.02	0.01	0.00
	Fe	0.16	0.16	0.15	0.15	0.15	0.34	0.34
	Si	1.95	1.95	1.97	1.96	1.94	1.92	1.93
	Ca	0.82	0.82	0.82	0.81	0.83	0.03	0.04
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.30	17.91	17.43	17.36	17.63	30.63	30.30
	Al2O3	1.64	1.27	1.42	1.57	1.91	1.68	0.57
	TiO2	0.73	0.92	0.50	0.73	0.90	0.27	0.00
	FeO	5.35	5.61	4.94	5.16	5.16	11.75	11.55
	SiO2	54.02	55.54	54.40	54.94	54.40	56.26	55.15
	CaO	21.20	21.73	21.17	21.17	21.60	0.69	1.04
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.63	0.79	0.88	0.95	0.77	0.67	0.25
	Total	100.87	103.76	100.74	101.88	102.38	101.94	98.85
	Cr ppm	6285	7893	8770	9500	7746	6723	2485
	% En	48.67	48.83	49.21	48.95	48.90	81.22	80.74
	% Fs	8.45	8.58	7.83	8.16	8.03	17.47	17.27
	% Wo	42.88	42.59	42.96	42.89	43.07	1.31	1.98

Drill hole: WM98-05
Thin section: SW98-5-18 Depth:382.60m

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12
Atomic	Mg	0.95	0.95	0.95	0.94	0.96
	Al	0.03	0.02	0.03	0.03	0.03
	Ti	0.02	0.02	0.02	0.02	0.01
	Fe	0.16	0.20	0.18	0.16	0.16
	Si	1.94	1.92	1.93	1.95	1.94
	Ca	0.82	0.81	0.82	0.82	0.83
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.53	17.88	17.28	17.31	17.41
	Al2O3	1.44	1.17	1.34	1.28	1.30
	TiO2	0.75	0.65	0.77	0.77	0.52
	FeO	5.26	6.61	5.69	5.38	5.17
	SiO2	53.38	53.72	52.28	53.31	52.48
	CaO	21.03	21.21	20.76	20.92	20.97
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.72	0.85	0.77	0.99	0.82
	Total	100.10	102.09	98.90	99.97	98.67
	Cr ppm	7162	8477	7746	9939	8185
	% En	49.24	48.54	48.82	48.96	49.20
	% Fs	8.29	10.07	9.01	8.53	8.20
	% Wo	42.46	41.39	42.17	42.51	42.60

Drill hole: WM98-05
Thin section: SW98-5-19 Depth:387.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	1.01	0.99	1.01	0.99
	Al	0.03	0.04	0.02	0.03
	Ti	0.02	0.02	0.02	0.02
	Fe	0.15	0.18	0.15	0.16
	Si	1.91	1.90	1.92	1.92
	Ca	0.84	0.83	0.84	0.84
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	18.06	17.88	18.57	18.36
	Al2O3	1.40	1.62	1.15	1.44
	TiO2	0.72	0.88	0.72	0.77
	FeO	4.89	5.74	5.00	5.25
	SiO2	50.64	51.09	52.52	53.29
	CaO	20.88	20.95	21.53	21.73
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.66	0.80	0.76	0.85
	Total	97.23	98.96	100.26	101.68
	Cr ppm	6577	8039	7600	8477
	% En	50.44	49.45	50.39	49.72
	% Fs	7.66	8.90	7.62	7.98
	% Wo	41.90	41.64	41.99	42.30

Drill hole: WM98-05
Thin section: SW98-5-20 Depth:394.00m

		Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	0.90	1.62	1.61	1.60
	Al	0.06	0.01	0.00	0.01
	Ti	0.04	0.01	0.01	0.01
	Fe	0.16	0.30	0.31	0.29
	Si	1.92	1.94	1.94	1.94
	Ca	0.83	0.03	0.03	0.03
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	17.00	32.69	31.96	31.87
	Al2O3	2.74	0.42	0.00	0.64
	TiO2	1.38	0.33	0.43	0.40
	FeO	5.47	10.92	10.97	10.30
	SiO2	53.97	58.27	57.29	57.65
	CaO	21.66	0.76	0.76	0.97
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.95	0.00	0.22	0.00
	Total	103.17	103.39	101.63	101.84
	Cr ppm	9500	0	2192	0
	% En	47.70	83.05	82.67	83.12
	% Fs	8.61	15.57	15.93	15.07
	% Wo	43.69	1.38	1.40	1.81

Drill hole: WM98-05
Thin section: SW98-5-21 Depth:407.00m

		Pyroxene 1
Atomic	Mg	0.96
	Al	0.05
	Ti	0.03
	Fe	0.15
	Si	1.92
	Ca	0.83
	Na	0.00
Wt %	MgO	17.76
	Al2O3	2.57
	TiO2	1.15
	FeO	4.97
	SiO2	52.78
	CaO	21.21
	Na2O	0.00
	Cr2O3	0.69
	Total	101.12
	Cr ppm	6870
	% En	49.62
	% Fs	7.78
	% Wo	42.60

Drill hole: WM98-05
Thin section: SW98-5-22 Depth:423.00m

		Pyroxene 1	Pyroxene 2
Atomic	Mg	1.65	1.63
	Al	0.00	0.01
	Ti	0.00	0.00
	Fe	0.29	0.29
	Si	1.94	1.95
	Ca	0.03	0.02
	Na	0.00	0.00
Wt %	MgO	32.39	32.40
	Al2O3	0.00	0.57
	TiO2	0.00	0.00
	FeO	10.30	10.10
	SiO2	56.69	57.63
	CaO	0.80	0.52
	Na2O	0.00	0.00
	Cr2O3	0.00	0.00
	Total	100.18	101.22
	Cr ppm	0	0
	% En	83.60	84.29
	% Fs	14.92	14.74
	% Wo	1.48	0.97

Drill hole: WM98-05
Thin section: SW98-5-23 Depth:475.02m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.92	0.93	0.94
	Al	0.04	0.03	0.03
	Ti	0.02	0.02	0.02
	Fe	0.15	0.14	0.14
	Si	1.96	1.97	1.97
	Ca	0.83	0.83	0.82
	Na	0.00	0.00	0.00
Wt %	MgO	16.55	17.30	17.26
	Al2O3	1.74	1.49	1.47
	TiO2	0.70	0.67	0.78
	FeO	4.77	4.70	4.66
	SiO2	52.93	54.68	53.93
	CaO	20.79	21.67	20.93
	Na2O	0.00	0.00	0.00
	Cr2O3	0.72	0.85	0.82
	Total	98.20	101.35	99.86
	Cr ppm	7162	8477	8185
	% En	48.43	48.71	49.44
	% Fs	7.84	7.42	7.48
	% Wo	43.73	43.87	43.08

Drill hole: WM98-05
Thin section: SW98-5-24 Depth:484.10m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.94	0.96	0.95
	Al	0.04	0.03	0.04
	Ti	0.03	0.02	0.03
	Fe	0.17	0.16	0.17
	Si	1.92	1.95	1.92
	Ca	0.83	0.81	0.83
	Na	0.00	0.00	0.00
Wt %	MgO	17.03	17.99	17.43
	Al2O3	1.97	1.38	1.95
	TiO2	1.08	0.82	0.98
	FeO	5.44	5.35	5.42
	SiO2	51.62	54.59	52.41
	CaO	20.75	21.27	21.25
	Na2O	0.00	0.00	0.00
	Cr2O3	0.79	0.85	0.85
	Total	98.68	102.25	100.29
	Cr ppm	7893	8477	8477
	% En	48.66	49.59	48.76
	% Fs	8.72	8.28	8.50
	% Wo	42.61	42.13	42.74

Drill hole: WM98-05
Thin section: SW98-5-26 Depth:495.03m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.96	0.97	0.99	0.99	0.98	0.99	0.95
	Al	0.06	0.06	0.03	0.03	0.03	0.03	0.03
	Ti	0.04	0.04	0.02	0.02	0.02	0.01	0.02
	Fe	0.15	0.16	0.14	0.15	0.15	0.15	0.15
	Si	1.92	1.91	1.96	1.95	1.96	1.94	1.96
	Ca	0.80	0.80	0.79	0.78	0.79	0.82	0.81
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.99	18.26	18.87	19.04	18.82	18.71	17.93
	Al2O3	3.06	2.78	1.42	1.53	1.59	1.25	1.40
	TiO2	1.40	1.50	0.77	0.82	0.65	0.50	0.73
	FeO	5.06	5.27	4.73	5.24	5.02	5.06	4.98
	SiO2	53.46	53.85	55.88	56.05	55.90	54.45	55.00
	CaO	20.85	21.17	21.04	21.02	20.97	21.37	21.28
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.60	0.75	0.86	0.75	0.75	0.83	0.83
	Total	102.42	103.57	103.58	104.43	103.70	102.15	102.15
	Cr ppm	5993	7454	8623	7454	7454	8331	8331
	% En	50.24	50.11	51.49	51.34	51.27	50.70	49.77
	% Fs	7.92	8.12	7.25	7.92	7.67	7.69	7.76
	% Wo	41.84	41.76	41.27	40.74	41.06	41.62	42.47

Drill hole: WM98-05
Thin section: SW98-5-26 Depth:495.03m

		Pyroxene 8	Pyroxene 9
Atomic	Mg	0.99	1.01
	Al	0.03	0.03
	Ti	0.02	0.02
	Fe	0.15	0.14
	Si	1.95	1.95
	Ca	0.80	0.80
	Na	0.00	0.00
Wt %	MgO	17.79	18.42
	Al2O3	1.30	1.23
	TiO2	0.55	0.67
	FeO	4.68	4.66
	SiO2	52.22	52.80
	CaO	19.84	20.34
	Na2O	0.00	0.00
	Cr2O3	0.82	0.00
	Total	97.21	98.12
	Cr ppm	8185	0
	% En	51.31	51.67
	% Fs	7.57	7.33
	% Wo	41.12	41.01

Drill hole: WM98-05
Thin section: SW98-5-27 Depth:520.90m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	0.97	0.97	1.04	1.05	1.01	1.02
	Al	0.06	0.03	0.03	0.03	0.03	0.04	0.03
	Ti	0.03	0.02	0.02	0.02	0.02	0.03	0.02
	Fe	0.16	0.59	0.16	0.14	0.14	0.15	0.15
	Si	1.92	2.03	1.94	1.93	1.95	1.91	1.93
	Ca	0.83	0.00	0.82	0.79	0.77	0.80	0.79
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.80	17.45	17.64	19.49	19.14	18.22	19.00
	Al2O3	2.72	1.28	1.44	1.57	1.17	2.02	1.34
	TiO2	1.07	0.57	0.58	0.70	0.58	1.05	0.77
	FeO	5.15	19.09	5.06	4.64	4.43	4.88	4.86
	SiO2	52.07	54.45	52.93	53.59	53.08	51.51	53.48
	CaO	21.11	0.00	20.89	20.60	19.52	20.22	20.33
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.80	0.60	0.72	0.83	0.94	0.76	0.89
	Total	99.72	93.43	99.25	101.42	98.85	98.67	100.68
	Cr ppm	8039	5993	7162	8331	9354	7600	8916
	% En	48.19	61.96	49.71	52.81	53.68	51.35	52.29
	% Fs	8.28	38.04	7.99	7.06	6.96	7.71	7.51
	% Wo	43.53	0.00	42.30	40.12	39.35	40.94	40.20

Drill hole: WM98-05
Thin section: SW98-5-28 Depth:544.40m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	1.67	1.01	0.99
	Al	0.00	0.03	0.04
	Ti	0.00	0.01	0.02
	Fe	0.32	0.15	0.15
	Si	1.92	1.94	1.94
	Ca	0.03	0.80	0.79
	Na	0.00	0.00	0.00
Wt %	MgO	33.38	18.59	18.66
	Al2O3	0.00	1.53	1.85
	TiO2	0.00	0.53	0.80
	FeO	11.24	4.93	5.00
	SiO2	57.16	52.93	54.49
	CaO	0.77	20.37	20.69
	Na2O	0.00	0.00	0.00
	Cr2O3	0.00	0.82	0.85
	Total	102.56	99.70	102.34
	Cr ppm	0	8185	8477
	% En	82.95	51.64	51.34
	% Fs	15.67	7.68	7.73
	% Wo	1.37	40.68	40.93

Drill hole: WM98-05
Thin section: SW98-5-30 Depth:556.04m

		Pyroxene 2	Pyroxene 3
Atomic	Mg	0.95	1.62
	Al	0.05	0.01
	Ti	0.03	0.01
	Fe	0.18	0.34
	Si	1.90	1.90
	Ca	0.82	0.05
	Na	0.02	0.00
Wt %	MgO	17.56	32.55
	Al2O3	2.40	0.36
	TiO2	0.98	0.30
	FeO	5.97	12.07
	SiO2	52.48	56.88
	CaO	21.06	1.47
	Na2O	0.53	0.00
	Cr2O3	0.56	0.00
	Total	101.53	103.63
	Cr ppm	5554	0
	% En	48.72	80.62
	% Fs	9.29	16.77
	% Wo	41.99	2.62

Drill hole: WM98-05
Thin section: SW98-5-31 Depth:564.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	0.97	0.89	0.93	0.93	0.92	0.94
	Al	0.03	0.02	0.05	0.03	0.03	0.03	0.02
	Ti	0.02	0.01	0.04	0.01	0.01	0.01	0.02
	Fe	0.16	0.18	0.18	0.15	0.15	0.14	0.14
	Si	1.94	1.95	1.92	1.96	1.96	1.97	1.97
	Ca	0.86	0.78	0.85	0.85	0.85	0.86	0.83
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.05	17.94	16.35	17.45	17.13	16.60	17.26
	Al2O3	1.49	1.13	2.51	1.23	1.27	1.27	0.81
	TiO2	0.78	0.47	1.33	0.52	0.52	0.48	0.65
	FeO	5.44	6.02	5.81	4.88	4.77	4.61	4.55
	SiO2	53.50	53.68	52.33	54.70	53.53	52.95	53.70
	CaO	22.19	20.09	21.63	22.16	21.56	21.51	21.14
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.66	0.70	0.53	0.73	1.05	0.82	0.69
	Total	101.12	100.03	100.50	101.66	99.83	98.23	98.81
	Cr ppm	6577	7016	5262	7308	10524	8185	6870
	% En	47.29	50.17	46.50	48.31	48.52	47.92	49.30
	% Fs	8.47	9.44	9.28	7.57	7.58	7.46	7.30
	% Wo	44.24	40.38	44.22	44.11	43.89	44.62	43.40

Drill hole: WM98-05
Thin section: SW98-5-32 Depth:570.50m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.89	1.55	0.88
	Al	0.04	0.00	0.05
	Ti	0.03	0.00	0.04
	Fe	0.18	0.35	0.17
	Si	1.94	1.96	1.92
	Ca	0.84	0.02	0.85
	Na	0.00	0.00	0.00
Wt %	MgO	16.10	30.41	16.09
	Al2O3	1.80	0.00	2.49
	TiO2	0.97	0.00	1.27
	FeO	5.71	12.14	5.69
	SiO2	52.16	57.29	52.33
	CaO	21.21	0.60	21.62
	Na2O	0.00	0.00	0.00
	Cr2O3	0.66	0.00	0.57
	Total	98.60	100.45	100.05
	Cr ppm	6577	0	5700
	% En	46.60	80.76	46.21
	% Fs	9.27	18.09	9.16
	% Wo	44.12	1.15	44.63

Drill hole: WM98-05
Thin section: SW98-5-33 Depth:573.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3
Atomic	Mg	0.96	0.89	0.97
	Al	0.03	0.07	0.02
	Ti	0.01	0.04	0.02
	Fe	0.15	0.18	0.14
	Si	1.97	1.92	1.97
	Ca	0.81	0.81	0.80
	Na	0.00	0.00	0.00
Wt %	MgO	17.66	16.32	17.68
	Al2O3	1.19	3.23	1.15
	TiO2	0.45	1.50	0.63
	FeO	4.85	5.72	4.57
	SiO2	54.06	52.22	53.72
	CaO	20.64	20.55	20.47
	Na2O	0.00	0.00	0.00
	Cr2O3	0.77	0.42	0.63
	Total	99.62	99.97	98.85
	Cr ppm	7746	4239	6285
	% En	50.15	47.57	50.58
	% Fs	7.73	9.36	7.33
	% Wo	42.12	43.07	42.09

Drill hole: WM98-05
Thin section: SW98-5-34 Depth:578.04m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.99	0.92	0.90	0.90	0.92	1.53	0.90
	Al	0.02	0.04	0.03	0.04	0.03	0.04	0.06
	Ti	0.01	0.03	0.02	0.02	0.02	0.00	0.05
	Fe	0.16	0.17	0.15	0.17	0.15	0.41	0.23
	Si	1.91	1.93	1.97	1.94	1.96	1.89	1.88
	Ca	0.88	0.84	0.84	0.84	0.86	0.01	0.81
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.35	16.85	16.70	16.70	16.65	29.52	16.30
	Al2O3	1.04	1.91	1.57	2.06	1.27	2.04	2.91
	TiO2	0.47	1.03	0.75	0.87	0.55	0.00	1.62
	FeO	4.88	5.65	5.02	5.67	4.67	14.15	7.26
	SiO2	49.91	52.88	54.49	53.93	52.69	54.53	50.36
	CaO	21.48	21.56	21.67	21.86	21.66	0.24	20.41
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.92	0.64	0.92	0.57	0.94	0.29	0.37
	Total	96.04	100.53	101.12	101.66	98.42	100.77	99.22
	Cr ppm	9208	6431	9208	5700	9354	2923	3654
	% En	48.84	47.44	47.59	46.92	47.79	78.45	46.52
	% Fs	7.70	8.92	8.02	8.94	7.52	21.10	11.62
	% Wo	43.46	43.64	44.39	44.14	44.69	0.45	41.87

Drill hole: WM98-05
Thin section: SW98-5-34 Depth:578.04m

		Pyroxene 8	Pyroxene 9	Pyroxene 10
Atomic	Mg	0.92	0.93	0.96
	Al	0.04	0.05	0.03
	Ti	0.03	0.03	0.02
	Fe	0.17	0.19	0.18
	Si	1.93	1.92	1.92
	Ca	0.84	0.82	0.83
	Na	0.00	0.00	0.00
Wt %	MgO	16.57	16.58	17.23
	Al2O3	1.89	2.19	1.55
	TiO2	0.95	1.13	0.68
	FeO	5.61	5.94	5.80
	SiO2	52.01	51.17	51.64
	CaO	21.24	20.39	20.83
	Na2O	0.00	0.00	0.00
	Cr2O3	0.76	0.51	0.42
	Total	99.02	97.92	98.17
	Cr ppm	7600	5116	4239
	% En	47.36	47.97	48.59
	% Fs	9.00	9.65	9.18
	% Wo	43.64	42.38	42.23

Drill hole: WM98-05
Thin section: SW98-5-35 Depth:582.14m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4
Atomic	Mg	1.53	0.91	0.94	0.92
	Al	0.00	0.04	0.03	0.03
	Ti	0.00	0.02	0.02	0.02
	Fe	0.34	0.18	0.20	0.18
	Si	1.96	1.94	1.93	1.95
	Ca	0.04	0.83	0.79	0.82
	Na	0.00	0.00	0.00	0.00
Wt %	MgO	30.16	16.96	17.71	17.06
	Al2O3	0.00	1.87	1.62	1.51
	TiO2	0.00	0.83	0.77	0.60
	FeO	11.89	6.10	6.79	5.97
	SiO2	57.68	53.89	54.27	54.06
	CaO	1.02	21.41	20.60	21.21
	Na2O	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.54	0.56	0.77
	Total	100.75	101.60	102.32	101.19
	Cr ppm	0	5408	5554	7746
	% En	80.29	47.42	48.76	47.85
	% Fs	17.75	9.56	10.49	9.39
	% Wo	1.95	43.01	40.75	42.75

Drill hole: WM98-05

Thin section: SW98-5-36 Depth:586.00m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	1.55	0.99	1.63	1.42	1.57
	Al	0.00	0.04	0.01	0.00	0.00
	Ti	0.01	0.02	0.00	0.53	0.01
	Fe	0.43	0.18	0.36	0.00	0.42
	Si	1.88	1.91	1.90	1.75	1.87
	Ca	0.04	0.81	0.02	0.02	0.04
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	30.13	18.26	32.64	30.11	30.98
	Al2O3	0.00	1.80	0.40	0.00	0.00
	TiO2	0.33	0.77	0.00	22.16	0.42
	FeO	14.72	6.05	13.01	0.00	14.81
	SiO2	54.25	52.63	56.69	55.15	54.87
	CaO	1.02	20.82	0.60	0.56	1.12
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.57	0.00	0.00	0.00
	Total	100.46	100.88	103.33	107.98	102.19
	Cr ppm	0	5700	0	0	0
	% En	77.02	49.87	80.85	98.68	77.27
	% Fs	21.10	9.26	18.08	0.00	20.72
	% Wo	1.88	40.87	1.07	1.32	2.01

Drill hole: WM00-04

Thin section: SW04-03 Depth:14.7m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.86	0.89	1.09	1.17	1.19	1.12	1.17
	Al	0.04	0.04	0.00	0.00	0.00	0.00	0.00
	Ti	0.03	0.02	0.00	0.00	0.00	0.01	0.01
	Fe	0.30	0.27	0.76	0.66	0.67	0.72	0.67
	Si	1.89	1.91	1.85	1.89	1.86	1.86	1.87
	Ca	0.78	0.76	0.05	0.06	0.06	0.05	0.05
	Na	0.03	0.03	0.02	0.00	0.03	0.00	0.02
Wt %	MgO	15.87	16.38	20.68	22.19	22.49	21.26	22.07
	Al2O3	1.80	1.74	0.00	0.00	0.00	0.00	0.00
	TiO2	0.98	0.88	0.00	0.00	0.00	0.28	0.33
	FeO	9.83	8.98	25.79	22.19	22.57	24.22	22.42
	SiO2	51.94	52.22	52.65	53.63	52.20	52.56	52.35
	CaO	19.91	19.36	1.32	1.68	1.65	1.41	1.43
	Na2O	0.96	0.77	0.69	0.00	0.75	0.00	0.61
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.29	100.34	101.12	99.69	99.66	99.74	99.21
	Cr ppm	0	0	0	0	0	0	0
	% En	44.46	46.36	57.29	61.90	61.89	59.28	61.87
	% Fs	15.45	14.25	40.09	34.73	34.84	37.89	35.26
	% Wo	40.09	39.38	2.62	3.37	3.27	2.83	2.88

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11
Atomic	Mg	1.16	0.99	0.98	0.72
	Al	0.00	0.00	0.00	0.00
	Ti	0.01	0.00	0.00	0.01
	Fe	0.68	0.84	0.83	0.34
	Si	1.86	1.86	1.86	1.96
	Ca	0.06	0.02	0.04	0.84
	Na	0.02	0.02	0.00	0.01
Wt %	MgO	21.43	18.71	18.46	13.07
	Al2O3	0.00	0.00	0.00	0.00
	TiO2	0.37	0.00	0.00	0.22
	FeO	22.40	28.11	27.80	10.96
	SiO2	51.36	52.26	52.16	53.08
	CaO	1.48	0.57	1.09	21.39
	Na2O	0.50	0.70	0.00	0.30
	Cr2O3	0.00	0.00	0.00	0.00
	Total	97.54	100.35	99.51	99.01
	Cr ppm	0	0	0	0
	% En	61.12	53.62	52.98	37.78
	% Fs	35.84	45.20	44.77	17.78
	% Wo	3.04	1.18	2.25	44.45

Drill hole: WM00-04

Thin section: SW04-06 Depth:51.10m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.85	0.87	0.85	0.87	0.84	0.87	0.86
	Al	0.05	0.05	0.05	0.05	0.05	0.04	0.05
	Ti	0.03	0.03	0.00	0.00	0.00	0.00	0.00
	Fe	0.25	0.24	0.25	0.26	0.25	0.24	0.26
	Si	1.90	1.91	1.93	1.92	1.94	1.94	1.92
	Ca	0.81	0.80	0.82	0.80	0.82	0.81	0.82
	Na	0.02	0.03	0.03	0.03	0.03	0.02	0.03
Wt %	MgO	15.77	16.20	15.59	15.87	15.47	16.17	15.62
	Al2O3	2.21	2.31	2.12	2.38	2.17	1.64	2.19
	TiO2	1.13	1.10	0.00	0.00	0.00	0.00	0.00
	FeO	8.39	7.89	8.17	8.48	8.23	7.91	8.39
	SiO2	52.48	52.78	52.86	51.86	53.27	53.80	51.77
	CaO	20.76	20.64	20.92	20.12	21.04	20.97	20.60
	Na2O	0.67	0.71	0.85	0.93	0.92	0.67	0.88
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.42	101.62	100.50	99.64	101.11	101.18	99.44
	Cr ppm	0	0	0	0	0	0	0
	% En	44.55	45.69	44.28	45.23	43.93	45.31	44.47
	% Fs	13.29	12.48	13.02	13.55	13.12	12.44	13.39
	% Wo	42.16	41.83	42.71	41.22	42.95	42.25	42.14

		Pyroxene 8	Pyroxene 9	Pyroxene 10
Atomic	Mg	0.90	0.85	0.84
	Al	0.03	0.05	0.04
	Ti	0.00	0.00	0.00
	Fe	0.24	0.25	0.24
	Si	1.94	1.93	1.95
	Ca	0.81	0.82	0.82
	Na	0.03	0.03	0.03
Wt %	MgO	16.60	15.64	15.54
	Al2O3	1.21	2.21	2.02
	TiO2	0.00	0.00	0.00
	FeO	7.83	8.20	8.08
	SiO2	53.20	52.61	53.82
	CaO	20.81	20.79	21.13
	Na2O	0.77	0.82	0.88
	Cr2O3	0.00	0.00	0.00
	Total	100.42	100.26	101.47
	Cr ppm	0	0	0
	% En	46.18	44.45	44.07
	% Fs	12.23	13.07	12.86
	% Wo	41.60	42.48	43.07

Drill hole: WM00-04
Thin section: SW04-10 Depth:72.9m

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.91	0.86	0.84	0.92	0.91	1.28	0.85
	Al	0.05	0.04	0.06	0.03	0.04	0.00	0.03
	Ti	0.03	0.03	0.03	0.02	0.03	0.00	0.00
	Fe	0.24	0.26	0.26	0.22	0.20	0.56	0.26
	Si	1.91	1.91	1.90	1.92	1.93	1.92	1.95
	Ca	0.77	0.82	0.81	0.80	0.82	0.05	0.80
	Na	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Wt %	MgO	16.33	16.10	14.97	16.67	16.25	24.01	15.24
	Al2O3	2.14	1.98	2.74	1.57	1.83	0.00	1.57
	TiO2	1.07	1.00	1.18	0.77	0.90	0.00	0.00
	FeO	7.71	8.52	8.45	7.04	6.25	18.89	8.29
	SiO2	50.85	52.99	50.72	51.69	51.43	53.70	52.24
	CaO	19.23	21.27	20.16	20.09	20.41	1.20	19.99
	Na2O	0.00	0.00	0.00	0.73	0.00	0.00	0.00
	Cr2O3	0.58	0.00	0.00	0.00	0.61	0.00	0.00
	Total	97.90	101.86	98.24	98.54	97.69	97.80	97.33
	Cr ppm	5846	0	0	0	6139	0	0
	% En	47.38	44.52	43.78	47.54	47.20	67.69	44.49
	% Fs	12.54	13.21	13.86	11.26	10.19	29.87	13.57
	% Wo	40.08	42.27	42.36	41.20	42.61	2.44	41.95

		Pyroxene 8
Atomic	Mg	0.84
	Al	0.06
	Ti	0.03
	Fe	0.25
	Si	1.91
	Ca	0.80
	Na	0.01
Wt %	MgO	15.14
	Al2O3	2.53
	TiO2	1.18
	FeO	7.96
	SiO2	51.39
	CaO	20.12
	Na2O	0.30
	Cr2O3	0.00
	Total	98.62
	Cr ppm	0
	% En	44.44
	% Fs	13.11
	% Wo	42.45

Surface
Thin section: Sur-01

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	0.83	0.91	0.90	1.38	1.37	0.95
	Al	0.03	0.04	0.03	0.05	0.01	0.01	0.03
	Ti	0.02	0.03	0.02	0.03	0.00	0.01	0.02
	Fe	0.27	0.26	0.25	0.27	0.52	0.53	0.25
	Si	1.92	1.90	1.91	1.90	1.88	1.87	1.91
	Ca	0.76	0.86	0.78	0.77	0.07	0.06	0.75
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.75	14.89	16.15	16.38	26.38	26.32	17.36
	Al2O3	1.55	1.83	1.55	2.17	0.47	0.34	1.61
	TiO2	0.78	0.98	0.75	0.93	0.00	0.43	0.80
	FeO	8.66	8.39	8.05	8.74	17.83	18.22	8.23
	SiO2	52.18	51.11	50.83	51.58	53.48	53.76	52.13
	CaO	19.23	21.67	19.45	19.60	1.79	1.62	19.20
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.34	0.00	0.39	0.00	0.00	0.00	0.00
	Total	99.48	98.88	97.18	99.41	99.96	100.69	99.33
	Cr ppm	3362	0	3946	0	0	0	0
	% En	47.28	42.34	46.62	46.32	70.03	69.80	48.53
	% Fs	13.71	13.38	13.04	13.85	26.55	27.10	12.91
	% Wo	39.01	44.29	40.34	39.83	3.42	3.09	38.56

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12	Pyroxene 13	Pyroxene 14
Atomic	Mg	0.91	1.39	0.87	0.90	0.90	0.89	0.94
	Al	0.04	0.00	0.05	0.05	0.05	0.04	0.04
	Ti	0.03	0.01	0.03	0.03	0.02	0.02	0.03
	Fe	0.27	0.54	0.26	0.27	0.26	0.29	0.25
	Si	1.89	1.87	1.91	1.89	1.90	1.91	1.89
	Ca	0.78	0.05	0.80	0.79	0.80	0.77	0.77
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.75	27.05	15.65	16.63	16.38	16.23	17.54
	Al2O3	2.02	0.00	2.10	2.21	2.12	1.68	1.74
	TiO2	1.22	0.23	1.03	0.93	0.78	0.80	1.15
	FeO	8.98	18.73	8.29	8.84	8.40	9.29	8.36
	SiO2	52.07	54.49	51.39	51.86	51.34	51.92	52.46
	CaO	19.98	1.26	20.13	20.15	20.06	19.49	20.01
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.23	0.00	0.00	0.00	0.00	0.25	0.32
	Total	101.25	101.76	98.59	100.62	99.09	99.67	101.58
	Cr ppm	2339	0	0	0	0	2485	3216
	% En	46.34	70.32	45.02	46.11	46.13	45.79	47.91
	% Fs	13.94	27.32	13.37	13.74	13.27	14.70	12.81
	% Wo	39.73	2.35	41.62	40.15	40.60	39.51	39.27

Surface
Thin section: Sur-03

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.87	0.87	0.87	0.90	0.88	0.88	0.91
	Al	0.04	0.05	0.06	0.04	0.04	0.05	0.04
	Ti	0.03	0.03	0.02	0.02	0.03	0.03	0.03
	Fe	0.28	0.28	0.26	0.25	0.29	0.29	0.24
	Si	1.91	1.90	1.91	1.93	1.91	1.91	1.92
	Ca	0.76	0.77	0.77	0.76	0.74	0.74	0.76
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	15.90	15.27	15.94	16.48	15.72	15.65	16.20
	Al2O3	1.74	2.31	2.59	1.78	1.87	2.12	1.76
	TiO2	0.92	1.17	0.87	0.78	1.17	1.15	0.92
	FeO	9.21	8.67	8.66	8.04	9.26	9.24	7.80
	SiO2	51.98	49.93	52.50	52.82	51.09	50.77	51.30
	CaO	19.23	18.83	19.78	19.46	18.46	18.34	18.97
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.37	0.34	0.45	0.00	0.25	0.35	0.28
	Total	99.35	96.52	100.79	99.37	97.81	97.62	97.22
	Cr ppm	3654	3362	4531	0	2485	3508	2777
	% En	45.58	45.36	45.52	47.12	45.99	46.01	47.36
	% Fs	14.81	14.45	13.87	12.89	15.20	15.23	12.78
	% Wo	39.61	40.20	40.61	39.99	38.81	38.75	39.86

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12	Pyroxene 13
Atomic	Mg	0.86	0.85	0.91	0.88	0.86	0.85
	Al	0.04	0.04	0.04	0.05	0.04	0.04
	Ti	0.03	0.03	0.02	0.02	0.02	0.03
	Fe	0.27	0.29	0.22	0.26	0.27	0.27
	Si	1.91	1.92	1.93	1.91	1.93	1.92
	Ca	0.77	0.77	0.77	0.78	0.76	0.77
	Na	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	15.97	15.44	17.20	16.04	15.99	15.24
	Al2O3	1.98	1.80	1.98	2.17	1.76	1.91
	TiO2	1.05	1.02	0.82	0.90	0.85	0.98
	FeO	8.99	9.28	7.54	8.61	9.02	8.74
	SiO2	52.73	51.75	54.10	52.18	53.20	51.26
	CaO	19.85	19.38	20.13	19.73	19.63	19.04
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.37	0.25	0.72	0.41	0.47	0.37
	Total	100.95	98.90	102.49	100.03	100.92	97.53
	Cr ppm	3654	2485	7162	4092	4677	3654
	% En	45.26	44.66	47.91	45.76	45.47	45.05
	% Fs	14.30	15.05	11.78	13.78	14.39	14.49
	% Wo	40.44	40.29	40.31	40.46	40.14	40.46

Surface
Thin section: Sur-04

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.98	0.91	1.41	0.94	0.96	0.92	0.94
	Al	0.03	0.04	0.00	0.03	0.03	0.03	0.03
	Ti	0.02	0.02	0.01	0.02	0.02	0.03	0.02
	Fe	0.24	0.26	0.49	0.25	0.26	0.27	0.24
	Si	1.91	1.90	1.89	1.93	1.90	1.91	1.92
	Ca	0.77	0.78	0.05	0.77	0.77	0.75	0.76
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.63	16.68	27.25	17.23	17.64	16.73	17.50
	Al2O3	1.40	1.74	0.00	1.32	1.49	1.53	1.30
	TiO2	0.58	0.82	0.35	0.57	0.70	1.00	0.68
	FeO	7.64	8.63	17.03	8.04	8.36	8.85	8.07
	SiO2	51.28	52.18	54.40	52.76	51.77	52.05	53.12
	CaO	19.32	19.91	1.43	19.66	19.64	19.06	19.74
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.58	0.00	0.00	0.35	0.00	0.66
	Total	97.85	100.54	100.46	99.57	99.97	99.22	101.07
	Cr ppm	0	5846	0	0	3508	0	6577
	% En	49.24	46.55	72.03	48.03	48.40	47.27	48.32
	% Fs	11.97	13.51	25.26	12.58	12.87	14.03	12.50
	% Wo	38.79	39.93	2.71	39.39	38.73	38.70	39.19

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12
Atomic	Mg	0.95	0.94	0.95	0.91	0.93
	Al	0.03	0.03	0.03	0.04	0.03
	Ti	0.02	0.02	0.02	0.03	0.02
	Fe	0.23	0.24	0.24	0.26	0.24
	Si	1.91	1.91	1.91	1.90	1.93
	Ca	0.79	0.78	0.79	0.78	0.78
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.50	17.05	17.35	16.33	16.96
	Al2O3	1.51	1.27	1.59	1.95	1.38
	TiO2	0.72	0.88	0.62	1.15	0.62
	FeO	7.50	7.86	7.87	8.38	7.62
	SiO2	52.18	51.56	52.07	51.11	52.13
	CaO	20.23	19.70	20.05	19.48	19.62
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.29	0.35	0.35	0.00	0.41
	Total	99.93	98.67	99.90	98.39	98.74
	Cr ppm	2923	3508	3508	0	4092
	% En	48.27	47.86	47.95	46.63	48.01
	% Fs	11.61	12.38	12.21	13.41	12.09
	% Wo	40.12	39.76	39.84	39.96	39.90

Surface
Thin section: Sur-08

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5
Atomic	Mg	0.89	0.91	0.88	0.90	0.91
	Al	0.03	0.03	0.04	0.03	0.03
	Ti	0.01	0.02	0.02	0.02	0.02
	Fe	0.19	0.19	0.21	0.20	0.19
	Si	1.96	1.97	1.95	1.96	1.96
	Ca	0.81	0.79	0.78	0.79	0.79
	Na	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.63	16.90	16.47	17.26	16.68
	Al2O3	1.47	1.32	1.80	1.27	1.47
	TiO2	0.43	0.63	0.90	0.88	0.68
	FeO	6.43	6.33	7.11	6.81	6.39
	SiO2	54.70	54.68	54.15	55.75	53.72
	CaO	21.09	20.48	20.23	20.99	20.34
	Na2O	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.72	0.70	0.79	0.56	0.76
	Total	101.48	101.05	101.44	103.51	100.06
	Cr ppm	7162	7016	7893	5554	7600
	% En	46.99	48.04	47.05	47.73	47.81
	% Fs	10.19	10.10	11.40	10.56	10.28
	% Wo	42.82	41.86	41.55	41.71	41.91

Surface
Thin section: Sur-09

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.81	0.93	0.85	0.82	0.82	0.85	0.83
	Al	0.02	0.04	0.04	0.04	0.03	0.02	0.01
	Ti	0.02	0.03	0.03	0.03	0.02	0.02	0.03
	Fe	0.30	0.21	0.27	0.31	0.29	0.34	0.31
	Si	1.95	1.93	1.92	1.91	1.94	1.91	1.92
	Ca	0.78	0.76	0.77	0.76	0.79	0.73	0.78
	Na	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	14.53	16.80	15.29	14.84	14.83	15.37	14.86
	Al2O3	0.68	1.83	2.04	1.95	1.17	1.06	0.25
	TiO2	0.53	1.00	1.13	1.15	0.65	0.72	1.23
	FeO	9.61	6.79	8.53	10.06	9.35	11.17	9.97
	SiO2	51.90	51.90	51.51	51.41	52.56	51.79	51.24
	CaO	19.28	19.09	19.14	19.14	19.83	18.57	19.38
	Na2O	0.38	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.47	0.22	0.00	0.00	0.00	0.29
	Total	96.91	97.88	97.87	98.55	98.39	98.67	97.22
	Cr ppm	0	4677	2192	0	0	0	2923
	% En	43.01	48.94	45.19	43.34	43.19	43.94	43.22
	% Fs	15.96	11.10	14.14	16.48	15.29	17.91	16.27
	% Wo	41.03	39.96	40.66	40.18	41.52	38.15	40.51

Surface
Thin section: Sur-09

		Pyroxene 8	Pyroxene 9
Atomic	Mg	0.85	0.84
	Al	0.04	0.03
	Ti	0.03	0.03
	Fe	0.31	0.32
	Si	1.91	1.91
	Ca	0.75	0.75
	Na	0.00	0.00
Wt %	MgO	15.39	15.14
	Al2O3	1.85	1.53
	TiO2	1.07	0.98
	FeO	10.11	10.39
	SiO2	51.64	51.19
	CaO	18.89	18.79
	Na2O	0.00	0.00
	Cr2O3	0.00	0.00
	Total	98.95	98.03
	Cr ppm	0	0
	% En	44.43	43.91
	% Fs	16.38	16.91
	% Wo	39.19	39.17

Surface
Thin section: Sur-11

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.92	1.33	0.93	0.85	0.90	0.88	0.84
	Al	0.04	0.01	0.03	0.01	0.04	0.05	0.02
	Ti	0.02	0.01	0.01	0.00	0.02	0.02	0.02
	Fe	0.22	0.54	0.23	0.26	0.22	0.25	0.28
	Si	1.92	1.88	1.94	1.97	1.95	1.92	1.94
	Ca	0.79	0.05	0.76	0.79	0.79	0.78	0.79
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.78	24.81	16.90	15.54	16.62	16.15	15.44
	Al2O3	1.97	0.60	1.61	0.43	1.66	2.15	0.96
	TiO2	0.82	0.28	0.48	0.00	0.62	0.90	0.60
	FeO	7.31	17.92	7.41	8.65	7.26	8.32	9.11
	SiO2	52.20	52.16	52.78	53.89	53.68	52.67	53.16
	CaO	20.04	1.36	19.28	20.13	20.29	19.97	20.22
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.32	0.42	0.00	0.53	0.37	0.26
	Total	99.11	97.45	98.88	98.64	100.64	100.53	99.75
	Cr ppm	0	3216	4239	0	5262	3654	2631
	% En	47.57	69.23	48.40	44.57	47.11	45.92	44.01
	% Fs	11.62	28.05	11.91	13.91	11.54	13.28	14.57
	% Wo	40.82	2.72	39.69	41.51	41.35	40.80	41.42

Surface
Thin section: Sur-11

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11
Atomic	Mg	0.88	0.88	0.84	0.87
	Al	0.03	0.05	0.04	0.04
	Ti	0.02	0.02	0.03	0.03
	Fe	0.30	0.27	0.28	0.27
	Si	1.92	1.93	1.92	1.92
	Ca	0.73	0.76	0.78	0.76
	Na	0.02	0.00	0.00	0.00
Wt %	MgO	16.10	15.64	15.46	15.72
	Al2O3	1.51	2.23	1.97	1.97
	TiO2	0.85	0.60	1.08	1.02
	FeO	9.69	8.48	9.16	8.53
	SiO2	52.01	51.21	52.63	51.64
	CaO	18.41	18.86	19.95	19.17
	Na2O	0.44	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.28
	Total	99.02	97.02	100.24	98.32
	Cr ppm	0	0	0	2777
	% En	46.31	46.06	44.24	45.86
	% Fs	15.63	14.01	14.71	13.96
	% Wo	38.06	39.93	41.05	40.19

Surface
Thin section: Sur-12

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.88	0.83	0.91	0.92	0.91	0.87	0.95
	Al	0.01	0.00	0.04	0.05	0.04	0.05	0.04
	Ti	0.00	0.01	0.03	0.03	0.03	0.03	0.02
	Fe	0.25	0.24	0.27	0.26	0.28	0.28	0.24
	Si	1.95	1.97	1.89	1.90	1.89	1.90	1.92
	Ca	0.83	0.86	0.75	0.77	0.76	0.79	0.74
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	16.04	15.49	16.72	16.95	17.01	16.10	17.20
	Al2O3	0.57	0.00	2.08	2.32	1.98	2.19	1.76
	TiO2	0.00	0.22	1.22	1.00	1.15	0.98	0.77
	FeO	8.07	8.07	8.95	8.47	9.37	9.29	7.91
	SiO2	52.80	55.02	51.73	52.01	52.35	52.16	51.77
	CaO	20.93	22.47	19.21	19.62	19.80	20.16	18.71
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.54
	Total	98.40	101.27	99.91	100.36	101.66	100.89	98.65
	Cr ppm	0	0	0	0	0	0	5408
	% En	45.04	42.83	47.03	47.35	46.62	44.97	49.02
	% Fs	12.71	12.51	14.13	13.27	14.40	14.55	12.65
	% Wo	42.25	44.66	38.84	39.39	38.99	40.47	38.33

Surface
Thin section: Sur-12

		Pyroxene 8	Pyroxene 9	Pyroxene 10	Pyroxene 11	Pyroxene 12	Pyroxene 13	Pyroxene 14
Atomic	Mg	0.88	0.83	0.88	0.91	0.84	0.83	0.86
	Al	0.05	0.00	0.00	0.03	0.04	0.05	0.18
	Ti	0.03	0.00	0.00	0.02	0.03	0.02	0.10
	Fe	0.27	0.25	0.21	0.21	0.25	0.29	0.38
	Si	1.90	1.97	1.97	1.95	1.94	1.91	1.79
	Ca	0.78	0.85	0.86	0.79	0.79	0.79	0.46
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Wt %	MgO	16.22	14.73	16.48	17.08	15.29	15.32	14.66
	Al2O3	2.40	0.00	0.00	1.34	2.00	2.34	7.73
	TiO2	1.23	0.00	0.00	0.73	0.95	0.80	3.39
	FeO	8.83	7.87	7.01	6.97	8.13	9.52	11.48
	SiO2	52.20	52.24	55.00	54.68	52.80	52.67	45.70
	CaO	20.05	21.13	22.46	20.81	20.16	20.22	10.91
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	2.53
	Cr2O3	0.23	0.00	0.00	0.61	0.00	0.00	0.00
	Total	101.16	95.97	100.95	102.23	99.33	100.87	96.39
	Cr ppm	2339	0	0	6139	0	0	0
	% En	45.58	42.90	45.09	47.52	44.52	43.54	50.65
	% Fs	13.91	12.87	10.76	10.88	13.28	15.17	22.24
	% Wo	40.50	44.24	44.15	41.60	42.20	41.29	27.10

		Pyroxene 15	Pyroxene 16	Pyroxene 17	Pyroxene 18	Pyroxene 19	Pyroxene 20
Atomic	Mg	0.83	1.25	0.83	0.83	1.24	0.88
	Al	0.17	0.01	0.03	0.04	0.01	0.03
	Ti	0.10	0.01	0.02	0.02	0.01	0.02
	Fe	0.39	0.55	0.28	0.27	0.55	0.24
	Si	1.80	1.91	1.94	1.94	1.92	1.95
	Ca	0.44	0.06	0.77	0.79	0.06	0.77
	Na	0.10	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	14.34	23.88	15.07	15.55	23.78	16.33
	Al2O3	7.54	0.55	1.59	1.80	0.57	1.42
	TiO2	3.52	0.52	0.82	0.88	0.27	0.80
	FeO	11.91	18.95	9.19	8.92	18.63	7.96
	SiO2	46.32	54.51	52.56	54.55	55.00	53.97
	CaO	10.56	1.64	19.34	20.61	1.62	19.90
	Na2O	2.59	0.00	0.00	0.00	0.00	0.00
	Cr2O3	0.00	0.00	0.00	0.35	0.00	0.00
	Total	96.78	100.04	98.56	102.66	99.87	100.39
	Cr ppm	0	0	0	3508	0	0
	% En	50.12	66.91	44.17	43.98	67.18	46.53
	% Fs	23.35	29.79	15.10	14.14	29.52	12.73
	% Wo	26.53	3.30	40.73	41.88	3.30	40.74

Surface
Thin section: Sur-13

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.87	0.87	0.93	0.87	0.97	0.90	1.01
	Al	0.02	0.04	0.03	0.03	0.03	0.04	0.08
	Ti	0.01	0.03	0.02	0.02	0.02	0.00	0.03
	Fe	0.23	0.26	0.25	0.27	0.24	0.27	0.32
	Si	1.92	1.92	1.91	1.91	1.91	1.92	1.91
	Ca	0.89	0.79	0.78	0.81	0.76	0.78	0.44
	Na	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Wt %	MgO	15.99	15.59	17.18	16.07	17.84	16.60	18.51
	Al2O3	1.08	1.74	1.61	1.59	1.57	2.08	3.89
	TiO2	0.45	0.93	0.62	0.83	0.68	0.00	1.27
	FeO	7.53	8.32	8.29	9.01	7.91	8.92	10.55
	SiO2	52.73	51.19	52.88	52.90	52.41	52.52	52.16
	CaO	22.71	19.55	20.01	20.89	19.45	19.91	11.08
	Na2O	0.00	0.00	0.00	0.00	0.00	0.00	1.85
	Cr2O3	0.00	0.00	0.37	0.00	0.53	0.00	0.00
	Total	100.48	97.32	100.95	101.29	100.40	100.02	99.30
	Cr ppm	0	0	3654	0	5262	0	0
	% En	43.76	45.44	47.45	44.47	49.21	46.22	57.14
	% Fs	11.56	13.61	12.84	13.98	12.24	13.93	18.27
	% Wo	44.68	40.95	39.72	41.55	38.55	39.85	24.59

		Pyroxene 8
Atomic	Mg	0.91
	Al	0.01
	Ti	0.00
	Fe	0.17
	Si	1.96
	Ca	0.90
	Na	0.00
Wt %	MgO	17.23
	Al2O3	0.30
	TiO2	0.00
	FeO	5.78
	SiO2	55.26
	CaO	23.73
	Na2O	0.00
	Cr2O3	0.25
	Total	102.55
	Cr ppm	2485
	% En	45.91
	% Fs	8.64
	% Wo	45.45

Microprobe Analyses

Microprobe

Drill hole: WM00-01 Thin section: SW01-19

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.86	0.89	0.91	0.93	0.95	0.93	0.95
	Al	0.12	0.10	0.08	0.08	0.04	0.05	0.05
	Ti	0.07	0.06	0.05	0.04	0.03	0.03	0.03
	Fe	0.20	0.20	0.19	0.19	0.17	0.17	0.15
	Si	1.85	1.88	1.90	1.88	1.93	1.92	1.91
	Ca	0.89	0.89	0.87	0.90	0.87	0.90	0.94
	Na	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Wt %	MgO	14.91	15.75	15.95	16.38	16.88	16.50	16.95
	Al2O3	5.09	4.25	3.43	3.36	2.02	2.13	2.16
	TiO2	2.58	2.00	1.66	1.50	1.03	1.00	1.02
	FeO	6.24	6.18	5.98	6.14	5.52	5.48	4.85
	SiO2	47.88	49.27	49.70	49.52	51.32	50.55	50.72
	CaO	21.55	21.70	21.32	22.16	21.67	22.21	23.27
	Na2O	0.40	0.36	0.32	0.37	0.26	0.38	0.31
	Cr2O3	0.50	0.38	0.83	0.66	0.72	0.89	0.74
	Total	99.14	99.89	99.19	100.10	99.44	99.14	100.02
	Cr ppm	4961	3850	8276	6568	7233	8939	7390
	% En	43.98	45.25	46.06	45.82	47.48	46.43	46.57
	% Fs	10.33	9.95	9.69	9.63	8.71	8.65	7.48
	% Wo	45.69	44.80	44.25	44.55	43.81	44.91	45.95

Microprobe

		Pyroxene 8	Pyroxene 9
Atomic	Mg	0.96	0.91
	Al	0.03	0.07
	Ti	0.02	0.04
	Fe	0.14	0.16
	Si	1.94	1.91
	Ca	0.90	0.91
	Na	0.01	0.01
Wt %	MgO	17.25	16.25
	Al2O3	1.56	2.98
	TiO2	0.72	1.50
	FeO	4.64	5.06
	SiO2	52.11	50.68
	CaO	22.68	22.63
	Na2O	0.34	0.33
	Cr2O3	0.91	0.76
	Total	100.22	100.19
	Cr ppm	9148	7619
	% En	47.70	45.97
	% Fs	7.21	8.02
	% Wo	45.09	46.00

Microprobe

Drill hole: WM00-01 Thin section: SW01-22

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.89	0.89	0.84	0.87	0.86	0.90	0.90
	Al	0.04	0.04	0.04	0.04	0.04	0.03	0.09
	Ti	0.02	0.03	0.03	0.03	0.03	0.02	0.05
	Fe	0.19	0.19	0.18	0.17	0.14	0.18	0.19
	Si	1.96	1.95	1.95	1.96	1.97	1.98	1.88
	Ca	0.89	0.90	0.94	0.89	0.94	0.86	0.88
	Na	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Wt %	MgO	16.02	16.04	15.09	15.55	15.41	16.15	15.85
	Al2O3	1.79	1.84	1.85	2.01	2.02	1.27	4.07
	TiO2	0.80	1.04	1.24	1.13	0.95	0.73	1.88
	FeO	6.11	6.00	5.61	5.52	4.43	5.92	6.06
	SiO2	52.35	52.37	52.16	52.09	52.73	53.14	49.70
	CaO	22.21	22.49	23.48	22.16	23.58	21.44	21.58
	Na2O	0.47	0.48	0.57	0.50	0.52	0.40	0.41
	Cr2O3	0.03	0.10	0.05	0.00	0.01	0.00	0.62
	Total	99.77	100.34	100.06	98.97	99.64	99.05	100.17
	Cr ppm	297	963	536	0	60	0	6232
	% En	45.24	45.10	42.98	44.98	44.23	46.31	45.61
	% Fs	9.68	9.46	8.96	8.95	7.13	9.52	9.78
	% Wo	45.07	45.45	48.06	46.06	48.65	44.17	44.61

Microprobe

		Pyroxene 8	Pyroxene 9
Atomic	Mg	0.97	0.95
	Al	0.04	0.06
	Ti	0.03	0.04
	Fe	0.16	0.18
	Si	1.94	1.90
	Ca	0.86	0.87
	Na	0.01	0.01
Wt %	MgO	17.53	16.93
	Al2O3	1.82	2.67
	TiO2	1.04	1.32
	FeO	5.12	5.76
	SiO2	52.13	50.49
	CaO	21.69	21.60
	Na2O	0.29	0.32
	Cr2O3	0.55	0.81
	Total	100.17	99.92
	Cr ppm	5458	8091
	% En	48.71	47.44
	% Fs	7.98	9.06
	% Wo	43.31	43.50

Microprobe

Drill hole: WM00-01 Thin section: SW01-25

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.93	0.96	0.96	0.98	0.97	0.96	0.91
	Al	0.03	0.03	0.03	0.03	0.03	0.03	0.04
	Ti	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Fe	0.15	0.15	0.15	0.15	0.14	0.14	0.16
	Si	1.94	1.95	1.93	1.93	1.93	1.95	1.97
	Ca	0.93	0.87	0.91	0.90	0.91	0.90	0.88
	Na	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Wt %	MgO	16.75	17.15	17.25	17.58	17.53	17.30	16.17
	Al2O3	1.54	1.57	1.51	1.38	1.48	1.52	1.70
	TiO2	0.77	0.74	0.65	0.64	0.70	0.66	0.72
	FeO	4.68	4.66	4.76	4.82	4.63	4.61	4.98
	SiO2	52.01	51.66	51.69	51.79	51.79	52.50	52.16
	CaO	23.24	21.65	22.74	22.64	22.67	22.71	21.88
	Na2O	0.30	0.32	0.30	0.31	0.32	0.33	0.00
	Cr2O3	0.69	0.72	0.71	0.81	0.88	0.75	0.83
	Total	99.98	98.47	99.60	99.97	99.99	100.37	98.44
	Cr ppm	6935	7214	7095	8125	8761	7454	8255
	% En	46.42	48.55	47.57	48.09	48.13	47.78	46.61
	% Fs	7.28	7.40	7.36	7.40	7.13	7.14	8.05
	% Wo	46.30	44.05	45.07	44.51	44.73	45.09	45.34

Microprobe

Drill hole: WM00-01 Thin section: SW01-29

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.97	0.98	0.95	0.97	1.68	1.65	1.70
	Al	0.04	0.04	0.05	0.03	0.02	0.04	0.01
	Ti	0.02	0.02	0.03	0.02	0.00	0.00	0.00
	Fe	0.14	0.15	0.13	0.13	0.34	0.37	0.28
	Si	1.94	1.94	1.94	1.97	1.96	1.96	1.99
	Ca	0.88	0.87	0.89	0.87	0.02	0.02	0.02
	Na	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Wt %	MgO	17.25	17.71	16.83	17.41	31.46	30.55	32.60
	Al2O3	1.75	1.70	2.33	1.41	1.06	1.69	0.65
	TiO2	0.83	0.77	1.12	0.65	0.03	0.03	0.02
	FeO	4.55	4.76	3.98	4.04	11.46	12.07	9.43
	SiO2	51.77	52.24	51.51	52.69	54.62	54.08	56.91
	CaO	21.79	21.81	21.97	21.73	0.40	0.41	0.55
	Na2O	0.28	0.30	0.00	0.00	0.00	0.01	0.04
	Cr2O3	0.80	0.74	0.58	0.75	0.13	0.10	0.22
	Total	99.02	100.04	98.31	98.68	99.15	98.94	100.43
	Cr ppm	7955	7421	5775	7456	1329	1007	2176
	% En	48.64	49.12	48.30	49.33	82.41	81.21	85.14
	% Fs	7.20	7.41	6.40	6.42	16.85	18.00	13.82
	% Wo	44.16	43.48	45.30	44.25	0.75	0.79	1.04

Microprobe

Drill hole: WM00-01 Thin section: SW01-22

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.89	0.89	0.84	0.87	0.86	0.90	0.90
	Al	0.04	0.04	0.04	0.04	0.04	0.03	0.09
	Ti	0.02	0.03	0.03	0.03	0.03	0.02	0.05
	Fe	0.19	0.19	0.18	0.17	0.14	0.18	0.19
	Si	1.96	1.95	1.95	1.96	1.97	1.98	1.88
	Ca	0.89	0.90	0.94	0.89	0.94	0.86	0.88
	Na	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Wt %	MgO	16.02	16.04	15.09	15.55	15.41	16.15	15.85
	Al2O3	1.79	1.84	1.85	2.01	2.02	1.27	4.07
	TiO2	0.80	1.04	1.24	1.13	0.95	0.73	1.88
	FeO	6.11	6.00	5.61	5.52	4.43	5.92	6.06
	SiO2	52.35	52.37	52.16	52.09	52.73	53.14	49.70
	CaO	22.21	22.49	23.48	22.16	23.58	21.44	21.58
	Na2O	0.47	0.48	0.57	0.50	0.52	0.40	0.41
	Cr2O3	0.03	0.10	0.05	0.00	0.01	0.00	0.62
	Total	99.77	100.34	100.06	98.97	99.64	99.05	100.17
	Cr ppm	297	963	536	0	60	0	6232
	% En	45.24	45.10	42.98	44.98	44.23	46.31	45.61
	% Fs	9.68	9.46	8.96	8.95	7.13	9.52	9.78
	% Wo	45.07	45.45	48.06	46.06	48.65	44.17	44.61

Microprobe Thin section: SW01-32

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.98	0.97	0.97	1.00	0.98	0.96	0.97
	Al	0.03	0.03	0.03	0.03	0.03	0.03	0.04
	Ti	0.02	0.02	0.02	0.02	0.02	0.02	0.03
	Fe	0.13	0.14	0.13	0.13	0.14	0.14	0.14
	Si	1.94	1.93	1.94	1.95	1.95	1.93	1.92
	Ca	0.91	0.91	0.91	0.89	0.89	0.92	0.92
	Na	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Wt %	MgO	17.78	17.50	17.48	17.94	17.66	17.30	17.50
	Al2O3	1.33	1.46	1.45	1.22	1.41	1.48	1.84
	TiO2	0.61	0.68	0.64	0.59	0.66	0.77	0.93
	FeO	4.04	4.41	4.23	4.10	4.43	4.39	4.37
	SiO2	52.48	51.79	52.18	52.11	52.43	51.71	51.64
	CaO	22.82	22.86	22.76	22.16	22.28	22.95	23.06
	Na2O	0.27	0.26	0.26	0.30	0.31	0.28	0.34
	Cr2O3	0.79	0.78	0.89	0.72	0.91	0.80	0.68
	Total	100.12	99.74	99.91	99.16	100.08	99.67	100.36
	Cr ppm	7928	7765	8930	7207	9063	7979	6811
	% En	48.78	48.06	48.26	49.60	48.85	47.71	47.90
	% Fs	6.22	6.80	6.56	6.36	6.87	6.79	6.72
	% Wo	45.00	45.14	45.18	44.03	44.28	45.50	45.38

Microprobe

Drill hole: WM00-01 Thin section: SW01-35

		Pyroxene 1	Pyroxene 2	Pyroxene 3	Pyroxene 4	Pyroxene 5	Pyroxene 6	Pyroxene 7
Atomic	Mg	0.91	0.91	0.95	0.95	0.96	1.60	1.63
	Al	0.05	0.05	0.05	0.05	0.05	0.02	0.00
	Ti	0.04	0.04	0.03	0.03	0.03	0.01	0.01
	Fe	0.17	0.17	0.16	0.16	0.16	0.32	0.30
	Si	1.90	1.90	1.90	1.90	1.91	1.99	2.01
	Ca	0.93	0.93	0.93	0.93	0.92	0.05	0.03
	Na	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Wt %	MgO	16.20	16.23	16.98	16.96	17.05	29.70	30.76
	Al2O3	2.24	2.38	2.32	2.32	2.11	0.85	0.00
	TiO2	1.56	1.53	1.08	1.04	0.94	0.45	0.24
	FeO	5.31	5.43	5.16	4.99	4.95	10.67	10.18
	SiO2	50.49	50.81	50.72	50.44	50.92	55.26	56.31
	CaO	23.09	23.25	23.09	22.90	22.72	1.19	0.86
	Na2O	0.35	0.29	0.32	0.30	0.31	0.00	0.05
	Cr2O3	0.52	0.55	0.64	0.64	0.63	0.18	0.12
	Total	99.76	100.48	100.31	99.61	99.63	98.30	98.52
	Cr ppm	5209	5545	6367	6430	6286	1798	1235
	% En	45.29	45.10	46.56	46.83	47.15	81.28	82.94
	% Fs	8.33	8.46	7.94	7.73	7.68	16.37	15.39
	% Wo	46.38	46.43	45.50	45.44	45.17	2.34	1.67

Appendix D

Oxide mineral chemistry from drill holes WM00-01 and WM98-05

Drill Hole: WM00-01

Sample : **SW01-01** Depth: 5.62m

		Oxide 1	Oxide 2	Oxide 3	Oxide 4
Atomic	**Mg**	0.04	0.15	0.09	0.18
	Al	0.00	0.08	0.03	0.01
	Ti	1.00	0.09	0.02	0.92
	Fe	0.80	2.58	3.05	0.80
	Cr	0.01	0.22	0.02	0.00
	V	0.00	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	1.86	3.13	3.21	1.93
Oxide %	**MgO**	0.96	1.72	1.03	4.43
	Al2O3	0.00	2.29	0.93	0.45
	TiO2	45.68	1.97	0.43	44.38
	Fe2O3	24.51	56.80	65.67	25.81
	FeO	22.05	26.87	31.07	23.22
	Cr2O3	0.83	9.35	0.64	0.42
	V2O5	0.52	0.32	0.00	0.75
	MnO	0.00	0.00	0.00	0.00
	Total	94.55	99.33	99.77	99.46
	Class	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-02** Depth: 6.46m

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6
Atomic	**Mg**	0.09	0.06	0.12	0.13	0.24	0.15
	Al	0.00	0.00	0.00	0.09	0.16	0.14
	Ti	1.01	1.06	0.95	0.15	0.26	0.15
	Fe	0.76	0.69	0.80	2.28	2.03	2.28
	Cr	0.00	0.00	0.01	0.39	0.32	0.34
	V	0.00	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.02	0.00	0.00	0.00	0.00
	Total	1.86	1.83	1.90	3.04	3.00	3.06
Oxide %	**MgO**	2.16	1.48	2.94	1.51	3.00	1.79
	Al2O3	0.00	0.00	0.00	2.83	4.95	4.35
	TiO2	50.37	50.35	46.63	3.50	6.42	3.47
	Fe2O3	25.38	21.73	26.22	52.36	49.37	52.26
	FeO	22.84	19.55	23.59	24.77	23.36	24.72
	Cr2O3	0.28	0.00	1.14	17.38	15.11	15.14
	V2O5	0.00	0.00	0.75	0.45	0.45	0.00
	MnO	0.00	1.01	0.00	0.00	0.00	0.00
	Total	101.03	94.12	101.27	102.81	102.67	101.73
	Class	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-05**		Depth: 52.10	
		Oxide 1	Oxide 2
Atomic	**Mg**	0.03	0.00
	Al	0.00	0.00
	Ti	1.01	1.01
	Fe	0.80	0.84
	Cr	0.00	0.00
	V	0.01	0.00
	Mn	0.00	0.00
	Total	1.85	1.85
Oxide %	**MgO**	0.75	0.00
	Al2O3	0.00	0.00
	TiO2	50.37	49.43
	Fe2O3	26.56	27.16
	FeO	23.90	24.44
	Cr2O3	0.00	0.00
	V2O5	0.82	0.00
	MnO	0.00	0.00
	Total	102.39	101.04
	Class	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-06**		Depth: 93.50							
		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.06	0.00	0.00	0.03	0.00	0.00	0.03	0.00
	Al	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	Ti	1.04	1.03	0.52	1.03	1.06	0.66	1.04	0.67
	Fe	0.73	0.79	2.34	0.77	0.75	2.02	0.76	2.01
	Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	V	0.01	0.00	0.02	0.00	0.00	0.02	0.00	0.02
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.83	1.83	2.88	1.84	1.81	2.78	1.83	2.78
Oxide %	**MgO**	1.44	0.00	0.00	0.75	0.00	0.00	0.68	0.00
	Al2O3	0.00	0.00	0.00	0.00	0.00	2.65	0.00	2.70
	TiO2	51.28	49.10	12.85	51.72	52.68	16.98	52.35	17.77
	Fe2O3	24.11	24.88	56.58	25.77	24.83	50.90	25.40	52.02
	FeO	21.70	22.39	26.77	23.19	22.34	24.08	22.85	24.61
	Cr2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	V2O5	0.66	0.54	1.29	0.00	0.00	1.46	0.00	1.09
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.20	96.91	97.47	101.42	99.85	96.07	101.28	98.19
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-09** Depth: 165.30

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.25	0.17	0.21	0.08	0.46	0.23	0.26	0.40
	Al	0.11	0.14	0.15	0.00	0.31	0.14	0.15	0.25
	Ti	0.31	0.25	0.23	1.00	0.19	0.21	0.32	0.26
	Fe	1.73	1.89	1.86	0.76	1.34	1.82	1.72	1.48
	Cr	0.52	0.50	0.53	0.01	0.68	0.56	0.48	0.56
	V	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.93	2.96	2.98	1.86	2.98	2.98	2.94	2.96
Oxide %	**MgO**	3.03	2.04	2.55	2.12	5.74	2.72	3.30	4.94
	Al2O3	3.55	4.12	4.55	0.00	9.73	4.08	4.95	7.92
	TiO2	7.47	6.02	5.52	50.48	4.60	4.92	8.09	6.51
	Fe2O3	41.09	44.05	43.00	25.46	32.09	41.27	42.16	35.61
	FeO	19.44	20.84	20.34	22.91	15.18	19.52	19.95	16.85
	Cr2O3	24.09	22.52	23.81	0.82	31.64	24.83	23.11	26.41
	V2O5	0.68	0.48	0.00	0.54	0.54	0.50	0.00	0.52
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.36	100.08	99.78	102.32	99.53	97.85	101.56	98.75
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.32	0.50	0.47	0.36	0.22	0.23	0.30	0.45
	Al	0.16	0.24	0.29	0.26	0.15	0.11	0.11	0.30
	Ti	0.35	0.19	0.13	0.27	0.24	0.31	0.30	0.17
	Fe	1.62	1.31	1.35	1.49	1.89	1.76	1.74	1.43
	Cr	0.46	0.75	0.75	0.57	0.46	0.52	0.51	0.64
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.93	2.99	3.00	2.95	2.98	2.94	2.96	3.00
Oxide %	**MgO**	4.18	6.12	5.65	4.56	2.55	2.82	3.66	5.64
	Al2O3	5.22	7.44	9.03	8.14	4.52	3.44	3.36	9.62
	TiO2	8.91	4.52	3.20	6.61	5.66	7.29	7.26	4.17
	Fe2O3	40.52	30.98	31.49	36.02	42.62	40.89	41.70	34.57
	FeO	19.17	14.66	14.90	17.04	20.16	19.34	19.73	16.35
	Cr2O3	22.60	34.55	34.42	26.81	20.24	23.53	24.04	30.14
	V2O5	0.70	0.46	0.39	0.39	0.43	0.41	0.39	0.45
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.29	98.73	99.09	99.56	96.18	97.72	100.16	100.93
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-11** Depth: 219.30

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.27	0.32	0.27	0.47	0.27	0.59	0.44	0.54
	Al	0.19	0.16	0.19	0.42	0.19	0.22	0.27	0.24
	Ti	0.11	0.31	0.14	0.05	0.16	0.16	0.16	0.20
	Fe	1.82	1.64	1.82	1.46	1.82	1.35	1.33	1.35
	Cr	0.63	0.50	0.60	0.64	0.58	0.72	0.78	0.67
	V	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.03	2.94	3.02	3.05	3.01	3.04	2.99	3.01
Oxide %	**MgO**	3.20	4.16	3.20	5.69	3.25	7.21	5.52	6.75
	Al2O3	5.91	5.29	5.86	12.94	5.74	6.76	8.50	7.69
	TiO2	2.55	7.92	3.34	1.28	3.80	3.95	3.92	5.04
	Fe2O3	42.15	40.96	41.97	33.99	42.45	32.19	32.11	32.45
	FeO	19.94	19.38	19.85	16.08	20.08	15.23	15.19	15.35
	Cr2O3	28.46	24.28	27.20	28.94	26.60	33.46	36.80	31.34
	V2O5	0.39	0.62	0.00	0.36	0.00	0.00	0.00	0.32
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.61	102.61	101.42	99.28	101.94	98.81	102.05	98.94
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.28	0.38	0.26	0.33	0.31	0.31	0.45	0.23
	Al	0.15	0.13	0.12	0.13	0.16	0.13	0.29	0.14
	Ti	0.21	0.30	0.25	0.19	0.22	0.25	0.14	0.21
	Fe	1.82	1.62	1.74	1.72	1.77	1.73	1.38	1.87
	Cr	0.52	0.53	0.58	0.62	0.54	0.54	0.74	0.52
	V	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.97	2.96	3.00	3.00	2.98	3.00	2.98
Oxide %	**MgO**	3.48	4.99	3.30	4.06	3.80	3.81	5.41	2.70
	Al2O3	4.78	4.21	3.89	4.06	4.91	4.06	8.77	4.25
	TiO2	5.29	7.69	6.29	4.69	5.47	6.04	3.22	5.05
	Fe2O3	43.64	40.79	42.07	40.22	42.10	40.78	31.72	42.94
	FeO	20.64	19.30	19.91	19.03	19.92	19.29	15.01	20.31
	Cr2O3	24.38	26.10	27.23	28.17	24.88	24.91	33.34	23.43
	V2O5	0.50	0.37	0.43	0.46	0.00	0.39	0.32	0.62
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.71	103.47	103.12	100.69	101.08	99.29	97.79	99.31
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-13** Depth: 237.80

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.24	0.24	0.21	0.27	0.22	0.27	0.35	0.28
	Al	0.14	0.16	0.22	0.15	0.20	0.14	0.14	0.16
	Ti	0.22	0.18	0.11	0.23	0.15	0.26	0.34	0.29
	Fe	1.80	1.80	1.86	1.76	1.89	1.78	1.63	1.73
	Cr	0.58	0.60	0.63	0.55	0.55	0.52	0.49	0.48
	V	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	2.99	3.02	2.98	3.01	2.97	2.95	2.95
Oxide %	**MgO**	2.84	2.80	2.32	3.25	2.49	3.30	4.48	3.33
	Al2O3	4.23	4.76	6.18	4.70	5.82	4.16	4.46	4.69
	TiO2	5.04	4.15	2.35	5.42	3.47	6.14	8.47	6.94
	Fe2O3	40.63	40.19	40.25	40.95	41.97	41.48	39.96	39.62
	FeO	19.22	19.01	19.04	19.37	19.85	19.63	18.90	18.74
	Cr2O3	25.40	26.02	26.76	25.20	23.68	23.82	23.60	21.68
	V2O5	0.00	0.55	0.00	0.52	0.00	0.36	0.00	0.50
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.36	97.49	96.90	99.41	97.28	98.88	99.88	95.49
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.28	0.31	0.67	0.43	0.45	0.55	0.26	0.11
	Al	0.18	0.19	0.22	0.26	0.24	0.21	0.14	0.00
	Ti	0.18	0.21	0.19	0.19	0.19	0.18	0.25	1.00
	Fe	1.81	1.70	1.17	1.42	1.45	1.29	1.78	0.74
	Cr	0.55	0.58	0.75	0.70	0.68	0.76	0.53	0.01
	V	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	2.99	3.02	2.99	3.00	3.00	2.97	1.86
Oxide %	**MgO**	3.23	3.66	8.31	5.11	5.51	6.78	3.20	2.79
	Al2O3	5.29	5.88	6.97	7.75	7.44	6.71	4.38	0.00
	TiO2	4.25	4.89	4.77	4.44	4.47	4.35	5.97	49.78
	Fe2O3	40.89	39.45	28.05	32.87	33.92	30.87	41.59	24.38
	FeO	19.34	18.67	13.27	15.55	16.05	14.61	19.68	21.94
	Cr2O3	24.38	26.26	35.22	31.73	30.96	35.59	24.20	0.77
	V2O5	0.00	0.00	0.57	0.00	0.00	0.52	0.36	0.68
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.39	98.81	97.16	97.44	98.34	99.43	99.38	100.35
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-13** Depth: 237.80

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22
Atomic	**Mg**	0.31	0.36	0.29	0.28	0.26	0.41
	Al	0.18	0.20	0.27	0.19	0.22	0.25
	Ti	0.25	0.24	0.20	0.17	0.07	0.15
	Fe	1.66	1.60	1.56	1.77	1.88	1.36
	Cr	0.56	0.57	0.64	0.60	0.59	0.83
	V	0.01	0.01	0.01	0.00	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.97	2.98	2.96	3.01	3.04	2.98
Oxide %	**MgO**	3.86	4.48	3.40	3.35	2.97	4.84
	Al2O3	5.59	6.24	7.97	5.52	6.24	7.44
	TiO2	6.09	5.81	4.59	3.87	1.67	3.49
	Fe2O3	39.77	38.50	35.34	40.31	41.30	31.24
	FeO	18.82	18.22	16.72	19.07	19.54	14.78
	Cr2O3	26.25	26.72	28.14	26.56	25.43	37.30
	V2O5	0.50	0.48	0.48	0.00	0.61	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.89	100.43	96.63	98.67	97.75	99.09
	Class	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-16** Depth: 292.20

		Oxide 1	Oxide 2	Oxide 3
Atomic	**Mg**	0.00	0.02	0.09
	Al	0.00	0.00	0.00
	Ti	1.49	1.03	1.01
	Fe	0.00	0.79	0.76
	Cr	0.00	0.00	0.00
	V	0.01	0.00	0.00
	Mn	0.00	0.00	0.00
	Total	1.50	1.84	1.86
Oxide %	**MgO**	0.00	0.51	2.19
	Al2O3	0.00	0.00	0.00
	TiO2	99.76	51.15	49.80
	Fe2O3	0.00	26.39	24.75
	FeO	0.00	23.74	22.27
	Cr2O3	0.00	0.00	0.35
	V2O5	1.05	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	100.82	101.79	99.36
	Class	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-17** Depth: 296.40

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.35	0.49	0.44	0.33	0.43	0.35	0.43	0.29
	Al	0.27	0.24	0.32	0.25	0.29	0.27	0.25	0.21
	Ti	0.20	0.19	0.28	0.23	0.35	0.28	0.16	0.23
	Fe	1.52	1.25	1.37	1.59	1.39	1.35	1.30	1.71
	Cr	0.62	0.81	0.54	0.56	0.47	0.68	0.82	0.52
	V	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.97	2.98	2.95	2.97	2.93	2.92	2.97	2.98
Oxide %	**MgO**	4.25	5.90	5.61	4.13	5.65	4.39	5.34	3.62
	Al2O3	8.35	7.24	10.34	7.97	9.62	8.54	7.67	6.65
	TiO2	4.94	4.67	6.96	5.59	9.21	6.84	4.00	5.64
	Fe2O3	36.03	29.16	33.54	38.44	35.32	32.62	31.05	40.52
	FeO	17.05	13.80	15.87	18.19	16.71	15.43	14.69	19.17
	Cr2O3	28.97	37.01	25.69	26.28	23.47	32.23	37.99	23.98
	V2O5	0.50	0.00	0.45	0.41	0.00	0.00	0.45	0.32
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.09	97.78	98.45	101.01	99.98	100.05	101.18	99.90
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-16** Depth: 292.20

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.45	0.44	0.39	0.31	0.61	0.62	0.60	0.63
	Al	0.28	0.25	0.27	0.26	0.30	0.23	0.25	0.23
	Ti	0.20	0.18	0.23	0.24	0.36	0.24	0.23	0.22
	Fe	1.29	1.30	1.40	1.34	1.20	1.15	1.17	1.13
	Cr	0.75	0.79	0.67	0.77	0.48	0.73	0.73	0.78
	V	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.97	2.97	2.96	2.92	2.96	2.99	2.98	2.99
Oxide %	**MgO**	5.42	5.37	4.89	3.78	8.42	8.06	7.66	8.11
	Al2O3	8.71	7.75	8.56	7.84	10.35	7.58	7.94	7.61
	TiO2	4.74	4.25	5.56	5.69	9.78	6.04	5.84	5.62
	Fe2O3	30.05	30.45	33.62	31.22	31.76	28.70	28.81	28.10
	FeO	14.21	14.41	15.90	14.77	15.03	13.58	13.63	13.30
	Cr2O3	34.42	35.96	31.60	35.24	25.05	35.78	34.98	38.05
	V2O5	0.00	0.34	0.00	0.00	0.00	0.55	0.50	0.34
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.55	98.53	100.13	98.54	100.40	100.28	99.36	101.13
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-18** Depth: 331.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.00	0.29	0.37	0.26	0.00	0.00	0.00	0.00
	Al	0.00	0.19	0.25	0.18	0.00	0.00	0.00	0.00
	Ti	1.00	0.16	0.18	0.24	1.01	1.00	1.02	1.50
	Fe	0.86	1.73	1.42	1.77	0.84	0.84	0.82	0.00
	Cr	0.00	0.64	0.75	0.53	0.00	0.00	0.00	0.00
	V	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.86	3.01	2.97	2.98	1.85	1.85	1.84	1.50
Oxide %	**MgO**	0.00	3.62	4.66	3.25	0.00	0.00	0.00	0.00
	Al2O3	0.00	5.78	7.94	5.74	0.00	0.00	0.00	0.00
	TiO2	48.45	3.85	4.47	5.79	48.30	48.93	50.07	95.83
	Fe2O3	27.63	41.14	34.04	42.46	26.68	27.16	26.99	0.00
	FeO	24.86	19.46	16.11	20.09	24.01	24.44	24.28	0.00
	Cr2O3	0.00	29.54	35.17	24.74	0.00	0.00	0.00	0.00
	V2O5	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.94	103.40	102.38	102.08	98.98	101.16	101.33	95.83
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11
Atomic	**Mg**	0.00	0.00	0.03
	Al	0.00	0.00	0.00
	Ti	1.00	1.01	0.95
	Fe	0.85	0.82	0.90
	Cr	0.00	0.00	0.00
	V	0.00	0.01	0.01
	Mn	0.00	0.00	0.00
	Total	1.86	1.84	1.89
Oxide %	**MgO**	0.00	0.00	0.81
	Al2O3	0.00	0.00	0.00
	TiO2	48.25	49.18	44.31
	Fe2O3	27.34	26.69	28.09
	FeO	24.60	24.01	25.27
	Cr2O3	0.00	0.00	0.00
	V2O5	0.00	0.68	0.68
	MnO	0.00	0.00	0.00
	Total	100.18	100.56	99.16
	Class	Unk	Unk	Unk

Drill Hole: WM00-01
Sample : **SW01-19** Depth: 332.39

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.50	0.40	0.38	0.36	0.31	0.40	0.46	0.37
	Al	0.23	0.28	0.32	0.26	0.27	0.30	0.25	0.30
	Ti	0.15	0.19	0.18	0.16	0.15	0.16	0.16	0.16
	Fe	1.36	1.41	1.53	1.40	1.82	1.47	1.36	1.51
	Cr	0.77	0.69	0.57	0.79	0.48	0.66	0.75	0.65
	V	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.98	2.99	2.97	3.03	2.99	2.99	2.99
Oxide %	**MgO**	6.02	4.93	4.71	4.20	3.75	4.88	5.46	4.38
	Al2O3	6.93	8.79	10.22	7.71	8.24	9.20	7.37	9.09
	TiO2	3.49	4.52	4.55	3.72	3.54	3.95	3.87	3.80
	Fe2O3	31.43	33.17	37.03	31.84	43.11	34.68	31.15	35.04
	FeO	14.87	15.69	17.52	15.06	20.40	16.41	14.74	16.58
	Cr2O3	34.73	31.95	27.19	35.08	22.20	30.49	33.65	29.57
	V2O5	0.00	0.00	0.34	0.00	0.45	0.41	0.43	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.47	99.05	101.57	97.61	101.68	100.01	96.66	98.46
	Class	IM	BM	BM	IM	BM	BM	IM	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.06	0.34	0.45	0.48	0.50	0.51	0.59	0.58
	Al	0.02	0.33	0.28	0.25	0.24	0.23	0.22	0.24
	Ti	0.02	0.14	0.20	0.18	0.16	0.16	0.23	0.23
	Fe	3.09	1.72	1.33	1.30	1.32	1.34	1.19	1.24
	Cr	0.01	0.49	0.71	0.78	0.78	0.76	0.76	0.70
	V	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.21	3.02	2.97	2.99	3.00	3.01	2.99	2.99
Oxide %	**MgO**	0.68	4.16	5.51	5.64	5.95	6.25	7.26	7.30
	Al2O3	0.60	10.03	8.64	7.52	7.18	7.01	6.99	7.73
	TiO2	0.50	3.34	4.77	4.22	3.70	3.75	5.67	5.74
	Fe2O3	64.63	40.44	31.28	29.54	30.52	31.64	28.40	30.22
	FeO	30.58	19.13	14.80	13.98	14.44	14.97	13.44	14.30
	Cr2O3	0.37	22.58	32.71	34.44	35.18	35.09	35.27	33.19
	V2O5	0.00	0.48	0.46	0.00	0.39	0.45	0.00	0.41
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.36	100.17	98.16	95.33	97.37	99.16	97.04	98.88
	Class	SBM	BM	IM	IM	IM	IM	IM	IM

Drill Hole: WM00-01

Sample : **SW01-20** Depth: 354.49

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.27	0.35	0.11	0.47	0.37	0.43	0.15	0.47
	Al	0.31	0.37	0.00	0.25	0.29	0.26	0.06	0.25
	Ti	0.18	0.20	0.98	0.21	0.19	0.17	0.02	0.17
	Fe	1.85	1.65	0.78	1.29	1.66	1.42	2.97	1.30
	Cr	0.39	0.41	0.01	0.73	0.49	0.71	0.02	0.80
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	1.88	2.97	3.00	2.99	3.22	2.99
Oxide %	**MgO**	3.30	4.44	2.59	5.89	4.61	5.19	1.67	5.70
	Al2O3	9.50	11.58	0.30	7.99	9.28	7.97	1.59	7.58
	TiO2	4.47	5.05	47.38	5.29	4.70	4.09	0.53	3.97
	Fe2O3	43.80	39.95	25.05	31.15	40.09	33.07	63.28	30.33
	FeO	20.72	18.90	22.54	14.74	18.97	15.65	29.94	14.35
	Cr2O3	18.26	19.44	0.53	34.19	23.08	32.17	0.66	36.35
	V2O5	0.45	0.54	0.55	0.37	0.41	0.37	0.00	0.34
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.50	99.90	98.94	99.62	101.14	98.52	97.68	98.62
	Class	BM	SBM	SBM	IM	BM	IM	SBM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.21	0.29	0.54	0.62	0.54	0.59	0.11	0.56
	Al	0.21	0.28	0.25	0.22	0.24	0.23	0.00	0.25
	Ti	0.17	0.20	0.16	0.16	0.17	0.17	1.00	0.16
	Fe	1.95	1.72	1.31	1.24	1.31	1.29	0.76	1.29
	Cr	0.47	0.51	0.74	0.77	0.74	0.75	0.00	0.75
	V	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.99	3.01	3.02	3.01	3.03	1.87	3.01
Oxide %	**MgO**	2.55	3.47	6.53	7.91	6.68	7.36	2.62	6.92
	Al2O3	6.42	8.43	7.69	7.18	7.54	7.10	0.00	7.82
	TiO2	3.94	4.70	3.87	4.15	4.14	4.29	48.45	4.04
	Fe2O3	45.18	39.89	30.62	30.42	31.14	30.87	24.75	31.02
	FeO	21.37	18.87	14.49	14.39	14.73	14.61	22.27	14.67
	Cr2O3	21.21	23.27	34.00	37.08	34.27	35.03	0.29	35.11
	V2O5	0.00	0.00	0.34	0.57	0.39	0.00	0.00	0.36
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.68	98.63	97.53	101.71	98.90	99.26	98.38	99.93
	Class	BM	BM	IM	IM	IM	IM	SBM	IM

		Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24	Oxide 25
Atomic	**Mg**	0.24	0.64	0.28	0.54	0.12	0.18	0.24	0.47
	Al	0.24	0.24	0.22	0.26	0.00	0.18	0.20	0.27
	Ti	0.14	0.21	0.20	0.15	0.99	0.08	0.15	0.14
	Fe	1.99	1.28	1.84	1.33	0.77	2.15	1.94	1.40
	Cr	0.42	0.65	0.46	0.74	0.00	0.46	0.48	0.73
	V	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.04	3.03	3.01	3.02	1.88	3.06	3.02	3.02
Oxide %	**MgO**	2.98	8.32	3.40	6.65	2.98	2.09	2.82	5.74
	Al2O3	7.43	8.01	6.88	8.01	0.00	5.14	6.07	8.37
	TiO2	3.42	5.34	4.74	3.72	48.35	1.85	3.52	3.37
	Fe2O3	47.14	32.20	43.29	31.81	24.86	47.35	43.83	32.69
	FeO	22.30	15.23	20.48	15.05	22.37	22.40	20.74	15.46
	Cr2O3	19.50	31.86	21.31	34.55	0.00	19.61	21.13	33.62
	V2O5	0.00	0.37	0.00	0.00	0.00	0.52	0.43	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.77	101.35	100.09	99.80	98.57	98.97	98.53	99.24
	Class	BM	BM	BM	IM	SBM	BM	BM	IM

		Oxide 26	Oxide 27	Oxide 28	Oxide 29	Oxide 30	Oxide 31	Oxide 32	Oxide 33
Atomic	**Mg**	0.31	0.41	0.16	0.27	0.12	0.69	0.25	0.49
	Al	0.30	0.31	0.13	0.22	0.21	0.24	0.21	0.24
	Ti	0.18	0.19	0.07	0.12	0.05	0.22	0.12	0.15
	Fe	1.67	1.45	2.25	1.64	1.84	1.18	1.65	1.34
	Cr	0.54	0.63	0.47	0.74	0.79	0.69	0.74	0.76
	V	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	3.08	2.99	3.00	3.02	2.98	3.00
Oxide %	**MgO**	3.81	5.02	1.82	3.10	1.33	9.12	2.92	6.05
	Al2O3	9.22	9.64	3.68	6.54	5.71	8.09	6.12	7.58
	TiO2	4.22	4.59	1.63	2.85	0.98	5.77	2.84	3.69
	Fe2O3	39.23	34.34	49.77	36.85	38.95	30.25	37.26	31.63
	FeO	18.56	16.24	23.55	17.43	18.43	14.31	17.63	14.96
	Cr2O3	24.77	29.28	20.13	32.37	32.52	34.36	32.80	35.28
	V2O5	0.00	0.00	0.00	0.00	0.32	0.39	0.57	0.48
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.82	99.11	100.59	99.15	98.23	102.30	100.13	99.67
	Class	BM	BM	BM	IM	IM	IM	IM	IM

Drill Hole: WM00-01

Sample : **SW01-21** Depth: 386.50

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.53	0.47	0.38	0.12	0.52	0.37	0.26	0.18
	Al	0.26	0.23	0.25	0.00	0.27	0.27	0.23	0.12
	Ti	0.18	0.27	0.23	1.06	0.17	0.27	0.19	0.22
	Fe	1.21	1.29	1.39	0.62	1.21	1.36	1.73	2.03
	Cr	0.79	0.67	0.69	0.01	0.81	0.64	0.56	0.44
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	2.95	2.95	1.82	2.99	2.92	2.98	3.00
Oxide %	**MgO**	6.57	6.05	4.76	3.48	6.14	4.39	2.98	2.19
	Al2O3	8.24	7.58	7.88	0.34	7.94	8.16	6.63	3.57
	TiO2	4.40	6.92	5.69	61.36	3.95	6.46	4.24	5.14
	Fe2O3	28.70	31.81	33.42	23.83	27.74	31.51	38.61	46.76
	FeO	13.58	15.05	15.81	21.44	13.13	14.91	18.27	22.12
	Cr2O3	36.44	32.04	32.59	0.58	36.26	28.97	24.39	19.63
	V2O5	0.57	0.43	0.57	0.82	0.41	0.57	0.75	0.57
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.49	99.88	100.73	111.85	95.57	94.97	95.87	99.98
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.52	0.54	0.26	0.46	0.49	0.32	0.28	0.17
	Al	0.25	0.27	0.19	0.26	0.24	0.19	0.25	0.20
	Ti	0.19	0.19	0.20	0.18	0.18	0.21	0.27	0.21
	Fe	1.26	1.19	1.77	1.28	1.35	1.75	1.43	1.98
	Cr	0.76	0.79	0.56	0.80	0.74	0.50	0.68	0.41
	V	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.98	2.98	2.98	3.00	3.00	2.91	2.99
Oxide %	**MgO**	6.37	6.68	3.03	5.44	5.87	3.91	3.45	2.07
	Al2O3	7.78	8.33	5.56	7.92	7.18	5.78	7.80	6.01
	TiO2	4.67	4.67	4.70	4.32	4.32	5.05	6.47	4.87
	Fe2O3	30.07	28.29	40.53	29.40	31.45	40.92	34.02	45.49
	FeO	14.23	13.38	19.17	13.91	14.88	19.36	16.09	21.52
	Cr2O3	35.34	36.60	24.92	35.75	33.68	22.95	31.41	18.49
	V2O5	0.39	0.48	0.48	0.00	0.00	0.68	0.48	0.57
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.86	98.44	98.40	96.74	97.38	98.65	99.73	99.03
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.52	0.54	0.30	0.09	0.18	0.29	0.52	0.22
	Al	0.29	0.26	0.26	0.81	0.15	0.27	0.26	0.17
	Ti	0.19	0.18	0.24	0.84	0.12	0.17	0.32	0.22
	Fe	1.23	1.20	1.60	0.01	1.97	1.52	1.26	1.86
	Cr	0.75	0.80	0.55	0.00	0.58	0.71	0.56	0.50
	V	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.99	2.95	1.75	3.02	2.96	2.94	2.98
Oxide %	**MgO**	6.24	6.68	3.65	2.98	2.11	3.35	6.55	2.64
	Al2O3	8.71	8.29	8.11	69.87	4.38	7.73	8.37	5.01
	TiO2	4.54	4.47	5.81	56.96	2.82	3.84	8.04	5.07
	Fe2O3	28.51	28.61	38.30	0.36	43.32	33.78	30.63	42.31
	FeO	13.49	13.53	18.12	0.33	20.49	15.98	14.49	20.02
	Cr2O3	34.07	37.15	25.45	0.00	24.79	31.00	26.26	21.94
	V2O5	0.00	0.37	0.59	0.00	0.46	0.37	0.66	0.55
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	95.55	99.12	100.01	130.51	98.37	96.06	95.01	97.53
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-22** Depth: 376.92

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.58	0.46	0.47	0.25	0.25	0.41	0.52	0.51
	Al	0.33	0.29	0.30	0.24	0.30	0.30	0.29	0.30
	Ti	0.18	0.19	0.19	0.16	0.07	0.19	0.16	0.19
	Fe	1.26	1.33	1.29	1.89	1.89	1.33	1.27	1.32
	Cr	0.65	0.69	0.72	0.47	0.53	0.71	0.76	0.67
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	2.98	2.97	3.02	3.05	2.96	3.01	3.00
Oxide %	**MgO**	7.41	5.75	5.87	3.03	2.94	5.07	6.62	6.70
	Al2O3	10.66	9.01	9.37	7.33	8.90	9.45	9.28	9.94
	TiO2	4.55	4.75	4.79	3.69	1.55	4.72	4.00	4.85
	Fe2O3	31.21	32.09	31.11	43.69	42.59	31.57	31.11	33.28
	FeO	14.77	15.18	14.72	20.67	20.15	14.94	14.72	15.74
	Cr2O3	31.35	32.68	33.78	21.02	23.15	33.09	36.20	33.11
	V2O5	0.48	0.59	0.59	0.39	0.37	0.39	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.43	100.07	100.23	99.83	99.65	99.23	101.93	103.62
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.10	0.33	0.34	0.44	0.66	0.44	0.38	0.72
	Al	0.01	0.28	0.28	0.29	0.27	0.31	0.35	0.24
	Ti	0.99	0.17	0.19	0.14	0.18	0.19	0.14	0.15
	Fe	0.78	1.42	1.42	1.33	1.18	1.37	1.51	1.08
	Cr	0.00	0.74	0.73	0.78	0.74	0.67	0.63	0.85
	V	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.88	2.95	2.96	2.99	3.03	2.99	3.00	3.04
Oxide %	**MgO**	2.42	4.05	4.18	5.26	8.13	5.49	4.64	9.00
	Al2O3	0.38	8.82	8.82	8.71	8.35	9.75	10.62	7.69
	TiO2	48.90	4.29	4.69	3.34	4.45	4.62	3.42	3.74
	Fe2O3	25.69	33.89	34.22	30.91	28.22	32.77	35.44	26.20
	FeO	23.12	16.03	16.19	14.62	13.35	15.51	16.77	12.40
	Cr2O3	0.00	34.68	34.44	35.50	34.52	31.16	28.76	40.03
	V2O5	0.00	0.46	0.00	0.37	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.51	102.23	102.54	98.71	97.03	99.30	99.66	99.06
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.72	0.69	0.70	0.70	0.73	0.32	0.19	0.33
	Al	0.25	0.25	0.25	0.25	0.25	0.27	0.08	0.32
	Ti	0.15	0.15	0.15	0.15	0.15	0.18	0.05	0.16
	Fe	1.09	1.10	1.09	1.08	1.08	1.44	2.21	1.48
	Cr	0.84	0.84	0.84	0.84	0.83	0.73	0.56	0.68
	V	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.04	3.03	3.04	3.03	3.04	2.95	3.09	2.98
Oxide %	**MgO**	9.10	8.72	8.79	9.02	9.42	4.10	2.16	4.21
	Al2O3	8.05	7.95	7.94	8.05	8.09	8.81	2.46	10.26
	TiO2	3.64	3.85	3.80	3.94	3.89	4.62	1.07	4.02
	Fe2O3	26.57	27.09	26.48	26.89	26.73	35.17	49.09	35.99
	FeO	12.57	12.82	12.53	12.72	12.65	16.64	23.23	17.03
	Cr2O3	39.89	40.41	39.78	40.59	40.33	34.63	24.53	32.33
	V2O5	0.00	0.00	0.00	0.37	0.00	0.43	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.82	100.86	99.33	101.58	101.10	104.39	102.52	103.84
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 25	Oxide 26	Oxide 27	Oxide 28	Oxide 29	Oxide 30	Oxide 31	Oxide 32
Atomic	**Mg**	0.31	0.16	0.29	0.37	0.50	0.32	0.24	0.62
	Al	0.29	0.19	0.24	0.25	0.28	0.28	0.26	0.27
	Ti	0.15	0.10	0.15	0.15	0.13	0.20	0.12	0.19
	Fe	1.64	2.19	1.53	1.48	1.35	1.40	1.81	1.18
	Cr	0.62	0.42	0.75	0.74	0.76	0.73	0.59	0.75
	V	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.06	2.97	2.99	3.02	2.94	3.02	3.01
Oxide %	**MgO**	3.80	1.86	3.62	4.54	6.33	3.86	2.82	8.18
	Al2O3	8.94	5.67	7.33	7.73	8.98	8.79	7.75	8.88
	TiO2	3.64	2.20	3.77	3.82	3.25	4.79	2.75	5.02
	Fe2O3	39.26	49.20	36.30	35.65	32.71	33.14	41.80	30.05
	FeO	18.57	23.28	17.17	16.86	15.47	15.68	19.78	14.21
	Cr2O3	28.95	18.36	34.80	34.76	35.82	33.56	26.70	37.52
	V2O5	0.00	0.36	0.36	0.00	0.00	0.71	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.16	100.92	103.34	103.36	102.57	100.53	101.60	103.86
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-23** Depth: 435.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.37	0.37	0.67	0.29	0.32	0.49	0.25	0.53
	Al	0.31	0.31	0.23	0.26	0.29	0.30	0.27	0.27
	Ti	0.22	0.22	0.18	0.22	0.23	0.16	0.27	0.20
	Fe	1.48	1.48	1.14	1.63	1.58	1.29	1.43	1.31
	Cr	0.58	0.58	0.78	0.56	0.53	0.75	0.67	0.70
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.96	2.96	3.02	2.96	2.96	2.99	2.90	3.00
Oxide %	**MgO**	4.51	4.51	8.42	3.43	3.86	5.80	3.02	6.40
	Al2O3	9.50	9.50	7.37	7.97	8.86	9.11	8.18	8.22
	TiO2	5.41	5.41	4.54	5.14	5.42	3.69	6.57	4.80
	Fe2O3	35.00	35.00	27.73	37.67	36.44	29.44	33.44	30.49
	FeO	16.56	16.56	13.12	17.82	17.24	13.93	15.82	14.43
	Cr2O3	26.79	26.79	37.02	25.15	23.98	33.38	30.42	31.76
	V2O5	0.37	0.37	0.48	0.34	0.32	0.36	0.43	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.14	98.14	98.68	97.52	96.14	95.71	97.88	96.10
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.30	0.29	0.22	0.30	0.29	0.36	0.28	0.49
	Al	0.31	0.28	0.19	0.30	0.29	0.29	0.25	0.28
	Ti	0.18	0.31	0.21	0.26	0.27	0.26	0.31	0.28
	Fe	1.45	1.46	1.87	1.50	1.54	1.53	1.52	1.43
	Cr	0.72	0.57	0.49	0.56	0.56	0.52	0.55	0.50
	V	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.96	2.91	2.98	2.93	2.94	2.96	2.91	2.98
Oxide %	**MgO**	3.52	3.62	2.59	3.78	3.50	4.46	3.50	6.05
	Al2O3	9.26	8.88	5.76	9.41	8.98	9.13	8.11	8.88
	TiO2	4.09	7.62	4.94	6.32	6.44	6.29	7.84	6.82
	Fe2O3	32.81	35.44	42.74	36.15	36.33	36.55	37.07	34.05
	FeO	15.52	16.77	20.22	17.10	17.19	17.29	17.54	16.11
	Cr2O3	31.79	27.14	21.84	26.29	25.64	24.34	26.02	23.47
	V2O5	0.00	0.00	0.45	0.57	0.00	0.36	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.99	99.47	98.54	99.63	98.06	98.41	100.08	95.40
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21
Atomic	**Mg**	0.37	0.53	0.52	0.55	0.47
	Al	0.31	0.30	0.28	0.26	0.28
	Ti	0.21	0.26	0.15	0.24	0.21
	Fe	1.52	1.32	1.26	1.29	1.33
	Cr	0.56	0.57	0.77	0.63	0.69
	V	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total	2.97	2.98	3.00	2.99	2.98
Oxide %	**MgO**	4.43	6.93	6.42	7.13	5.70
	Al2O3	9.47	9.81	8.69	8.56	8.60
	TiO2	5.04	6.61	3.64	6.11	5.12
	Fe2O3	35.48	33.10	29.84	32.26	31.13
	FeO	16.79	15.66	14.12	15.26	14.73
	Cr2O3	25.80	27.77	35.87	30.75	31.63
	V2O5	0.48	0.43	0.68	0.45	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	97.48	100.31	99.25	100.51	96.91
	Class	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-24** Depth: 448.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.53	0.56	0.45	0.63	0.43	0.68	0.46	0.67
	Al	0.27	0.27	0.27	0.26	0.29	0.25	0.28	0.25
	Ti	0.16	0.18	0.16	0.20	0.18	0.18	0.14	0.19
	Fe	1.30	1.27	1.32	1.19	1.38	1.17	1.36	1.17
	Cr	0.74	0.72	0.78	0.74	0.70	0.75	0.76	0.75
	V	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.01	2.98	3.02	2.98	3.03	3.00	3.03
Oxide %	**MgO**	6.53	6.92	5.46	8.06	5.14	8.56	5.61	8.57
	Al2O3	8.37	8.52	8.41	8.35	8.86	7.90	8.71	8.01
	TiO2	3.97	4.37	3.82	4.92	4.24	4.40	3.49	4.80
	Fe2O3	31.28	30.22	30.72	29.25	31.91	28.54	32.11	29.06
	FeO	14.80	14.30	14.54	13.84	15.10	13.50	15.19	13.75
	Cr2O3	34.89	33.70	35.44	35.49	31.79	35.46	35.28	36.26
	V2O5	0.32	0.37	0.37	0.00	0.34	0.52	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.16	98.40	98.76	99.91	97.37	98.88	100.39	100.47
	Class	BM	BM	IM	BM	IM	BM	IM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.43	0.36	0.23	0.34	0.39	0.53	0.52	0.24
	Al	0.27	0.29	0.24	0.30	0.31	0.30	0.31	0.25
	Ti	0.19	0.23	0.20	0.30	0.24	0.18	0.19	0.24
	Fe	1.38	1.43	1.76	1.39	1.39	1.30	1.26	1.69
	Cr	0.70	0.63	0.53	0.57	0.61	0.68	0.71	0.52
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	2.95	2.97	2.91	2.95	3.00	2.99	2.95
Oxide %	**MgO**	5.49	4.63	2.85	4.48	5.12	6.60	6.55	2.95
	Al2O3	8.69	9.47	7.58	9.90	10.32	9.33	9.96	7.75
	TiO2	4.65	5.69	4.90	7.94	6.22	4.32	4.77	5.91
	Fe2O3	33.60	35.19	42.06	35.31	35.22	31.06	30.79	40.12
	FeO	15.90	16.65	19.90	16.70	16.66	14.70	14.57	18.98
	Cr2O3	33.54	30.05	24.95	28.17	30.21	31.86	33.89	24.13
	V2O5	0.45	0.43	0.46	0.68	0.37	0.46	0.00	0.43
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.32	102.10	102.71	103.17	104.13	98.34	100.53	100.27
	Class	IM	IM	BM	BM	IM	Unk	IM	BM

Drill Hole: WM00-01

Sample : **SW01-25** Depth: 477.00

		Oxide 1	Oxide 2	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8	Oxide 9
Atomic	**Mg**	0.45	0.47	0.23	0.48	0.44	0.43	0.54	0.37
	Al	0.36	0.34	0.31	0.34	0.32	0.32	0.26	0.32
	Ti	0.18	0.15	0.31	0.19	0.21	0.20	0.21	0.21
	Fe	1.38	1.35	1.60	1.37	1.43	1.42	1.38	1.57
	Cr	0.61	0.67	0.46	0.59	0.58	0.60	0.62	0.50
	V	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.99	2.91	2.99	2.98	2.98	3.01	2.98
Oxide %	**MgO**	5.67	5.89	2.92	6.12	5.57	5.56	6.96	4.74
	Al2O3	11.34	10.92	10.15	11.22	10.20	10.37	8.64	10.34
	TiO2	4.39	3.79	7.91	4.79	5.31	5.07	5.44	5.36
	Fe2O3	33.51	32.77	39.74	34.17	35.20	35.24	34.71	38.45
	FeO	15.85	15.51	18.80	16.17	16.65	16.67	16.42	18.19
	Cr2O3	29.03	32.05	22.29	28.85	27.83	28.94	30.34	24.00
	V2O5	0.39	0.75	0.00	0.70	0.39	0.57	0.00	0.41
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.18	101.68	101.81	102.02	101.16	102.42	102.52	101.49
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12
Atomic	**Mg**	0.43	0.23	0.43	0.19
	Al	0.28	0.21	0.32	0.23
	Ti	0.20	0.22	0.24	0.18
	Fe	1.35	1.85	1.45	1.93
	Cr	0.69	0.47	0.53	0.47
	V	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00
	Total	2.97	2.98	2.97	3.00
Oxide %	**MgO**	5.32	2.87	5.57	2.32
	Al2O3	8.67	6.56	10.62	6.99
	TiO2	4.90	5.41	6.29	4.34
	Fe2O3	32.27	44.42	36.69	45.16
	FeO	15.27	21.02	17.36	21.37
	Cr2O3	32.27	22.26	25.99	21.75
	V2O5	0.54	0.34	0.37	0.00
	MnO	0.00	0.00	0.00	0.00
	Total	99.24	102.87	102.88	101.92
	Class	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-26** Depth: 499.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.68	0.48	0.61	0.55	0.23	0.39	0.39	0.31
	Al	0.25	0.29	0.27	0.27	0.18	0.22	0.33	0.30
	Ti	0.16	0.21	0.16	0.18	0.16	0.19	0.12	0.10
	Fe	1.08	1.24	1.23	1.29	1.83	1.62	1.46	1.79
	Cr	0.85	0.74	0.74	0.72	0.58	0.58	0.69	0.53
	V	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.97	3.02	3.01	2.99	3.00	3.00	3.04
Oxide %	**MgO**	8.61	5.97	7.89	6.96	2.79	4.78	4.76	3.78
	Al2O3	7.84	9.07	8.98	8.43	5.56	6.75	10.11	9.13
	TiO2	3.87	5.31	4.17	4.60	4.02	4.55	3.02	2.49
	Fe2O3	26.33	29.94	30.60	31.29	43.74	38.39	34.55	41.60
	FeO	12.46	14.16	14.48	14.80	20.70	18.16	16.35	19.68
	Cr2O3	40.12	35.03	36.07	33.91	27.17	27.10	31.91	24.19
	V2O5	0.34	0.00	0.39	0.00	0.73	0.62	0.62	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.56	99.48	102.58	100.00	104.70	100.36	101.31	100.86
	Class	BM	IM	BM	BM	BM	IM	IM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15
Atomic	**Mg**	0.50	0.54	0.37	0.28	0.41	0.19	0.23
	Al	0.29	0.30	0.21	0.23	0.24	0.15	0.21
	Ti	0.22	0.18	0.20	0.22	0.16	0.09	0.06
	Fe	1.41	1.33	1.60	1.75	1.49	2.04	1.91
	Cr	0.56	0.65	0.60	0.50	0.68	0.56	0.62
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.01	2.99	2.98	3.00	3.04	3.04
Oxide %	**MgO**	6.53	6.83	4.63	3.40	5.17	2.24	2.70
	Al2O3	9.54	9.60	6.71	7.09	7.77	4.57	6.25
	TiO2	5.71	4.54	4.94	5.27	4.05	2.04	1.35
	Fe2O3	35.52	32.64	38.24	41.62	36.14	45.92	42.78
	FeO	16.81	15.44	18.09	19.69	17.10	21.72	20.24
	Cr2O3	27.43	31.22	28.14	23.40	32.11	24.83	26.94
	V2O5	0.70	0.36	0.39	0.57	0.37	0.46	0.59
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.24	100.62	101.13	101.03	102.72	101.78	100.86
	Class	IM	BM	IM	BM	IM	BM	BM

Drill Hole: WM00-01

Sample : **SW01-27** Depth: 530.80

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.45	0.60	0.67	0.47	0.62	0.61	0.28	0.39
	Al	0.32	0.25	0.26	0.31	0.27	0.27	0.16	0.29
	Ti	0.18	0.17	0.16	0.12	0.19	0.18	0.27	0.15
	Fe	1.41	1.20	1.15	1.31	1.22	1.22	1.75	1.24
	Cr	0.63	0.77	0.79	0.79	0.71	0.73	0.50	0.88
	V	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.01	3.03	3.00	3.02	3.01	2.97	2.95
Oxide %	**MgO**	5.75	7.53	8.61	5.61	8.01	7.91	3.58	5.41
	Al2O3	10.20	8.07	8.48	9.33	8.90	8.92	5.01	10.11
	TiO2	4.49	4.30	4.17	2.85	4.92	4.74	6.72	4.09
	Fe2O3	34.83	29.06	28.62	30.32	30.55	30.67	43.00	33.33
	FeO	16.48	13.75	13.54	14.34	14.45	14.51	20.34	15.77
	Cr2O3	30.30	36.74	38.18	35.52	34.65	35.90	24.12	46.13
	V2O5	0.45	0.57	0.00	0.36	0.00	0.48	0.39	0.43
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.50	100.02	101.60	98.33	101.49	103.12	103.16	115.25
	Class	IM	BM	BM	IM	BM	BM	BM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.41	0.58	0.40	0.23	0.44	0.40	0.43	0.44
	Al	0.31	0.28	0.29	0.11	0.29	0.21	0.22	0.32
	Ti	0.18	0.35	0.19	0.19	0.22	0.32	0.35	0.16
	Fe	1.47	1.31	1.48	1.93	1.48	1.54	1.48	1.33
	Cr	0.61	0.43	0.61	0.53	0.55	0.48	0.45	0.74
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.96	2.98	3.00	2.99	2.95	2.94	2.99
Oxide %	**MgO**	5.04	7.96	5.02	2.77	5.56	5.16	5.74	5.37
	Al2O3	9.69	9.62	9.43	3.55	9.50	6.92	7.22	10.05
	TiO2	4.49	9.53	4.84	4.67	5.49	8.11	9.16	3.90
	Fe2O3	35.17	34.78	36.21	45.75	36.59	38.14	37.77	31.56
	FeO	16.64	16.46	17.13	21.65	17.31	18.05	17.87	14.93
	Cr2O3	28.72	22.55	28.98	24.44	26.37	23.28	22.60	34.32
	V2O5	0.52	0.71	0.41	0.61	0.52	0.34	0.54	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.27	101.61	102.03	103.44	101.33	99.99	100.89	100.14
	Class	IM	BM	IM	BM	IM	BM	BM	IM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.48	0.43	0.47	0.49	0.33	0.47	0.30	0.44
	Al	0.36	0.33	0.31	0.34	0.29	0.34	0.20	0.32
	Ti	0.14	0.17	0.09	0.13	0.19	0.16	0.30	0.16
	Fe	1.31	1.42	1.38	1.30	1.62	1.39	1.62	1.39
	Cr	0.70	0.63	0.77	0.75	0.54	0.65	0.51	0.67
	V	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	3.02	3.01	2.98	3.01	2.94	2.99
Oxide %	**MgO**	5.90	5.39	5.56	5.89	4.05	5.75	3.85	5.49
	Al2O3	11.07	10.35	9.33	10.28	9.07	10.39	6.33	10.18
	TiO2	3.47	4.14	2.12	3.22	4.72	3.94	7.61	4.00
	Fe2O3	31.01	34.37	31.65	30.49	38.40	32.74	39.92	33.29
	FeO	14.67	16.26	14.97	14.43	18.17	15.49	18.89	15.75
	Cr2O3	32.29	29.73	34.30	34.17	24.77	30.09	24.39	31.23
	V2O5	0.50	0.54	0.32	0.00	0.61	0.00	0.55	0.39
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.91	100.78	98.25	98.48	99.79	98.41	101.54	100.34
	Class	IM	IM	IM	IM	IM	IM	BM	IM

Drill Hole: WM00-01

Sample : **SW01-28** Depth: 571.70

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.42	0.41	0.22	0.46	0.41	0.44	0.48	0.44
	Al	0.27	0.27	0.11	0.32	0.29	0.28	0.31	0.30
	Ti	0.18	0.17	0.13	0.14	0.14	0.14	0.14	0.17
	Fe	1.46	1.48	1.88	1.32	1.42	1.34	1.23	1.44
	Cr	0.66	0.67	0.67	0.75	0.71	0.79	0.82	0.67
	V	0.01	0.00	0.01	0.01	0.02	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.00	3.01	2.99	2.99	2.99	2.99	3.00
Oxide %	**MgO**	5.26	5.02	2.57	5.75	4.97	5.31	5.79	5.49
	Al2O3	8.46	8.35	3.25	10.18	8.92	8.52	9.54	9.30
	TiO2	4.45	4.14	3.07	3.59	3.49	3.40	3.40	4.09
	Fe2O3	35.23	35.04	42.42	32.12	33.53	31.56	28.84	34.51
	FeO	16.67	16.58	20.07	15.20	15.86	14.93	13.65	16.33
	Cr2O3	30.91	30.91	29.38	35.58	32.90	36.23	37.53	31.21
	V2O5	0.46	0.00	0.45	0.54	0.86	0.36	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.45	100.05	101.21	102.96	100.53	100.31	98.75	100.92
	Class	IM	IM	BM	IM	IM	IM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.22	0.31	0.26	0.39	0.44	0.59	0.57	0.56
	Al	0.12	0.21	0.17	0.24	0.31	0.28	0.27	0.28
	Ti	0.13	0.27	0.18	0.12	0.13	0.14	0.18	0.13
	Fe	1.84	1.53	1.72	1.02	1.27	1.17	1.26	1.19
	Cr	0.70	0.61	0.64	0.01	0.84	0.83	0.73	0.85
	V	0.01	0.01	0.01	0.69	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	2.94	2.98	2.47	2.99	3.01	3.01	3.01
Oxide %	**MgO**	2.62	4.05	3.08	5.74	5.44	7.36	7.21	7.00
	Al2O3	3.68	6.88	5.20	9.16	9.67	8.75	8.62	8.77
	TiO2	2.95	6.87	4.32	3.42	3.09	3.52	4.60	3.19
	Fe2O3	42.30	38.03	39.84	29.11	30.20	28.40	30.79	28.98
	FeO	20.01	17.99	18.85	13.77	14.29	13.44	14.57	13.71
	Cr2O3	31.29	29.80	29.23	0.57	38.91	39.21	34.71	40.25
	V2O5	0.37	0.37	0.50	46.24	0.00	0.48	0.32	0.46
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.23	104.00	101.02	108.02	101.60	101.17	100.83	102.36
	Class	BM	BM	BM	IM	IM	BM	BM	IM

		Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23
Atomic	**Mg**	0.50	0.65	0.51	0.47	0.45	0.39
	Al	0.30	0.31	0.30	0.31	0.30	0.24
	Ti	0.13	0.16	0.14	0.13	0.14	0.21
	Fe	1.19	1.16	1.22	1.35	1.38	1.50
	Cr	0.87	0.73	0.81	0.73	0.72	0.63
	V	0.00	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.02	2.99	3.00	3.00	2.98
Oxide %	**MgO**	6.10	8.27	6.28	5.82	5.64	4.83
	Al2O3	9.09	10.07	9.47	9.90	9.49	7.61
	TiO2	3.24	4.14	3.35	3.30	3.55	5.05
	Fe2O3	28.02	28.37	29.10	32.60	33.27	36.03
	FeO	13.25	13.42	13.77	15.42	15.74	17.04
	Cr2O3	39.83	34.74	37.97	34.27	34.06	29.36
	V2O5	0.00	0.43	0.57	0.50	0.37	0.71
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.53	99.44	100.52	101.82	102.11	100.64
	Class	IM	BM	IM	IM	IM	IM

Drill Hole: WM00-01

Sample : **SW01-29** Depth: 573.40

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.54	0.58	0.47	0.46	0.49	0.51	0.29	0.50
	Al	0.31	0.20	0.26	0.29	0.26	0.30	0.17	0.30
	Ti	0.13	0.30	0.18	0.15	0.18	0.13	0.21	0.13
	Fe	1.23	1.31	1.43	1.43	1.43	1.24	1.64	1.26
	Cr	0.79	0.57	0.65	0.68	0.65	0.82	0.65	0.82
	V	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
	Total	3.01	2.98	3.00	3.01	3.01	3.00	2.98	3.00
Oxide %	**MgO**	6.77	7.83	5.97	5.79	6.14	6.32	3.53	6.10
	Al2O3	9.75	6.67	8.20	9.11	8.29	9.35	5.16	9.35
	TiO2	3.24	8.07	4.47	3.75	4.54	3.32	5.05	3.12
	Fe2O3	29.89	34.01	34.77	34.71	34.78	29.71	38.46	29.89
	FeO	14.14	16.09	16.45	16.42	16.46	14.05	18.20	14.14
	Cr2O3	37.36	28.59	30.93	32.05	30.74	38.57	30.05	37.90
	V2O5	0.64	0.66	0.59	0.50	0.48	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00
	Total	101.78	101.92	101.38	102.34	101.43	101.32	100.91	100.51
	Class	IM	BM	IM	IM	IM	IM	BM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13
Atomic	**Mg**	0.66	0.53	0.33	0.29	0.28
	Al	0.27	0.32	0.16	0.17	0.18
	Ti	0.16	0.14	0.19	0.19	0.22
	Fe	1.12	1.14	1.64	1.68	1.63
	Cr	0.78	0.85	0.63	0.61	0.64
	V	0.01	0.00	0.01	0.01	0.01
	Mn	0.02	0.00	0.02	0.03	0.00
	Total	3.03	2.99	2.99	2.99	2.96
Oxide %	**MgO**	8.59	6.19	4.06	3.62	3.57
	Al2O3	8.86	9.62	4.82	5.54	5.80
	TiO2	4.05	3.37	4.72	4.67	5.39
	Fe2O3	28.23	25.91	38.78	40.89	39.67
	FeO	13.36	12.26	18.35	19.34	18.77
	Cr2O3	38.47	37.86	29.17	29.10	30.15
	V2O5	0.62	0.00	0.57	0.79	0.50
	MnO	0.56	0.00	0.53	0.68	0.00
	Total	102.74	95.20	101.01	104.63	103.84
	Class	BM	IM	IM	IM	IM

Drill Hole: WM00-01
Sample : **SW01-30** Depth: 574.35

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.47	0.25	0.50	0.45	0.50	0.66	0.53	0.52
	Al	0.28	0.13	0.32	0.22	0.31	0.29	0.29	0.32
	Ti	0.15	0.17	0.13	0.25	0.14	0.19	0.13	0.15
	Fe	1.36	1.79	1.27	1.44	1.25	1.21	1.24	1.25
	Cr	0.74	0.65	0.78	0.60	0.80	0.66	0.81	0.77
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	3.00	2.97	3.00	3.02	3.00	3.00
Oxide %	**MgO**	5.82	2.95	6.02	5.59	6.10	8.42	6.63	6.55
	Al2O3	8.88	3.82	9.73	6.97	9.56	9.58	9.15	10.09
	TiO2	3.60	3.95	3.04	6.11	3.39	4.92	3.29	3.82
	Fe2O3	32.57	41.67	29.72	34.82	29.63	29.94	30.00	30.34
	FeO	15.41	19.71	14.06	16.47	14.02	14.16	14.19	14.35
	Cr2O3	34.46	29.45	35.78	28.44	36.93	32.23	38.28	36.34
	V2O5	0.39	0.73	0.45	0.61	0.34	0.48	0.50	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.14	102.28	98.79	99.01	99.97	99.74	102.03	101.48
	Class	IM	BM	IM	Unk	Unk	BM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.58	0.51	0.22	0.33	0.26	0.33	0.46	0.51
	Al	0.32	0.33	0.14	0.08	0.13	0.31	0.28	0.23
	Ti	0.12	0.13	0.13	0.28	0.17	0.14	0.17	0.24
	Fe	1.13	1.29	1.93	1.62	1.78	1.51	1.33	1.37
	Cr	0.87	0.74	0.58	0.63	0.65	0.67	0.73	0.63
	V	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.01	3.02	2.95	2.99	2.98	2.98	2.99
Oxide %	**MgO**	7.18	6.32	2.59	4.13	3.15	4.18	5.62	6.65
	Al2O3	10.13	10.39	4.08	2.65	3.91	9.73	8.82	7.50
	TiO2	2.92	3.25	3.10	7.01	4.07	3.47	4.27	6.12
	Fe2O3	27.10	30.80	43.93	39.35	42.42	36.60	31.84	34.38
	FeO	12.82	14.57	20.78	18.61	20.07	17.31	15.06	16.27
	Cr2O3	40.87	34.38	25.97	29.66	30.28	31.83	33.95	30.94
	V2O5	0.00	0.57	0.70	0.62	0.68	0.66	0.41	0.57
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.02	100.29	101.15	102.02	104.59	103.79	99.99	102.44
	Class	IM	IM	BM	Unk	Unk	IM	IM	Unk

Drill Hole: WM00-01

Sample : **SW01-31** Depth: 577.79

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.25	0.26	0.52	0.21	0.39	0.40	0.44	0.26
	Al	0.10	0.10	0.29	0.14	0.30	0.34	0.28	0.11
	Ti	0.18	0.23	0.15	0.18	0.16	0.12	0.15	0.18
	Fe	1.82	1.74	1.34	1.89	1.37	1.42	1.47	1.78
	Cr	0.63	0.62	0.72	0.54	0.73	0.71	0.67	0.65
	V	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
	Total	3.00	2.97	3.02	3.00	2.97	3.00	3.01	2.99
Oxide %	**MgO**	3.13	3.27	6.70	2.64	4.91	5.09	5.61	3.23
	Al2O3	3.16	3.06	9.37	4.31	9.58	10.81	8.90	3.34
	TiO2	4.45	5.76	3.90	4.52	3.99	3.12	3.75	4.57
	Fe2O3	43.63	41.69	33.39	45.25	33.24	34.49	36.15	42.89
	FeO	20.64	19.73	15.80	21.41	15.73	16.32	17.10	20.29
	Cr2O3	29.54	29.23	35.05	25.15	34.76	33.57	31.91	30.58
	V2O5	0.45	0.59	0.00	0.46	0.62	0.41	0.45	0.64
	MnO	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00
	Total	105.00	103.33	104.22	104.29	102.82	103.81	103.87	105.55
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15
Atomic	**Mg**	0.40	0.24	0.49	0.41	0.27	0.50	0.08
	Al	0.31	0.14	0.29	0.26	0.11	0.31	0.02
	Ti	0.16	0.09	0.14	0.16	0.25	0.13	0.02
	Fe	1.36	1.89	1.37	1.54	1.67	1.29	3.08
	Cr	0.74	0.66	0.71	0.63	0.64	0.76	0.01
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	3.03	3.01	3.01	2.95	3.00	3.21
Oxide %	**MgO**	4.96	2.80	6.15	5.12	3.43	6.37	0.98
	Al2O3	9.79	4.18	9.20	8.05	3.65	10.05	0.53
	TiO2	3.90	2.22	3.47	3.87	6.29	3.25	0.38
	Fe2O3	32.77	43.50	33.56	36.95	41.23	31.72	69.20
	FeO	15.51	20.58	15.88	17.48	19.51	15.01	32.74
	Cr2O3	34.58	29.55	33.94	29.45	30.68	36.50	0.48
	V2O5	0.37	0.62	0.66	0.54	0.79	0.73	0.29
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.88	103.46	102.86	101.46	105.57	103.64	104.59
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-32** Depth: 583.70

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.40	0.19	0.36	0.37	0.23	0.23	0.47	0.38
	Al	0.22	0.19	0.25	0.25	0.13	0.16	0.29	0.26
	Ti	0.19	0.16	0.17	0.17	0.18	0.22	0.17	0.16
	Fe	1.56	1.89	1.53	1.50	1.75	1.83	1.34	1.53
	Cr	0.62	0.56	0.67	0.69	0.66	0.54	0.72	0.67
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	2.99	2.99	2.97	2.98	2.99	3.00
Oxide %	**MgO**	4.84	2.22	4.46	4.56	2.70	2.85	5.89	4.56
	Al2O3	6.67	5.76	7.63	7.77	4.01	4.93	9.16	7.67
	TiO2	4.59	3.72	4.07	4.19	4.30	5.46	4.17	3.69
	Fe2O3	36.40	43.73	36.32	35.44	39.82	43.99	32.19	35.03
	FeO	17.22	20.69	17.18	16.77	18.84	20.81	15.23	16.58
	Cr2O3	28.14	25.27	31.13	31.75	29.44	25.14	33.68	30.02
	V2O5	0.61	0.66	0.52	0.32	0.52	0.37	0.41	0.34
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.47	102.06	101.31	100.79	99.63	103.55	100.73	97.89
	Class	IM	BM	IM	IM	BM	BM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.18	0.46	0.44	0.47	0.33	0.32	0.34	0.33
	Al	0.11	0.29	0.27	0.28	0.18	0.11	0.20	0.20
	Ti	0.10	0.13	0.14	0.17	0.23	0.24	0.20	0.24
	Fe	1.99	1.42	1.41	1.35	1.67	1.69	1.69	1.61
	Cr	0.63	0.71	0.72	0.71	0.55	0.61	0.56	0.58
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.03	3.01	3.00	2.99	2.98	2.98	2.99	2.96
Oxide %	**MgO**	2.09	5.67	5.26	5.85	4.08	3.95	4.13	4.03
	Al2O3	3.10	9.16	8.26	8.90	5.67	3.57	6.01	6.20
	TiO2	2.39	3.12	3.30	4.20	5.62	5.82	4.82	5.74
	Fe2O3	44.29	34.07	32.74	32.27	39.73	40.61	39.53	38.27
	FeO	20.95	16.12	15.49	15.27	18.80	19.21	18.70	18.10
	Cr2O3	27.30	33.30	32.71	33.08	25.78	28.85	25.61	26.94
	V2O5	0.57	0.46	0.62	0.62	0.79	0.41	0.59	0.66
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.69	101.91	98.39	100.19	100.47	102.42	99.39	99.94
	Class	BM	IM	IM	IM	IM	BM	IM	IM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20
Atomic	**Mg**	0.12	0.35	0.00	0.43
	Al	0.00	0.19	0.00	0.29
	Ti	0.99	0.18	1.49	0.16
	Fe	0.73	1.67	0.01	1.42
	Cr	0.01	0.59	0.00	0.68
	V	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	1.87	3.00	1.50	2.99
Oxide %	**MgO**	2.92	4.23	0.00	5.27
	Al2O3	0.26	5.90	0.00	9.09
	TiO2	49.13	4.29	93.17	3.89
	Fe2O3	24.20	38.47	0.29	33.89
	FeO	21.77	18.20	0.26	16.03
	Cr2O3	1.01	26.63	0.47	31.76
	V2O5	0.91	0.71	0.64	0.43
	MnO	0.00	0.00	0.00	0.00
	Total	100.21	98.43	94.84	100.36
	Class	BM	IM	BM	IM

Drill Hole: WM00-01
Sample : **SW01-33** Depth: 585.50

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.31	0.39	0.43	0.40	0.39	0.43	0.44	0.29
	Al	0.11	0.25	0.15	0.16	0.15	0.16	0.18	0.11
	Ti	0.26	0.10	0.34	0.32	0.30	0.34	0.35	0.21
	Fe	1.84	1.58	1.62	1.65	1.69	1.62	1.58	1.88
	Cr	0.46	0.70	0.42	0.43	0.44	0.40	0.40	0.50
	V	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.03	2.97	2.97	2.98	2.96	2.96	3.01
Oxide %	**MgO**	3.83	4.63	5.67	5.27	5.07	5.70	5.74	3.53
	Al2O3	3.50	7.65	4.84	5.16	4.86	5.18	6.03	3.34
	TiO2	6.36	2.39	8.89	8.27	7.71	8.83	9.01	5.05
	Fe2O3	44.28	36.21	41.01	41.74	42.36	41.02	40.23	43.99
	FeO	20.95	17.13	19.40	19.75	20.04	19.41	19.03	20.81
	Cr2O3	21.46	31.38	20.84	21.31	21.66	19.76	20.02	22.80
	V2O5	0.80	0.41	0.54	0.66	0.48	0.98	0.62	0.59
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.17	99.80	101.18	102.17	102.19	100.88	100.68	100.12
	Class	BM	IM	BM	BM	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.26	0.32	0.21	0.40	0.40	0.30	0.28	0.20
	Al	0.13	0.18	0.11	0.26	0.27	0.15	0.13	0.13
	Ti	0.22	0.13	0.20	0.10	0.09	0.18	0.17	0.10
	Fe	1.90	1.75	1.98	1.56	1.52	1.78	1.95	2.16
	Cr	0.49	0.63	0.49	0.72	0.74	0.59	0.49	0.47
	V	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.02	3.01	3.03	3.03	3.01	3.03	3.06
Oxide %	**MgO**	3.07	3.85	2.60	4.74	4.83	3.63	3.43	2.34
	Al2O3	3.84	5.31	3.33	8.01	8.14	4.44	3.85	3.76
	TiO2	5.22	3.12	4.82	2.27	2.15	4.27	4.09	2.24
	Fe2O3	44.01	40.10	46.51	36.03	35.34	41.68	45.78	49.40
	FeO	20.82	18.97	22.00	17.05	16.72	19.72	21.66	23.37
	Cr2O3	22.17	28.33	22.49	32.48	33.50	26.89	22.68	21.11
	V2O5	0.46	0.50	0.36	0.00	0.30	0.46	0.59	0.45
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.60	100.18	102.12	100.58	100.98	101.11	102.09	102.66
	Class	Unk	Unk	Unk	IM	IM	IM	BM	BM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.35	0.37	0.32	0.36	0.13	0.44	0.36	0.37
	Al	0.29	0.25	0.25	0.24	0.12	0.17	0.21	0.23
	Ti	0.09	0.11	0.19	0.14	0.03	0.35	0.14	0.15
	Fe	1.73	1.53	1.48	1.51	2.34	1.56	1.63	1.55
	Cr	0.57	0.74	0.69	0.74	0.48	0.42	0.65	0.69
	V	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
	Total	3.04	3.01	2.96	2.99	3.10	2.96	3.01	3.01
Oxide %	**MgO**	4.18	4.41	3.96	4.29	1.41	5.84	4.29	4.48
	Al2O3	8.84	7.58	7.97	7.26	3.50	5.67	6.42	7.07
	TiO2	2.15	2.49	4.77	3.37	0.65	9.16	3.40	3.62
	Fe2O3	39.91	35.03	35.64	34.82	50.42	39.93	37.69	35.89
	FeO	18.88	16.57	16.86	16.47	23.86	18.89	17.83	16.98
	Cr2O3	25.65	33.08	32.27	33.32	20.33	20.77	29.54	31.29
	V2O5	0.45	0.34	0.50	0.36	0.00	0.79	0.59	0.00
	MnO	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00
	Total	100.06	99.49	102.34	99.90	100.16	101.04	99.77	99.33
	Class	IM	IM	IM	IM	BM	BM	IM	IM

Drill Hole: WM00-01

Sample : **SW01-34** Depth: 603.70

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.50	0.60	0.54	0.51	0.61	0.40	0.24	0.21
	Al	0.21	0.22	0.24	0.26	0.25	0.25	0.16	0.20
	Ti	0.37	0.16	0.18	0.22	0.22	0.16	0.27	0.26
	Fe	1.44	1.19	1.28	1.38	1.24	1.41	1.80	1.88
	Cr	0.41	0.83	0.76	0.62	0.68	0.76	0.47	0.41
	V	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.95	3.01	3.00	3.00	3.01	2.99	2.96	2.97
Oxide %	**MgO**	6.82	7.33	6.63	6.40	7.73	4.84	2.98	2.59
	Al2O3	7.14	6.92	7.35	8.31	7.84	7.73	4.95	6.37
	TiO2	10.01	3.82	4.29	5.32	5.46	3.82	6.64	6.32
	Fe2O3	37.54	27.97	30.43	33.28	30.37	32.60	43.22	44.71
	FeO	17.76	13.23	14.40	15.74	14.37	15.42	20.45	21.15
	Cr2O3	21.13	38.05	35.55	29.13	32.45	34.33	21.82	18.88
	V2O5	0.62	0.55	0.54	0.43	0.39	0.00	0.84	0.48
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.03	97.86	99.18	98.62	98.60	98.74	100.90	100.51
	Class	Unk	IM	IM	BM	BM	IM	BM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.17	0.38	0.66	0.18	0.25	0.38	0.26	0.17
	Al	0.14	0.20	0.23	0.13	0.14	0.25	0.15	0.14
	Ti	0.29	0.18	0.18	0.11	0.25	0.17	0.24	0.17
	Fe	1.88	1.62	1.15	2.13	1.71	1.50	1.73	1.90
	Cr	0.45	0.64	0.77	0.47	0.57	0.68	0.57	0.58
	V	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02
	Mn	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00
	Total	2.94	3.01	3.02	3.05	2.96	2.98	2.96	2.98
Oxide %	**MgO**	2.09	4.49	8.34	2.16	3.02	4.59	3.15	1.97
	Al2O3	4.44	6.01	7.41	3.97	4.35	7.69	4.57	4.29
	TiO2	6.97	4.24	4.59	2.67	6.01	4.19	5.81	4.12
	Fe2O3	44.51	37.22	27.88	48.38	40.47	35.20	40.58	43.71
	FeO	21.06	17.61	13.19	22.89	19.15	16.65	19.20	20.68
	Cr2O3	20.84	28.62	36.64	20.70	26.47	31.03	26.32	26.25
	V2O5	0.50	0.00	0.61	0.55	0.79	0.48	0.66	0.82
	MnO	0.00	0.00	0.00	0.36	0.41	0.00	0.00	0.00
	Total	100.41	98.19	98.66	101.68	100.66	99.84	100.29	101.85
	Class	BM	IM	BM	IM	IM	Unk	Unk	Unk

		Oxide 17	Oxide 18	Oxide 19	Oxide 20
Atomic	**Mg**	0.44	0.35	0.51	0.51
	Al	0.28	0.15	0.22	0.21
	Ti	0.15	0.31	0.37	0.38
	Fe	1.33	1.64	1.41	1.42
	Cr	0.78	0.49	0.43	0.41
	V	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	2.99	2.95	2.95	2.95
Oxide %	**MgO**	5.31	4.39	6.87	6.90
	Al2O3	8.58	4.86	7.63	7.01
	TiO2	3.59	7.74	9.79	10.09
	Fe2O3	30.99	40.07	36.59	36.85
	FeO	14.66	18.96	17.31	17.43
	Cr2O3	35.52	23.56	21.62	20.77
	V2O5	0.39	0.52	0.64	0.84
	MnO	0.00	0.00	0.00	0.00
	Total	99.03	100.10	100.45	99.89
	Class	IM	IM	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-35** Depth: 647.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.31	0.39	0.43	0.40	0.39	0.43	0.44	0.29
	Al	0.11	0.25	0.15	0.16	0.15	0.16	0.18	0.11
	Ti	0.26	0.10	0.34	0.32	0.30	0.34	0.35	0.21
	Fe	1.84	1.58	1.62	1.65	1.69	1.62	1.58	1.88
	Cr	0.46	0.70	0.42	0.43	0.44	0.40	0.40	0.50
	V	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.03	2.97	2.97	2.98	2.96	2.96	3.01
Oxide %	**MgO**	3.83	4.63	5.67	5.27	5.07	5.70	5.74	3.53
	Al2O3	3.50	7.65	4.84	5.16	4.86	5.18	6.03	3.34
	TiO2	6.36	2.39	8.89	8.27	7.71	8.83	9.01	5.05
	Fe2O3	44.28	36.21	41.01	41.74	42.36	41.02	40.23	43.99
	FeO	20.95	17.13	19.40	19.75	20.04	19.41	19.03	20.81
	Cr2O3	21.46	31.38	20.84	21.31	21.66	19.76	20.02	22.80
	V2O5	0.80	0.41	0.54	0.66	0.48	0.98	0.62	0.59
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.17	99.80	101.18	102.17	102.19	100.88	100.68	100.12
	Class	BM	IM	BM	BM	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.26	0.32	0.21	0.40	0.40	0.30	0.28	0.20
	Al	0.13	0.18	0.11	0.26	0.27	0.15	0.13	0.13
	Ti	0.22	0.13	0.20	0.10	0.09	0.18	0.17	0.10
	Fe	1.90	1.75	1.98	1.56	1.52	1.78	1.95	2.16
	Cr	0.49	0.63	0.49	0.72	0.74	0.59	0.49	0.47
	V	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.02	3.01	3.03	3.03	3.01	3.03	3.06
Oxide %	**MgO**	3.07	3.85	2.60	4.74	4.83	3.63	3.43	2.34
	Al2O3	3.84	5.31	3.33	8.01	8.14	4.44	3.85	3.76
	TiO2	5.22	3.12	4.82	2.27	2.15	4.27	4.09	2.24
	Fe2O3	44.01	40.10	46.51	36.03	35.34	41.68	45.78	49.40
	FeO	20.82	18.97	22.00	17.05	16.72	19.72	21.66	23.37
	Cr2O3	22.17	28.33	22.49	32.48	33.50	26.89	22.68	21.11
	V2O5	0.46	0.50	0.36	0.00	0.30	0.46	0.59	0.45
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.60	100.18	102.12	100.58	100.98	101.11	102.09	102.66
	Class	Unk	Unk	Unk	IM	IM	IM	BM	BM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.35	0.37	0.32	0.36	0.13	0.44	0.36	0.37
	Al	0.29	0.25	0.25	0.24	0.12	0.17	0.21	0.23
	Ti	0.09	0.11	0.19	0.14	0.03	0.35	0.14	0.15
	Fe	1.73	1.53	1.48	1.51	2.34	1.56	1.63	1.55
	Cr	0.57	0.74	0.69	0.74	0.48	0.42	0.65	0.69
	V	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
	Total	3.04	3.01	2.96	2.99	3.10	2.96	3.01	3.01
Oxide %	**MgO**	4.18	4.41	3.96	4.29	1.41	5.84	4.29	4.48
	Al2O3	8.84	7.58	7.97	7.26	3.50	5.67	6.42	7.07
	TiO2	2.15	2.49	4.77	3.37	0.65	9.16	3.40	3.62
	Fe2O3	39.91	35.03	35.64	34.82	50.42	39.93	37.69	35.89
	FeO	18.88	16.57	16.86	16.47	23.86	18.89	17.83	16.98
	Cr2O3	25.65	33.08	32.27	33.32	20.33	20.77	29.54	31.29
	V2O5	0.45	0.34	0.50	0.36	0.00	0.79	0.59	0.00
	MnO	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00
	Total	100.06	99.49	102.34	99.90	100.16	101.04	99.77	99.33
	Class	IM	IM	IM	IM	BM	BM	IM	IM

Drill Hole: WM00-01

Sample : **SW01-36** Depth: 665.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.41	0.44	0.37	0.27	0.30	0.47	0.35	0.41
	Al	0.18	0.18	0.15	0.13	0.12	0.26	0.25	0.41
	Ti	0.31	0.32	0.28	0.21	0.20	0.23	0.14	0.04
	Fe	1.58	1.54	1.66	1.83	1.83	1.39	1.49	1.57
	Cr	0.46	0.44	0.49	0.54	0.54	0.61	0.74	0.62
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.02	0.01	0.02	0.02	0.00	0.02	0.00	0.00
	Total	2.97	2.97	2.98	3.00	3.01	2.99	2.99	3.05
Oxide %	**MgO**	5.37	5.77	4.83	3.25	3.62	5.95	4.11	4.88
	Al2O3	5.91	6.03	4.87	3.87	3.70	8.24	7.41	12.19
	TiO2	8.06	8.29	7.14	5.00	4.82	5.66	3.35	1.02
	Fe2O3	39.76	38.68	41.30	42.47	42.52	33.56	33.76	35.88
	FeO	18.81	18.30	19.54	20.09	20.12	15.88	15.97	16.98
	Cr2O3	22.82	21.78	24.01	24.31	24.61	28.72	32.81	27.48
	V2O5	0.64	0.82	0.45	0.61	0.52	0.54	0.39	0.32
	MnO	0.36	0.34	0.41	0.35	0.00	0.46	0.00	0.00
	Total	101.74	100.00	102.55	99.96	99.91	99.00	97.82	98.73
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.42	0.35	0.30	0.25	0.24	0.20	0.36	0.27
	Al	0.26	0.23	0.13	0.12	0.16	0.15	0.14	0.13
	Ti	0.08	0.12	0.23	0.30	0.21	0.10	0.19	0.19
	Fe	1.50	1.56	1.83	1.80	1.93	2.08	1.79	1.78
	Cr	0.76	0.73	0.50	0.46	0.46	0.52	0.53	0.61
	V	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
	Mn	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02
	Total	3.03	3.02	3.00	2.96	3.01	3.06	3.02	3.00
Oxide %	**MgO**	5.01	4.20	3.65	3.08	2.92	2.39	4.38	3.25
	Al2O3	7.73	6.75	3.97	3.85	4.84	4.38	4.25	3.93
	TiO2	1.89	2.70	5.52	7.32	5.07	2.34	4.49	4.39
	Fe2O3	34.45	35.64	43.34	43.33	44.85	47.35	41.68	41.05
	FeO	16.30	16.86	20.50	20.50	21.22	22.40	19.72	19.42
	Cr2O3	34.25	32.71	22.99	21.50	21.09	22.96	24.26	27.26
	V2O5	0.45	0.36	0.57	0.61	0.00	0.00	0.79	0.39
	MnO	0.00	0.41	0.00	0.40	0.00	0.36	0.00	0.40
	Total	100.07	99.62	100.54	100.59	99.99	102.19	99.57	100.10
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-37** Depth: 693.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.11	0.15	0.08	0.37	0.19	0.33	0.14	0.33
	Al	0.08	0.10	0.02	0.13	0.00	0.10	0.11	0.10
	Ti	0.14	0.26	0.02	0.36	0.94	0.31	0.13	0.36
	Fe	2.46	2.17	2.99	1.81	0.77	1.99	2.39	1.91
	Cr	0.26	0.30	0.09	0.28	0.01	0.26	0.28	0.24
	V	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
	Total	3.07	2.99	3.20	2.97	1.92	3.00	3.08	2.98
Oxide %	**MgO**	1.33	1.92	0.90	5.04	4.81	4.38	1.77	4.51
	Al2O3	2.46	3.02	0.70	4.53	0.00	3.25	3.40	3.51
	TiO2	3.22	6.36	0.35	9.74	46.36	8.22	3.27	9.74
	Fe2O3	56.94	52.27	67.21	47.43	25.46	51.01	56.44	49.79
	FeO	26.94	24.73	31.80	22.44	22.91	24.14	26.70	23.56
	Cr2O3	11.93	14.32	3.98	14.18	1.13	13.18	12.79	12.20
	V2O5	0.73	0.79	0.00	1.02	0.93	0.77	0.46	0.64
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.44
	Total	103.53	103.41	104.92	104.39	101.59	104.95	105.24	104.40
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.27	0.13	0.15	0.66	0.34	0.15	0.14	0.15
	Al	0.15	0.00	0.08	0.23	0.10	0.11	0.00	0.09
	Ti	0.14	0.96	0.14	0.20	0.31	0.05	0.96	0.06
	Fe	1.90	0.80	2.48	1.27	1.98	2.48	0.80	2.54
	Cr	0.55	0.01	0.23	0.67	0.27	0.32	0.00	0.27
	V	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01
	Mn	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.04	1.90	3.09	3.04	3.01	3.12	1.90	3.13
Oxide %	**MgO**	3.33	3.23	1.86	8.67	4.44	1.76	3.37	1.81
	Al2O3	4.70	0.00	2.51	7.77	3.33	3.21	0.00	2.85
	TiO2	3.34	47.90	3.34	5.21	8.17	1.27	47.50	1.53
	Fe2O3	44.76	26.68	58.06	32.04	49.98	56.87	26.09	58.46
	FeO	21.18	24.01	27.47	15.16	23.64	26.90	23.48	27.66
	Cr2O3	25.14	0.58	10.44	33.35	13.49	14.37	0.47	12.07
	V2O5	0.46	0.00	0.59	0.00	0.34	0.34	0.00	0.34
	MnO	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.43	102.40	104.26	102.20	103.39	104.72	100.90	104.72
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01
Sample : **SW01-38** Depth: 704.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.11	0.00	0.12	0.23	0.00	0.16	0.15	0.08
	Al	0.07	0.05	0.05	0.10	0.00	0.00	0.08	0.01
	Ti	0.09	0.15	0.08	0.06	0.00	0.95	0.11	0.01
	Fe	2.73	2.69	2.80	2.07	3.22	0.80	2.81	3.12
	Cr	0.13	0.19	0.11	0.62	0.00	0.00	0.01	0.00
	V	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.14	3.08	3.16	3.08	3.22	1.91	3.16	3.22
Oxide %	**MgO**	1.29	0.00	1.36	2.45	0.00	3.71	1.74	0.88
	Al2O3	1.93	1.45	1.45	2.74	0.00	0.00	2.21	0.36
	TiO2	2.04	3.19	1.68	1.20	0.00	45.19	2.39	0.22
	Fe2O3	59.89	57.05	60.73	43.48	67.45	25.37	62.26	66.58
	FeO	28.33	26.99	28.73	20.57	31.91	22.83	29.46	31.50
	Cr2O3	5.39	7.73	4.74	25.53	0.00	0.00	0.29	0.00
	V2O5	0.30	0.00	0.00	0.00	0.00	0.00	0.30	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.17	96.42	98.70	95.98	99.36	97.11	98.66	99.54
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.26	0.04	0.19	0.10	0.14	0.12	0.16	0.19
	Al	0.11	0.01	0.05	0.06	0.00	0.05	0.00	0.07
	Ti	0.06	0.00	0.31	0.10	0.94	0.13	0.95	0.07
	Fe	1.92	3.16	2.31	2.80	0.82	2.83	0.79	2.86
	Cr	0.72	0.00	0.14	0.07	0.00	0.01	0.00	0.00
	V	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.06	3.22	3.01	3.14	1.92	3.15	1.91	3.20
Oxide %	**MgO**	2.87	0.46	2.40	1.13	3.40	1.38	3.91	2.16
	Al2O3	3.00	0.42	1.59	1.66	0.30	1.45	0.25	1.91
	TiO2	1.27	0.00	7.61	2.39	44.74	3.02	45.89	1.62
	Fe2O3	41.34	67.13	55.52	62.18	26.08	61.90	25.45	62.30
	FeO	19.56	31.76	26.27	29.42	23.47	29.28	22.90	29.48
	Cr2O3	30.14	0.00	6.80	3.20	0.37	0.28	0.34	0.00
	V2O5	0.00	0.00	0.68	0.41	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	98.17	99.77	100.86	100.38	98.37	97.31	98.74	97.46
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.11	0.25	0.05	0.08	0.09	0.06	0.04	0.11
	Al	0.05	0.07	0.05	0.05	0.06	0.05	0.03	0.06
	Ti	0.11	0.38	0.04	0.00	0.02	0.02	0.02	0.04
	Fe	2.72	2.14	2.94	2.95	2.87	2.91	3.11	2.68
	Cr	0.12	0.14	0.10	0.10	0.13	0.13	0.01	0.25
	V	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.12	2.98	3.17	3.19	3.18	3.17	3.20	3.14
Oxide %	**MgO**	1.23	3.18	0.53	0.83	0.99	0.63	0.38	1.21
	Al2O3	1.57	2.21	1.28	1.51	1.59	1.42	0.74	1.61
	TiO2	2.37	9.53	0.83	0.00	0.40	0.40	0.52	0.85
	Fe2O3	59.86	52.76	62.06	62.27	60.75	61.27	65.22	57.04
	FeO	28.32	24.96	29.36	29.46	28.74	28.99	30.85	26.99
	Cr2O3	5.16	6.49	4.03	4.18	5.38	5.35	0.37	10.41
	V2O5	0.64	0.55	0.00	0.34	0.37	0.29	0.00	0.36
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.14	99.69	98.11	98.60	98.23	98.33	98.07	98.46
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 25	Oxide 26	Oxide 27	Oxide 28	Oxide 29	Oxide 30	Oxide 31	Oxide 32
Atomic	**Mg**	0.16	0.06	0.00	0.10	0.08	0.06	0.13	0.18
	Al	0.07	0.08	0.00	0.07	0.05	0.01	0.01	0.08
	Ti	0.19	0.35	0.00	0.07	0.01	0.02	0.07	0.11
	Fe	2.12	2.25	3.22	2.79	2.97	3.07	2.86	2.65
	Cr	0.46	0.20	0.00	0.12	0.09	0.04	0.11	0.11
	V	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	2.95	3.22	3.15	3.19	3.20	3.17	3.14
Oxide %	**MgO**	1.86	0.70	0.00	1.13	0.81	0.63	1.43	1.89
	Al2O3	2.06	2.27	0.00	1.85	1.21	0.34	0.19	2.06
	TiO2	4.17	8.32	0.00	1.40	0.27	0.45	1.53	2.42
	Fe2O3	46.04	51.97	65.53	58.46	60.57	65.01	58.73	54.47
	FeO	21.78	24.59	31.00	27.66	28.65	30.76	27.79	25.77
	Cr2O3	19.47	8.80	0.00	4.87	3.76	1.80	4.24	4.28
	V2O5	0.66	0.68	0.00	0.29	0.00	0.00	0.00	0.34
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.04	97.32	96.53	95.65	95.27	98.99	93.91	91.23
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-40** Depth: 713.60

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.20	0.17	0.43	0.41	0.13	0.44	0.07	0.10
	Al	0.11	0.04	0.23	0.22	0.00	0.25	0.00	0.00
	Ti	0.05	0.36	0.10	0.08	0.97	0.09	0.11	0.99
	Fe	2.26	2.30	1.32	1.38	0.79	1.24	2.79	0.79
	Cr	0.49	0.10	0.91	0.92	0.00	0.97	0.13	0.00
	V	0.00	0.01	0.01	0.00	0.01	0.00	0.02	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.10	2.99	3.00	3.01	1.89	3.00	3.12	1.88
Oxide %	**MgO**	2.26	2.07	5.22	4.78	3.07	4.73	0.80	2.42
	Al2O3	3.04	1.36	6.90	6.46	0.00	6.84	0.00	0.00
	TiO2	1.10	8.93	2.47	1.79	46.15	1.94	2.45	46.05
	Fe2O3	49.39	55.73	30.66	30.93	25.03	25.40	60.84	24.66
	FeO	23.37	26.37	14.50	14.63	22.52	12.02	28.78	22.19
	Cr2O3	21.08	4.82	41.49	40.49	0.35	38.86	5.51	0.00
	V2O5	0.00	0.82	0.34	0.00	0.80	0.00	0.98	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.24	100.10	101.58	99.07	97.91	89.79	99.36	95.31
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.34	0.20	0.38	0.08	0.07	0.11	0.07	0.17
	Al	0.20	0.15	0.19	0.04	0.05	0.05	0.04	0.10
	Ti	0.07	0.04	0.06	0.11	0.13	0.17	0.05	0.05
	Fe	1.57	1.93	1.43	2.73	2.76	2.68	3.02	2.28
	Cr	0.85	0.73	0.94	0.13	0.08	0.08	0.00	0.49
	V	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	3.05	3.01	3.12	3.11	3.09	3.19	3.10
Oxide %	**MgO**	4.01	2.27	4.43	0.98	0.85	1.26	0.76	1.96
	Al2O3	5.99	4.31	5.63	1.19	1.55	1.42	1.06	2.83
	TiO2	1.63	0.95	1.38	2.57	3.07	3.94	0.98	1.20
	Fe2O3	36.30	42.04	32.24	61.56	63.57	62.06	64.00	49.44
	FeO	17.17	19.89	15.25	29.12	30.07	29.36	30.28	23.39
	Cr2O3	38.34	30.93	41.32	5.88	3.79	3.62	0.00	20.68
	V2O5	0.00	0.00	0.32	0.73	0.79	0.95	0.41	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.44	100.39	100.58	102.02	103.68	102.61	97.50	99.51
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

Drill Hole: WM00-01

Sample : **SW01-41** Depth: 718.40

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.00	0.24	0.03	0.16	0.00	0.00	0.00	0.00
	Al	0.00	0.14	0.02	0.06	0.02	0.00	0.00	0.00
	Ti	0.00	0.09	0.02	0.08	0.00	0.98	0.00	0.02
	Fe	3.17	2.04	3.02	2.77	3.12	0.90	3.15	3.12
	Cr	0.04	0.56	0.09	0.09	0.05	0.00	0.06	0.06
	V	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.21	3.06	3.18	3.17	3.19	1.87	3.20	3.19
Oxide %	**MgO**	0.00	2.84	0.33	1.92	0.00	0.00	0.00	0.00
	Al2O3	0.00	4.21	0.66	1.76	0.59	0.00	0.00	0.00
	TiO2	0.00	2.14	0.42	1.97	0.00	46.61	0.00	0.37
	Fe2O3	69.09	46.74	67.25	62.95	68.63	28.49	68.85	69.60
	FeO	32.69	22.11	31.82	29.78	32.47	25.64	32.57	32.93
	Cr2O3	1.56	25.10	3.84	3.77	2.10	0.00	2.38	2.53
	V2O5	0.00	0.00	0.37	0.00	0.39	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.34	103.14	104.70	102.16	104.19	100.75	103.80	105.43
	Class	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11
Atomic	**Mg**	0.00	0.00	0.00
	Al	0.04	0.00	0.00
	Ti	0.03	0.00	0.00
	Fe	3.00	3.14	3.16
	Cr	0.11	0.06	0.05
	V	0.00	0.00	0.00
	Mn	0.00	0.00	0.00
	Total	3.17	3.20	3.21
Oxide %	**MgO**	0.00	0.00	0.00
	Al2O3	1.11	0.00	0.00
	TiO2	0.58	0.00	0.00
	Fe2O3	67.17	68.45	69.31
	FeO	31.78	32.38	32.79
	Cr2O3	4.88	2.66	2.03
	V2O5	0.00	0.00	0.00
	MnO	0.00	0.00	0.00
	Total	105.53	103.49	104.14
	Class	Unk	Unk	Unk

Drill Hole: WM98-05
Sample : **SW98-5-02** Depth: 17.62

		Oxide 1	Oxide 2
Atomic	**Mg**	0.38	0.38
	Al	0.25	0.26
	Ti	0.20	0.21
	Fe	1.80	1.77
	Cr	0.39	0.39
	V	0.01	0.01
	Mn	0.00	0.00
	Total	3.03	3.02
Oxide %	**MgO**	4.69	4.78
	Al2O3	7.90	8.39
	TiO2	4.95	5.26
	Fe2O3	43.48	43.36
	FeO	20.57	20.52
	Cr2O3	18.14	18.53
	V2O5	0.62	0.55
	MnO	0.00	0.00
	Total	100.36	101.39
	Class	Unk	Unk

Drill Hole: WM98-05
Sample : SW98-5-03 Depth: 25.10

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.10	0.22	0.20	0.38	0.43	0.43	0.09	0.06
	Al	0.01	0.13	0.14	0.26	0.28	0.27	0.03	0.01
	Ti	0.99	0.17	0.06	0.15	0.15	0.15	0.02	0.02
	Fe	0.77	2.23	2.20	1.69	1.65	1.67	3.03	3.04
	Cr	0.00	0.30	0.47	0.54	0.52	0.50	0.03	0.06
	V	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.87	3.06	3.08	3.03	3.04	3.04	3.21	3.20
Oxide %	**MgO**	2.49	2.74	2.39	4.79	5.42	5.44	1.08	0.68
	Al2O3	0.49	4.21	4.18	8.35	8.79	8.71	0.85	0.40
	TiO2	49.06	4.19	1.43	3.60	3.79	3.79	0.48	0.47
	Fe2O3	25.53	53.24	49.64	40.80	40.23	40.52	66.53	68.36
	FeO	22.97	25.19	23.49	19.30	19.03	19.17	31.47	32.34
	Cr2O3	0.44	13.93	20.55	25.56	24.69	23.82	1.23	2.75
	V2O5	0.00	0.48	0.52	0.57	0.36	0.39	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.98	103.97	102.20	102.99	102.30	101.84	101.64	105.00
	Class	BMS	BM	BM	IM	IM	IM	BMS	BMs

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.06	0.12	0.42	0.40	0.39	0.15	0.26	0.00
	Al	0.00	0.06	0.30	0.30	0.28	0.12	0.19	0.00
	Ti	1.02	0.00	0.15	0.13	0.15	0.09	0.21	0.00
	Fe	0.74	2.97	1.65	1.69	1.73	2.25	1.96	3.22
	Cr	0.00	0.07	0.52	0.52	0.49	0.45	0.39	0.00
	V	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
	Mn	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.85	3.21	3.04	3.04	3.04	3.06	3.02	3.22
Oxide %	**MgO**	1.46	1.28	5.37	5.02	4.91	1.69	3.23	0.00
	Al2O3	0.00	1.76	9.58	9.54	8.84	3.61	6.01	0.00
	TiO2	51.25	0.00	3.77	3.39	3.87	2.10	5.07	0.00
	Fe2O3	24.58	63.47	40.43	41.40	42.09	50.64	47.11	71.34
	FeO	22.12	30.03	19.13	19.59	19.91	23.96	22.29	33.75
	Cr2O3	0.00	2.75	24.85	24.83	23.27	19.56	18.24	0.00
	V2O5	0.00	0.00	0.00	0.00	0.00	0.45	0.36	0.00
	MnO	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.09	99.28	103.13	103.78	102.90	102.00	102.31	105.09
	Class	BM	BM	IM	IM	IM	BM	BM	BMs

Drill Hole: WM98-05

Sample : **SW98-5-09** Depth: 189.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.50	0.29	0.30	0.26	0.29	0.32	0.25	0.28
	Al	0.34	0.21	0.18	0.20	0.25	0.11	0.21	0.17
	Ti	0.06	0.10	0.17	0.05	0.07	0.27	0.08	0.05
	Fe	1.49	1.85	1.81	2.01	1.78	1.74	1.96	2.07
	Cr	0.68	0.59	0.54	0.54	0.64	0.54	0.54	0.52
	V	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.07	3.04	3.01	3.07	3.04	2.97	3.05	3.09
Oxide %	**MgO**	6.10	3.48	3.70	3.17	3.53	4.08	3.05	3.28
	Al2O3	10.56	6.44	5.67	6.33	7.73	3.48	6.42	4.97
	TiO2	1.45	2.34	4.24	1.25	1.79	6.76	2.02	1.22
	Fe2O3	35.34	43.09	43.57	47.32	41.47	43.02	46.45	47.49
	FeO	16.72	20.39	20.61	22.39	19.62	20.36	21.98	22.47
	Cr2O3	31.63	26.67	25.53	25.08	29.03	26.06	24.91	23.50
	V2O5	0.00	0.37	0.39	0.45	0.00	0.59	0.45	0.30
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.80	102.79	103.71	105.99	103.16	104.34	105.27	103.23
	Class	IM	Unk	BM	BM	BM	BM	BM	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15
Atomic	**Mg**	0.32	0.31	0.51	0.30	0.16	0.43	0.35
	Al	0.21	0.20	0.30	0.22	0.00	0.30	0.23
	Ti	0.15	0.14	0.11	0.12	0.96	0.18	0.13
	Fe	1.76	1.80	1.39	1.81	0.78	1.49	1.71
	Cr	0.56	0.56	0.72	0.58	0.00	0.59	0.60
	V	0.01	0.01	0.00	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	3.03	3.04	3.03	1.91	3.00	3.03
Oxide %	**MgO**	4.08	4.00	6.33	3.73	3.96	5.57	4.41
	Al2O3	6.73	6.52	9.49	6.76	0.00	9.62	7.26
	TiO2	3.80	3.59	2.69	2.82	47.83	4.62	3.10
	Fe2O3	43.54	44.07	33.32	42.85	25.98	36.78	41.01
	FeO	20.60	20.85	15.76	20.27	23.38	17.40	19.40
	Cr2O3	27.24	26.69	33.56	26.82	0.47	28.44	28.19
	V2O5	0.68	0.54	0.00	0.34	0.00	0.61	0.54
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	106.67	106.25	101.14	103.60	101.61	103.04	103.92
	Class	BM	BM	IM	BM	SBM	IM	BM

Drill Hole: WM98-05

Sample : **SW98-5-10** Depth: 193.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.41	0.51	0.73	0.45	0.71	0.68	0.53	0.45
	Al	0.30	0.34	0.24	0.24	0.24	0.25	0.27	0.35
	Ti	0.16	0.07	0.19	0.15	0.16	0.17	0.14	0.15
	Fe	1.53	1.42	1.17	1.34	1.22	1.21	1.38	1.44
	Cr	0.60	0.70	0.71	0.80	0.70	0.72	0.71	0.60
	V	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.05	3.05	2.99	3.05	3.04	3.03	3.00
Oxide %	**MgO**	5.27	6.25	9.50	5.61	9.34	9.14	6.70	5.74
	Al2O3	9.79	10.52	8.03	7.56	8.09	8.39	8.69	11.26
	TiO2	4.09	1.77	4.87	3.82	4.25	4.57	3.55	3.85
	Fe2O3	37.88	33.51	29.62	32.10	30.66	31.47	33.62	35.13
	FeO	17.92	15.85	14.01	15.19	14.50	14.89	15.90	16.62
	Cr2O3	28.98	32.29	35.09	37.31	34.71	36.26	33.85	28.59
	V2O5	0.37	0.30	0.00	0.57	0.46	0.45	0.00	0.68
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	104.31	100.50	101.13	102.16	102.02	105.17	102.32	101.87
	Class	BM	IM	BM	IM	BM	BM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.36	0.46	0.46	0.46	0.73	0.73	0.74	0.58
	Al	0.23	0.29	0.30	0.25	0.23	0.25	0.25	0.26
	Ti	0.15	0.19	0.17	0.13	0.16	0.18	0.18	0.16
	Fe	1.69	1.38	1.35	1.41	1.15	1.18	1.15	1.34
	Cr	0.57	0.67	0.71	0.75	0.77	0.70	0.72	0.70
	V	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.99	2.99	3.01	3.05	3.05	3.04	3.04
Oxide %	**MgO**	4.53	5.90	5.87	5.74	9.30	9.83	9.72	7.69
	Al2O3	7.16	9.54	9.49	7.84	7.56	8.67	8.18	8.75
	TiO2	3.74	4.85	4.34	3.32	3.99	4.77	4.80	4.07
	Fe2O3	40.76	34.32	33.24	33.86	28.55	30.69	29.17	33.98
	FeO	19.29	16.24	15.73	16.02	13.51	14.52	13.80	16.07
	Cr2O3	27.07	32.71	34.06	35.03	37.42	35.90	35.60	34.71
	V2O5	0.71	0.00	0.00	0.37	0.36	0.43	0.39	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.26	103.56	102.71	102.19	100.68	104.81	101.67	105.28
	Class	BM	IM	IM	IM	BM	BM	BM	BM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21
Atomic	**Mg**	0.75	0.76	0.43	0.45	0.50
	Al	0.26	0.25	0.26	0.32	0.31
	Ti	0.17	0.17	0.19	0.15	0.14
	Fe	1.20	1.15	1.45	1.33	1.29
	Cr	0.69	0.72	0.65	0.73	0.75
	V	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00
	Total	3.07	3.05	2.99	2.99	3.00
Oxide %	**MgO**	9.80	10.15	5.42	5.59	6.28
	Al2O3	8.43	8.31	8.28	10.26	9.92
	TiO2	4.42	4.62	4.75	3.74	3.55
	Fe2O3	30.13	29.55	35.09	32.14	31.12
	FeO	14.26	13.98	16.60	15.21	14.72
	Cr2O3	33.73	35.97	30.99	34.46	35.18
	V2O5	0.00	0.46	0.32	0.37	0.39
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	100.77	103.05	101.46	101.77	101.18
	Class	BM	BM	IM	IM	IM

Drill Hole: WM98-05

Sample : **SW98-5-13** Depth: 311.02

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.50	0.28	0.22	0.48	0.49	0.48	0.22	0.45
	Al	0.28	0.21	0.14	0.29	0.28	0.28	0.20	0.28
	Ti	0.14	0.18	0.15	0.16	0.14	0.14	0.08	0.15
	Fe	1.36	1.74	2.01	1.37	1.36	1.36	2.05	1.39
	Cr	0.73	0.57	0.50	0.69	0.73	0.73	0.51	0.72
	V	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.99	3.03	3.00	3.01	3.01	3.06	3.00
Oxide %	**MgO**	6.22	3.52	2.60	6.12	6.05	5.84	2.59	5.59
	Al2O3	8.98	6.67	4.29	9.32	8.62	8.75	5.95	8.84
	TiO2	3.55	4.37	3.65	4.12	3.54	3.40	1.79	3.62
	Fe2O3	32.93	41.89	46.99	33.36	32.41	31.94	46.45	33.54
	FeO	15.58	19.82	22.23	15.78	15.34	15.11	21.98	15.87
	Cr2O3	34.35	27.02	22.67	32.81	33.87	33.62	22.49	33.89
	V2O5	0.00	0.50	0.39	0.43	0.50	0.39	0.32	0.55
	MnO	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.05	103.79	102.84	101.93	100.32	99.05	101.57	101.91
	Class	IM	BM	SBM	IM	IM	IM	BM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.48	0.21	0.29	0.45	0.22	0.21	0.41	0.49
	Al	0.28	0.11	0.28	0.27	0.15	0.15	0.30	0.30
	Ti	0.16	0.19	0.19	0.16	0.15	0.19	0.24	0.26
	Fe	1.38	1.98	1.58	1.43	1.96	1.98	1.43	1.44
	Cr	0.71	0.51	0.61	0.69	0.53	0.48	0.59	0.49
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.01	2.96	3.01	3.02	3.01	2.97	2.99
Oxide %	**MgO**	6.04	2.67	3.62	5.74	2.74	2.69	5.19	6.48
	Al2O3	8.90	3.40	8.75	8.64	4.57	4.67	9.56	10.01
	TiO2	3.94	4.62	4.70	3.90	3.70	4.79	6.09	6.92
	Fe2O3	33.70	47.64	37.68	34.88	45.99	48.57	35.25	36.87
	FeO	15.94	22.54	17.82	16.50	21.76	22.98	16.68	17.44
	Cr2O3	33.95	23.82	28.56	32.84	24.23	22.92	28.24	24.50
	V2O5	0.34	0.52	0.46	0.41	0.41	0.37	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.80	105.21	101.59	102.91	103.41	106.98	101.00	102.23
	Class	IM	BM	BM	IM	BM	BM	BM	BM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20
Atomic	**Mg**	0.48	0.60	0.55	0.61
	Al	0.25	0.28	0.28	0.28
	Ti	0.17	0.25	0.26	0.26
	Fe	1.38	1.32	1.37	1.31
	Cr	0.72	0.54	0.53	0.53
	V	0.00	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	3.01	3.01	3.00	3.00
Oxide %	**MgO**	6.04	8.09	7.33	8.23
	Al2O3	7.88	9.66	9.45	9.67
	TiO2	4.30	6.67	6.87	6.91
	Fe2O3	33.27	34.31	35.05	34.22
	FeO	15.74	16.23	16.58	16.19
	Cr2O3	34.00	27.21	26.63	26.98
	V2O5	0.00	0.36	0.00	0.43
	MnO	0.00	0.00	0.00	0.00
	Total	101.22	102.53	101.92	102.62
	Class	BM	BM	BM	BM

Drill Hole: WM98-05

Sample : **SW98-5-14** Depth: 323.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.42	0.58	0.54	0.69	0.61	0.56	0.68	0.57
	Al	0.34	0.28	0.29	0.31	0.31	0.31	0.31	0.29
	Ti	0.16	0.13	0.20	0.27	0.27	0.15	0.29	0.25
	Fe	1.48	1.25	1.31	1.28	1.35	1.31	1.27	1.36
	Cr	0.61	0.77	0.67	0.46	0.46	0.69	0.47	0.54
	V	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.03	3.01	3.02	3.01	3.03	3.02	3.01
Oxide %	**MgO**	5.22	7.18	6.90	9.42	8.36	7.08	9.20	7.40
	Al2O3	10.54	8.81	9.18	10.64	10.77	10.09	10.51	9.52
	TiO2	3.92	3.19	4.97	7.27	7.42	3.74	7.61	6.31
	Fe2O3	35.19	29.83	32.24	33.75	35.63	32.13	32.98	34.04
	FeO	16.65	14.11	15.25	15.97	16.86	15.20	15.60	16.11
	Cr2O3	28.34	36.00	31.92	23.66	23.66	33.08	23.65	26.56
	V2O5	0.00	0.41	0.00	0.36	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.87	99.53	100.47	101.07	102.70	101.32	99.54	99.93
	Class	BM	IM	IM	BM	BM	IM	BM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.50	0.31	0.52	0.26	0.51	0.32	0.51	0.30
	Al	0.29	0.30	0.30	0.20	0.31	0.29	0.31	0.23
	Ti	0.26	0.14	0.16	0.13	0.16	0.16	0.16	0.27
	Fe	1.40	1.72	1.31	1.99	1.39	1.71	1.34	1.73
	Cr	0.54	0.53	0.71	0.46	0.65	0.51	0.67	0.45
	V	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	3.01	3.00	3.04	3.02	3.01	3.01	2.97
Oxide %	**MgO**	6.52	3.76	6.38	3.07	6.37	3.96	6.53	3.83
	Al2O3	9.50	9.33	9.50	5.93	9.84	9.05	10.13	7.46
	TiO2	6.84	3.44	3.85	3.20	3.94	4.02	4.09	6.77
	Fe2O3	35.44	40.69	31.43	46.18	33.46	40.98	33.00	42.83
	FeO	16.77	19.25	14.87	21.85	15.83	19.39	15.61	20.26
	Cr2O3	26.66	24.53	33.12	20.83	30.64	23.85	32.18	21.62
	V2O5	0.00	0.37	0.46	0.45	0.00	0.46	0.36	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.73	101.38	99.63	101.51	100.08	101.71	101.90	102.78
	Class	BM	BM	IM	BM	IM	BM	IM	BM

Drill Hole: WM98-05

Sample : SW98-5-15 Depth: 348.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.51	0.62	0.39	0.51	0.54	0.44	0.37	0.52
	Al	0.31	0.26	0.32	0.29	0.31	0.32	0.33	0.28
	Ti	0.20	0.17	0.21	0.23	0.22	0.25	0.14	0.24
	Fe	1.37	1.28	1.57	1.44	1.38	1.44	1.70	1.41
	Cr	0.61	0.70	0.51	0.54	0.54	0.51	0.50	0.53
	V	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.03	3.00	3.00	3.01	2.97	3.03	3.00
Oxide %	**MgO**	6.42	7.88	4.93	6.43	6.96	5.80	4.58	6.88
	Al2O3	9.69	8.37	10.39	9.49	10.28	10.51	10.32	9.43
	TiO2	5.04	4.19	5.21	5.77	5.66	6.51	3.40	6.39
	Fe2O3	33.30	31.71	38.85	35.29	34.66	36.27	41.13	36.01
	FeO	15.75	15.00	18.38	16.69	16.40	17.16	19.46	17.03
	Cr2O3	29.00	33.66	24.50	25.81	26.57	25.20	23.77	26.44
	V2O5	0.00	0.45	0.00	0.00	0.34	0.45	0.00	0.34
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.20	101.25	102.25	99.49	100.86	101.89	102.65	102.52
	Class	BM	BM	Unk	BM	BM	BM	BM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14
Atomic	**Mg**	0.53	0.49	0.43	0.34	0.51	0.68
	Al	0.33	0.33	0.31	0.28	0.32	0.25
	Ti	0.16	0.16	0.26	0.17	0.15	0.23
	Fe	1.29	1.31	1.45	1.77	1.34	1.25
	Cr	0.68	0.68	0.51	0.46	0.67	0.60
	V	0.01	0.01	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	2.99	2.97	3.03	3.01	3.03
Oxide %	**MgO**	6.70	6.32	5.61	4.39	6.45	9.21
	Al2O3	10.58	10.69	10.15	9.24	10.37	8.56
	TiO2	4.12	4.12	6.62	4.37	3.89	6.29
	Fe2O3	31.74	32.30	36.42	44.09	32.83	32.71
	FeO	15.02	15.28	17.23	20.86	15.53	15.47
	Cr2O3	32.77	32.92	25.01	22.44	32.11	30.45
	V2O5	0.45	0.70	0.48	0.00	0.37	0.39
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.38	102.32	101.52	105.39	101.56	103.07
	Class	IM	IM	BM	BM	IM	BM

Drill Hole: WM98-05

Sample : **SW98-5-16** Depth: 355.65

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.35	0.54	0.53	0.26	0.24	0.22	0.28	0.26
	Al	0.14	0.30	0.30	0.14	0.12	0.13	0.17	0.13
	Ti	0.28	0.16	0.17	0.19	0.25	0.21	0.22	0.20
	Fe	1.63	1.28	1.30	1.86	1.80	1.88	1.74	1.86
	Cr	0.57	0.73	0.71	0.55	0.55	0.54	0.57	0.56
	V	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.97	3.01	3.01	3.01	2.96	2.99	2.98	3.00
Oxide %	**MgO**	4.49	6.73	6.78	3.12	2.92	2.72	3.55	3.28
	Al2O3	4.57	9.39	9.81	4.38	3.70	4.06	5.23	4.01
	TiO2	7.12	4.09	4.24	4.60	6.06	5.14	5.51	5.00
	Fe2O3	40.30	31.01	32.06	43.84	43.25	45.34	42.00	44.82
	FeO	19.06	14.67	15.17	20.74	20.46	21.45	19.87	21.20
	Cr2O3	27.58	34.22	34.45	25.39	25.90	25.36	26.75	26.22
	V2O5	0.00	0.00	0.00	0.00	0.54	0.45	0.34	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.13	100.10	102.51	102.07	102.82	104.52	103.24	104.54
	Class	BM	IM	IM	BM	BM	BM	IM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.52	0.57	0.28	0.26	0.59	0.48	0.51	0.51
	Al	0.29	0.30	0.20	0.14	0.33	0.29	0.29	0.30
	Ti	0.18	0.16	0.10	0.21	0.17	0.18	0.18	0.17
	Fe	1.33	1.29	1.88	1.81	1.24	1.34	1.34	1.35
	Cr	0.67	0.68	0.57	0.57	0.69	0.68	0.68	0.68
	V	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.02	3.04	3.00	3.02	2.99	3.00	3.01
Oxide %	**MgO**	6.52	7.33	3.43	3.25	7.76	6.12	6.55	6.37
	Al2O3	9.18	9.83	6.31	4.40	10.90	9.52	9.54	9.35
	TiO2	4.40	4.14	2.49	5.07	4.42	4.65	4.65	4.30
	Fe2O3	32.07	31.88	44.57	43.54	31.59	33.02	33.23	32.51
	FeO	15.17	15.08	21.09	20.60	14.94	15.62	15.72	15.38
	Cr2O3	31.78	32.90	26.50	26.88	34.36	32.97	33.15	32.01
	V2O5	0.55	0.54	0.32	0.00	0.00	0.45	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.68	101.69	104.70	103.74	103.98	102.35	102.85	99.93
	Class	IM	IM	IM	BM	IM	IM	IM	IM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.26	0.57	0.29	0.68	0.68	0.65	0.24	0.20
	Al	0.14	0.23	0.17	0.27	0.26	0.26	0.17	0.12
	Ti	0.43	0.28	0.49	0.23	0.23	0.23	0.38	0.67
	Fe	1.51	1.36	1.33	1.20	1.21	1.26	1.49	1.16
	Cr	0.53	0.56	0.54	0.64	0.63	0.61	0.57	0.54
	V	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.87	3.00	2.83	3.02	3.02	3.01	2.87	2.70
Oxide %	**MgO**	3.47	7.66	4.01	9.00	9.04	8.81	3.10	2.85
	Al2O3	4.55	7.71	6.07	9.13	8.81	8.94	5.65	4.31
	TiO2	11.43	7.41	13.53	6.07	5.94	6.29	9.93	19.44
	Fe2O3	38.77	35.22	35.64	30.85	30.86	33.15	37.58	32.70
	FeO	18.34	16.66	16.86	14.60	14.60	15.68	17.78	15.47
	Cr2O3	26.66	28.43	28.41	31.88	31.42	31.41	28.19	29.74
	V2O5	0.00	0.00	0.00	0.00	0.54	0.43	0.45	0.55
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.22	103.09	104.52	101.53	101.20	104.71	102.67	105.06
	Class	BM	BM	BM	IM	IM	BM	BM	BM

Drill Hole: WM98-05

Sample : **SW98-5-18** Depth: 382.60

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.36	0.41	0.23	0.48	0.48	0.20	0.34	0.43
	Al	0.28	0.32	0.14	0.33	0.33	0.11	0.18	0.28
	Ti	0.21	0.19	0.08	0.18	0.18	0.21	0.24	0.19
	Fe	1.56	1.44	2.01	1.36	1.35	1.84	1.56	1.41
	Cr	0.56	0.62	0.60	0.64	0.66	0.60	0.64	0.66
	V	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	2.98	3.06	3.00	3.00	2.97	2.97	2.98
Oxide %	**MgO**	4.64	5.17	2.67	6.28	6.07	2.37	4.20	5.39
	Al2O3	8.99	10.05	4.23	10.69	10.54	3.51	5.80	9.01
	TiO2	5.27	4.60	1.75	4.55	4.55	5.16	5.84	4.82
	Fe2O3	38.33	34.67	45.00	34.06	33.03	43.09	37.53	34.58
	FeO	18.13	16.40	21.29	16.12	15.62	20.39	17.76	16.36
	Cr2O3	26.72	29.03	26.05	31.13	31.72	27.43	30.11	31.60
	V2O5	0.59	0.61	0.00	0.57	0.00	0.57	0.00	0.36
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.67	100.53	100.98	103.42	101.53	102.53	101.23	102.12
	Class	IM	IM	BM	IM	IM	BM	BM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.58	0.38	0.65	0.45	0.57	0.56	0.46	0.47
	Al	0.24	0.25	0.27	0.32	0.25	0.26	0.28	0.34
	Ti	0.19	0.17	0.27	0.18	0.23	0.22	0.17	0.16
	Fe	1.29	1.59	1.29	1.38	1.35	1.35	1.43	1.35
	Cr	0.72	0.61	0.53	0.65	0.60	0.62	0.67	0.67
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.00	3.01	2.99	3.00	3.01	3.01	3.00
Oxide %	**MgO**	7.25	4.76	8.91	5.65	7.33	7.35	5.80	6.02
	Al2O3	7.56	8.09	9.26	10.09	8.07	8.52	8.81	10.75
	TiO2	4.64	4.19	7.27	4.39	5.97	5.64	4.17	4.10
	Fe2O3	31.31	38.81	34.29	33.23	33.37	34.47	34.39	33.03
	FeO	14.81	18.36	16.22	15.72	15.79	16.31	16.27	15.62
	Cr2O3	33.97	29.10	27.21	30.78	28.94	30.68	31.61	31.88
	V2O5	0.34	0.39	0.48	0.34	0.45	0.43	0.00	0.43
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.87	103.70	103.64	100.20	99.92	103.40	101.06	101.83
	Class	BM	BM	BM	IM	BM	BM	IM	IM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22	Oxide 23	Oxide 24
Atomic	**Mg**	0.42	0.46	0.23	0.42	0.26	0.58	0.58	0.41
	Al	0.17	0.32	0.12	0.27	0.16	0.23	0.24	0.27
	Ti	0.25	0.20	0.21	0.22	0.14	0.24	0.23	0.18
	Fe	1.63	1.43	1.95	1.52	1.92	1.31	1.35	1.46
	Cr	0.51	0.59	0.49	0.56	0.55	0.64	0.61	0.67
	V	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.00	3.01	2.99	3.03	3.01	3.01	2.99
Oxide %	**MgO**	5.36	5.92	2.79	5.39	3.18	7.76	7.58	5.19
	Al2O3	5.56	10.28	3.68	8.69	4.95	7.75	8.01	8.60
	TiO2	6.46	5.04	5.04	5.54	3.54	6.21	5.89	4.45
	Fe2O3	40.25	35.36	45.59	37.98	46.32	33.75	34.01	35.90
	FeO	19.04	16.73	21.57	17.97	21.91	15.97	16.09	16.98
	Cr2O3	24.72	28.47	22.46	27.32	25.74	32.27	30.01	32.14
	V2O5	0.64	0.00	0.00	0.34	0.32	0.00	0.43	0.54
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.02	101.79	101.13	103.22	105.96	103.71	102.01	103.80
	Class	BM	IM	BM	IM	BM	BM	BM	IM

		Oxide 25	Oxide 26	Oxide 27	Oxide 28	Oxide 29	Oxide 30	Oxide 31	Oxide 32
Atomic	**Mg**	0.40	0.44	0.66	0.52	0.69	0.66	0.43	0.56
	Al	0.30	0.26	0.21	0.22	0.22	0.23	0.25	0.24
	Ti	0.20	0.21	0.17	0.17	0.18	0.17	0.17	0.15
	Fe	1.50	1.48	1.24	1.35	1.21	1.22	1.45	1.32
	Cr	0.57	0.60	0.75	0.74	0.74	0.74	0.69	0.74
	V	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	3.00	3.04	3.01	3.04	3.03	3.00	3.02
Oxide %	**MgO**	5.04	5.75	8.42	6.65	9.10	8.57	5.39	7.18
	Al2O3	9.66	8.54	6.90	7.10	7.50	7.58	7.78	7.67
	TiO2	5.14	5.44	4.19	4.34	4.64	4.49	4.30	3.85
	Fe2O3	36.82	37.01	30.49	33.50	30.91	30.82	34.90	32.57
	FeO	17.42	17.51	14.43	15.85	14.62	14.58	16.51	15.41
	Cr2O3	27.32	29.52	36.12	35.87	37.05	36.54	32.61	35.43
	V2O5	0.39	0.00	0.50	0.34	0.43	0.34	0.32	0.68
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.79	103.77	101.04	103.65	104.26	102.92	101.82	102.79
	Class	IM	IM	BM	BM	BM	BM	IM	BM

Drill Hole: WM98-05

Sample : **SW98-5-29** Depth: 387.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.44	0.40	0.26	0.44	0.22	0.47	0.53	0.51
	Al	0.28	0.29	0.12	0.30	0.18	0.28	0.33	0.31
	Ti	0.23	0.23	0.22	0.19	0.19	0.19	0.17	0.18
	Fe	1.45	1.42	1.80	1.48	1.90	1.43	1.29	1.28
	Cr	0.57	0.63	0.56	0.58	0.49	0.61	0.68	0.71
	V	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	2.96	2.98	3.00	2.99	3.00	3.00	2.99
Oxide %	**MgO**	5.62	5.09	3.20	5.64	2.82	6.12	6.75	6.45
	Al2O3	9.09	9.41	3.91	9.49	5.74	9.18	10.75	9.86
	TiO2	5.76	5.91	5.56	4.65	4.77	5.04	4.39	4.42
	Fe2O3	35.91	35.08	43.41	36.35	46.10	36.13	31.93	31.49
	FeO	16.99	16.60	20.54	17.20	21.81	17.09	15.11	14.90
	Cr2O3	27.67	30.30	26.45	27.92	23.37	30.23	32.84	34.08
	V2O5	0.36	0.00	0.64	0.43	0.62	0.48	0.41	0.46
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.39	102.39	103.72	101.66	105.24	104.27	102.18	101.67
	Class	IM	IM	Unk	IM	Unk	IM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.48	0.49	0.58	0.56	0.64	0.50	0.60	0.53
	Al	0.31	0.31	0.26	0.25	0.23	0.26	0.25	0.30
	Ti	0.17	0.18	0.22	0.23	0.20	0.20	0.20	0.18
	Fe	1.31	1.28	1.33	1.35	1.20	1.33	1.26	1.33
	Cr	0.72	0.73	0.63	0.60	0.76	0.70	0.69	0.65
	V	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.98	3.01	3.00	3.02	2.99	3.01	3.00
Oxide %	**MgO**	5.90	6.17	7.25	7.06	8.29	6.25	7.74	6.65
	Al2O3	9.71	9.84	8.11	8.05	7.44	8.35	8.14	9.71
	TiO2	4.20	4.47	5.54	5.84	4.99	4.94	4.99	4.50
	Fe2O3	31.52	31.50	32.24	33.04	29.84	32.44	31.33	32.47
	FeO	14.91	14.90	15.25	15.63	14.12	15.35	14.82	15.36
	Cr2O3	33.95	34.82	29.79	28.72	36.76	33.37	33.70	31.19
	V2O5	0.00	0.36	0.00	0.62	0.00	0.00	0.59	0.48
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.21	102.06	98.17	98.98	101.44	100.70	101.32	100.37
	Class	IM	IM	BM	BM	BM	IM	BM	IM

Drill Hole: WM98-05
Sample : **SW98-5-20** Depth: 394.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.53	0.53	0.51	0.37	0.28	0.52	0.47	0.20
	Al	0.36	0.34	0.35	0.16	0.17	0.36	0.34	0.15
	Ti	0.16	0.17	0.17	0.32	0.24	0.16	0.16	0.20
	Fe	1.25	1.25	1.29	1.55	1.72	1.24	1.33	1.94
	Cr	0.68	0.70	0.66	0.53	0.55	0.71	0.69	0.50
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.00	2.99	2.94	2.97	2.99	2.99	2.99
Oxide %	**MgO**	6.47	6.88	6.57	4.86	3.53	6.82	5.94	2.47
	Al2O3	11.26	11.26	11.39	5.39	5.39	11.79	11.05	4.57
	TiO2	3.99	4.30	4.44	8.49	5.92	4.10	4.12	4.82
	Fe2O3	29.65	31.52	32.04	39.63	41.60	31.08	32.63	46.16
	FeO	14.03	14.91	15.16	18.75	19.68	14.71	15.44	21.84
	Cr2O3	31.37	34.30	31.88	26.48	26.05	34.61	33.35	23.33
	V2O5	0.59	0.45	0.54	0.45	0.39	0.48	0.00	0.39
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	97.34	103.63	102.02	104.04	102.56	103.59	102.53	103.58
	Class	IM	IM	IM	IM	Unk	IM	IM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.48	0.26	0.52	0.24	0.38	0.47	0.22	0.43
	Al	0.32	0.18	0.38	0.21	0.23	0.34	0.17	0.30
	Ti	0.16	0.26	0.16	0.10	0.25	0.18	0.13	0.20
	Fe	1.41	1.70	1.31	1.93	1.58	1.34	1.96	1.45
	Cr	0.64	0.53	0.63	0.55	0.52	0.65	0.54	0.61
	V	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	2.95	3.00	3.04	2.98	2.99	3.03	2.99
Oxide %	**MgO**	6.28	3.28	6.95	3.00	4.94	5.97	2.67	5.56
	Al2O3	10.56	5.95	13.08	6.63	7.71	10.96	5.39	9.67
	TiO2	4.05	6.57	4.27	2.52	6.44	4.57	3.07	5.07
	Fe2O3	35.76	42.10	34.07	46.01	39.56	33.17	46.41	36.31
	FeO	16.92	19.92	16.12	21.77	18.72	15.69	21.96	17.18
	Cr2O3	31.61	25.86	32.16	25.71	25.56	31.23	24.73	29.67
	V2O5	0.43	0.77	0.37	0.00	0.43	0.55	0.57	0.45
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	105.63	104.45	107.02	105.65	103.36	102.15	104.80	103.90
	Class	IM	BM	IM	BM	IM	IM	BM	IM

Drill Hole: WM98-05

Sample : **SW98-5-21** Depth: 407.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.57	0.35	0.45	0.50	0.44	0.38	0.32	0.29
	Al	0.33	0.25	0.33	0.33	0.29	0.17	0.18	0.24
	Ti	0.15	0.09	0.19	0.14	0.21	0.25	0.22	0.11
	Fe	1.27	1.80	1.41	1.44	1.46	1.64	1.78	1.82
	Cr	0.69	0.57	0.60	0.63	0.58	0.53	0.50	0.57
	V	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	3.06	2.99	3.03	2.99	2.98	3.00	3.04
Oxide %	**MgO**	7.21	4.13	5.62	6.12	5.69	4.83	4.05	3.60
	Al2O3	10.64	7.65	10.51	10.39	9.50	5.48	5.84	7.50
	TiO2	3.75	2.12	4.72	3.35	5.46	6.31	5.57	2.72
	Fe2O3	31.11	41.15	34.26	34.11	36.48	40.62	43.95	42.88
	FeO	14.72	19.47	16.21	16.14	17.26	19.22	20.79	20.29
	Cr2O3	33.09	25.56	28.59	29.13	28.37	25.72	23.96	26.22
	V2O5	0.41	0.00	0.45	0.00	0.36	0.59	0.34	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.94	100.08	100.35	99.25	103.12	102.76	104.49	103.21
	Class	BM	IM	IM	IM	IM	BM	BM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.54	0.42	0.18	0.55	0.46	0.47	0.50	0.27
	Al	0.35	0.26	0.00	0.33	0.34	0.33	0.22	0.18
	Ti	0.13	0.21	0.96	0.16	0.18	0.18	0.22	0.13
	Fe	1.37	1.55	0.75	1.33	1.35	1.36	1.50	1.90
	Cr	0.64	0.56	0.01	0.65	0.65	0.65	0.57	0.53
	V	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.03	3.00	1.90	3.02	2.99	2.99	3.01	3.03
Oxide %	**MgO**	7.05	5.32	4.51	7.05	5.80	5.90	6.53	3.28
	Al2O3	11.54	8.18	0.00	10.79	10.85	10.58	7.22	5.50
	TiO2	3.37	5.27	48.80	4.04	4.42	4.44	5.77	3.17
	Fe2O3	34.46	37.52	25.35	32.74	32.84	32.90	38.06	44.24
	FeO	16.30	17.75	22.81	15.49	15.54	15.57	18.01	20.93
	Cr2O3	31.45	26.45	1.20	31.47	30.77	30.52	28.14	24.23
	V2O5	0.41	0.00	0.00	0.00	0.45	0.32	0.43	0.62
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	104.59	100.50	102.67	101.58	100.66	100.23	104.16	101.98
	Class	IM	IM	SBM	IM	IM	IM	BM	BM

Drill Hole: WM98-05

Sample : **SW98-5-22** Depth: 423.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.42	0.40	0.53	0.30	0.42	0.42	0.42	0.29
	Al	0.33	0.33	0.53	0.23	0.30	0.30	0.35	0.27
	Ti	0.20	0.18	0.07	0.23	0.18	0.18	0.17	0.07
	Fe	1.47	1.50	1.36	1.70	1.50	1.50	1.46	1.87
	Cr	0.55	0.57	0.57	0.52	0.60	0.60	0.59	0.54
	V	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	2.99	3.05	2.97	3.00	3.00	3.00	3.05
Oxide %	**MgO**	5.27	5.02	6.48	3.71	5.24	5.24	5.27	3.25
	Al2O3	10.49	10.28	16.50	7.24	9.54	9.54	11.17	7.69
	TiO2	4.95	4.44	1.65	5.64	4.37	4.37	4.19	1.62
	Fe2O3	35.69	35.93	32.12	41.12	36.05	36.05	35.36	41.03
	FeO	16.88	17.00	15.20	19.46	17.06	17.06	16.73	19.41
	Cr2O3	26.25	26.88	26.29	24.41	28.34	28.34	27.99	22.93
	V2O5	0.48	0.41	0.00	0.57	0.00	0.00	0.34	0.71
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.02	99.96	98.25	102.15	100.61	100.61	101.04	96.65
	Class	IM	IM	IM	BM	IM	IM	IM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.19	0.42	0.45	0.40	0.49	0.48	0.35	0.44
	Al	0.00	0.26	0.22	0.32	0.36	0.37	0.26	0.33
	Ti	0.98	0.18	0.17	0.22	0.19	0.19	0.18	0.20
	Fe	0.73	1.48	1.57	1.50	1.36	1.37	1.63	1.45
	Cr	0.00	0.65	0.61	0.55	0.58	0.59	0.56	0.56
	V	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.90	2.99	3.02	2.98	2.99	3.00	2.99	2.99
Oxide %	**MgO**	4.54	5.32	5.65	4.91	6.15	5.90	4.26	5.46
	Al2O3	0.00	8.50	7.01	10.01	11.41	11.45	7.95	10.45
	TiO2	47.23	4.59	4.32	5.36	4.82	4.69	4.34	5.05
	Fe2O3	23.33	36.69	38.09	35.84	32.82	32.60	38.20	35.07
	FeO	21.00	17.36	18.02	16.96	15.53	15.42	18.07	16.59
	Cr2O3	0.00	31.28	28.76	25.75	27.26	27.42	25.55	26.34
	V2O5	0.00	0.39	0.36	0.00	0.36	0.00	0.66	0.41
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	96.10	104.13	102.22	98.83	98.35	97.48	99.04	99.38
	Class	SBM	Unk	Unk	Unk	IM	IM	Unk	IM

		Oxide 17	Oxide 18	Oxide 19	Oxide 20	Oxide 21	Oxide 22
Atomic	**Mg**	0.41	0.30	0.31	0.32	0.47	0.27
	Al	0.34	0.28	0.27	0.29	0.36	0.17
	Ti	0.18	0.04	0.07	0.10	0.16	0.16
	Fe	1.49	1.87	1.84	1.73	1.30	1.84
	Cr	0.56	0.57	0.57	0.59	0.69	0.56
	V	0.01	0.01	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.99	3.07	3.05	3.04	2.99	3.01
Oxide %	**MgO**	5.11	3.43	3.57	3.81	5.82	3.30
	Al2O3	10.83	8.29	7.86	8.75	11.09	5.31
	TiO2	4.57	0.92	1.62	2.39	3.90	3.94
	Fe2O3	35.91	41.66	41.42	39.69	30.85	43.62
	FeO	16.99	19.71	19.60	18.78	14.60	20.64
	Cr2O3	26.35	24.79	24.98	26.53	31.75	25.88
	V2O5	0.45	0.41	0.50	0.00	0.50	0.36
	MnO	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.20	99.21	99.54	99.95	98.51	103.04
	Class	IM	BM	BM	BM	IM	Unk

Drill Hole: WM98-05

Sample : **SW98-5-23** Depth: 475.02

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.52	0.49	0.48	0.50	0.26	0.28	0.30	0.32
	Al	0.26	0.30	0.32	0.34	0.17	0.23	0.21	0.22
	Ti	0.18	0.12	0.12	0.13	0.22	0.06	0.17	0.15
	Fe	1.41	1.34	1.39	1.37	1.76	1.98	1.80	1.77
	Cr	0.64	0.76	0.72	0.68	0.55	0.53	0.51	0.55
	V	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	3.01	3.02	3.02	2.98	3.08	3.01	3.02
Oxide %	**MgO**	6.58	6.02	5.70	6.14	3.17	3.60	3.73	3.95
	Al2O3	8.20	9.43	9.75	10.45	5.35	7.46	6.52	6.84
	TiO2	4.54	2.87	2.74	3.17	5.42	1.53	4.19	3.70
	Fe2O3	34.35	31.92	32.09	32.37	41.50	48.51	42.67	42.25
	FeO	16.25	15.10	15.18	15.31	19.63	22.95	20.19	19.99
	Cr2O3	30.31	35.28	32.65	31.54	25.42	25.18	23.36	25.69
	V2O5	0.43	0.41	0.00	0.00	0.34	0.00	0.80	0.48
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.66	101.03	98.12	98.97	100.83	109.24	101.45	102.90
	Class	BM	IM	IM	IM	BM	BM	BM	BM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15
Atomic	**Mg**	0.45	0.28	0.43	0.27	0.44	0.43	0.32
	Al	0.26	0.23	0.27	0.21	0.29	0.22	0.20
	Ti	0.18	0.10	0.14	0.11	0.14	0.26	0.18
	Fe	1.45	1.86	1.49	1.84	1.46	1.51	1.74
	Cr	0.64	0.55	0.66	0.58	0.68	0.56	0.56
	V	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.02	0.00	0.00	0.00	0.00
	Total	3.00	3.04	3.02	3.03	3.01	2.98	3.00
Oxide %	**MgO**	5.64	3.35	5.27	3.25	5.42	5.54	3.88
	Al2O3	8.31	7.14	8.45	6.41	8.96	7.07	6.10
	TiO2	4.45	2.52	3.39	2.67	3.32	6.62	4.30
	Fe2O3	35.09	43.67	35.28	42.17	34.57	37.48	41.11
	FeO	16.60	20.66	16.69	19.95	16.35	17.73	19.45
	Cr2O3	30.40	25.14	30.36	25.80	31.42	26.95	25.87
	V2O5	0.46	0.50	0.37	0.62	0.41	0.41	0.50
	MnO	0.00	0.00	0.49	0.00	0.00	0.00	0.00
	Total	100.97	102.97	100.30	100.87	100.46	101.81	101.22
	Class	IM	BM	IM	BM	IM	BM	BM

Drill Hole: WM98-05

Sample : **SW98-5-24** Depth: 484.10

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.31	0.29	0.37	0.37	0.11	0.45	0.66	0.63
	Al	0.24	0.18	0.26	0.29	0.00	0.28	0.24	0.23
	Ti	0.14	0.17	0.17	0.21	0.98	0.16	0.23	0.21
	Fe	1.86	1.71	1.57	1.58	0.79	1.42	1.27	1.25
	Cr	0.47	0.62	0.61	0.52	0.00	0.68	0.60	0.68
	V	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.03	2.99	3.00	2.99	1.88	3.00	3.02	3.01
Oxide %	**MgO**	3.78	3.52	4.68	4.69	2.67	5.77	8.97	8.37
	Al2O3	7.46	5.74	8.11	9.30	0.00	8.94	8.16	7.71
	TiO2	3.50	4.27	4.25	5.19	47.93	4.15	6.24	5.47
	Fe2O3	44.14	40.65	38.19	38.29	25.61	35.02	33.14	31.86
	FeO	20.88	19.23	18.07	18.11	23.04	16.57	15.68	15.07
	Cr2O3	22.06	28.84	29.10	24.76	0.00	33.03	30.62	34.17
	V2O5	0.59	0.70	0.50	0.45	0.00	0.41	0.62	0.68
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.42	102.94	102.89	100.78	99.25	103.89	103.44	103.34
	Class	IM	BM	IM	IM	BM	IM	IM	BM

Drill Hole: WM98-05

Sample : **SW98-5-25** Depth: 489.13

		Oxide 1	Oxide 2
Atomic	**Mg**	0.43	0.26
	Al	0.31	0.17
	Ti	0.10	0.20
	Fe	1.58	1.82
	Cr	0.61	0.52
	V	0.01	0.01
	Mn	0.02	0.02
	Total	3.05	3.00
Oxide %	**MgO**	5.32	3.27
	Al2O3	9.69	5.25
	TiO2	2.39	5.02
	Fe2O3	37.64	43.84
	FeO	17.81	20.74
	Cr2O3	28.25	24.20
	V2O5	0.43	0.50
	MnO	0.50	0.44
	Total	102.03	103.27
	Class	IM	BM

Drill Hole: WM98-05

Sample : **SW98-5-26** Depth: 495.03

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.52	0.42	0.68	0.51	0.46	0.71	0.57	0.46
	Al	0.30	0.25	0.25	0.32	0.29	0.24	0.26	0.32
	Ti	0.14	0.21	0.31	0.12	0.11	0.18	0.20	0.13
	Fe	1.36	1.47	1.28	1.29	1.32	1.21	1.32	1.36
	Cr	0.70	0.64	0.47	0.78	0.81	0.71	0.66	0.74
	V	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	2.99	3.00	3.02	3.00	3.05	3.02	3.01
Oxide %	**MgO**	6.45	5.27	9.44	6.19	5.69	9.30	7.35	5.67
	Al2O3	9.47	7.95	8.82	9.94	8.99	7.82	8.45	9.92
	TiO2	3.52	5.21	8.56	2.90	2.77	4.69	5.17	3.25
	Fe2O3	32.77	35.82	34.23	30.12	31.26	30.62	32.91	32.62
	FeO	15.51	16.95	16.19	14.25	14.79	14.49	15.57	15.43
	Cr2O3	33.06	30.50	24.66	35.49	37.75	35.03	31.95	34.74
	V2O5	0.00	0.00	0.70	0.00	0.43	0.34	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.78	101.71	102.59	98.89	101.68	102.29	101.39	101.64
	Class	IM	IM	BM	IM	IM	BM	BM	IM

		Oxide 9	Oxide 10	Oxide 11
Atomic	**Mg**	0.61	0.63	0.33
	Al	0.24	0.26	0.20
	Ti	0.22	0.21	0.12
	Fe	1.28	1.27	1.78
	Cr	0.66	0.64	0.60
	V	0.01	0.01	0.01
	Mn	0.00	0.00	0.00
	Total	3.01	3.02	3.03
Oxide %	**MgO**	8.01	8.27	3.93
	Al2O3	8.12	8.62	6.08
	TiO2	5.67	5.59	2.77
	Fe2O3	32.41	32.43	41.04
	FeO	15.34	15.34	19.42
	Cr2O3	32.61	31.67	27.29
	V2O5	0.39	0.55	0.46
	MnO	0.00	0.00	0.00
	Total	102.56	102.48	101.00
	Class	BM	BM	BM

Drill Hole: WM98-05

Sample : **SW98-5-27** Depth: 520.90

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5
Atomic	**Mg**	0.38	0.45	0.57	0.73	0.65
	Al	0.23	0.32	0.26	0.23	0.25
	Ti	0.19	0.10	0.20	0.15	0.16
	Fe	1.57	1.42	1.39	1.11	1.19
	Cr	0.61	0.72	0.62	0.80	0.79
	V	0.01	0.01	0.00	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total	3.00	3.02	3.03	3.04	3.03
Oxide %	**MgO**	4.88	5.54	7.50	9.40	8.41
	Al2O3	7.54	10.22	8.58	7.63	8.07
	TiO2	4.75	2.54	5.09	3.87	4.07
	Fe2O3	38.48	34.12	35.18	27.73	29.45
	FeO	18.21	16.14	16.64	13.12	13.93
	Cr2O3	29.41	33.57	30.65	39.04	38.19
	V2O5	0.37	0.48	0.00	0.54	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	103.64	102.62	103.64	101.34	102.13
	Class	Unk	IM	BM	BM	BM

Drill Hole: WM98-05
Sample : **SW98-5-28** Depth: 544.40

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.27	0.41	0.45	0.44	0.42	0.46	0.40	0.48
	Al	0.14	0.10	0.24	0.24	0.24	0.17	0.27	0.17
	Ti	0.18	0.29	0.16	0.14	0.08	0.37	0.13	0.30
	Fe	1.89	1.76	1.46	1.50	1.45	1.56	1.52	1.59
	Cr	0.52	0.43	0.70	0.71	0.83	0.38	0.69	0.44
	V	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.00	3.01	3.02	3.02	2.96	3.01	2.99
Oxide %	**MgO**	3.35	5.29	5.77	5.56	5.02	6.40	4.91	6.43
	Al2O3	4.31	3.17	7.63	7.63	7.24	5.93	8.29	5.59
	TiO2	4.54	7.47	4.00	3.49	1.87	10.21	3.10	7.81
	Fe2O3	45.21	44.11	36.04	36.48	33.78	41.53	36.08	40.70
	FeO	21.39	20.87	17.05	17.26	15.98	19.65	17.07	19.26
	Cr2O3	24.48	21.15	33.57	33.72	37.65	19.56	32.14	22.14
	V2O5	0.54	0.75	0.50	0.00	0.34	0.75	0.32	0.75
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.81	102.82	104.58	104.14	101.89	104.03	101.92	102.69
	Class	BM	BM	BM	IM	IM	BM	IM	BM

Drill Hole: WM98-05
Sample : **SW98-5-30** Depth: 556.04

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.35	0.39	0.22	0.35	0.35	0.36	0.21	0.37
	Al	0.17	0.21	0.12	0.19	0.18	0.18	0.11	0.20
	Ti	0.07	0.05	0.19	0.05	0.08	0.05	0.24	0.09
	Fe	1.86	1.75	2.23	1.78	1.86	1.81	2.13	1.75
	Cr	0.63	0.68	0.28	0.69	0.61	0.68	0.32	0.64
	V	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.08	3.08	3.05	3.07	3.08	3.08	3.02	3.06
Oxide %	**MgO**	4.10	4.73	2.74	4.08	4.15	4.25	2.64	4.51
	Al2O3	5.20	6.24	3.65	5.73	5.48	5.57	3.48	6.08
	TiO2	1.58	1.28	4.64	1.05	1.77	1.22	5.84	2.20
	Fe2O3	42.16	40.56	52.99	40.06	42.67	41.76	51.56	41.09
	FeO	19.95	19.19	25.07	18.95	20.19	19.76	24.39	19.44
	Cr2O3	27.98	30.78	13.18	30.34	27.16	30.43	14.97	29.47
	V2O5	0.00	0.00	0.55	0.34	0.00	0.00	0.57	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.96	102.77	102.82	100.56	101.42	102.99	103.44	102.80
		Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.38	0.38	0.32	0.34	0.43	0.43	0.45	0.40
	Al	0.20	0.18	0.08	0.10	0.20	0.20	0.20	0.19
	Ti	0.08	0.04	0.27	0.29	0.05	0.08	0.08	0.06
	Fe	1.74	1.72	2.03	1.98	1.60	1.57	1.61	1.72
	Cr	0.67	0.74	0.31	0.29	0.79	0.77	0.72	0.70
	V	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.06	3.07	3.02	3.01	3.07	3.05	3.07	3.07
Oxide %	**MgO**	4.56	4.53	4.10	4.49	5.17	5.11	5.46	4.81
	Al2O3	6.07	5.63	2.63	3.21	6.08	6.01	5.99	5.88
	TiO2	1.85	0.97	6.96	7.57	1.15	1.95	1.95	1.52
	Fe2O3	40.68	39.96	50.88	50.45	37.26	36.03	37.38	40.07
	FeO	19.24	18.90	24.07	23.87	17.63	17.05	17.69	18.96
	Cr2O3	30.81	33.62	15.03	14.56	35.93	34.65	32.64	31.91
	V2O5	0.00	0.37	0.70	0.82	0.00	0.00	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	103.21	103.98	104.35	104.98	103.22	100.81	101.11	103.14
	Class	IM	IM	BM	BM	IM	IM	IM	IM

Drill Hole: WM98-05

Sample : **SW98-5-31** Depth: 564.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.37	0.43	0.33	0.33	0.18	0.11	0.37	0.31
	Al	0.18	0.19	0.20	0.19	0.10	0.00	0.14	0.19
	Ti	0.06	0.15	0.04	0.05	0.19	0.95	0.10	0.04
	Fe	1.74	1.75	1.86	1.80	2.31	0.83	1.74	1.95
	Cr	0.69	0.53	0.65	0.70	0.26	0.01	0.69	0.59
	V	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01
	Mn	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.07	3.05	3.08	3.07	3.05	1.90	3.05	3.08
Oxide %	**MgO**	4.36	5.22	3.88	3.83	2.17	2.59	4.38	3.58
	Al2O3	5.48	5.97	5.86	5.69	3.17	0.00	4.27	5.52
	TiO2	1.52	3.60	1.03	1.22	4.50	44.96	2.42	1.00
	Fe2O3	40.03	41.52	42.54	40.72	53.97	26.14	39.68	43.71
	FeO	18.94	19.64	20.13	19.27	25.54	23.52	18.77	20.68
	Cr2O3	30.75	24.32	28.95	30.87	11.88	0.60	30.68	25.81
	V2O5	0.32	0.50	0.00	0.00	0.62	0.00	0.00	0.37
	MnO	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.81	100.78	102.39	101.60	101.87	97.81	100.19	100.68
		Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.12	0.20	0.22	0.30	0.20	0.18	0.19	0.31
	Al	0.07	0.09	0.10	0.14	0.12	0.10	0.08	0.18
	Ti	0.11	0.15	0.18	0.21	0.20	0.14	0.25	0.05
	Fe	2.49	2.32	2.25	1.86	2.24	2.34	2.12	1.97
	Cr	0.27	0.29	0.31	0.50	0.27	0.29	0.35	0.57
	V	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.08	3.07	3.06	3.01	3.04	3.07	3.01	3.09
Oxide %	**MgO**	1.41	2.39	2.72	3.60	2.44	2.27	2.40	3.63
	Al2O3	2.19	2.82	3.04	4.38	3.87	3.04	2.65	5.46
	TiO2	2.74	3.69	4.45	5.05	4.79	3.52	6.11	1.08
	Fe2O3	57.95	54.35	54.06	43.76	53.55	56.55	51.48	44.81
	FeO	27.42	25.72	25.58	20.70	25.33	26.75	24.36	21.20
	Cr2O3	12.48	13.33	14.41	22.82	12.76	13.65	16.81	25.26
	V2O5	0.86	0.77	0.54	0.34	0.57	0.91	0.50	0.36
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	105.05	103.06	104.80	100.66	103.31	106.70	104.30	101.80
	Class	BM	IM	UM	BM	BM	IM	IM	IM

Drill Hole: WM98-05

Sample : **SW98-5-32** Depth: 570.50

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.00	0.17	0.37	0.40	0.34	0.34	0.30	0.44
	Al	0.00	0.11	0.18	0.18	0.18	0.18	0.14	0.21
	Ti	0.00	0.12	0.04	0.06	0.06	0.07	0.11	0.04
	Fe	3.22	2.37	1.58	1.66	1.85	1.85	1.91	1.42
	Cr	0.00	0.31	0.88	0.77	0.64	0.62	0.58	0.92
	V	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
	Total	3.22	3.09	3.05	3.06	3.08	3.07	3.05	3.04
Oxide %	**MgO**	0.00	2.02	4.26	4.78	4.00	4.03	3.66	5.31
	Al2O3	0.00	3.36	5.35	5.44	5.31	5.39	4.16	6.50
	TiO2	0.00	2.90	0.92	1.33	1.33	1.55	2.70	1.02
	Fe2O3	69.44	53.95	35.44	38.39	42.57	41.81	44.49	32.91
	FeO	32.85	25.52	16.77	18.16	20.14	19.78	21.05	15.57
	Cr2O3	0.00	13.83	38.32	34.82	28.78	27.36	26.25	41.52
	V2O5	0.00	0.00	0.00	0.00	0.00	0.34	0.48	0.00
	MnO	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
	Total	102.29	101.58	101.06	102.93	102.53	100.26	102.80	102.83
	Class	SBM	SBM	IM	IM	IM	IM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15
Atomic	**Mg**	0.39	0.32	0.26	0.17	0.31	0.11	0.39
	Al	0.22	0.21	0.19	0.12	0.09	0.10	0.18
	Ti	0.37	0.34	0.38	0.29	0.19	0.03	0.06
	Fe	1.77	1.91	1.87	2.16	1.99	2.58	1.62
	Cr	0.21	0.21	0.20	0.23	0.46	0.30	0.79
	V	0.01	0.00	0.01	0.01	0.01	0.01	0.01
	Mn	0.00	0.00	0.02	0.00	0.00	0.00	0.00
	Total	2.97	2.99	2.95	2.99	3.04	3.13	3.04
Oxide %	**MgO**	5.32	4.23	3.62	2.17	3.76	1.26	4.58
	Al2O3	7.54	7.01	6.69	3.78	2.68	3.00	5.27
	TiO2	10.08	8.76	10.29	7.29	4.60	0.62	1.52
	Fe2O3	46.97	48.39	49.59	52.63	47.12	57.20	37.02
	FeO	22.22	22.90	23.46	24.90	22.29	27.06	17.51
	Cr2O3	10.79	10.60	10.57	11.18	21.41	13.15	35.11
	V2O5	0.70	0.00	0.86	0.66	0.37	0.32	0.48
	MnO	0.00	0.00	0.50	0.00	0.00	0.00	0.00
	Total	103.61	101.88	105.57	102.61	102.25	102.62	101.48

Drill Hole: WM98-05

Sample : **SW98-5-33** Depth: 573.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.10	0.36	0.39	0.19	0.34	0.36	0.31	0.34
	Al	0.01	0.18	0.18	0.01	0.16	0.18	0.15	0.16
	Ti	0.95	0.07	0.06	0.94	0.07	0.05	0.21	0.07
	Fe	0.85	1.69	1.60	0.76	1.82	1.72	1.89	1.78
	Cr	0.00	0.75	0.82	0.01	0.67	0.74	0.45	0.72
	V	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.91	3.05	3.05	1.92	3.07	3.06	3.02	3.06
Oxide %	**MgO**	2.32	4.16	4.44	4.61	3.80	4.10	3.73	3.95
	Al2O3	0.45	5.25	5.23	0.30	4.61	5.12	4.65	4.69
	TiO2	42.52	1.65	1.42	44.18	1.62	1.13	4.94	1.50
	Fe2O3	25.33	37.42	35.28	23.73	39.82	37.77	44.17	39.89
	FeO	22.79	17.71	16.69	21.35	18.84	17.87	20.90	18.87
	Cr2O3	0.00	32.54	35.09	0.98	28.76	31.67	20.71	31.28
	V2O5	0.00	0.00	0.00	0.64	0.00	0.36	0.39	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	93.42	98.73	98.16	95.79	97.45	98.02	99.49	100.17
	Class	SBM	IM	IM	SBM	IM	IM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13
Atomic	**Mg**	0.35	0.33	0.35	0.35	0.41
	Al	0.19	0.18	0.11	0.19	0.20
	Ti	0.07	0.06	0.38	0.08	0.11
	Fe	1.78	1.86	1.86	1.73	1.50
	Cr	0.68	0.64	0.25	0.70	0.81
	V	0.00	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00
	Total	3.07	3.08	2.97	3.05	3.03
Oxide %	**MgO**	4.10	3.88	4.69	4.15	4.79
	Al2O3	5.54	5.33	3.80	5.56	5.95
	TiO2	1.55	1.37	9.98	1.85	2.42
	Fe2O3	39.83	41.65	48.06	39.36	33.42
	FeO	18.84	19.70	22.74	18.62	15.81
	Cr2O3	29.70	28.05	12.86	31.09	35.21
	V2O5	0.00	0.00	0.86	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00
	Total	99.56	99.97	102.99	100.63	97.61

Drill Hole: WM98-05

Sample : **SW98-5-34** Depth: 578.04

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.32	0.39	0.43	0.18	0.18	0.15	0.19	0.33
	Al	0.22	0.19	0.22	0.08	0.94	0.11	0.00	0.16
	Ti	0.13	0.05	0.05	0.23	0.02	0.07	0.95	0.06
	Fe	1.48	1.57	1.39	2.29	1.14	2.47	0.79	1.78
	Cr	0.83	0.84	0.94	0.25	0.64	0.30	0.00	0.74
	V	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.98	3.04	3.03	3.03	2.91	3.11	1.92	3.06
Oxide %	**MgO**	3.81	4.53	5.14	2.22	2.98	1.77	4.73	3.93
	Al2O3	6.54	5.73	6.50	2.44	39.49	3.25	0.00	4.63
	TiO2	3.00	1.07	1.13	5.64	0.80	1.72	47.30	1.33
	Fe2O3	33.93	35.47	31.95	55.10	36.72	56.77	26.13	40.47
	FeO	16.05	16.78	15.11	26.07	17.37	26.86	23.52	19.15
	Cr2O3	37.21	37.27	42.30	11.55	39.97	13.48	0.00	32.90
	V2O5	0.00	0.36	0.00	0.91	0.00	0.41	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.55	101.20	102.14	103.92	137.35	104.26	101.67	102.41
	Class	BM	IM	IM	BM	BM	SBM	SBM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12
Atomic	**Mg**	0.31	0.31	0.36	0.15
	Al	0.18	0.17	0.16	0.00
	Ti	0.06	0.05	0.11	0.92
	Fe	1.56	1.87	1.60	0.83
	Cr	0.90	0.68	0.80	0.01
	V	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	3.02	3.07	3.02	1.92
Oxide %	**MgO**	3.68	3.60	4.28	3.60
	Al2O3	5.56	4.93	4.89	0.00
	TiO2	1.42	1.13	2.54	43.98
	Fe2O3	35.82	42.46	36.52	26.48
	FeO	16.95	20.09	17.28	23.83
	Cr2O3	40.41	29.98	35.60	0.83
	V2O5	0.00	0.00	0.00	0.73
	MnO	0.00	0.00	0.00	0.00
	Total	103.84	102.19	101.11	99.44

Drill Hole: WM98-05
Sample : **SW98-5-35** Depth: 582.14

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.36	0.38	0.42	0.32	0.23	0.24	0.22	0.11
	Al	0.20	0.20	0.23	0.15	0.16	0.11	0.06	0.00
	Ti	0.07	0.06	0.06	0.15	0.05	0.14	0.20	0.97
	Fe	1.47	1.45	1.41	1.82	2.17	1.86	2.07	0.81
	Cr	0.91	0.93	0.90	0.59	0.49	0.67	0.45	0.00
	V	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.02	3.02	3.03	3.04	3.10	3.02	3.02	1.89
Oxide %	**MgO**	4.20	4.28	4.96	3.90	2.74	2.92	2.72	2.62
	Al2O3	5.74	5.63	6.76	4.69	4.67	3.33	1.87	0.00
	TiO2	1.62	1.33	1.50	3.60	1.10	3.24	5.04	46.50
	Fe2O3	32.92	31.78	31.91	42.45	48.88	42.78	49.69	25.78
	FeO	15.57	15.04	15.10	20.08	23.12	20.24	23.51	23.20
	Cr2O3	39.73	39.83	39.52	26.62	21.76	30.23	20.86	0.00
	V2O5	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	99.78	97.89	99.75	101.34	102.27	102.73	104.48	98.09
	Class	IM	IM	IM	BM	IM	IM	BM	SBM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.28	0.45	0.44	0.41	0.39	0.38	0.39	0.26
	Al	0.14	0.25	0.25	0.19	0.20	0.24	0.22	0.13
	Ti	0.26	0.06	0.08	0.10	0.07	0.08	0.17	0.18
	Fe	1.98	1.30	1.34	1.49	1.54	1.55	1.60	1.95
	Cr	0.36	0.95	0.91	0.84	0.83	0.80	0.62	0.50
	V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.01	3.02	3.02	3.03	3.04	3.03	3.01	3.02
Oxide %	**MgO**	3.55	5.34	5.19	4.96	4.66	4.44	4.84	3.13
	Al2O3	4.33	7.33	7.61	5.80	6.05	7.05	6.86	4.02
	TiO2	6.46	1.50	1.77	2.30	1.67	1.80	4.24	4.22
	Fe2O3	47.98	29.65	30.82	34.39	35.35	35.24	38.08	45.18
	FeO	22.70	14.03	14.58	16.27	16.72	16.67	18.02	21.37
	Cr2O3	16.85	42.34	40.60	37.83	37.10	35.41	28.75	22.61
	V2O5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.86	100.19	100.58	101.55	101.54	100.62	100.79	100.92

Drill Hole: WM98-05

Sample : **SW98-5-36** Depth: 586.00

		Oxide 1	Oxide 2	Oxide 3	Oxide 4	Oxide 5	Oxide 6	Oxide 7	Oxide 8
Atomic	**Mg**	0.36	0.16	0.23	0.14	0.19	0.27	0.40	0.40
	Al	0.18	0.06	0.00	0.06	0.01	0.12	0.28	0.27
	Ti	0.05	0.17	0.94	0.17	0.95	0.19	0.06	0.05
	Fe	1.60	2.41	0.76	2.51	0.77	2.01	1.30	1.34
	Cr	0.87	0.24	0.01	0.17	0.01	0.42	0.96	0.96
	V	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.04	3.06	1.93	3.08	1.92	3.03	3.00	3.01
Oxide %	**MgO**	4.20	2.02	5.92	1.74	4.68	3.35	4.71	4.59
	Al2O3	5.22	1.97	0.00	2.02	0.43	3.61	8.37	7.80
	TiO2	1.07	4.29	47.58	4.27	46.28	4.75	1.40	1.13
	Fe2O3	36.39	57.92	25.73	60.41	24.98	48.03	29.28	30.05
	FeO	17.22	27.40	23.16	28.58	22.48	22.73	13.85	14.21
	Cr2O3	38.40	11.15	0.73	8.02	0.67	19.48	42.33	41.71
	V2O5	0.00	0.93	0.00	0.82	0.00	0.75	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	102.49	105.67	103.12	105.87	99.51	102.70	99.94	99.51
	Class	IM	Unk	Unk	Unk	Unk	IM	IM	IM

		Oxide 9	Oxide 10	Oxide 11	Oxide 12	Oxide 13	Oxide 14	Oxide 15	Oxide 16
Atomic	**Mg**	0.37	0.53	0.14	0.30	0.41	0.46	0.49	0.38
	Al	0.21	0.27	0.00	0.17	0.21	0.23	0.21	0.06
	Ti	0.07	0.07	0.95	0.07	0.12	0.07	0.05	0.84
	Fe	1.56	1.24	0.83	1.84	1.66	1.40	1.38	0.72
	Cr	0.83	0.92	0.00	0.68	0.63	0.86	0.91	0.00
	V	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00
	Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	3.03	3.03	1.91	3.06	3.04	3.03	3.05	2.01
Oxide %	**MgO**	4.33	6.45	3.43	3.60	5.07	5.65	5.95	9.45
	Al2O3	6.14	8.24	0.00	5.03	6.48	7.12	6.50	3.72
	TiO2	1.60	1.67	47.55	1.58	3.05	1.75	1.32	41.21
	Fe2O3	35.51	29.39	27.67	42.04	39.65	33.10	32.35	23.43
	FeO	16.80	13.91	24.90	19.89	18.76	15.66	15.30	21.09
	Cr2O3	36.69	42.20	0.28	30.45	29.52	39.48	41.67	0.00
	V2O5	0.00	0.30	0.00	0.00	0.36	0.30	0.00	0.00
	MnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	101.07	102.16	103.83	102.59	102.89	103.08	103.09	98.90

		Oxide 17	Oxide 18	Oxide 19	Oxide 20
Atomic	**Mg**	0.49	0.40	0.47	0.21
	Al	0.24	0.21	0.23	0.08
	Ti	0.04	0.08	0.07	0.20
	Fe	1.32	1.55	1.33	2.28
	Cr	0.96	0.79	0.93	0.26
	V	0.00	0.00	0.00	0.01
	Mn	0.00	0.00	0.00	0.00
	Total	3.04	3.04	3.02	3.05
Oxide %	**MgO**	6.09	4.86	5.72	2.74
	Al2O3	7.61	6.39	7.16	2.48
	TiO2	1.02	2.04	1.80	5.19
	Fe2O3	31.77	36.47	31.48	56.51
	FeO	15.03	17.26	14.89	26.73
	Cr2O3	45.09	36.23	43.10	12.83
	V2O5	0.00	0.00	0.00	0.82
	MnO	0.00	0.00	0.00	0.00
	Total	106.61	103.24	104.16	107.30
	Class	IM	IM	IM	BM

Appendix E

Whole Rock Geochemistry

Method	Sample	WMOO-01-96	WMOO-01-340	WMOO-01-600	SW08-5	SW08-14	SW08-24
XRF	**SiO2**	48.74	36.01	39.42	35.01	34.59	35.13
XRF	**TiO2**	1.18	0.39	0.74	0.47	0.44	0.37
XRF	**Al2O3**	15.79	1.23	2.16	1.34	1.32	1.27
	FeO	12.41	14.82	14.95	16.27	14.44	14.28
XRF	**Fe2O3t**	13.79	16.47	16.62	18.08	16.05	15.87
XRF	**MnO**	0.19	0.24	0.23	0.24	0.24	0.22
XRF	**MgO**	7.31	36.30	35.95	31.73	33.07	35.42
XRF	**CaO**	10.04	1.15	2.18	0.95	2.01	1.44
XRF	**Na2O**	0.37	0.51	0.81	0.50	0.55	0.50
XRF	**K2O**	2.38	0.00	0.23	0.00	0.00	0.00
XRF	**P2O5**	0.13	0.04	0.04	0.05	0.09	0.04
	LOI	0.05	7.05	1.10	11.60	11.10	9.30
	Sum	99.97	99.39	99.48	99.97	99.46	99.56
	(ppm)						
XRF	**Cr**	193	6138	7223	4835	6069	6078
ICP-MS	**Co**	71	204	210	183	180	189
ICP-MS	**Ni**	176	1565	1927	1125	1236	1508
XRF	**Rb**	9.00	19.00	32.00	22.00	20.00	20.00
ICP-MS/XRF	**Sr**	197.19	59.18	74.93	38.46	58.04	75.41
ICP-MS	**Cs**	0.52	0.21	0.46	0.35	0.34	0.21
ICP-MS/XRF	**Ba**	233.78	126.57	123.81	68.01	56.76	45.94
ICP-MS	**Sc**	33.04	10.91	14.71	13.28	12.98	10.98
ICP-MS	**V**	278.35	62.60	99.09	87.99	71.39	65.53
ICP-MS	**Ta**	0.29	0.16	0.39	0.16	0.59	0.14
ICP-MS/XRF	**Nb**	4.86	2.62	6.17	2.50	4.61	2.46
ICP-MS/XRF	**Zr**	82.56	27.50	52.91	24.54	29.32	22.11
ICP-MS	**Hf**	2.42	0.77	1.45	0.70	0.80	0.62
ICP-MS	**Th**	1.16	0.30	0.61	0.28	0.32	0.27
ICP-MS	**U**	0.32	0.11	0.40	0.08	0.13	0.11
ICP-MS/XRF	**Y**	23.01	2.82	4.02	3.06	3.17	2.68
ICP-MS	**La**	7.26	2.41	4.18	1.70	2.29	2.62
ICP-MS	**Ce**	16.98	6.70	9.54	5.08	5.28	6.33
ICP-MS	**Pr**	2.33	1.10	1.36	0.89	0.79	0.95
ICP-MS	**Nd**	10.87	5.00	5.97	4.15	3.68	4.49
ICP-MS	**Sm**	3.11	1.09	1.37	1.08	0.88	0.93
ICP-MS	**Eu**	1.07	0.23	0.33	0.18	0.15	0.23
ICP-MS	**Gd**	4.09	0.93	1.28	0.98	0.89	0.91
ICP-MS	**Tb**	0.66	0.11	0.17	0.13	0.11	0.10
ICP-MS	**Dy**	4.22	0.62	0.92	0.76	0.62	0.60
ICP-MS	**Ho**	0.91	0.11	0.16	0.12	0.12	0.12
ICP-MS	**Er**	2.60	0.28	0.41	0.34	0.35	0.28
ICP-MS	**Tm**	0.35	0.04	0.06	0.04	0.05	0.04
ICP-MS	**Yb**	2.27	0.21	0.31	0.34	0.27	0.20
ICP-MS	**Lu**	0.35	0.02	0.05	0.00	0.03	0.02
ICP-MS	**Cu**	188	20	35	14	14	15
ICP-MS	**Zn**	116	117	158	89	117	107
ICP-MS	**Mo**	0.53	0.34	0.00	0.14	0.22	0.13
ICP-MS	**Ag**	0.00	0.00	0.00	0.00	0.00	0.00
ICP-MS	**Tl**	0.08	0.08	0.10	0.00	0.16	0.09
ICP-MS	**Pb**	5.83	4.05	5.04	2.28	5.17	1.51
ICP-MS	**Sn**	3.49	1.42	3.68	0.93	1.09	1.43
ICP-MS	**Sb**	0.00	0.00	0.14	0.00	0.00	0.00
ICP-MS	**Ga**						
ICP-MS	**Ge**	1.38	1.21	1.34	0.89	1.24	0.65
ICP-MS	**As**	0.51	1.34	1.27	0.96	0.87	0.41
ICP-MS	**W**	9.36	1.87	2.14	0.07	0.20	0.64
ICP-MS	**Bi**	0.03	0.08	0.10	0.03	0.14	0.05

Method	Sample	SW08-36	SW08-45	SW08-51	SW98-5-04	SW98-5-08	SW98-5-19
XRF	**SiO2**	39.64	39.71	42.21	35.15	48.72	36.21
XRF	**TiO2**	0.40	0.50	1.31	0.45	1.41	0.43
XRF	**Al2O3**	1.42	2.83	5.48	1.66	15.42	1.32
	FeO	15.77	14.50	12.88	14.20	13.39	15.25
XRF	**Fe2O3t**	17.53	16.11	14.31	15.78	14.88	16.95
XRF	**MnO**	0.22	0.22	0.25	0.31	0.21	0.24
XRF	**MgO**	39.38	32.64	24.74	32.31	6.69	36.09
XRF	**CaO**	1.20	3.41	4.96	1.62	9.82	1.02
XRF	**Na2O**	0.39	0.70	1.21	0.61	0.54	0.61
XRF	**K2O**	0.02	0.24	0.67	0.00	2.41	0.00
XRF	**P2O5**	0.05	0.05	0.17	0.02	0.15	0.04
	LOI	0.00	3.25	4.75	11.65	0.30	6.75
	Sum	100.25	99.66	100.06	99.56	100.55	99.66
	(ppm)						
XRF	**Cr**	6217	4772	3681	6401	209	5007
ICP-MS	**Co**	209	161	132	172	65	199
ICP-MS	**Ni**	1821	1419	1124	1171	140	1652
XRF	**Rb**	12.00	22.00	32.00	26.00	12.00	21.00
ICP-MS/XRF	**Sr**	55.65	126.04	343.23	33.38	189.99	53.87
ICP-MS	**Cs**	0.23	0.40	3.48	0.57	0.65	0.22
ICP-MS/XRF	**Ba**	50.20	225.63	431.96	62.44	183.24	55.64
ICP-MS	**Sc**	13.54	18.45	19.91	11.49	31.69	11.85
ICP-MS	**V**	68.07	91.17	139.43	63.11	308.25	66.86
ICP-MS	**Ta**	0.20	0.19	0.80	0.20	0.37	0.18
ICP-MS/XRF	**Nb**	3.12	3.46	13.13	3.02	5.96	3.01
ICP-MS/XRF	**Zr**	28.44	30.86	122.69	47.39	94.07	26.72
ICP-MS	**Hf**	0.84	0.93	3.29	1.27	2.81	0.80
ICP-MS	**Th**	0.35	0.41	1.47	0.95	1.40	0.31
ICP-MS	**U**	0.12	0.14	0.97	0.33	0.38	0.23
ICP-MS/XRF	**Y**	2.88	4.51	11.31	3.65	24.77	2.98
ICP-MS	**La**	3.03	14.48	20.14	1.44	8.73	2.24
ICP-MS	**Ce**	7.56	27.44	41.45	3.98	19.98	5.17
ICP-MS	**Pr**	1.14	3.04	5.23	0.68	2.77	0.76
ICP-MS	**Nd**	5.02	11.04	21.22	3.01	12.18	3.43
ICP-MS	**Sm**	1.10	1.80	4.27	0.89	3.50	0.82
ICP-MS	**Eu**	0.30	0.56	1.34	0.16	1.22	0.15
ICP-MS	**Gd**	0.93	1.67	3.75	0.85	4.55	0.79
ICP-MS	**Tb**	0.11	0.19	0.47	0.12	0.73	0.11
ICP-MS	**Dy**	0.66	1.04	2.55	0.74	4.78	0.66
ICP-MS	**Ho**	0.12	0.18	0.44	0.13	0.98	0.11
ICP-MS	**Er**	0.30	0.52	1.12	0.43	2.98	0.30
ICP-MS	**Tm**	0.04	0.06	0.15	0.06	0.41	0.04
ICP-MS	**Yb**	0.28	0.42	0.84	0.38	2.58	0.31
ICP-MS	**Lu**	0.02	0.05	0.12	0.05	0.40	0.00
ICP-MS	**Cu**	33	22	159	19	233	22
ICP-MS	**Zn**	114	131	158	123	103	90
ICP-MS	**Mo**	0.28	0.19	1.66	0.19	0.39	0.13
ICP-MS	**Ag**	0.03	0.10	0.28	0.06	0.00	0.06
ICP-MS	**Tl**	0.00	0.08	0.91	0.17	0.00	0.11
ICP-MS	**Pb**	3.41	4.50	8.03	8.97	3.21	7.84
ICP-MS	**Sn**	1.57	1.85	2.79	1.51	4.29	1.44
ICP-MS	**Sb**	0.00	0.07	0.14	0.00	0.03	0.00
ICP-MS	**Ga**						
ICP-MS	**Ge**	1.10	1.13	1.08	1.33	1.36	1.01
ICP-MS	**As**	0.00	0.00	2.62	0.78	1.19	2.33
ICP-MS	**W**	0.35	0.40	0.72	0.08	1.58	0.47
ICP-MS	**Bi**	0.07	0.08	0.18	0.05	0.07	0.15

Method	Sample	SW98-5-28	SW98-5-36	SW04-03	SW04-06	SW04-13
XRF	**SiO2**	36.80	43.54	49.03	48.39	48.80
XRF	**TiO2**	0.66	1.35	2.34	1.78	2.17
XRF	**Al2O3**	2.28	6.16	9.82	6.56	8.67
	FeO	14.46	12.93	12.85	11.88	10.64
XRF	**Fe2O3t**	16.07	14.37	14.28	13.20	11.82
XRF	**MnO**	0.21	0.24	0.22	0.21	0.27
XRF	**MgO**	31.83	22.38	9.17	12.36	11.79
XRF	**CaO**	2.47	5.91	9.98	12.89	9.03
XRF	**Na2O**	0.85	1.15	1.28	1.25	2.34
XRF	**K2O**	0.13	0.93	2.19	1.26	1.41
XRF	**P2O5**	0.07	0.17	0.33	0.19	0.23
	LOI	8.20	3.45	0.45	1.75	2.70
	Sum	99.57	99.65	99.09	99.84	99.23
	(ppm)					
XRF	**Cr**	5358	2938	686	811	834
ICP-MS	**Co**	162	120	78	81	52
ICP-MS	**Ni**	1402	952	152	179	138
XRF	**Rb**	26.00	29.00	26.00	19.00	49.00
ICP-MS/XRF	**Sr**	69.75	424.20	694.22	303.56	339.01
ICP-MS	**Cs**	0.34	2.17	0.87	0.38	0.64
ICP-MS/XRF	**Ba**	104.25	407.01	427.62	308.77	506.40
ICP-MS	**Sc**	15.01	22.72	33.14	42.96	31.57
ICP-MS	**V**	95.83	194.65	293.40	296.50	236.41
ICP-MS	**Ta**	1.22	0.91	1.37	0.92	1.26
ICP-MS/XRF	**Nb**	9.56	15.34	22.70	14.88	20.26
ICP-MS/XRF	**Zr**	66.52	128.46	179.46	165.14	203.26
ICP-MS	**Hf**	1.68	3.45	4.98	4.64	5.80
ICP-MS	**Th**	0.75	1.55	1.87	1.85	2.24
ICP-MS	**U**	0.28	0.63	0.64	0.56	0.98
ICP-MS/XRF	**Y**	6.18	12.76	21.92	17.12	19.47
ICP-MS	**La**	7.55	24.73	28.14	22.55	16.18
ICP-MS	**Ce**	17.87	53.40	68.01	52.87	41.61
ICP-MS	**Pr**	2.49	6.78	9.36	7.18	6.39
ICP-MS	**Nd**	10.53	26.37	40.23	29.80	29.39
ICP-MS	**Sm**	2.27	5.11	8.37	6.42	7.00
ICP-MS	**Eu**	0.57	1.60	2.53	1.84	2.02
ICP-MS	**Gd**	2.19	4.31	7.46	6.00	6.40
ICP-MS	**Tb**	0.24	0.53	0.92	0.72	0.81
ICP-MS	**Dy**	1.42	2.81	5.03	3.88	4.51
ICP-MS	**Ho**	0.26	0.52	0.87	0.70	0.79
ICP-MS	**Er**	0.70	1.32	2.22	1.72	1.99
ICP-MS	**Tm**	0.09	0.17	0.28	0.22	0.27
ICP-MS	**Yb**	0.52	1.05	1.76	1.40	1.68
ICP-MS	**Lu**	0.07	0.13	0.23	0.18	0.23
ICP-MS	**Cu**	51	310	238	128	31
ICP-MS	**Zn**	118	175	125	100	76
ICP-MS	**Mo**	0.36	0.72	1.37	0.82	1.26
ICP-MS	**Ag**	0.03	0.62	0.03	0.00	0.00
ICP-MS	**Tl**	0.16	0.44	0.41	0.00	0.16
ICP-MS	**Pb**	6.30	21.75	6.90	4.50	14.37
ICP-MS	**Sn**	2.42	4.92	4.88	4.10	2.63
ICP-MS	**Sb**	0.00	0.11	0.10	0.12	0.07
ICP-MS	**Ga**					
ICP-MS	**Ge**	1.10	1.24	1.87	1.94	1.54
ICP-MS	**As**	1.02	1.09	1.91	0.79	2.18
ICP-MS	**W**	0.62	1.81	1.27	1.46	0.75
ICP-MS	**Bi**	0.08	0.80	0.12	0.08	0.29

ICP-AES SAMPLE	6	12.1	18.2	22	30	36	46	70
SiO2	46.18	45.52	46.02	47.17	46.42	45.00	47.50	47.67
TiO2	0.50	0.53	0.43	0.46	0.42	0.57	1.35	1.17
Al2O3	2.68	3.22	2.50	2.92	2.69	3.35	15.77	16.74
FeO	9.38	14.51	12.52	12.69	12.60	13.48	12.58	11.79
Fe2O3t	10.43	16.13	13.91	14.10	14.01	14.98	13.98	13.11
MnO	0.16	0.17	0.18	0.19	0.17	0.15	0.18	0.17
MgO	20.14	29.53	26.12	27.60	29.81	29.61	5.30	6.90
CaO	12.02	2.00	2.71	5.12	4.04	3.09	10.33	9.71
Na2O	1.20	1.13	1.17	1.17	1.08	1.29	3.73	3.50
K2O	0.25	0.84	0.43	0.34	0.49	1.10	0.60	0.39
P2O5	0.03	0.05	0.04	0.04	0.03	0.01	0.18	0.13
CO2	0.04	0.46	0.11	0.46	0.48	0.48	0.55	0.07
H2O	6.39	0.43	6.39	0.43	0.36	0.36	0.54	0.45
(ppm)								
Cr	2170	4079	1669	2358	2389	4155	72	51
Co	96	145	133	133	139	121	731	98
Ni	510	1067	716	718	769	797	83	150
Rb								
Sr	39.06	8.97	8.20	14.35	13.71	14.19	180.99	170.05
Cs								
Ba	37.31	123.55	62.87	86.30	86.65	146.48	177.34	154.01
Sc								
V	95.80	76.14	72.10	84.41	87.29	94.41	322.02	278.45
Ta								
Nb	1.75	3.33	2.03	2.27	1.95	4.70	4.55	4.18
Zr	116.07	114.88	106.25	92.67	89.43	110.62	199.72	128.75
Hf								
Th								
U								
Yb	5.24	4.26	3.60	4.34	3.66	4.00	28.40	22.06
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	66.22	40.55	13.54	10.78	5.29	6.03	178.55	186.70
Zn	68.11	103.13	59.87	92.19	80.07	46.70	94.49	101.50
Mo	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00
Ag								
Tl								
Pb	9.22	14.59	14.82	11.01	12.27	9.71	9.27	11.51
Sn								
Sb								
Ga								
Ge								
As								
W								
S	532	1069	879	880	796	592	152	105

ICP-AES SAMPLE	96	110	113	122	126	140	150	160
SiO2	46.22	50.55	49.42	42.05	44.42	48.66	47.06	46.90
TiO2	1.17	1.12	1.26	0.41	0.45	0.40	0.35	0.33
Al2O3	16.42	14.09	13.28	2.77	2.81	2.62	2.45	2.40
FeO	12.18	11.86	12.78	13.88	12.97	13.16	12.74	12.98
Fe2O3t	13.54	13.18	14.21	15.42	14.41	14.63	14.16	14.43
MnO	0.18	0.18	0.20	0.13	0.16	0.15	0.18	0.18
MgO	7.59	6.56	6.20	28.80	29.56	28.89	29.04	29.56
CaO	10.02	9.03	9.30	1.10	2.26	1.31	1.68	1.78
Na2O	3.30	3.00	2.94	1.08	1.18	1.07	1.10	1.16
K2O	0.36	0.46	0.50	0.77	0.76	0.63	0.63	0.38
P2O5	0.12	0.12	0.14	0.06	0.05	0.04	0.04	0.05
CO2	0.55	0.07	0.22	0.11	0.15	0.15	0.07	0.04
H2O	0.54	1.62	2.34	7.29	3.78	1.44	3.24	2.79
(ppm)								
Cr	77	82	104	4056	3856	4034	2916	3162
Co	98	127	154	134	142	145	144	146
Ni	171	149	115	1028	1029	1060	1031	1035
Rb								
Sr	158.77	144.24	138.46	8.66	14.30	10.26	13.76	18.46
Cs								
Ba	119.75	182.77	187.33	125.15	94.07	179.29	108.13	75.77
Sc								
V	287.03	273.60	317.80	63.72	72.90	71.50	51.74	50.24
Ta								
Nb	4.00	3.39	4.29	2.27	3.43	3.15	2.81	2.45
Zr	181.48	139.69	217.35	74.25	106.15	90.17	90.01	114.13
Hf								
Th								
U								
Yb	21.18	20.86	24.16	2.78	3.20	2.68	2.94	2.58
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	182.22	175.08	211.18	9.18	10.08	7.22	7.28	39.12
Zn	119.97	97.87	126.99	86.19	92.15	91.41	97.67	102.51
Mo	0.26	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Ag								
Tl								
Pb	7.55	7.84	11.20	18.62	13.38	14.96	14.50	15.10
Sn								
Sb								
Ga								
Ge								
As								
W								
S	98	153	177	1358	934	3550	1106	967

ICP-AES SAMPLE	170	180	186	192	196	215	248	250
SiO2	47.25	41.84	50.50	50.36	36.06	39.01	34.98	36.71
TiO2	0.34	0.31	0.35	0.39	0.38	0.26	0.29	0.38
Al2O3	2.32	2.20	1.93	2.11	2.45	2.26	2.15	2.76
FeO	13.80	14.27	8.83	8.56	12.93	13.02	14.32	15.25
Fe2O3t	15.33	15.86	9.81	9.52	14.37	14.47	15.91	16.94
MnO	0.19	0.21	0.15	0.14	0.19	0.20	0.26	0.22
MgO	29.05	30.02	22.66	22.06	30.32	31.48	29.81	28.20
CaO	1.80	1.52	12.00	11.87	3.28	1.42	0.88	0.72
Na2O	1.25	1.13	1.19	1.29	1.09	1.11	1.17	1.21
K2O	0.33	0.27	0.03	0.05	0.61	0.52	0.46	0.66
P2O5	0.05	0.05	0.01	0.01	0.04	0.03	0.02	0.02
CO2	0.11	0.11	0.11	0.22	0.40	0.40	0.48	0.40
H2O	1.98	6.48	1.26	1.98	10.80	8.82	13.59	11.79
(ppm)								
Cr	4000	3864	2006	2130	2510	2738	3342	3514
Co	153	165	99	94	145	154	158	148
Ni	1044	1024	484	499	965	1178	1149	999
Rb								
Sr	23.76	28.86	44.68	44.68	23.19	18.23	13.67	10.87
Cs								
Ba	62.19	53.93	37.17	16.99	43.86	97.76	51.60	73.90
Sc								
V	59.62	57.22	95.76	89.34	53.25	36.09	58.49	66.17
Ta								
Nb	1.77	2.55	0.73	1.53	1.86	1.62	2.20	2.10
Zr	109.89	129.81	49.29	89.51	120.59	64.15	183.87	108.23
Hf								
Th								
U								
Yb	2.42	2.38	3.30	3.72	3.10	2.22	2.74	2.34
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	10.16	20.96	7.52	17.18	10.49	9.97	70.07	211.55
Zn	123.79	105.43	54.53	55.67	95.69	107.81	186.67	186.21
Mo	0.00	0.00	0.00	0.00	0.60	1.04	1.08	0.64
Ag								
Tl								
Pb	11.18	15.56	5.82	3.16	13.63	20.71	39.67	14.45
Sn								
Sb								
Ga								
Ge								
As								
W								
S	891	870	447	579	961	936	1552	3345

ICP-AES SAMPLE	256	280	300	320	340	350.1	355	370
SiO2	35.46	36.89	36.17	36.22	36.98	37.03	38.48	42.21
TiO2	0.30	0.28	0.27	0.31	0.30	0.28	0.26	0.30
Al2O3	2.09	2.19	2.04	2.28	2.43	2.38	2.26	2.39
FeO	13.03	13.21	14.54	13.59	14.08	14.19	14.21	13.79
Fe2O3t	14.49	14.68	16.16	15.11	15.65	15.77	15.80	15.33
MnO	0.19	0.22	0.21	0.19	0.21	0.20	0.19	0.19
MgO	31.43	31.79	30.67	34.24	35.07	35.14	34.97	35.07
CaO	1.18	1.65	0.78	1.16	0.92	1.10	0.87	0.77
Na2O	1.13	1.21	1.01	1.08	1.24	1.26	1.04	1.11
K2O	0.46	0.39	0.41	0.30	0.51	0.52	0.68	0.79
P2O5	0.08	0.03	0.01	0.04	0.05	0.04	0.04	0.04
CO2	0.51	0.40	0.48	0.15	0.26	0.26	0.18	0.18
H2O	12.69	10.26	11.79	8.91	6.39	6.03	5.22	1.62
(ppm)								
Cr	3196	2874	3234	3534	2932	2360	2308	2688
Co	152	144	137	169	170	175	174	163
Ni	1139	1168	1047	1336	1354	1331	1313	1372
Rb								
Sr	14.41	27.75	18.13	32.59	25.41	19.91	17.57	21.31
Cs								
Ba	67.86	138.28	96.94	53.76	66.36	70.04	86.74	124.56
Sc								
V	38.31	39.31	44.43	43.17	39.99	36.87	34.35	37.49
Ta								
Nb	1.68	1.02	0.66	2.18	3.00	2.04	1.96	2.14
Zr	79.87	86.03	63.73	154.67	126.61	101.53	115.57	102.41
Hf								
Th								
U								
Yb	2.58	2.52	1.76	2.48	2.58	2.60	2.64	2.70
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	9.15	5.51	104.39	39.17	13.87	9.99	9.35	14.09
Zn	101.99	131.69	134.39	106.71	109.91	101.67	99.95	111.45
Mo	0.64	0.64	0.32	1.60	1.20	1.28	2.12	1.06
Ag								
Tl								
Pb	7.33	22.29	18.77	10.29	16.61	14.63	19.39	18.77
Sn								
Sb								
Ga								
Ge								
As								
W								
S	1207	1105	607	328	268	225	302	373

ICP-AES SAMPLE	374	400	430	460	490	520	545	550
SiO2	37.70	39.52	38.98	39.63	39.22	41.00	39.31	40.61
TiO2	0.32	0.31	0.34	0.31	0.34	0.35	0.34	0.41
Al2O3	2.59	2.58	2.65	2.44	2.42	2.59	2.12	3.34
FeO	13.92	14.56	14.91	14.46	15.35	14.19	15.45	14.87
Fe2O3t	15.47	16.19	16.57	16.07	17.06	15.77	17.17	16.52
MnO	0.19	0.20	0.21	0.21	0.21	0.21	0.21	0.21
MgO	35.24	35.24	35.73	35.00	35.77	34.37	34.61	33.18
CaO	0.62	1.03	1.35	2.13	1.88	1.66	1.57	1.70
Na2O	1.24	1.26	1.28	1.28	1.26	1.24	1.36	1.41
K2O	0.73	0.69	0.57	0.27	0.32	0.58	0.51	0.82
P2O5	0.05	0.04	0.05	0.04	0.05	0.04	0.02	0.07
CO2	0.18	0.15	0.11	0.18	0.11	0.11	0.18	0.11
H2O	5.67	2.79	2.16	2.43	1.35	2.07	2.61	1.62
(ppm)								
Cr	2458	2468	4260	3446	3598	2940	3194	4124
Co	171	177	190	190	203	163	234	165
Ni	1456	1470	1372	1359	1738	1414	2215	1360
Rb								
Sr	19.37	19.39	22.33	22.55	18.89	25.21	15.15	53.75
Cs								
Ba	67.88	57.34	98.74	97.70	49.86	66.68	59.02	101.64
Sc								
V	40.49	43.41	50.83	50.79	54.89	51.61	60.29	83.83
Ta								
Nb	2.12	2.62	1.74	2.96	1.58	1.84	1.42	2.74
Zr	142.01	139.47	151.57	92.47	130.69	119.25	120.97	116.55
Hf								
Th								
U								
Yb	2.60	2.68	3.10	2.88	2.84	2.60	2.98	4.10
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	11.29	12.19	32.89	89.71	1395.95	19.95	83.85	16.75
Zn	113.91	107.65	114.35	120.01	133.03	124.33	114.21	133.53
Mo	0.72	1.04	1.38	1.04	1.02	1.30	0.64	1.22
Ag								
Tl								
Pb	14.83	13.95	11.37	15.43	19.27	23.53	13.43	13.61
Sn								
Sb								
Ga								
Ge								
As								
W								
S	271	324	266	314	2637	399	4177	188

ICP-AES SAMPLE	560	570	580	590.4	596	600	610	620
SiO2	42.64	44.73	44.14	37.11	42.33	43.97	42.60	44.13
TiO2	0.68	0.28	0.36	0.29	0.38	0.42	0.52	0.58
Al2O3	4.17	3.35	2.96	3.96	2.59	3.06	3.08	3.39
FeO	13.99	12.73	13.13	13.84	13.09	13.21	13.74	14.08
Fe2O3t	15.54	14.15	14.59	15.38	14.55	14.68	15.27	15.65
MnO	0.20	0.18	0.17	0.20	0.20	0.19	0.20	0.19
MgO	30.61	33.03	33.28	35.10	32.75	31.71	30.90	29.63
CaO	1.75	1.64	1.99	1.97	2.93	2.35	3.07	2.17
Na2O	1.62	1.26	1.29	1.32	1.34	1.26	1.25	1.12
K2O	1.33	0.79	0.79	1.03	0.60	0.74	0.66	0.79
P2O5	0.09	0.02	0.03	0.02	0.13	0.04	0.08	0.04
CO2	0.11	0.11	0.04	0.29	0.22	0.15	0.40	0.15
H2O	1.26	0.45	0.36	3.33	1.98	1.44	1.98	2.16
(ppm)								
Cr	4516	4090	3176	3428	3172	4592	4454	4288
Co	182	175	200	188	164	149	157	147
Ni	1499	1533	2255	1464	1405	1463	1408	1393
Rb								
Sr	50.17	44.03	37.85	62.97	25.27	41.05	37.07	79.33
Cs								
Ba	197.00	99.56	88.40	145.16	94.68	106.90	121.12	85.66
Sc								
V	82.03	57.77	58.63	63.91	67.19	75.97	85.17	92.71
Ta								
Nb	5.52	3.02	3.74	2.14	4.38	2.64	3.30	3.20
Zr	182.35	96.57	116.15	176.65	119.15	123.89	112.67	141.31
Hf								
Th								
U								
Yb	5.03	3.91	4.29	3.58	6.01	3.93	5.03	3.25
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	25.16	14.82	2059.94	15.07	22.08	15.12	29.74	37.10
Zn	122.45	111.17	114.99	126.91	104.89	134.21	123.29	127.21
Mo	3.57	0.49	1.39	1.84	1.69	0.45	1.31	1.09
Ag								
Tl								
Pb	28.76	10.68	11.92	17.15	13.94	16.16	19.66	15.88
Sn								
Sb								
Ga								
Ge								
As								
W								
S	457	163	4472	213	319	253	311	397

ICP-AES SAMPLE	628	632	645	660	675	680	685	690
SiO2	42.59	44.34	43.02	42.09	45.74	42.18	40.44	46.22
TiO2	0.51	0.66	0.57	0.67	0.62	0.69	0.79	0.73
Al2O3	3.68	3.06	3.44	3.40	3.94	4.36	4.54	4.33
FeO	13.72	14.11	13.42	13.22	12.77	12.66	12.76	12.73
Fe2O3t	15.25	15.69	14.92	14.69	14.20	14.07	14.18	14.15
MnO	0.19	0.19	0.18	0.21	0.15	0.18	0.20	0.19
MgO	29.85	29.44	29.72	27.73	27.23	25.66	25.94	23.27
CaO	2.40	2.94	2.91	2.61	3.32	3.14	3.29	3.84
Na2O	2.28	1.04	1.13	1.18	1.41	2.28	2.36	1.23
K2O	0.73	0.52	0.73	0.81	0.78	0.78	0.75	0.77
P2O5	0.06	0.04	0.07	0.10	0.06	0.06	0.10	0.08
CO2	0.11	0.11	0.07	0.11	0.22	0.11	0.11	0.15
H2O	2.34	1.98	3.24	6.39	2.34	6.48	7.29	5.04
(ppm)								
Cr	4250	4190	4060	4100	3708	3554	2840	3074
Co	169	170	146	139	135	140	131	139
Ni	1454	1577	1305	1156	1197	1234	1121	1087
Rb								
Sr	38.91	69.63	69.75	53.93	39.51	52.73	64.61	59.05
Cs								
Ba	98.20	105.30	119.64	439.76	109.88	113.76	140.24	111.32
Sc								
V	81.55	125.71	81.71	91.07	89.21	95.29	88.31	105.89
Ta								
Nb	3.86	4.54	3.84	5.56	4.92	6.16	6.46	6.04
Zr	185.57	139.71	101.97	156.05	131.15	208.27	182.33	135.27
Hf								
Th								
U								
Yb	4.29	4.05	4.01	6.33	4.87	6.31	7.27	5.31
La								
Ce								
Pr								
Nd								
Sm								
Eu								
Gd								
Tb								
Dy								
Ho								
Er								
Tm								
Yb								
Lu								
Cu	23.28	281.54	60.86	36.66	26.34	50.26	76.90	53.60
Zn	120.63	125.75	112.37	124.43	114.33	116.65	133.79	119.83
Mo	1.77	1.33	1.47	0.91	1.05	4.07	0.09	1.05
Ag								
Tl								
Pb	14.78	7.76	10.68	10.32	7.72	12.68	22.44	14.52
Sn								
Sb								
Ga								
Ge								
As								
W								
S	429	945	518	382	464	468	569	865

ICP-AES SAMPLE	700	710	716	719.6	723
SiO2	42.46	47.16	46.42	63.36	64.83
TiO2	0.91	1.23	1.12	0.58	0.55
Al2O3	4.68	6.97	5.98	14.10	13.40
FeO	13.06	12.31	12.67	6.43	6.56
Fe2O3t	14.52	13.68	14.08	7.14	7.29
MnO	0.18	0.21	0.19	0.06	0.05
MgO	22.91	19.05	20.15	3.99	3.56
CaO	5.63	5.65	5.06	3.28	2.98
Na2O	1.58	1.94	1.96	3.60	3.38
K2O	0.60	1.09	0.96	2.03	2.57
P2O5	0.11	0.18	0.15	0.17	0.15
CO2	0.04	0.04	0.15	0.07	0.07
H2O	6.39	2.79	3.78	1.62	1.17
(ppm)					
Cr	2626	2578	2136	384	455
Co	124	114	122	58	87
Ni	874	735	813	118	149
Rb					
Sr	66.25	189.97	88.51	543.97	460.37
Cs					
Ba	98.30	236.76	208.56	805.96	695.16
Sc					
V	123.15	166.69	143.75	113.83	105.01
Ta					
Nb	5.20	12.58	8.40	5.04	6.74
Zr	216.47	174.47	134.65	154.89	169.13
Hf					
Th					
U					
Yb	7.31	12.31	9.19	10.11	11.91
La					
Ce					
Pr					
Nd					
Sm					
Eu					
Gd					
Tb					
Dy					
Ho					
Er					
Tm					
Yb					
Lu					
Cu	170.64	111.32	176.22	111.04	50.44
Zn	113.19	111.41	174.49	123.23	44.71
Mo	0.35	1.97	1.11	1.03	3.29
Ag					
Tl					
Pb	14.20	14.64	9.34	19.94	12.52
Sn					
Sb					
Ga					
Ge					
As					
W					
S	1280	730	3824	2718	5140