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Edmonton Block Government Assessment Report

Edmonton Block
NTS 83 G, H, I and J

Takla Star Resources Ltd. and Fairstar Exploration

BY
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EDMONTON, ALBERTA

DECEMBER, 1994

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Edmonton Block Summary

The Edmonton Block consists of 75 contiguous metallic and industrial mineral permits in the Eastern Alberta Plains of Alberta. The block lies in the area bounded by range 24 west of the 4th meridian to range 8 west of the 5th meridian between townships 51 and 63.

Exploration in the Edmonton Block has focused on sampling streams that drain limited areas. The Pembina River and the Athabaska River were not sampled since they derive sediment from west of the block. Sampling in the block initiated in the September of 1992 when anomalous magnesiochromites were found in a sample taken from preglacial gravels. In October and November of 1993 a detailed 41 sample heavy mineral stream sediment program was conducted. In September of 1994 six samples were taken to follow up on three occurrences of minerals which had chemistries similar to minerals included in diamond in 1993.

Peridotitic G1, G9 and G11 garnets (Stephen and Dawson, 1975), eclogitic G3 and G7 garnets and chrome diopside were found all over the Edmonton Block except in the vicinity of Morinville. This could be due to the lack of suitable heavy mineral stream traps and glacial Lake Edmonton.

Two chromites were found in the northern half of the block that had compositions similar to chromites included in diamond. The samples from Clearwater Creek, north of Fort Assiniboine, were dominantly derived from preglacial sediments. The samples from Wabash Creek, west of Westlock, were derived from sediments of derived from glacial till of mixed shield and preglacial origin. Samples taken in 1994 determined P1 and P4 chromites were found in Wabash Creek. P3 and P4 chromites were found in the two samples taken in 1994 from Clearwater Creek.

Samples from the southern half of the block which contained chromites were from streams that derived sediment from preglacial gravel or the Paskapoo Formation. A number of chromites were found in Kilini Creek near a gravel pit in preglacial gravel. A sample containing lithic fragments of Paskapoo Formation contained abundant chromites from south of Seba Beach. One sample taken in 1993 from near Darwell, north of Lake Isle, contained a G3 eclogitic garnet (Stephen and Dawson, 1975) with elevated sodium similar to garnets included in diamond (McCandless and Gurney, 1989). Two samples taken near Darwell in 1994 found few chromites.

Streams that contained predominantly glacially derived sediments were found to contain predominantly more peridotitic garnets and chrome diopside than streams which sourced sediment from predominantly preglacial and bedrock sources. Samples that were derived from predominantly preglacial and bedrock derived sediment contained P3 chromites suggesting the primary source of the chromites is lamproitic in nature(Griffin et al., 1994). The lack chromites and the predominance of indicator garnets and pyroxenes

found in sediment samples of glacial origin suggest a kimberlitic origin for the minerals. The preglacial gravel and the Paskapoo Formation sediment were derived from west of the block and the glacial sediments were derived from north of the block.

It is inconclusive as to whether the mineral grains found indicate the presence of diatreme activity in the block. There is no discernible pattern evident to the spatial concentrations of indicator minerals. The thickness and complex nature of the glacial drift could completely mask the geochemical signature of any potential diamond exploration target.

Introduction

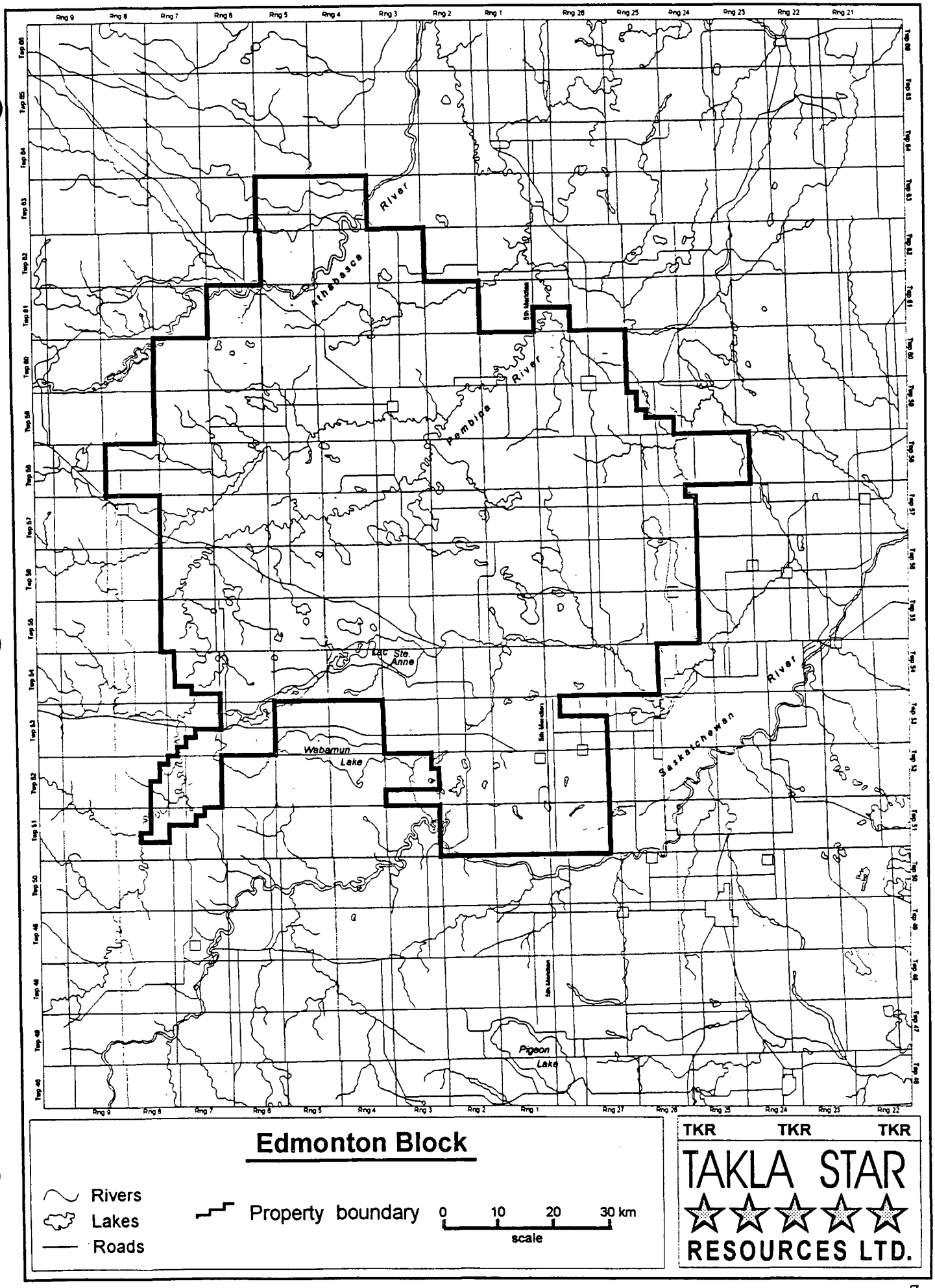
This assessment report details the stream sediment heavy mineral surveys carried out in the Edmonton Block in the search for alkaline ultrabasic diamond bearing rock. The one sample taken in 1992 and the 6 samples taken in 1994 are detailed in this report. The 1993 sample program report is given in Appendix II.

The Edmonton Block lies on the SW-NE trending Thorsby Magnetic Low (Ross et al., 1990). Sheared gneiss and gabbro from the basement low have yielded ages of 2.29 and 2.38 Ga and a pegmatite dated at 1.92 Ga (Ross et al., 1990). The Jack Diatreme is known to contain diamonds (Fipke et al., 1989) and lies on the western edge of the Thorsby terrane. Diamond bearing alkaline ultrabasic rocks have been found near Debawnt Lake, in the Northwest Territories, on the Snowbird Tectonic Zone (STZ). The STZ is the northeast extension of the Thorsby terrane. Diamond bearing rocks coincident with the paleozoic basement terrane make the Edmonton Block a potential target for diamond exploration.

Location

This assessment report pertains to the Edmonton Block. The block consists of 75 contiguous metallic and industrial mineral permits in the Eastern Alberta Plains of Alberta. The block lies in the area bounded by range 24 west of the 4th meridian to range 8 west of the 5th meridian between townships 51 and 63.

The block is readily accessible by vehicle from highways 2, 18, 43 and 16. Range and township roads grid the area at 1 mile intervals. The land is extensively cultivated providing good access by foot.



Edmonton Block

Rivers
Lakes
Roads

Property boundary

0 10 20 30 km
scale

TKR TKR TKR

TAKLA STAR
RESOURCES LTD.

Permit Tabulation

The permit holder of the metallic and industrial mineral permits which comprise the Edmonton Block is held by Takla Star Resources Ltd. This assessment report is submitted by Takla Star Resources Ltd. and authored by Douglas I. Sraega. G.I.T. The list of permits, which comprise the Edmonton Block, is given below with amount of money allocated to each permit. The described lands are to be retained for 6 years with expenditures in excess of $25 per hectare on retained lands. At the current time the block is a joint venture between Takla Star Resources Ltd. (75%) and Fairstar Exploration (25%). The description of the tracts of lands pertaining to each permit is given in Appendix III. The statement of expenditures is given in appendix IV. The statement of expenditures is given in appendix IV.

Permit Number	Amount of Money Spent in Permit
9393030203	$0.0
9393030204	$0.0
9393030205	$0.0
9393030206	$0.0
9393030207	$0.0
9393030208	$0.0
9393030209	$0.0
9393030209	$0.0
9393030210	$0.0
9393030211	$0.0
9393030212	$0.0
9393030213	$23,276.21
9393030214	$0.0
9393030215	$33,251.73
9393030216	$0.0
9393030217	$0.0
9393030218	$0.0
9393030219	$0.0
9393030220	$0.0
9393030221	$0.0
9393030222	$0.0
9393030223	$0.0
9393030224	$0.0
9393030225	$0.0
9393030226	$0.0
9393030227	$0.0
9393030228	$0.0
9393030229	$0.0
9393030230	$0.0
9393030231	$0.0

9393030232	$0.0
9393030233	$0.0
9393030234	$0.0
9393030235	$0.0
9393030236	$0.0
9393030237	$0.0
9393030238	$0.0
9393030239	$0.0
9393030240	$0.0
9393030241	$0.0
9393030242	$0.0
9393030243	$0.0
9393030244	$0.0
9393030245	$0.0
9393030246	$0.0
9393030247	$0.0
9393030248	$0.0
9393030249	$0.0
9393030250	$0.0
9393030251	$0.0
9393030252	$0.0
9393030253	$0.0
9393030254	$0.0
9393030255	$0.0
9393030256	$0.0
9393030257	$0.0
9393030258	$0.0
9393030259	$0.0
9393030260	$0.0
9393030261	$0.0
9393030262	$0.0
9393030263	$0.0
9393030264	$0.0
9393030266	$0.0
9393030267	$0.0
9393030268	$0.0
9393030269	$0.0
9393030270	$0.0
9393030271	$0.0
9393030272	$0.0
9393030273	$0.0
9393030274	$0.0
9393030275	$0.0
9393030586	$0.0
9393030587	$0.0

The list of metallic and industrial mineral permit numbers with the locations to be retained by Takla Star Resources.

Permit Number	Description of Lands to be Retained
9393030203	-
9393030204	-
9393030205	-
9393030206	-
9393030207	-
9393030208	-
9393030209	-
9393030209	-
9393030210	-
9393030211	-
9393030212	-
9393030213	4-27-059: 14 N; 23; 26; 35 W; 34 E
9393030214	-
9393030215	4-27-060: 2 W; 11; 14 E; 13 W; 24 W, 25 W; 26 E; 35 E; 36 W
9393030216	-
9393030217	-
9393030218	-
9393030219	-
9393030220	-
9393030221	-
9393030222	-
9393030223	-
9393030224	-
9393030225	-
9393030226	-
9393030227	-
9393030228	-
9393030229	-
9393030230	-
9393030231	-
9393030232	-
9393030233	-
9393030234	-
9393030235	-
9393030236	-
9393030237	-
9393030238	-

9393030239 -
9393030240 -
9393030241 -
9393030242 -
9393030243 -
9393030244 -
9393030245 -
9393030246 -
9393030247 -
9393030248 -
9393030249 -
9393030250 -
9393030251 -
9393030252 -
9393030253 -
9393030254 -
9393030255 -
9393030256 -
9393030257 -
9393030258 -
9393030259 -
9393030260 -
9393030261 -
9393030262 -
9393030263 -
9393030264 -
9393030266 -
9393030267 -
9393030268 -
9393030269 -
9393030270 -
9393030271 -
9393030272 -
9393030273 -
9393030274 -
9393030275 -
9393030586 -
9393030587 -

Work Performed

A sample was taken from pre-glacial gravel near Onoway in September of 1992 (sample R5011). In October and November of 1993 a 41 sample stream sediment heavy mineral program was conducted over the entire block. The 1993 sample program report is given in appendix II. In September of 1994 six stream sediment samples were taken to follow up on anomalous samples from the 1993 program

Field Work	Dates
Stream sediment heavy mineral sampling	September 16-25, 1992
Stream sediment heavy mineral sampling	October 15 to November. 5, 1993
Stream sediment heavy mineral sampling	September 1 to 15, 1993

Stream Sediment Heavy Mineral Programs

One sample (R5011) was initial taken from the preglacial gravel near Onoway in September of 1992. The 83 series of samples consists of 41 samples taken from creeks and rivers in the Block. There were six samples taken in September of 1994 to follow-up three anomalous samples taken in the 1993 sample program. The sample processing and data of the 1993 field work are given in Appendix II

Field Sampling

Sample R5011 taken in September of 1994 was field sieved to -1.8 mm and put into a 5 gallon pail for consignment to the Saskatchewan Research Council (SRC). The sample weighed approximately 40 kg.

The 6 samples taken in the 1994 were field sieved to -18 mesh and washed of silt and clay. Each sample was then hand panned to approximately one fifth the original volume and put into a plastic bag for transport to the laboratory. The samples were processed at Loring Laboratories in Calgary.

Lab Processing

The one sample taken in the fall of 1992 was processed at the SRC. The sample was run through a wilfley table to produce a coarse heavy mineral concentrate. The concentrate was then dried and the ferromagnetic minerals removed with a hand magnet. The concentrate was sieved into a fraction containing grains of 1 mm to 0.2 mm diameter. The sieved fraction was run through the magstream separator at a density setting of 3.1 g/cm^3. The heavy mineral fraction from the magstream was again processed through the magstream at a density setting of 3.4 g/cm^3 to produce the "Mids" concentrate. The greater than 3.4 g/cm^3 concentrate was processed through a Frantz Isodynamic Magnetic Separator at 0.19 Amps to produce the "Uppers" heavy magnetic concentrate and the "Lower" paramagnetic concentrate.

The six samples taken in September of 1993 were processed at Loring Laboratories in Calgary. The samples were run individually through a wilfley table to produce coarse heavy mineral concentrates. The concentrates were dried under moderate heat and separated using diiodomethane (MeI_2) with a density of 3.2 g/cm^3. The heavy mineral separates were each rinsed with acetone and the MeI_2 recycled. The heavy media concentrates were then sieved into + and - 28 mesh fractions. The -28 mesh fractions were then run through a Frantz Isodynamic Magnetic separator at current settings of .5, .6, .75 and 1.2 Amps. The current settings produced .5 paramagnetic, .6 paramagnetic, .75 paramagnetic, 1.2 paramagnetic and non-magnetic fractions.

The nonmagnetic separates from the six samples taken in the 1994 field season were fused using alkali fusion to remove silicate minerals. The residual minerals were mounted on a metal stub and scanned by scanning electron microscope. It was determined there were no diamonds in the six samples.

Indicator Mineral Picking

Heavy mineral separates were picked for any potential lamproite, kimberlite and diamond indicator minerals. Separates were picked utilizing a stereoscopic reflected light microscope. The mineral grains were mounted on petrocraft booklets for shipment to the electron microprobe lab for mounting and probing. The concentrates were visually scanned for chrome diopside, picroilmenite, diamond, olivine, chromite, eclogitic garnet and pyrope. All separates with magnetic susceptibilities less than Fe-ilmenite were picked for minerals. A list of heavy minerals found is given in Appendix II.

Probe Analysis

The grains from the one sample taken in 1992 were probed at the University of Saskatchewan in Saskatoon. Wavelength Dispersive Spectroscopy (WDS) was used to spot probe the core of each grain. Mineral grains were analyzed for CaO, FeO, ZnO, MgO, Al_2O_3, MnO, TiO_2 and Cr_2O_3. The microprobe electron beam was set to 2.00E-8 Amps with an accelerating voltage of 20 kV. The oxide weight analyses were corrected with the ZAF correction algorithm.

The mineral grains from 1994 sample program were probed by Ixion Research in Montreal. Wavelength Dispersive Analysis (WDS) was used to probe the mineral grains. The core of each grain was spot probed utilizing a 5 micron electron beam. Oxide mineral grains (chromite and ilmenite) were analyzed for V_2O_3, FeO, NiO, ZnO, MgO, Al_2O_3, MnO, TiO_2 and Cr_2O_3. Silicate mineral grains were analyzed for SiO_2, TiO_2, Al_2O_3, Cr_2O_3, FeO, MnO, CaO, Na_2O and K_2O. The electron microprobe utilized was a Jeol model JXA-8900L located at McGill University. The beam current for the oxide analysis was set at 40 nA with an accelerating voltage of 20 kV. Counting times were 20 seconds, except for ZnO, V_2O_3 and NiO which had 25 second counting times. The lower detection limits for ZnO, V_2O_3 and NiO are 0.02 weight percent and detection limits for major

elements are 0.01 to 0.02 weight percent. The beam current for the silicate analyses was set at 40 nA with an accelerating voltage of 15 kV. The counting times for major elements were 20 seconds (25 seconds for hot detector crystals) and 60 seconds for Na_2O. The lower detection limit for Na_2O is 0.07 weight percent.

Data Analysis

The electron microprobe can not distinguish between ferrous and ferric iron. The estimate of FeO and Fe_2O_3 oxide weight percent is recast based on the method of Finger (1972). The recast totals are calculated as cation totals based on three cations in the idealized spinel formula. The Mg#, Ti#, Cr#, Fe^{3+}# and Fe^{2+}# numbers were calculated from the cation totals. The Zn and Ni contents in part per million (ppm) calculated based on their analyzed weight percents. These parameters were used to generate P-type classifications based on the method of Griffin et al. (1994) is given in appendix I and II. The pyroxenes were classified utilizing the criteria of Stephen and Dawson (1977) and the garnets classified using Dawson and Stephen (1975). The formulas used to calculate chromite parameters are:

$$Mg\# = Mg / (Mg + Fe^{2+})$$

$$Fe^{2+}\# = Fe^{2+} / (Mg + Fe^{2+})$$

$$Cr\# = Cr / (Cr + Al + Fe^{3+})$$

$$Ti\# = Ti / (Al + Cr + Ti)$$

$$Fe^{3+}\# = Fe^{3+} / (Fe^{3+} + Al + Cr)$$

$$Zn\ ppm = (molar\ wt.\ Zn * 10000) / molar\ wt.\ ZnO * Analyzed\ wt.\ \%\ ZnO$$

$$Ni\ ppm = (molar\ wt.\ Ni * 10000) / molar\ wt.\ NiO * Analyzed\ wt.\ \%\ NiO$$

The P1 to P4 Chromite Classification System

The P1 to P4 chromite classification system (Griffin et al., 1994) is a paragenesis based system based on chromites from group 1 and 2 kimberlites and olivine lamproites. P1 and P4 chromites are of xenocrystal origin while P2 and P3 chromites are magmatic phenocrysts. It is common to have zoned chromites with xenocryst cores and magmatic rims. P1 chromites are the dominant population in group 1 kimberlites, significant in group 2 kimberlites and minor in olivine lamproites and represent chromites derived from dissaggregated dunites, harzburgites and subordinate lherzolites. P4 chromites are derived from disaggregated low temperature and pressure spinel +/- garnet lherzolites.

Partitioning of Zn and Ni between chromite and olivine in peridotite is temperature dependent and independent of pressure. Increasing temperature lowers the Zn

content and is a factor in increasing Ni in chromites. The bulk composition of a peridotite can be modified by metasomatism hence changing the trace element content of chromites. The Ni and Zn contents are crucial in the recognition of mantle derived chromites from other chromite sources. (Refer to Appendix I and II)

Conclusion

Exploration in the Edmonton Block has focused on sampling streams that drain limited areas. The Pembina River and the Athabaska River were not sampled since they derive sediment from west of the block. Sampling in the block initiated in the September of 1992 when anomalous magnesiochromites were found in a sample taken from preglacial gravels. In October and November of 1993 a detailed 41 sample heavy mineral stream sediment program was conducted. In September of 1994 six samples were taken to follow up on three occurrences of minerals which had chemistries similar to minerals included in diamond in 1993.

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It is inconclusive as to whether the mineral grains found indicate the presence of diatreme activity in the block. There is no discernible pattern evident to the spatial concentrations of indicator minerals. The thickness and complex nature of the glacial drift could completely mask the geochemical signature of any potential diamond exploration target.

UTM Coordinates of Edmonton Block Sample Series 83

Sample	UTM Coordinates	Stream/Creek
83G-2	5952310N 690470E	Kilini Creek
83G-3	5958950N 689560E	trib. to Toad Creek
83G-4	5955550N 688200E	Sturgeon River
83G-7	5948900N 657260E	trib. to Isle Lake
83G-8	5955130N 659160E	trib. to Pembina River
83G-10	5959210N 645300E	trib. to Brock Lake
83G-11	5974360N 650850E	trib. to Pembina River
83G-12	5976910N 654580E	trib. to Pembina River
83G-14	5979250N 635020E	Paddle River
83G-15	5979000N 633730E	Little Paddle River
83G-17	5939600N 657260E	trib. to Isle Lake
83G-18	5969930N 638590E	trib. to Pembina River
83G-19	5963390N 633940E	trib. to Pembina River
83G-20	5951300N 634180E	trib. to Pembina River
83G-21	5977640N 659400E	trib. to Pembina River
83G-22	5977660N 675880E	trib. to Lac La Nonne
83G-23	5957750N 633520E	trib. to Pembina River
83G-24	5952620N 636350E	trib. to Pembina River
83G-25	5942640N 642520E	trib. to Isle Lake
83G-26	8935240N 649800E	trib. to Wabamun Lake
83G-27	5966370N 650850E	trib. to Pembina
83G-28	5969430N 663030E	trib. to Oldmam Lake
83G-29	5951630N 669420E	trib. to Lac Ste Anne
83G-30	5943411N 688200E	Kilini Creek
83H-3	5971800N 307200E	Riviere Qui Barre
83H-4	5972950N 323075E	trib. to Manawan Lake
83H-5	5965550N 346210E	Little Egg Creek
83H-7	5955800N 312950E	Riviere Qui Barre
83H-8	5956000N 307450E	Sturgeon River
83I-1	6017325N 307475E	Wabash Creek
83I-2	6004380N 307700E	Wabash Creek
83I-3	5991375N 321125E	Redwater River
83I-5	5992725N 328550E	trib. to Redwater River
83J-1	5989840N 680150E	Newton Creek
83J-2	5960450N 677740E	trib. to Paddle River
83J-3	5997675N 571600E	Paddle River
83J-4	6003650N 648520E	trib. to Paddle River
83J-5	5992950N 655090E	trib. to Paddle River
83J-6	5987840N 640430E	Romeo Creek
83J-8	5995670N 632770E	Romeo Creek
83J-11	6033780N 644630E	Clearwater Creek

UTM Coordinates of 1994 Edmonton Block Samples

Sample	UTM Coordinates	Stream/Creek
W1	6002510N 307500E	Wabash Creek
W2	6004380N 307700E	Wabash Creek
FA1	6034200N 644630E	Clearwater Creek
FA2	6033780N 644630E	Clearwater Creek
LL1	5948900N 657260E	trib. to Isle Lake
LL2	5950200N 651180E	unnamed creek

References

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Stephen W. E. and Dawson J. B., 1977, Statistical comparison between pyroxenes from kimberlites and their associated xenoliths. Journal of Geology, vol. 85, pages 443-449.

Statement of Qualification

I, Douglas I. Sraega of [redacted] Edmonton , Alberta do hereby certify that.

1.) I am a graduate of the University of Alberta, Edmonton with a B.Sc. in Science obtained in 1987.

2.) I have completed a Special Certificate in Geology from the University of Alberta obtained in 1993.

3.) I am the author, except for the statement of expenditures, of this report.

Certified [redacted] Data Dec 16./94

Appendix I

Electron Microprobe Data
for
Samples taken in 1992 and 1994

Sample R5011 Electron Microprobe Data
(sample taken from preglacial gravel in 1992)

Takla Star Res Ltd. R5000-series Raw Data University of Saskatchewan Microprobe													
Sample	Grain	Al2O3	Cr2O3	Na2O	MgO	SiO2	K2O	CaO	TiO2	MnO	FeO	ZnO	Total
R5011	8	19.07	49.86	.00	13.95	.04	.00	.00	.00	.29	17.95	.11	101.26
R5011	15	18.51	51.36	.00	14.08	.03	.00	.00	.15	.29	17.32	.10	101.84
R5011	16	16.27	49.39	.00	12.07	.07	.00	.00	.18	.32	22.08	.13	100.47
R5011	22	10.28	53.61	.00	13.12	.09	.00	.00	.31	.34	23.82	.00	101.56

Takla Star Res. Ltd. R5000-series Processed Probe Data											
Sample	Grai	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Zn_ppm	Nomenclature
R5011	8	4.52	13.89	101.71	.642	.000	.604	.358	.052	911.	aluminous_magnesiochromite
R5011	15	3.80	13.90	102.22	.643	.002	.622	.357	.044	797.	aluminous_ferrous_magnesiochromite
R5011	16	6.46	16.26	101.15	.569	.002	.619	.431	.077	1017.	aluminous_ferrous_magnesiochromite
R5011	22	10.52	14.35	102.62	.620	.004	.679	.380	.127	16.	aluminous_ferrous_magnesiochromite

Samples W1, W2, FA1, FA2, LL1 and LL2
Electron Microprobe Data
(Samples taken in 1994)

Takla Star Res. Ltd. / TS94-04 / Weight % Recon-Grade Silicates													
Sample	Grain	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	Total	Class
W1	B1	39.57	0.09	22.34	0.02	21.28	0.55	9.07	6.99	0.01	0.02	99.94	G3
W1	C1	38.27	0	21.95	0.07	27.63	0.38	9.87	1.08	0	0	99.24	G5
W1	D1	37.93	0.05	21.55	0.02	32.41	0.5	6.87	1.13	0.01	0.01	100.49	
W1	E1	50.92	0.13	1.44	0.03	10.96	0.41	11.05	23.81	0.49	0	99.23	
W1	F1	27.31	0.65	52.79	0.01	12.81	0.12	1.26	0	0.01	0	94.96	
W1	G1	27.54	0.73	52.48	0.05	12.48	0.16	1.91	0	0.01	0.01	95.36	
W1	H1	36.27	0.03	20.52	0.05	19.11	15.09	2.12	6.03	0.02	0.01	99.25	
W1	I1	27.55	0.56	52.44	0.05	13.65	0.34	1.73	0	0.02	0.01	96.34	
W2	A2	34.75	0.22	0.23	9.61	16.81	0	2.3	33.02	0	0.01	96.96	
W2	B2	53.03	0.01	1.05	0	6.84	0.54	12.78	24.74	0.45	0.01	99.44	
W2	C2	27.4	0.6	51.97	0.02	12.35	0.03	1.83	0	0.03	0	94.24	
W2	D2	37.58	0.21	17.73	0	8.34	1.06	0.04	32.13	0.01	0	97.09	
W2	E2	27.56	0.64	52.31	0.03	12.73	0.11	2.11	0	0.01	0	95.49	
W2	F2	27.41	0.58	52.08	0.02	13.38	0.11	2.08	0	0.01	0.01	95.66	
W2	G2	27.39	0.68	51.32	0.1	12.11	0.11	1.73	0	0.03	0	93.46	
W2	H2	37.73	0.01	21.19	0.06	26	1.4	6.06	6.31	0	0	98.76	
W2	I2	37.58	0.05	20.87	0.06	25.61	0.76	6.79	6.61	0.01	0.01	98.33	
W2	J2	35.82	0.1	20.41	0.01	33.92	1.41	1.81	4.9	0.02	0	98.39	
FA1	A3	35.7	0.76	6.85	4.77	14.51	0.76	0.02	34.35	0	0.01	97.72	
FA1	B3	37.23	0.02	21.24	0.02	20.61	0.72	1.74	16.63	0	0.02	98.22	
FA1	C3	37.85	0.02	21.27	0.02	23.04	0.68	9.08	6.2	0.01	0.01	98.16	
FA1	D3	36.69	0	21.07	0.05	33.86	1.7	3.87	2.02	0	0.01	99.27	
FA1	E3	36.63	0.02	20.67	0.02	16.91	20.24	1.52	4.63	0	0.01	100.65	
FA1	F3	36.31	0.09	20.18	0.04	31.58	0.85	1.41	7.5	0	0	97.96	
FA1	G3	36.46	0.74	14.34	0	10.95	0.96	0.18	32.7	0.02	0	96.35	
FA1	H3	38.59	0.05	21.64	0.11	22.75	1.01	9.03	6.17	0	0	99.35	G3
FA2	A4	38.05	0.1	21.1	0.07	20.6	1.34	9.39	7.18	0	0	97.83	G3
FA2	B4	32.18	0.01	0	0	0.14	0	0.01	0.03	0.02	0.02	32.4	
FA2	C4	38.36	0.16	21.35	0.07	24.91	0.34	4.5	8.88	0.03	0.01	98.6	
FA2	D4	38.39	0.12	21.42	0.03	21.19	0.42	8.53	8.19	0.01	0.01	98.28	G3
FA2	E4	36.75	0.12	20.85	0.01	27.66	4.04	1.54	7.81	0.03	0	98.82	
FA2	F4	27.74	0.61	52.02	0.09	12.01	0.24	1.93	0	0	0	94.62	
FA2	G4	38.63	0.09	21.59	0	24.22	0.59	7.9	6.77	0	0	99.79	G5
LL1	A5	39.09	0.04	21.98	0.01	28.28	0.7	4.6	5.67	0.01	0.01	100.38	
LL1	B5	39.49	0.11	21.85	0	23.04	0.4	6.88	8.6	0.02	0	100.39	
LL1	C5	37.58	0.04	20.73	0	27.31	0.66	4.92	6.83	0	0.01	98.07	
LL1	D5	37.14	0.05	20.44	0.03	31.87	0.64	2.14	6.88	0.01	0	99.21	
LL1	E5	36.43	0.07	19.9	0	32.86	0.57	0.82	7.38	0.02	0	98.03	
LL1	F5	37.31	0.06	20.66	0.03	30.02	0.57	3.44	6.62	0	0.03	98.72	
LL1	G5	36.89	0.03	20.24	0.02	29.65	0.45	2.77	8.19	0	0	98.24	
LL1	H5	38.21	0.09	21.19	0	25.06	1.06	6.31	7.05	0	0	98.96	G5
LL2	A6	50.52	0.3	2.59	0.05	9.05	0.48	13.13	22.19	0.85	0	99.16	
LL2	B6	37.46	0	21.26	0.04	31.59	1.37	7.37	0.5	0	0	99.58	
LL2	C6	37.79	0.03	21.11	0.01	33.49	0.95	3.65	3.27	0	0	100.29	
LL2	D6	34.91	0.03	19.6	0	19.43	23.62	0.02	0.3	0	0	97.91	
LL2	E6	36.9	0.06	20.33	0.05	31.09	0.74	1.87	7.52	0.01	0.01	98.58	
LL2	F6	37.8	0.04	20.84	0.02	31.47	1	6.72	1.39	0	0	99.28	
LL2	G6	27.5	0.41	54.82	0.02	13.92	0.08	1.27	0.01	0.03	0	98.06	
LL2	H6	37.46	0.07	21.01	0.04	28.22	0.52	4.95	6.64	0.01	0.01	98.93	

Takla Star Res. Ltd. Edmonton Block 1994 Raw Electron Microprobe Data (Ixion)											
Sample	Grain	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total
W1	C1	0.14	7.64	58.92	0.06	20.55	0.31	12.11	0.112	0.087	99.92
W1	E1	0.11	0.16	0.02	0.59	87.65	0.16	0.02	0	0.014	88.7
W1	G1	0.16	9.04	58.02	0.06	18.12	0.31	14.05	0.137	0.074	99.97
W1	H1	0.16	9.32	45.88	0.07	36.44	0.61	6.14	0.102	0.479	99.21
W1	I1	1.13	17.75	44.87	0.13	20.1	0.19	15.27	0.217	0.061	99.71
W1	A2	0.09	16.83	48.62	0.2	22.62	0.26	10.41	0.065	0.243	99.34
W1	B2	1.37	15	46.97	0.16	22.37	0.24	13.33	0.246	0.099	99.79
W1	C2	1.17	15.67	46.87	0.14	19.49	0.23	14.92	0.2	0.08	98.76
W1	D2	0.3	0.18	0.01	0.31	88.33	0.06	0.01	0	0.008	89.2
W1	E2	0.08	8.2	61.01	0.1	21.44	0.4	8.6	0.036	0.228	100.09
W1	F2	0.09	17.92	47.76	0.1	23.17	0.33	10.5	0.015	0.199	100.08
W1	G2	1.35	16.44	43.26	0.13	24.86	0.27	12.41	0.167	0.076	98.96
W1	H2	0.33	21.68	44.56	0.09	16.33	0.26	16.22	0.251	0.063	99.78
W1	I2	1.81	14.9	42.8	0.13	24.92	0.24	13.83	0.211	0.099	98.93
W1	J2	0.44	22.32	40.96	0.1	21.15	0.33	13.18	0.096	0.191	98.76
W1	A3	0.06	0.08	0.04	0.12	88.97	0.11	0	0	0.059	89.43
W1	B3	1.04	17.81	44.49	0.12	19.72	0.22	15.13	0.244	0.065	98.83
W1	D3	0.38	22.41	41.29	0.08	19.72	0.21	14.96	0.169	0.062	99.29
W1	E3	1.37	15.98	45.08	0.15	20.39	0.22	14.63	0.225	0.076	98.12
W1	F3	1.62	20.98	36.17	0.2	24.69	0.22	13.84	0.208	0.086	98.02
W1	G3	1.47	17.52	40.79	0.1	26.84	0.26	11.32	0.19	0.134	98.62
W1	H3	0.1	0.37	0.07	0.13	88.09	0.15	0.06	0	0.027	89
W1	J3	1.38	15.29	46.62	0.12	21.38	0.26	13.39	0.193	0.074	98.69
W1	A4	0.03	8.58	59.56	0.22	19.91	0.34	10.72	0.039	0.149	99.55
W1	B4	0.05	58.42	0.5	0.28	34.66	0.13	5.62	0.072	0.435	100.17
W1	C4	2	16.61	42.92	0.23	23.86	0.25	13.5	0.206	0.09	99.66
W1	E4	1.2	19.01	41.84	0.11	24.36	0.24	12.66	0.135	0.093	99.65
W1	F4	2.22	18.16	37.63	0.2	28.28	0.25	11.96	0.217	0.141	99.06
W1	G4	0.18	0.16	0.02	0.08	88.62	0.05	0	0	0.022	89.12
W1	H4	0.35	9.65	54.77	0.05	17.02	0.19	16.64	0.13	0.04	98.85
W1	I4	0.03	25.37	41.67	0.2	17.49	0.22	14.27	0.074	0.168	99.49
W1	J4	0.16	19.54	38.33	0.12	29.65	0.39	10.22	0.119	0.176	98.71
W1	A5	0.1	11.6	54.03	0.19	24.17	0.37	9.03	0.022	0.207	99.72
W1	B5	0.04	19.17	45.6	0.22	23.94	0.33	9.77	0.036	0.381	99.49
W1	C5	1.23	19.62	40.33	0.13	25.42	0.3	12.39	0.096	0.114	99.62
W1	D5	0.01	3.91	65.75	0.23	20.38	0.41	8.72	0.025	0.199	99.63
W1	E5	1.15	17.27	44.95	0.12	19.21	0.2	15.55	0.218	0.077	98.73
W1	F5	0.54	11.54	51.36	0.12	20.93	0.28	14.74	0.12	0.047	99.68
W2	G5	2.5	14.05	41.25	0.18	27.77	0.23	12.95	0.215	0.074	99.22
W2	H5	0.49	24.52	36.1	0.07	21.23	0.24	15.84	0.27	0.13	98.89
W2	I5	0.1	20.7	44.38	0.16	21.06	0.28	12.75	0.103	0.265	99.8
W2	J5	0.08	21.07	44.09	0.2	22.06	0.33	11.56	0.07	0.278	99.74
W2	A6	0.83	26.39	24.51	0.26	31.79	0.23	12.87	0.098	0.125	97.1
W2	B6	1.18	17.64	44.54	0.14	19.98	0.21	15.2	0.246	0.066	99.19
W2	C6	0.07	12.87	51.85	0.24	24.1	0.4	9.16	0.068	0.235	98.98
W2	D6	0.14	0.1	0	0.06	88.68	0.15	0	0	0.036	89.16
W2	E6	0.06	18.74	46.22	0.21	23.62	0.44	9.63	0.04	0.299	99.27
W2	F6	1.05	18.13	45.05	0.13	19.05	0.22	15.56	0.217	0.086	99.5
W2	G6	0.2	8.52	53.25	0.05	29.63	0.53	7.1	0.041	0.183	99.49

W2	I6	1.44	15.2	40.58	0.39	30.61	0.38	10.4	0.175	0.175	99.35
W2	J6	0.55	30.94	25.53	0.19	26.62	0.31	14.92	0.137	0.112	99.31
W2	D5	0.02	3.74	65.12	0.22	20.3	0.44	8.64	0.017	0.212	98.72
W2	B7	1.3	20.02	41.66	0.1	19.03	0.19	16.04	0.239	0.049	98.61
W2	C7	0.24	27.24	36.3	0.16	21.3	0.26	13.68	0.145	0.139	99.45
W2	D7	1.28	18.44	42.19	0.16	20.98	0.21	14.81	0.195	0.075	98.33
W2	E7	0.08	7.13	60.65	0.12	21.23	0.35	9.69	0.03	0.186	99.47
W2	G7	1.01	18.91	44.13	0.1	20	0.23	14.87	0.225	0.065	99.54
W2	H7	0.41	24.11	40.37	0.13	21.1	0.27	13.31	0.106	0.169	99.97
W2	I7	0.43	7.43	53.75	0.08	24.84	0.34	12.39	0.098	0.07	99.43
W2	A8	1.93	14.48	44.87	0.13	22.21	0.21	14.7	0.151	0.067	98.74
W2	B8	0.28	15.97	46.27	0.09	24.2	0.36	11.01	0.095	0.186	98.46
W2	C8	0.33	15.48	45.28	0.19	28	0.36	8.37	0.057	0.245	98.31
W2	D8	0.75	27.34	32.13	0.22	26.88	0.34	10.65	0.112	0.326	98.73
W2	E8	0.03	11.93	53.96	0.31	24.37	0.42	7.79	0.015	0.293	99.13
W2	F8	2.32	18.21	35.67	0.2	29.3	0.25	12.8	0.179	0.091	99.03
W2	G8	0.25	13.62	45.67	0.12	31.8	0.63	6.09	0.081	0.386	98.64
W2	H8	0.26	9.72	51.89	0.05	27.02	0.38	9.81	0.092	0.098	99.32
W2	I8	0.22	13.32	49	0.13	26.42	0.4	9.96	0.078	0.199	99.73
W2	J8	0.06	6.36	60.52	0.22	23.76	0.43	8.49	0.046	0.208	100.09
W2	A9	0.1	0.08	0.02	0.14	88.1	0.24	0.01	0	0.105	88.8
W2	C9	0.13	8.3	54.24	0.1	27.04	0.41	8.49	0.048	0.184	98.93
W2	D9	0.28	15.48	47.18	0.11	24.42	0.37	11.13	0.116	0.186	99.25
W2	E9	0.38	23.33	41.27	0.19	18.4	0.22	15.58	0.138	0.082	99.58
W2	G9	1.5	18.83	41.61	0.17	23.08	0.24	13.2	0.227	0.09	98.94
W2	H9	0.83	23.44	31.29	0.2	31.33	0.28	11.05	0.167	0.157	98.74
W2	I9	0.05	31.97	32.31	0.15	20.64	0.23	13.93	0.138	0.257	99.67
W2	J9	0.09	10.91	56.83	0.17	20.74	0.39	10.36	0.02	0.2	99.71
W2	B10	0.48	29.24	28.14	0.14	23.78	0.21	15.69	0.117	0.11	97.91
W2	C10	0.06	9.84	57.3	0.1	21.3	0.33	9.72	0.008	0.204	98.86
W2	D10	0.24	18.63	49.09	0.15	17.85	0.25	12.91	0.075	0.153	99.34
W2	E10	0.1	0.23	0.24	0.19	88.35	0.04	0.06	0	0.017	89.23
W2	F10	1.41	20.36	39.13	0.17	22.63	0.23	15.04	0.201	0.066	99.23
W2	G10	0.73	11.47	44.94	0.09	28.39	0.3	13.01	0.132	0.051	99.1
W2	H10	1.3	19.31	42.01	0.12	20.78	0.24	15.28	0.2	0.068	99.31
FA1	C1	0.08	0.11	0.05	0.13	89.42	0	0.01	0	0.014	89.8
FA1	D1	0.46	26.9	31.33	0.16	25.43	0.23	14.63	0.113	0.095	99.34
FA1	E1	0.09	17.13	46.95	0.2	23.57	0.34	10.86	0.06	0.206	99.4
FA1	F1	0.05	4.03	65.05	0.15	22.35	0.4	8.03	0.011	0.223	100.3
FA1	G1	0.06	0.12	0.23	0.19	88.58	0.13	0.01	0	0.03	89.35
FA1	H1	0.08	13.7	52.59	0.21	21.92	0.36	10.53	0.072	0.198	99.67
FA1	I1	0.1	22.57	40.12	0.21	23.46	0.29	12.49	0.089	0.232	99.55
FA1	J1	0.37	8.61	51.31	0.03	22.8	0.29	15.61	0.127	0.051	99.19
FA1	A2	2.51	18.99	22.43	0.35	43.19	0.25	10.02	0.102	0.104	97.94
FA1	B2	0.14	12.93	51.24	0.2	24.56	0.35	9.24	0.052	0.258	98.97
FA1	C2	0.47	10.51	51.07	0.17	30.17	0.67	4.16	0.04	0.47	97.71
FA1	D2	0.23	9.84	53.94	0.1	24.8	0.45	9.35	0.031	0.171	98.92
FA1	E2	1.86	16.37	41.63	0.16	25.66	0.26	13.02	0.223	0.082	99.27
FA1	G2	0.9	16.24	34.75	0.15	32.2	0.29	13.3	0.242	0.096	98.16
FA1	H2	0.1	12.48	54.37	0.1	20.89	0.35	11.41	0.03	0.214	99.95
FA1	I2	0.13	20.8	43.75	0.11	17.99	0.26	15.16	0.15	0.104	98.45

FA1	J2	1.84	18.58	40.11	0.21	26.03	0.24	12.1	0.132	0.105	99.35
FA1	A3	1.35	17.02	43.66	0.16	22.28	0.24	14.4	0.206	0.079	99.39
FA1	B3	1.84	19.18	39.45	0.2	23.8	0.2	14.52	0.22	0.104	99.51
FA1	C3	1.11	9.54	44.6	0.11	33.15	0.38	9.33	0.118	0.098	98.44
FA1	D3	0.12	0.09	0.05	0.14	89.19	0.02	0.02	0	0.018	89.63
FA1	E3	1.61	14.26	46.7	0.11	22.31	0.21	13.93	0.246	0.062	99.44
FA1	F3	1.51	13.99	47.46	0.16	22	0.28	13.97	0.165	0.082	99.61
FA1	G3	0.4	0.27	0.02	0.18	87.82	0.18	0	0	0.048	88.93
FA1	H3	0.07	0.1	0.01	0.06	88.93	0.19	0	0	0.05	89.4
FA1	I3	0.18	0.07	0.24	0.13	87.89	0.28	0.01	0.024	0.021	88.85
FA1	J3	0.06	9.01	55.4	0.21	26.56	0.45	8.01	0.028	0.253	99.98
FA1	A4	1.39	17.06	52.29	0.14	24.18	0.25	12.86	0.182	0.097	98.44
FA1	B4	0.02	0.06	0.26	0.07	88.53	0.05	0.02	0	0.027	89.05
FA1	C4	0.24	0.1	0.03	0.03	88.28	0.02	0	0	0.028	88.72
FA1	D4	0.7	11.73	50.95	0.12	19.68	0.23	15.57	0.092	0.078	99.16
FA1	E4	1.54	18.92	39.51	0.16	25.14	0.2	13.38	0.17	0.079	99.1
FA1	F4	0.11	18.92	44.25	0.23	22.84	0.29	12.89	0.064	0.153	99.74
FA1	G4	1.08	17.4	44.09	0.1	20.69	0.23	15.15	0.161	0.066	98.97
FA1	H4	0.13	14.16	51.09	0.06	17.88	0.23	16.12	0.126	0.035	99.83
FA1	I4	0.26	14.63	46.51	0.1	25.89	0.37	11.05	0.065	0.17	99.04
FA2	J4	0.09	0.11	0.04	0.11	89.3	0.03	0.01	0	0.027	89.7
FA2	A5	0.02	0.07	0.01	0.12	88.94	0.04	0.02	0	0.007	89.22
FA2	B5	0.12	7.86	56.25	0.19	25.89	0.39	8.63	0.045	0.157	99.53
FA2	C5	1.32	14.9	41.03	0.32	33.92	0.47	7.15	0.117	0.226	99.46
FA2	D5	0.74	9.6	40.51	0.07	33.36	0.27	12.85	0.188	0.062	97.65
FA2	E5	0.1	0.06	0.01	0.1	89.31	0.1	0.01	0	0.036	89.72
FA2	H5	0.09	0.06	0.02	0.09	89.24	0.05	0.01	0	0.04	89.6
FA2	I5	0.05	0.14	0.03	0.17	89.1	0.01	0.02	0	0.041	89.57
FA2	J5	1.78	17.35	40.95	0.2	25.66	0.26	12.96	0.18	0.089	99.43
FA2	A6	0.19	27.48	39.08	0.12	13.77	0.18	17.3	0.169	0.078	98.37
LL1	C6	0.16	13.04	50.05	0.17	26.95	0.41	8.64	0.07	0.202	99.69
LL1	D6	0.05	0.09	0.07	0.15	89.05	0.06	0	0	0.026	89.48

W1	D5	1.92	18.65	99.83	.454	.000	.896	.546	.025	196.	1619.	nc	magnesian_chromite	
W1	E5	8.79	11.30	99.63	.710	.015	.568	.290	.106	1713.	626.	nc	titanian_aluminous_magnesiochromite	
W1	F5	10.53	11.46	100.73	.696	.007	.654	.304	.128	943.	382.	nc	aluminous_ferrous_magnesiochromite	
W2	G5	12.88	16.18	100.51	.588	.037	.554	.412	.165	1690.	602.	nc	aluminous_ferrous_magnesiochromite	
W2	H5	10.98	11.35	99.99	.713	.006	.434	.287	.126	2122.	1057.	nc	chromian_spinel	
W2	I5	6.36	15.33	100.44	.597	.001	.546	.403	.074	809.	2156.	nc	aluminous_magnesiochromite	
W2	J5	5.48	17.13	100.29	.546	.001	.546	.454	.065	550.	2261.	nc	aluminous_ferrous_magnesiochromite	
W2	A6	17.32	16.20	98.84	.586	.012	.305	.414	.205	770.	1017.	nc	ferrous_spinel	
W2	B6	8.83	12.04	100.09	.692	.016	.562	.308	.106	1933.	537.	nc	titanian_aluminous_magnesiochromite	
W2	C6	5.41	19.23	99.54	.459	.001	.681	.541	.068	534.	1912.	nc	magnesian_chromite	
W2	D6	65.58	29.67	95.74	.000	.472	.000	1.000	.998	.	293.	nc	magnetite	
W2	E6	4.66	19.43	99.73	.469	.001	.588	.531	.056	314.	2432.	nc	magnesian_chromite	
W2	F6	8.35	11.53	100.33	.706	.014	.563	.294	.099	1705.	700.	nc	titanian_aluminous_magnesiochromite	
W2	G6	8.50	21.98	100.36	.365	.003	.719	.635	.109	322.	1489.	nc	magnesian_chromite	
W2	I6	12.75	19.13	100.63	.492	.021	.538	.508	.161	1375.	1423.	nc	titanian_magnesian_chromite	
W2	J6	13.94	14.08	100.71	.654	.007	.301	.346	.156	1077.	911.	nc	chromian_spinel	
W2	D5	2.08	18.43	98.92	.455	.000	.896	.545	.027	134.	1724.	nc	magnesian_chromite	
W2	B7	8.82	11.10	99.51	.720	.017	.521	.280	.105	1878.	399.	nc	titanian_aluminous_magnesiochromite	
W2	C7	6.93	15.07	100.16	.618	.003	.435	.382	.079	1139.	1131.	nc	chromian_spinel	
W2	D7	9.29	12.62	99.27	.676	.017	.537	.324	.113	1532.	610.	nc	titanian_aluminous_magnesiochromite	
W2	E7	3.83	17.79	99.85	.493	.001	.809	.507	.049	236.	1513.	nc	magnesian_chromite	
W2	G7	8.12	12.69	100.35	.676	.013	.551	.324	.097	1768.	529.	nc	titanian_aluminous_magnesiochromite	
W2	H7	6.28	15.45	100.60	.606	.005	.490	.394	.073	833.	1375.	nc	aluminous_magnesiochromite	
W2	I7	11.83	14.19	100.61	.609	.006	.706	.391	.148	770.	569.	P1	aluminous_ferrous_magnesiochromite	1050
W2	A8	10.29	12.95	99.78	.669	.027	.588	.331	.128	1187.	545.	nc	aluminous_ferrous_magnesiochromite	
W2	B8	7.98	17.02	99.26	.536	.004	.596	.464	.098	747.	1513.	nc	aluminous_ferrous_magnesiochromite	
W2	C8	7.83	20.95	99.10	.416	.005	.597	.584	.098	448.	1993.	nc	magnesian_chromite	
W2	D8	7.93	19.74	99.54	.490	.010	.399	.510	.094	880.	2652.	nc	aluminous_hercynite	
W2	E8	3.60	21.13	99.48	.397	.000	.718	.603	.046	118.	2383.	nc	magnesian_chromite	
W2	F8	13.83	16.85	100.41	.575	.034	.469	.425	.173	1407.	740.	nc	titanian_aluminous_magnesiochromite	
W2	G8	8.91	23.78	99.54	.313	.004	.613	.687	.114	637.	3140.	nc	magnesian_chromite	
W2	H8	9.78	18.22	100.30	.490	.004	.686	.510	.123	723.	797.	nc	magnesian_chromite	
W2	I8	8.76	18.53	100.61	.489	.003	.635	.511	.108	613.	1619.	nc	magnesian_chromite	
W2	J8	4.65	19.58	100.56	.436	.001	.813	.564	.059	361.	1692.	nc	magnesian_chromite	
W2	A9	65.31	29.33	95.34	.001	.406	.000	.999	.998	.	854.	nc	magnetite	
W2	C9	8.17	19.68	99.76	.435	.002	.729	.565	.105	377.	1497.	nc	magnesian_chromite	
W2	D9	8.26	16.99	100.10	.539	.004	.604	.461	.101	912.	1513.	nc	aluminous_ferrous_magnesiochromite	

W2	E9	7.32	11.81	100.32	.702	.005	.497	.298	.084	1084.	667.	nc	aluminous_magnesiochromite	
W2	G9	8.48	15.45	99.80	.604	.020	.535	.396	.104	1784.	732.	nc	titanian_aluminous_magnesiochromite	
W2	H9	13.87	18.85	100.13	.511	.012	.394	.489	.166	1312.	1277.	nc	ferrous_spinel	
W2	I9	6.00	15.24	100.28	.620	.001	.377	.380	.067	1084.	2090.	nc	chromian_spinel	
W2	J9	3.71	17.40	100.08	.515	.001	.742	.485	.046	157.	1627.	nc	aluminous_ferrous_magnesiochromite	
W2	B10	12.84	12.22	99.19	.696	.006	.335	.304	.146	919.	895.	nc	chromian_spinel	
W2	C10	3.69	17.98	99.23	.491	.001	.759	.509	.047	63.	1659.	nc	magnesian_chromite	
W2	D10	3.33	14.86	99.68	.608	.003	.613	.392	.040	589.	1245.	P4	aluminous_ferrous_magnesiochromite	812
W2	E10	65.19	29.70	95.76	.004	.140	.004	.996	.991	.	138.	nc	magnetite	
W2	F10	10.72	12.98	100.31	.674	.019	.491	.326	.128	1580.	537.	nc	titanian_aluminous_magnesiochromite	
W2	G10	15.84	14.14	100.70	.621	.011	.583	.379	.195	1037.	415.	P3	aluminous_ferrous_magnesiochromite	
W2	H10	9.37	12.34	100.25	.688	.017	.527	.312	.112	1572.	553.	nc	titanian_aluminous_magnesiochromite	
FA1	C1	66.05	29.98	96.43	.001	.262	.001	.999	.997	.	114.	nc	magnetite	
FA1	D1	12.79	13.92	100.63	.652	.006	.375	.348	.146	888.	773.	nc	chromian_spinel	
FA1	E1	6.67	17.57	100.07	.524	.001	.595	.476	.081	472.	1676.	nc	aluminous_ferrous_magnesiochromite	
FA1	F1	2.62	19.99	100.56	.417	.001	.884	.583	.034	86.	1814.	nc	magnesian_chromite	
FA1	G1	65.48	29.66	95.91	.001	.122	.004	.999	.993	.	244.	nc	chromian_magnetite	
FA1	H1	4.86	17.55	100.15	.517	.001	.677	.483	.060	566.	1611.	nc	aluminous_ferrous_magnesiochromite	
FA1	I1	8.27	16.01	100.39	.582	.001	.491	.418	.096	699.	1887.	nc	aluminous_magnesiochromite	
FA1	J1	5.52	17.84	99.70	.028	.005	.739	.972	.076	122669.	1033.	nc	aluminous_chromite	
FA1	A2	24.34	21.29	100.38	.456	.045	.303	.544	.313	802.	846.	nc	aluminous_hercynite	
FA1	B2	5.92	19.23	99.56	.461	.002	.673	.539	.074	409.	2099.	nc	magnesian_chromite	
FA1	C2	4.64	26.00	98.19	.222	.007	.718	.778	.062	314.	3823.	nc	magnesian_aluminous_chromite	
FA1	D2	6.83	18.66	99.60	.472	.003	.718	.528	.087	244.	1391.	nc	magnesian_chromite	
FA1	E2	10.96	15.80	100.36	.595	.026	.544	.405	.136	1752.	667.	nc	aluminous_ferrous_magnesiochromite	
FA1	G2	19.98	14.22	100.17	.625	.014	.446	.375	.244	1902.	781.	nc	aluminous_magnesiochromite	
FA1	H2	5.25	16.17	100.47	.557	.001	.697	.443	.064	236.	1741.	nc	aluminous_ferrous_magnesiochromite	
FA1	I2	7.33	11.40	99.19	.703	.002	.535	.297	.085	1179.	846.	nc	aluminous_magnesiochromite	
FA1	J2	9.34	17.62	100.28	.550	.025	.523	.450	.116	1037.	854.	nc	aluminous_ferrous_magnesiochromite	
FA1	A3	9.88	13.39	100.38	.657	.018	.557	.343	.120	1619.	643.	nc	titanian_aluminous_magnesiochromite	
FA1	B3	10.84	14.05	100.60	.648	.025	.503	.352	.132	1729.	846.	nc	titanian_aluminous_magnesiochromite	
FA1	C3	15.20	19.47	99.96	.461	.018	.608	.539	.197	927.	797.	nc	titanian_magnesian_chromite	
FA1	D3	65.87	29.92	96.25	.001	.383	.001	.999	.997	.	146.	nc	magnetite	
FA1	E3	9.32	13.93	100.37	.641	.022	.608	.359	.115	1933.	504.	P3	aluminous_ferrous_magnesiochromite	
FA1	F3	9.14	13.77	100.53	.644	.021	.616	.356	.113	1297.	667.	nc	aluminous_ferrous_magnesiochromite	
FA1	G3	64.50	29.78	95.38	.000	.474	.000	1.000	.993	.	390.	nc	magnetite	
FA1	H3	65.90	29.64	96.01	.000	.295	.000	1.000	.997	.	407.	nc	magnetite	

FA1	I3	64.97	29.43	95.35	.001	.332	.004	.999	.994	189.	171.	nc	magnetite	
FA1	J3	6.53	20.68	100.64	.408	.001	.738	.592	.083	220.	2058.	nc	magnesian_chromite	
FA1	A4	6.16	18.64	109.07	.552	.017	.626	.448	.070	1430.	789.	nc	aluminous_ferrous_magnesiochromite	
FA1	B4	65.50	29.59	95.60	.001	.052	.004	.999	.994	.	220.	nc	chromian_magnetite	
FA1	C4	65.05	29.75	95.25	.000	.560	.000	1.000	.997	.	228.	nc	magnetite	
FA1	D4	10.49	10.24	100.20	.730	.010	.650	.270	.127	723.	634.	nc	aluminous_ferrous_magnesiochromite	
FA1	E4	10.80	15.42	100.18	.607	.021	.507	.393	.132	1336.	643.	nc	titanian_aluminous_magnesiochromite	
FA1	F4	8.71	15.00	100.62	.605	.001	.548	.395	.103	503.	1245.	P4	aluminous_ferrous_magnesiochromite	812
FA1	G4	9.67	11.99	99.94	.692	.014	.556	.308	.116	1265.	537.	nc	titanian_aluminous_magnesiochromite	
FA1	H4	9.34	9.48	100.77	.752	.002	.630	.248	.110	990.	285.	P3	aluminous_magnesiochromite	
FA1	I4	9.90	16.98	100.04	.537	.004	.598	.463	.121	511.	1383.	nc	aluminous_ferrous_magnesiochromite	
FA2	J4	65.99	29.92	96.33	.001	.296	.001	.999	.997	.	220.	nc	magnetite	
FA2	A5	65.85	29.68	95.82	.001	.143	.000	.999	.998	.	57.	nc	magnetite	
FA2	B5	6.99	19.60	100.23	.440	.002	.754	.560	.089	354.	1277.	nc	magnesian_chromite	
FA2	C5	11.00	24.02	100.33	.347	.019	.557	.653	.142	.	952.	nc	magnesian_aluminous_chromite	
FA2	D5	21.85	13.70	99.84	.626	.013	.536	.374	.275	1477.	504.	nc	aluminous_ferrous_magnesiochromite	
FA2	E5	66.08	29.85	96.35	.001	.489	.000	.999	.998	.	293.	nc	magnetite	
FA2	H5	66.01	29.84	96.21	.001	.439	.000	.999	.998	.	325.	nc	magnetite	
FA2	I5	65.87	29.83	96.16	.001	.166	.000	.999	.996	.	333.	nc	magnetite	
FA2	J5	10.67	16.06	100.50	.590	.025	.532	.410	.132	1415.	724.	nc	aluminous_ferrous_magnesiochromite	
FA2	A6	5.03	9.25	98.87	.769	.002	.461	.231	.056	1328.	634.	nc	chromian_spinel	
LL1	C6	7.27	20.41	100.42	.430	.002	.655	.570	.091	550.	1643.	nc	magnesian_chromite	
LL1	D6	65.86	29.79	96.09	.000	.189	.001	1.000	.997	.	211.	nc	magnetite	

Takla Star Res. Ltd. Processed Electron Microprobe Data														
Sample	Grain	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn)
W1	C1	6.76	14.47	100.61	.599	.002	.768	.401	.084	880.	708.	nc	aluminous_ferrous_magnesiochromite	
W1	E1	64.69	29.45	95.20	.001	.288	.000	.999	.996	.	114.	nc	magnetite	
W1	G1	7.08	11.74	100.68	.681	.002	.742	.319	.086	1077.	602.	P1	aluminous_ferrous_magnesiochromite	1030
W1	H1	14.78	23.14	100.68	.321	.003	.621	.679	.191	802.	3896.	nc	magnesian_chromite	
W1	I1	8.86	12.12	100.61	.692	.015	.562	.308	.106	1705.	496.	nc	titanian_aluminous_magnesiochromite	
W1	A2	4.91	18.20	99.83	.505	.001	.620	.495	.060	511.	1977.	nc	aluminous_ferrous_magnesiochromite	
W1	B2	8.44	14.78	100.63	.617	.018	.607	.383	.104	1933.	805.	nc	aluminous_ferrous_magnesiochromite	
W1	C2	8.31	12.01	99.60	.689	.016	.600	.311	.101	1572.	651.	nc	titanian_aluminous_magnesiochromite	
W1	D2	64.92	29.92	95.71	.001	.506	.000	.999	.996	.	65.	nc	magnetite	
W1	E2	1.93	19.70	100.29	.438	.001	.813	.562	.024	283.	1855.	nc	magnesian_chromite	
W1	F2	5.19	18.50	100.60	.503	.001	.601	.497	.062	118.	1619.	nc	aluminous_ferrous_magnesiochromite	
W1	G2	9.60	16.22	99.93	.577	.019	.562	.423	.119	1312.	618.	nc	aluminous_ferrous_magnesiochromite	
W1	H2	6.54	10.45	100.44	.735	.004	.536	.265	.075	1972.	512.	nc	aluminous_magnesiochromite	
W1	I2	11.90	14.21	100.13	.634	.026	.561	.366	.148	1658.	805.	nc	aluminous_ferrous_magnesiochromite	
W1	J2	6.90	14.94	99.46	.611	.006	.507	.389	.081	754.	1554.	nc	aluminous_magnesiochromite	
W1	A3	65.87	29.70	96.04	.000	.264	.001	1.000	.997	.	480.	nc	magnetite	
W1	B3	8.67	11.92	99.71	.693	.014	.561	.307	.104	1917.	529.	nc	titanian_aluminous_magnesiochromite	
W1	D3	7.99	12.53	100.08	.680	.005	.502	.320	.092	1328.	504.	nc	aluminous_magnesiochromite	
W1	E3	8.80	12.47	99.00	.676	.019	.583	.324	.108	1768.	618.	nc	titanian_aluminous_magnesiochromite	
W1	F3	11.10	14.71	99.13	.626	.022	.464	.374	.135	1635.	700.	nc	titanian_aluminous_magnesiochromite	
W1	G3	9.83	18.00	99.61	.529	.020	.535	.471	.123	1493.	1090.	nc	aluminous_ferrous_magnesiochromite	
W1	H3	65.09	29.52	95.52	.004	.133	.001	.996	.990	.	220.	nc	magnetite	
W1	J3	7.72	14.44	99.48	.623	.019	.607	.377	.096	1517.	602.	nc	aluminous_ferrous_magnesiochromite	
W1	A4	3.84	16.45	99.93	.537	.000	.784	.463	.048	306.	1212.	nc	aluminous_ferrous_magnesiochromite	
W1	B4	2.70	32.23	100.44	.237	.001	.006	.763	.029	566.	3538.	nc	aluminous_hercynite	
W1	C4	9.46	15.35	100.61	.610	.027	.560	.390	.117	1619.	732.	nc	aluminous_ferrous_magnesiochromite	
W1	E4	8.89	16.36	100.54	.580	.016	.532	.420	.108	1061.	756.	nc	aluminous_ferrous_magnesiochromite	
W1	F4	11.50	17.93	100.21	.543	.032	.497	.457	.145	1705.	1147.	nc	aluminous_ferrous_magnesiochromite	
W1	G4	65.36	29.81	95.68	.000	.398	.000	1.000	.996	.	179.	nc	magnetite	
W1	H4	10.14	7.89	99.86	.790	.005	.695	.210	.122	1022.	325.	nc	aluminous_ferrous_magnesiochromite	
W1	I4	4.19	13.72	99.91	.650	.000	.499	.350	.048	582.	1367.	nc	aluminous_magnesiochromite	
W1	J4	12.08	18.78	99.92	.492	.002	.485	.508	.146	935.	1432.	nc	magnesian_chromite	
W1	A5	5.09	19.59	100.23	.451	.001	.709	.549	.064	173.	1684.	nc	magnesian_chromite	
W1	B5	5.06	19.38	99.99	.473	.001	.577	.527	.061	283.	3099.	nc	magnesian_chromite	
W1	C5	9.51	16.86	100.58	.567	.017	.513	.433	.115	754.	927.	P4	aluminous_ferrous_magnesiochromite	891

Appendix II

1993 Edmonton Block Stream Sediment Survey Report

REPORT ON THE 1993 STREAM SEDIMENT HEAVY MINERAL GEOCHEMISTRY SURVEY

ON THE

EDMONTON BLOCK
ALBERTA
NTS 83-G, H, I and J

Prepared for

TAKLA STAR RESOURCES LTD.

BY

D.I. SRAEGA, Geologist
EDMONTON ALBERTA

FEBUARY 1994

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Executive Summary

General

A stream sediment heavy mineral geochemistry program was conducted in the Edmonton Block during October 1993. The program was performed to define the source of magmatic lamproite chromites found in a gravel pit near Onoway during a previous sampling program. Forty stream sediment samples were taken encompassing the entire Edmonton Block.

Results

Large numbers of peridotitic garnets, eclogitic garnets and chrome diopsides were found all over the Edmonton Block except in the Morinville area. It is inconclusive as to whether the large number of these mineral infer to the presence of diatremes in the Edmonton Block or represent a regional background due to the last glaciation since no discernable pattern is evident in concentrations of these minerals. The thickness and complex nature of glacial drift could potentially mask the geochemical signature of any potential diamondiferous source rock in the block. Two diamond inclusion chromites were found in the northern portion of the block and may indicate the potential source of the indicator minerals the block may be diamondiferous.

Lamproite derived magmatic P3 chromites and P4 xenolith derived chromites were found in close proximity to the preglacial Beverly Channel. These minerals point to a source in the in the extreme south of the Edmonton Block or further west in the preglacial Beverly Valley. A diamond inclusion eclogitic garnet found west of Lac Ste. Anne indicates that this potential source may be diamondiferous.

Recomendations

The results to date indicate a potential lamproite source my be found on the extreme southwest of the Edmonton Block or further west in the preglacial Beverly Valley. Heavy mineral geochemistry samples should be taken from the preglacial Beverly Channel in the extreme south of the block to delineate the lamproite indicator mineral anomaly. It is recommended that once the source area has been constrained low level tightly spaced aeromagnetic survey should be conducted to locate positive magnetic anomalies indicative of lamproites.

1 Introduction

This report describes the results of a stream sediment heavy mineral geochemistry program carried out on the Edmonton Block during October of 1993. The object of the program is to delineate a magmatic lamproite indicator mineral anomaly found in the preglacial Onoway Channel during a previous heavy mineral sampling survey.

Lamproites and kimberlites are the primary source of diamonds. Lamproites are associated with paleobenioff zones and mobile belts on the edge of cratons. Diatreme clusters and fields lie along linears controlled by deep crustal fractures. The Edmonton Block lies over Thorsby terrane (Ross et al., 1991) and it is interpreted as the southern extension of the Snowbird Tectonic Zone (STZ). Diamondiferous lamproites are spatially associated with the STZ at Debawnt Lake in the N.W.T. and recently lamproites have been found near Rankin Inlet in the N.W.T.. The diamondiferous Jack diatreme lies over the Thorsby terrane.

2 Location, Access and Physiography

2.1 Location and Access

The study area encompasses the Edmonton Block and comprises 709600 hectares or 75 mineral applications. The area lies between range 24 West of the 4th meridian to range 10 West of the 5th meridian between townships 51 and 63. The area is readily accessible from highways 2, 18, 43, and 16. Range and township roads grid the block at 1 mile intervals. Topographic and Surficial Geology maps are available for this area at a 1:250000 and 1:50000 scales and were used in the field.

2.2 Physiography

The study area lies within the Eastern Alberta Plains. Elevations range from 1200m above sea level in the southwest to 600m above sea level in the northeast. The western half of the study area consists of broad, bedrock controlled, ridges and valleys formed preglacially and mantled by less than 15 m of drift. The geomorphology of the eastern portion of the block is controlled by the glacial and glaciolacustrine deposition (Andriashek, 1988).

The North Saskatchewan, Athabaska and Pembina Rivers flow through the study area. The rivers have deeply incised into glacial sediment, preglacial sediment and bedrock. Lakes are the result broad post-glacial lows or glacial thrusting. The majority of the block consists of parkland with isolated stands of coniferous and deciduous trees while the area around Morinville is intensively cultivated.

3 Regional Geology

The study area lies above the SW-NE trending Thorsby Magnetic Low (Ross et al., 1991). Sheared gneiss and gabbro have yielded ages of 2.29 and 2.38 Ga and a pegmatite dated at 1.92 Ga from this terrane. The coincident magnetic low and collinear

gravity gradient is interpreted as the southern extension of the Snowbird Tectonic Zone. The Wabamun Magnetic High to the north is dated at 2.3 Ga and the Rimbey Magnetic High to the south is dated at 1.8 Ga. These terranes were a region of plate convergence and transpressional movement producing the Rimbey magmatic arc, residual Wabamun tectonic escape wedge and Thorsby shear zone. The diamondiferous Jack diatreme lies over the Thorsby terrane.

The contact between the Thorsby and the Wabamum terranes trends north through Lac Ste. Anne and arcs east through the Barrhead area. The contact between the Thorsby and the Rimbey terrane coincides with the eastern margin of the claim block.

The sedimentary strata overlying the Precambrian basement contains carbonates, evaporites and siliciclastic rocks. The Paleozoic strata consists of Devonian to Mississipian carbonates, evaporites and shales uncomformably overlain by Mesozoic and Tertiary siliciclastic rocks.

Bedrock outcrops are commonly found along rivers and streams in the western portion of the Edmonton Block. The late Cretaceous Wapiti Formation comprises the bedrock in most of the block. It consists of sandstones, mudstones and shales with minor ironstone and coal beds. The Paleocene Paskapoo Formation subcrops and outcrops in the extreme southwest of the block near Wabamun Lake. It consists of sandstones and siltstones with minor tuff and coal beds.

Numerous channels of preglacial and glacial fluvial origin exist. These channels cut the bedrock up to 90m and are filled with preglacial sediment or have been re-eroded by post-glacial drainages. Drift thickness averages less than 30 meters in the study area and only reaches a maximum in the preglacial channels (Andriashek, 1988).

During the Pleistocene epoch the continental ice sheet advanced from the northeast covering the area at least twice. There are two types of glacial till in the study area. Hummocky moraine represents a stagnant ice feature and ground moraine representing basal melt out of glacially entrained sediments. Hummocky moraine is up to 150 ft thick while ground moraine is up to 40 ft thick. Glacial outwash and glacial lacustrine deposits overly tills while ice-contact deposits are rare. Aeolian deposits are derived from glacial outwash and glacial lacustrine deposits. Alluvium and colluvium deposits are found predominantly in valleys and streams. Organic deposits such as bogs or fens are found in broad topographic lows.

4 Exploration Program

4.1 Field Sampling

Field samples were obtained by screening gravel to -18 mesh and washing to remove excess silt and clay. The sample was then put into a five gallon pail for lab consignment. The samples weigh +/- 45 kg.

Sample sites were chosen to enhance recovery of heavy minerals and to avoid contamination. Natural bedrock traps do not exist and talwegs were commonly sampled. Clast or matrix supported gravel was sampled. Well sorted sands were not sampled due to their low heavy mineral content. A description of each sample site is given in Appendix 12.1.

There were 40 samples taken in the study. Sample numbers were designated by the NTS 1:250000 map number and the sample number from the map area. There were 24, 4, 4, and 8 samples taken respectively from areas corresponding to 83G, 83H, 83I, and 83J NTS map sheets.

4.2 Lab Processing

The regional heavy mineral suite and the indicator minerals sought dictated the laboratory concentration process. The process concentrated standard indicator minerals by density and magnetic susceptibility. Samples were processed to produce 3 middling magnetic separates because of the large variety of heavy minerals present in the samples. The samples were not processed utilizing alkali fusion or x-ray fluorescence to recover diamond. Diamond would report in the non-magnetic heavy fraction.

Field samples were weighed and run through a wilfley table to produce coarse heavy mineral concentrates. The concentrates were dried under moderate heat then separated with heavy liquid utilizing acetylene tetrabromoethane (TBE) with a density of 2.96 g/cm^3. The heavy mineral separates were rinsed with acetone and the TBE recycled. The sample was sieved to + and - 28 mesh fractions. The -28 mesh fraction was cleaned of magnetite with a hand magnet. Magnetic separation was done utilizing a Frantz Isodynamic Magnetic Separator with current settings of .5, .6, .75, and 1.2 amps. These settings produced three middling separates and a nonmagnetic separate.

4.3 Indicator Mineral Picking

Heavy mineral separates were picked for any potential lamproite, kimberlite and diamond indicator minerals. The three middling and non magnetic separates were picked under 20x and 40x stereoscopic reflected light microscope. Picked mineral grains were mounted on petrocraft booklets for shipment to the electron microprobe lab. Large amounts of grossular garnet and staurolite made discrimination of eclogitic garnet difficult. Tourmaline and other opaque minerals make discrimination of chromite and ilmenite difficult. Minerals greater with a density greater than 2.96 g/cm^3 that were commonly found during picking were:

apatite	andradite	almandine	barite	beryl
biotite	chromite	cordierite	corundum	diaspore
diopside	dolomite	epidote	gahnite	graphite
grossular	goethite	gold	hematite	hornblende
ilmenite	kyanite	marcasite	magnetite	melanite
monazite	muscovite	pyrite	pyrochlore	sillimanite

staurolite	titanite	tourmaline	topaz	witherite
rutile	spinel	xenotime	zircon	

4.4 Data Analysis

Garnets, ilmenites, pyroxenes and some chromites were sent to Loring Labs in Calgary and subsequently sent to U of A for electron microprobe analysis. The garnets were classified according Dawson and Stephen (1975), pyroxenes according to Stephen and Dawson (1977) and ilmenites according to Fipke et al. (1989) at the lab. The majority of chromites were sent to sent to CANMET a department of Energy, Mines and Resources in Ottawa. Electron microprobe results are listed in Appendix 12.2.

The chromite electron microprobe analysis were analyzed by computer. The estimate of FeO and Fe_2O_3 wt. % was recast based on ideal stoichiometry and has an error of 25 %. The recast totals were calculated as cation totals based on four oxygen anions in the idealized spinel formula. The Mg#, Ti#, Cr#, Fe3# and Fe2# numbers were then calculated from the cation totals. The Zn and Ni contents in part per million was calculated from the analyzed weight percents. The formulas used to calculate chromite parameters are:

Mg#= Mg / (Mg+Fe2)

Fe2#= Fe2 / (Mg+Fe2)

Cr#= Cr / (Cr + Al + Fe3)

Ti#= Ti / (Al + Cr + Ti)

Fe3#= Fe3 / (Fe3 + Al +Cr)

Zn ppm = analyzed wt. % ZnO*((molar wt. Zn*10000)/molar wt. ZnO)

Ni ppm = analyzed wt. % NiO*((molar wt. Ni*10000)/molar wt. NiO)

5 Indicator Minerals

5.1 Indicator Minerals

Indicator minerals are minerals which indicate to the presence of a lamproite or kimberlite intrusion or the potential for diamond in an intrusion. These minerals are characteristic of phases found in lamproites or kimberlites, the source region in the upper mantle of the source rock or found as inclusions in diamonds. Some minerals commonly found in kimberlites and lamproites are also found in alkali basalts, carbonatites, lamprophyres and other rocks. Care should be taken to screen for minerals only of potential economic importance.

Diamond inclusion (DI) mineral chemistries are determined from syngenetic inclusions from diamonds. Diamond inclusion chromites typically have greater than 60 wt. % Cr_2O_3, Mg# greater than .6 and Al_2O_3 less than 10 wt. %. Eclogitic garnet containing greater than .07 wt. % Na_2O with elevated titanium (McCandless and Gurney, 1989 and Fipke et al., 1989) have been found as diamond inclusions.

Eclogites and peridotites are the two paragenetic sources of minerals from the upper mantle. They are found in xenocrysts and xenoliths in the primary source rocks. Peridotites are the source for peridotitic G1, G2, G7, G9, G10 and G11 garnets (Dawson and Stephen, 1975) and chrome diopside. Eclogitic rocks are formed from failed basaltic melts in the upper mantle or the ultrametamorphism of subducted oceanic crust. Eclogitic garnets are classes G3 and G5 garnets as defined by Dawson and Stephen (1975).

Minerals common to other rocks have compositions similar to minerals from kimberlites and lamproites. Chromium substitution in diopside increases with pressure and calcium depletion is correlative with increasing temperature. Chrome diopside is common to lamprophyres, layered mafic intrusions and other rocks. Subcalcic chrome diopside with greater than 1 wt. % Cr_2O_3 is potentially derived from peridotite xenoliths (Mitchell, 1986). Uvarovitic garnets are often mistakenly classified as G7 (Dawson and Stephen, 1975) garnets. G7 garnets with only greater than 5 wt % MgO and less than 26 wt % CaO are important to diamond exploration. The G7 garnet is interpreted to originate from the subduction and subsequent metamorphism of uvarovite bearing serpentinites (Schulze, 1989). Eclogitic G5 (Dawson and Stephen, 1975) garnet has been found by Fipke et al.(1989) to overlap with regional garnet compositions. Garnets containing less than 29.93 wt % FeO (Fipke et al., 1989) are potentially derived from eclogitic rocks. Picroilmenites are commonly found in carbonatites but are low in chromium. Ilmenites with greater than 9 wt. % MgO and 3 wt. % Cr_2O_3 is significant to diamond exploration.

Kimberlites contain a relatively greater variety and number indicator minerals as compared to lamproites. Because of the diversity of lamproites the only useful indicators are phenocryst and xenocryst chromites and xenocryst eclogitic garnets. Kimberlites contain a wide variety of distinctive phenocryst, macrocryst and xenolith minerals including eclogite garnets. The P1 to P4 classification system is the only method for the determination of the provenance of chromites from lamproites, kimberlites and mantle sources. It is discussed in detail in the next section.

5.2 The P1 to P4 Chromite Classification System

The P1 to P4 chromite classification system (Griffin et al., unpublished) is a paragenesis based system developed from chromites from group 1 and 2 kimberlites and olivine lamproites. P1 and P4 chromites are of xenocryst origin while P2 and P3 chromites are magmatic phenocrysts. P3 chromite are found in olivine lamproites. It is common to have zoned chromites with xenocryst cores and magmatic rims. P1 chromites are the dominant population in group 1 kimberlites, significant in group 2 kimberlites and minor in olivine lamproites and represent chromites derived from dunites, harzburgites and

subordinate lherzolites. P4 chromites are derived from disaggregated low temperature and pressure spinel +/- garnet lherzolites.

Partitioning of Zn and Ni between chromite and olivine in peridotite is temperature dependent and independent of pressure. Increasing temperature raises Ni and lowers Zn content in chromites. The Ni and Zn contents are crucial in the recognition of indicator chromites from other chromite sources.

7 Discussion

7.1 Discussion of Microprobe Results

Electron microprobe garnet analysis was classified at Loring Labs according to Stephen and Dawson (1975) classification scheme. Garnets often classified as G5 containing greater than 29.93 wt. % FeO were not included in the final results. This criteria removed the majority of G5 garnets from the final results.

All uvarovitic garnets classified at Loring Labs as G7 garnets contained less than 5 wt . % MgO and were probably derived from crustal sources (Schulze, 1989). Chrome diopsides with greater than 1 wt. % Cr_2O_3 are reported because these pyroxenes are potentially derived mantle derived xenoliths (Mitchell, 1986).

A large number of peridotitic garnets were found in the block. Peridotitic garnets classified by Stephen and Dawson (1975) as G1, G2, G9 and G11 are potentially derived from mantle xenoliths or macrocryst phases in the kimberlite or lamproite intrusion (Mitchell, 1986). Peridotitic G9 garnets are commonly found in garnet lherzolite xenoliths.

Two diamond inclusion chromites were found. These samples were 83I-2 north of Fort Assiniboine and 83J-11 west of Westlock. One diamond inclusion eclogitic garnet was found in sample 83G-8 east of Lac Ste. Anne.

7.2 Potential Sources of Indicator Minerals

Maps illustrating the sample locations and the distribution of indicator garnets and chrome diopside and the distribution of diamomd inclusion, P3 and P4 chromites is given figures 1 and 2.

Peridotitic G1, G9 and G11 and eclogitic G3 and G7 garnets and chrome diopside were found all over the Edmonton Block except near Morinville. There is a lack of indicator minerals in the Morinville area which coincides with glacial Lake Edmonton. Other than the lack of indicator minerals near Morinville there is no discernible pattern or trend to the locations of these minerals in the block. They may represent a regional background of indicator minerals derived from the last glaciation. The thickness and complex nature of glacial drift could completely mask the geochemical signature of any potential diamondiferous source rock in the block.

Large amount of peridotitic garnets are found in kimberlites relative to lamproites. These garnets suggest the potential source is a kimberlite.

In the southern part of the block P3 and P4 lamproite chromites are found in close proximity with the Onoway preglacial drainage channels. Sample 83G-30 sampled upstream from a gravel pit near Onoway contained one P4 and two P3 chromites and at the time of sampling was thought to be derived from preglacial sediments. East of Lac Ste.

Anne one sample contained a diamond inclusion G3 garnet (McCandless and Gurney, 1989). A sample taken south of the Pembina River contained one P3 chromite. A sample taken immediately west of the coal mine south of Seba Beach (83G-26) contained three P3 and one P4 chromites. This sample contained lithic fragments of sandstone derived from the locally subcropping Paskapoo Formation. The presence of magmatic P3 chromites suggests that the potential source is a lamproite and it contains low temperature and pressure lherzolitic garnets.

8 Conclusion

Large numbers of peridotitic garnets, eclogitic garnets and chrome diopsides were found all over the Edmonton Block except around Morinville. It is inconclusive as to whether the large number of these mineral infer to the presence of diatremes in the Edmonton Block or represent a regional background due to the last glaciation since no discernable pattern is evident in concentrations of these minerals. The thickness and complex nature of glacial drift could completely mask the geochemical signature of any potential diamondiferous source rock in the block. Two diamond inclusion chromites were found in the northern portion of the block and may indicate the potential source of these minerals may be diamondiferous.

Lamproite derived magmatic P3 chromites and P4 xenolith derived chromites were found in close proximity to the preglacial Onoway Channel. These minerals point to a source in the in the extreme south of the Edmonton Block or further west in the preglacial Onoway Valley. A diamond inclusion eclogitic garnet found west of Lac Ste. Anne indicates that this potential source may be diamondiferous.

9 Recommendations

The results to date indicate a potential lamproite source my be found on the extreme southwest of the Edmonton Block or further west in the preglacial Onoway Valley. Heavy mineral geochemistry samples should be taken from the preglacial Onoway Channel in the extreme south of the block to delineate the lamproite indicator mineral anomaly. It is recommended that once the source area has been constrained low level tightly spaced aeromagnetic survey should be conducted to locate positive magnetic anomalies indicative of lamproites.

10 References

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11 CERTIFICATE OF QUALIFICATION

I, Douglas I Sraega of [redacted] Edmonton, Alberta do hereby certify that:

1. I am a graduate of the University of Alberta, Edmonton with a B.Sc. in Science obtained in 1987.

2. I have a Special Certificate in Geology from the University of Alberta obtained in 1993.

3. I have not, nor do I expect to receive any interest directly or indirectly in the property or in the securities of Takla Star Resources Ltd.

Dated in Edmonton, Alberta, this 4th day of February, 1994

Certified Date

Appendix 12.1

Sample Site Descriptions

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 36302
Client: Takla Star
Microprobe Data

83G

Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83G-02	72	B	1	41.91	0.30	19.32	5.73	7.13	0.44	20.19	5.95	0.05	–	0.00	–	–	101.02	Garnet
83G-02	72	C	1	38.87	0.06	22.28	0.00	28.13	1.17	7.26	4.08	0.01	–	0.00	–	–	101.86	Garnet
83G-02	72	F	1	40.69	0.00	23.09	0.00	16.18	0.25	13.41	7.44	0.01	–	0.00	–	–	101.07	Garnet
83G-02	72	G	1	42.85	0.98	20.95	2.05	9.16	0.26	20.45	5.10	0.09	–	0.00	–	–	101.89	Garnet
83G-02	72	H	1	38.02	0.06	21.25	0.00	31.51	1.11	2.82	7.16	0.02	–	0.00	–	–	101.95	Garnet
83G-03	72	A	2	42.05	0.07	20.85	4.32	7.60	0.33	19.76	5.59	0.04	–	0.00	–	–	100.61	Garnet
83G-03	72	B	2	38.37	0.27	18.42	0.18	6.80	0.08	0.26	35.79	0.04	–	0.04	–	–	100.36	Garnet
83G-03	71	C	2	0.17	0.09	11.94	47.13	36.13	0.45	2.52	–	–	–	–	0.68	0.00	99.09	Chromite
83G-03	72	C	2	36.74	0.41	9.71	11.52	5.67	0.63	0.46	32.26	0.01	–	1.17	–	–	98.58	Garnet
83G-03	72	D	2	37.04	0.09	11.66	7.77	6.73	0.70	0.35	34.01	0.03	–	0.12	–	–	98.50	Garnet
83G-03	72	I	2	0.06	0.00	55.72	0.00	8.95	0.18	1.52	–	–	–	–	33.11	0.04	99.58	Gahnite
83G-03	72	J	2	0.05	0.00	54.90	0.00	3.68	1.14	2.20	–	–	–	–	37.12	0.00	99.09	Gahnite
83G-03	72	C	3	52.64	0.11	1.19	0.00	7.14	0.23	15.06	23.76	0.49	–	0.04	–	–	100.66	Pyroxene
83G-03	72	C	3	53.39	0.09	1.38	0.15	6.48	0.20	15.82	22.50	0.52	0.00	–	–	–	100.53	Pyroxene
83G-04	69	D	1	41.82	0.28	18.02	5.53	7.55	0.28	20.27	5.62	0.02	–	0.00	–	–	99.39	Garnet
83G-04	69	E	1	41.60	0.00	21.70	2.90	8.82	0.52	20.03	4.35	0.04	–	0.00	–	–	99.96	Garnet
83G-04	69	F	1	41.16	0.14	18.58	6.37	7.35	0.48	19.55	5.85	0.06	–	0.00	–	–	99.54	Garnet
83G-04	69	G	1	36.33	0.48	10.50	8.08	5.12	0.73	0.40	33.55	0.03	–	2.70	–	–	97.90	Garnet
83G-04	69	H	1	37.35	0.32	13.77	4.75	5.44	0.79	0.37	33.29	0.06	–	2.03	–	–	98.17	Garnet
83G-04	69	I	1	54.10	0.18	2.19	0.60	4.04	0.20	16.58	22.41	0.94	0.00	–	–	–	101.22	Pyroxene
83G-04	69	A	2	53.46	0.06	1.42	0.56	7.22	0.23	13.90	22.32	2.04	0.00	–	–	–	101.23	Pyroxene
83G-04	69	D	2	53.75	0.09	2.47	0.86	3.40	0.16	16.91	22.95	0.86	0.00	–	–	–	101.45	Pyroxene
83G-04	69	E	2	53.77	0.04	0.82	0.13	5.47	0.20	15.88	23.81	0.65	0.00	–	–	–	100.77	Pyroxene
83G-04	69	F	2	55.14	0.00	0.59	0.49	3.23	0.09	17.57	24.24	0.58	0.00	–	–	–	101.93	Pyroxene
83G-04	69	G	2	54.30	0.06	0.81	0.17	4.00	0.20	16.66	24.77	0.50	0.00	–	–	–	101.49	Pyroxene
83G-07	69	A	4	41.71	0.61	19.05	4.47	7.70	0.25	20.12	6.02	0.08	–	0.00	–	–	100.01	Garnet
83G-07	69	B	4	41.09	0.00	18.95	5.87	7.58	0.45	19.27	5.98	0.02	–	0.00	–	–	99.21	Garnet
83G-07	69	D	4	42.30	0.62	21.03	2.59	7.65	0.28	21.22	5.24	0.06	–	0.00	–	–	100.99	Garnet
83G-07	69	F	4	37.81	0.00	21.36	0.00	30.18	0.84	2.65	8.95	0.00	–	0.00	–	–	101.79	Garnet
83G-07	69	G	4	41.24	0.87	19.02	3.93	7.69	0.28	20.53	5.40	0.12	–	0.00	–	–	99.08	Garnet
83G-07	69	I	4	37.96	0.07	21.33	0.10	29.89	0.93	4.62	6.94	0.01	–	0.00	–	–	101.85	Garnet
83G-07	69	B	5	53.89	0.13	1.89	0.84	3.82	0.11	17.06	23.04	0.56	0.00	–	–	–	101.34	Pyroxene
83G-07	69	F	5	0.03	52.63	0.48	0.89	29.39	0.29	13.91	–	–	–	–	0.00	0.09	97.71	Ilmenite
83G-08	72	A	4	38.51	0.09	21.86	0.05	23.70	0.80	4.83	11.35	0.08	–	0.00	–	–	101.27	Garnet
83G-08	72	B	4	38.91	0.01	22.14	0.13	25.88	0.79	7.32	6.50	0.03	–	0.00	–	–	101.71	Garnet
83G-08	72	C	4	38.12	0.09	21.22	0.02	29.61	0.72	4.49	7.38	0.03	–	0.00	–	–	101.68	Garnet
83G-10	69	A	6	41.65	0.22	19.23	5.44	8.16	0.35	20.03	5.55	0.04	–	0.00	–	–	100.67	Garnet
83G-10	69	C	6	42.15	0.81	20.25	3.34	7.43	0.24	20.94	5.23	0.08	–	0.00	–	–	100.47	Garnet
83G-10	69	D	6	38.26	0.08	21.37	0.09	27.96	1.02	4.97	6.12	0.05	–	0.00	–	–	101.92	Garnet
83G-10	69	G	6	39.17	0.13	22.25	0.00	20.43	0.32	7.77	10.99	0.00	–	0.00	–	–	101.06	Garnet
83G-10	69	J	6	54.32	0.09	0.78	0.11	6.58	0.27	15.15	23.60	0.90	0.00	–	–	–	101.80	Pyroxene
83G-11	69	C	8	38.00	0.24	21.93	0.04	27.46	0.61	6.71	6.78	0.00	–	0.00	–	–	101.77	Garnet
83G-11	69	D	8	37.95	0.06	21.44	0.04	30.89	0.59	4.38	6.92	0.08	–	0.00	–	–	102.35	Garnet
83G-11	69	G	8	54.51	0.08	0.98	1.02	3.13	0.06	17.47	23.42	0.64	0.00	–	–	–	101.31	Pyroxene
83G-11	69	B	9	0.13	57.30	0.20	0.23	31.28	0.38	2.20	–	–	–	–	0.41	0.04	92.17	Ilmenite

Loring Laboratories Ltd.

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Tel: 274-2777 Fax: 275-0541

File No. : 36302
Client: Takla Star
Microprobe Data

Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83G-12	69	B	10	39.20	0.10	22.13	0.05	27.89	1.25	8.80	2.77	0.01	–	0.00	–	–	102.20	Garnet
83G-12	69	C	10	37.60	0.00	21.23	0.02	37.63	0.19	3.68	2.37	0.03	–	0.00	–	–	102.75	Garnet
83G-12	69	E	10	52.60	0.17	6.99	0.83	2.55	0.08	15.69	21.05	1.68	0.00	–	–	–	101.64	Pyroxene
83G-14	67	A	7	44.90	0.00	19.53	5.75	7.71	0.49	18.15	7.07	0.01	–	0.00	–	–	103.61	Garnet
83G-14	67	B	7	37.82	0.01	21.99	0.04	29.60	0.49	8.13	0.82	0.00	–	0.00	–	–	98.90	Garnet
83G-14	67	C	7	38.06	0.03	22.22	0.00	27.54	0.50	8.78	1.88	0.00	–	0.00	–	–	99.01	Garnet
83G-14	67	D	7	37.21	0.00	22.09	0.00	31.79	0.56	6.41	1.77	0.01	–	0.00	–	–	99.84	Garnet
83G-14	67	F	7	38.64	0.00	22.76	0.11	25.30	0.53	10.28	2.27	0.00	–	0.00	–	–	99.89	Garnet
83G-14	67	G	7	52.82	0.04	1.29	0.68	6.87	0.38	13.57	24.11	0.59	0.00	–	–	–	100.35	Pyroxene
83G-14	67	I	7	51.94	0.43	6.85	0.86	2.94	0.13	16.17	20.70	1.36	0.00	–	–	–	101.38	Pyroxene
83G-14	67	A	8	53.86	0.06	1.85	0.32	5.69	0.05	14.38	22.34	1.78	0.00	–	–	–	100.33	Pyroxene
83G-15	67	B	9	38.59	0.06	21.28	0.03	29.54	0.49	7.47	1.52	0.02	–	0.00	–	–	97.00	Garnet
83G-15	67	C	9	37.92	0.00	22.15	0.09	28.34	0.43	8.78	1.46	0.01	–	0.00	–	–	99.18	Garnet
83G-15	67	D	9	54.71	0.06	1.53	0.37	4.00	0.21	16.41	23.85	0.77	0.00	–	–	–	101.93	Pyroxene
83G-15	67	H	9	53.48	0.04	1.52	0.07	7.40	0.23	15.32	22.04	0.71	0.00	–	–	–	100.81	Pyroxene
83G-15	67	A	10	0.18	0.25	17.26	45.22	22.06	0.31	10.03	–	–	–	–	0.15	0.16	95.62	Chromite
83G-15	67	B	10	0.04	0.42	26.31	35.40	21.83	0.30	12.76	–	–	–	–	0.19	0.20	97.45	Chromite
83G-17	70	D	1	41.64	0.28	19.81	4.56	7.22	0.34	20.24	5.60	0.10	–	0.00	–	–	99.79	Garnet
83G-17	70	E	1	38.49	0.02	21.24	0.00	29.67	0.49	5.25	6.59	0.01	–	0.00	–	–	101.76	Garnet
83G-17	70	F	1	37.04	0.06	20.58	0.00	34.68	0.32	2.04	6.80	0.06	–	0.00	–	–	101.58	Garnet
83G-17	70	I	1	53.93	0.08	1.04	0.51	2.99	0.12	18.48	23.74	0.22	0.00	–	–	–	101.11	Pyroxene
83G-18	68	C	1	38.19	0.16	21.96	0.01	22.99	0.38	7.32	8.34	0.00	–	0.00	–	–	99.35	Garnet
83G-18	68	D	1	38.26	0.03	21.74	0.02	25.99	0.80	5.13	7.73	0.04	–	0.00	–	–	99.74	Garnet
83G-18	68	E	1	37.41	0.18	21.54	0.00	28.01	0.39	5.20	6.83	0.00	–	0.00	–	–	99.61	Garnet
83G-18	68	F	1	38.16	0.09	21.25	0.00	25.80	0.64	5.51	8.80	0.04	–	0.00	–	–	100.29	Garnet
83G-19	70	A	3	37.92	0.00	21.96	0.03	34.75	0.29	5.32	1.00	0.03	–	0.00	–	–	101.29	Garnet
83G-19	70	C	3	42.32	0.05	21.25	3.91	6.99	0.39	20.25	5.56	0.03	–	0.00	–	–	100.75	Garnet
83G-19	70	E	3	51.68	0.28	2.74	0.20	4.97	0.12	15.90	24.02	0.38	0.00	–	–	–	100.29	Pyroxene
83G-19	70	G	3	36.93	0.35	11.12	8.33	7.78	0.57	0.46	33.09	0.00	–	0.22	–	–	98.85	Garnet
83G-20	70	A	4	41.44	0.07	18.10	6.62	7.83	0.35	18.45	7.06	0.04	–	0.00	–	–	99.96	Garnet
83G-20	70	C	4	53.60	0.08	0.71	0.58	6.68	0.12	14.34	21.88	1.72	0.00	–	–	–	99.71	Pyroxene
83G-20	70	D	4	53.40	0.03	1.09	0.41	4.52	0.26	15.75	23.95	0.55	0.00	–	–	–	99.96	Pyroxene
83G-20	70	F	4	37.55	0.32	13.35	6.73	6.10	0.49	0.34	33.43	0.08	–	0.34	–	–	98.71	Garnet
83G-20	70	I	4	53.65	0.05	1.72	0.14	5.96	0.19	15.79	22.51	0.66	0.00	–	–	–	100.67	Pyroxene
83G-21	70	A	6	41.79	0.21	20.34	4.43	8.01	0.45	19.87	5.09	0.04	–	0.00	–	–	100.23	Garnet
83G-21	70	B	6	41.36	0.99	16.34	7.05	7.19	0.27	19.55	6.51	0.08	–	0.00	–	–	99.34	Garnet
83G-21	70	C	6	39.84	0.15	22.36	0.02	17.35	0.32	8.19	12.37	0.04	–	0.00	–	–	100.64	Garnet
83G-23	72	A	5	38.22	0.06	21.48	0.00	29.96	1.04	3.87	7.14	0.00	–	0.00	–	–	101.79	Garnet
83G-23	72	E	5	0.42	2.69	18.71	36.64	28.26	0.19	12.48	–	–	–	–	0.01	0.17	98.57	Chromite
83G-25	72	D	7	37.74	0.11	21.44	0.01	32.19	0.53	2.58	7.82	0.00	–	0.00	–	–	102.42	Garnet
83G-25	72	F	7	0.01	0.10	22.78	42.70	21.32	0.40	11.69	–	–	–	–	0.28	0.07	99.35	Chromite
83G-25	72	H	7	52.22	0.02	0.81	0.02	10.07	0.31	12.75	23.11	0.81	0.00	–	–	–	100.12	Pyroxene
83G-26	72	A	8	37.98	0.02	21.17	0.00	29.32	3.18	2.74	6.97	0.03	–	0.00	–	–	101.39	Garnet
83G-26	72	B	8	37.67	0.06	21.02	0.02	31.46	1.83	2.73	7.11	0.00	–	0.00	–	–	101.90	Garnet
83G-26	72	E	8	35.49	0.08	5.06	0.14	27.79	0.58	0.24	31.35	0.04	–	0.01	–	–	100.78	Garnet

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Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83G-26	72	H	8	0.07	0.04	22.91	43.49	18.94	0.38	13.07	–	–	–	–	0.00	0.14	99.04	Chromite
83G-26	72	I	8	0.14	0.35	6.44	48.07	37.44	0.58	5.48	–	–	–	–	0.25	0.10	98.85	Chromite
83G-26	72	J	8	0.10	0.02	12.70	53.17	23.77	0.37	8.85	–	–	–	–	0.19	0.03	99.20	Chromite
83G-26	72	A	9	0.06	0.23	8.22	55.71	22.85	0.45	8.74	–	–	–	–	0.07	0.00	96.33	Chromite
83G-26	72	B	9	0.16	1.36	18.67	41.36	24.40	0.25	12.85	–	–	–	–	0.00	0.24	99.29	Chromite
83G-26	72	C	9	0.02	0.39	14.67	43.06	33.68	0.37	5.74	–	–	–	–	0.42	0.04	98.39	Chromite
83G-26	72	D	9	0.12	0.29	7.76	52.53	21.96	0.27	15.22	–	–	–	–	0.05	0.28	98.48	Chromite
83G-29	67	B	1	41.14	0.15	21.15	3.41	8.88	0.42	17.99	6.50	0.08	–	0.00	–	–	99.72	Garnet
83G-29	67	D	1	36.73	0.10	21.10	0.03	32.15	1.38	2.34	7.63	0.03	–	0.00	–	–	101.49	Garnet
83G-29	67	F	1	39.00	0.21	22.22	0.00	19.52	0.28	9.04	9.74	0.00	–	0.00	–	–	100.01	Garnet
83G-29	67	G	1	40.88	0.24	23.09	1.43	9.24	0.31	19.09	5.50	0.04	–	0.00	–	–	99.62	Garnet
83G-29	67	H	1	37.01	0.05	20.69	0.06	32.04	0.46	2.78	7.31	0.06	–	0.00	–	–	100.48	Garnet
83G-29	67	J	1	36.91	0.03	21.76	0.00	33.26	0.48	5.96	0.72	0.00	–	0.00	–	–	99.12	Garnet
83G-29	67	A	2	36.45	0.08	21.76	0.03	27.88	0.51	8.48	1.77	0.01	–	0.00	–	–	96.97	Garnet
83G-29	67	B	2	53.83	0.03	0.58	0.59	6.94	0.24	14.73	23.73	0.66	0.00	–	–	–	101.33	Pyroxe
83G-29	67	D	2	54.10	0.10	1.28	0.42	3.86	0.14	16.36	23.99	0.58	0.00	–	–	–	100.83	Pyroxe
83G-29	67	G	2	52.94	0.21	2.65	0.64	6.41	0.22	14.91	21.53	1.33	0.00	–	–	–	100.84	Pyroxe
83G-29	67	H	2	53.48	0.02	1.71	0.15	6.39	0.18	14.80	23.40	0.24	0.00	–	–	–	100.37	Pyroxe
83G-29	67	J	2	53.20	0.04	1.85	0.11	5.22	0.20	15.07	24.23	0.55	0.00	–	–	–	100.47	Pyroxe
83G-30	68	A	3	41.10	1.10	20.00	3.34	6.84	0.81	20.78	5.98	0.08	–	0.00	–	–	100.03	Garne
83G-30	68	C	3	37.27	0.16	21.82	0.00	30.78	0.38	4.78	4.63	0.03	–	0.00	–	–	95.85	Garne
83G-30	68	E	3	53.23	0.17	3.00	1.24	3.15	0.04	16.06	23.05	0.90	0.00	–	–	–	100.84	Pyrox
83G-30	68	J	3	0.05	0.00	56.80	0.03	8.89	0.22	2.02	–	–	–	–	32.65	0.00	100.66	Gahn
83G-30	68	E	4	0.01	44.53	0.44	0.40	42.13	0.18	9.72	–	–	–	–	0.54	0.14	98.19	Ilmen
83H-03	71	A	2	41.58	0.72	16.79	7.83	6.75	0.33	20.01	6.36	0.06	–	0.00	–	–	100.43	Garn
83H-03	71	B	2	37.99	0.36	15.83	3.92	4.17	0.80	0.36	35.17	0.03	–	0.28	–	–	99.01	Garn
83H-04	71	A	3	38.60	0.00	21.65	0.33	31.27	0.48	6.54	2.47	0.04	–	0.00	–	–	101.38	Garn
83H-08	71	A	4	53.33	0.08	1.81	0.86	2.94	0.10	16.84	23.47	0.62	0.00	–	–	–	100.03	Pyro
83I-01	71	C	5	37.28	0.48	12.29	7.66	4.78	0.56	0.38	33.60	0.02	–	1.94	–	–	99.19	Gar
83I-01	71	D	5	36.80	0.45	11.01	10.25	6.90	1.07	0.57	30.82	0.00	–	0.82	–	–	98.69	Gar
83I-01	71	E	5	53.75	0.09	1.87	1.04	3.77	0.14	18.08	20.40	0.83	0.00	–	–	–	99.97	Pyr
83I-01	71	G	5	53.69	0.04	1.78	0.46	5.51	0.00	15.34	21.72	1.35	0.00	–	–	–	99.89	Pyr
83I-01	71	I	5	0.03	46.01	0.28	2.76	38.56	0.21	9.29	–	–	–	–	0.26	0.13	97.53	Ilm
83I-02	71	A	6	38.73	0.04	22.39	0.03	29.65	0.98	7.44	2.55	0.01	–	0.00	–	–	102.00	Ga
83I-02	71	B	6	41.85	0.22	19.87	5.27	7.82	0.50	19.77	5.70	0.10	–	0.00	–	–	100.80	Ga
83I-02	71	C	6	41.95	0.15	20.00	5.20	6.89	0.26	19.62	6.36	0.00	–	0.00	–	–	100.43	Ga
83I-02	71	E	6	42.98	0.64	19.51	4.43	7.20	0.33	21.49	5.39	0.07	–	0.00	–	–	102.04	Ga
83I-02	71	F	6	41.73	0.71	17.20	6.80	6.89	0.29	19.94	6.52	0.09	–	0.00	–	–	100.17	G
83I-02	71	G	6	37.34	0.02	21.65	0.00	35.49	0.40	3.16	3.82	0.02	–	0.00	–	–	101.92	G
83I-02	71	H	6	36.71	0.43	9.17	11.38	3.43	0.68	0.41	33.68	0.02	–	1.68	–	–	97.59	G
83I-02	71	I	6	42.34	0.20	20.43	4.17	7.55	0.33	20.35	5.18	0.08	–	0.00	–	–	100.63	G
83I-02	71	A	7	53.28	0.04	1.78	1.01	2.52	0.09	16.80	23.88	0.55	0.00	–	–	–	99.95	P
83I-02	71	B	7	53.69	0.07	0.94	0.13	5.21	0.15	16.36	23.10	0.36	0.00	–	–	–	100.01	P
83I-02	71	D	7	52.80	0.02	2.31	1.14	3.93	0.14	16.28	22.79	0.82	0.00	–	–	–	100.23	P
83I-02	71	E	7	53.74	0.04	1.09	0.53	3.96	0.10	16.73	23.67	0.41	0.00	–	–	–	100.27	P

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Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83I-02	71	H	7	0.25	61.15	0.36	0.37	24.82	0.36	2.58	-	-	-	-	0.13	0.08	90.10	Ilmenite
83I-03	71	A	8	42.51	0.15	21.48	3.34	8.11	0.40	20.47	4.88	0.07	-	0.00	-	-	101.41	Garnet
83I-03	71	B	8	42.08	0.13	21.25	3.08	8.39	0.41	20.29	4.61	0.04	-	0.00	-	-	100.28	Garnet
83I-03	71	C	8	42.42	0.05	21.08	3.76	8.67	0.45	18.92	8.08	0.05	-	0.00	-	-	101.48	Garnet
83I-03	71	E	8	51.69	0.25	6.78	0.72	2.71	0.08	15.59	20.59	1.66	0.00	-	-	-	100.07	Pyroxene
83I-03	71	F	8	51.93	0.47	6.65	0.78	2.72	0.07	15.23	21.13	1.71	0.00	-	-	-	100.69	Pyroxene
83I-05	71	A	9	42.52	0.21	21.09	3.38	7.53	0.34	20.81	4.91	0.03	-	0.00	-	-	100.82	Garnet
83I-05	71	E	9	53.13	0.07	0.83	0.05	7.96	0.56	14.04	23.77	0.57	0.00	-	-	-	100.98	Pyroxene
83I-05	71	F	9	53.99	0.10	1.49	1.39	3.53	0.10	16.34	22.65	0.99	0.00	-	-	-	100.78	Pyroxene
83I-05	71	G	9	52.81	0.17	2.45	1.16	4.77	0.18	15.65	22.13	1.13	0.00	-	-	-	100.45	Pyroxene
83J-01	67	A	4	40.82	0.83	21.19	2.62	7.67	0.38	19.67	5.07	0.05	-	0.00	-	-	98.30	Garnet
83J-01	67	B	4	36.52	0.04	21.32	0.01	36.41	0.75	3.47	1.28	0.03	-	0.00	-	-	98.83	Garnet
83J-01	67	E	4	52.62	0.19	2.33	0.00	4.90	0.08	15.14	24.69	0.42	0.00	-	-	-	100.35	Pyroxene
83J-01	67	F	4	53.37	0.04	1.38	0.36	5.38	0.19	16.47	23.35	0.48	0.00	-	-	-	101.02	Pyroxene
83J-01	67	I	4	0.05	0.00	54.68	0.01	3.23	1.31	3.26	-	-	-	-	36.65	0.00	98.19	Gahnite
83J-02	67	B	5	37.01	0.35	11.20	10.80	2.95	0.43	0.47	33.90	0.00	-	1.13	-	-	98.24	Garnet
83J-02	67	D	5	37.67	0.19	21.59	0.01	25.44	0.85	5.77	8.08	0.00	-	0.00	-	-	99.60	Garnet
83J-02	67	E	5	37.18	0.05	20.76	0.00	31.33	0.44	2.35	7.72	0.07	-	0.00	-	-	99.90	Garnet
83J-02	67	G	5	37.16	0.00	21.95	0.02	33.32	0.46	5.89	1.02	0.00	-	0.00	-	-	99.82	Garnet
83J-03	68	A	5	41.16	0.43	20.95	3.44	6.82	0.34	20.87	5.68	0.06	-	0.00	-	-	99.75	Garnet
83J-03	68	B	5	40.71	0.44	18.02	6.53	5.71	0.31	20.69	6.20	0.07	-	0.00	-	-	98.68	Garnet
83J-03	68	C	5	41.50	0.34	18.82	5.44	6.63	0.31	19.99	6.11	0.09	-	0.00	-	-	99.23	Garnet
83J-03	68	D	5	41.13	0.46	21.37	2.59	8.06	0.36	20.01	4.87	0.05	-	0.00	-	-	98.90	Garnet
83J-03	68	G	5	37.52	0.17	13.03	8.05	4.17	0.59	0.36	35.15	0.01	-	0.20	-	-	99.24	Garnet
83J-03	68	H	5	54.28	0.00	0.97	0.11	4.81	0.18	17.22	23.12	0.49	0.00	-	-	-	101.18	Pyroxene
83J-03	68	J	5	54.12	0.09	0.91	0.20	4.77	0.16	16.48	22.77	0.78	0.00	-	-	-	100.28	Pyroxene
83J-03	68	A	6	53.01	0.24	2.93	1.13	2.91	0.10	16.38	23.77	0.66	0.00	-	-	-	101.13	Pyroxene
83J-03	68	D	6	36.86	0.40	9.95	4.79	12.24	0.74	0.28	33.96	0.02	-	0.08	-	-	99.32	Garnet
83J-03	68	A	7	0.16	0.28	8.50	46.43	37.29	0.52	5.35	-	-	-	-	0.15	0.13	98.79	Chromite
83J-04	68	A	8	41.45	0.39	21.85	2.61	7.35	0.36	19.81	5.72	0.07	-	0.00	-	-	99.60	Garnet
83J-04	68	B	8	37.76	0.00	22.19	0.09	28.47	0.60	7.03	3.62	0.00	-	0.00	-	-	99.78	Garnet
83J-04	68	C	8	41.41	0.15	21.12	3.64	7.82	0.40	20.07	5.33	0.04	-	0.00	-	-	99.98	Garnet
83J-04	68	D	8	37.68	0.04	21.76	0.02	28.77	1.35	5.94	4.38	0.00	-	0.00	-	-	99.94	Garnet
83J-04	68	E	8	38.21	0.13	22.40	0.08	23.79	0.39	9.57	5.02	0.02	-	0.00	-	-	99.61	Garnet
83J-04	68	G	8	51.03	0.15	1.35	0.00	11.72	1.10	11.31	23.97	0.24	0.00	-	-	-	100.87	Pyroxene
83J-04	68	H	8	53.40	0.01	1.39	0.23	6.04	0.09	14.84	23.18	1.04	0.00	-	-	-	100.22	Pyroxene
83J-04	67	H	8	0.05	0.02	42.58	23.94	14.43	0.16	17.58	-	-	-	-	0.19	0.27	99.22	Chromite
83J-05	68	B	9	53.55	0.01	0.67	0.20	7.73	0.52	13.89	23.71	0.58	0.00	-	-	-	100.84	Pyroxene
83J-06	68	B	10	50.60	0.16	3.96	0.14	4.92	0.40	14.79	24.95	0.09	0.00	-	-	-	100.03	Pyroxene
83J-06	70	A	7	41.37	0.00	19.24	5.91	8.81	0.55	17.17	7.49	0.01	-	0.00	-	-	100.55	Garnet
83J-06	70	B	7	41.36	0.11	18.36	6.56	8.35	0.55	17.81	6.96	0.02	-	0.00	-	-	100.08	Garnet
83J-06	70	D	7	40.67	0.19	18.23	6.23	10.11	0.45	16.25	7.54	0.02	-	0.00	-	-	99.69	Garnet
83J-06	70	E	7	37.05	0.00	21.12	0.06	32.33	1.38	2.22	6.99	0.02	-	0.00	-	-	101.17	Garnet
83J-06	70	F	7	42.35	0.27	21.78	1.97	8.74	0.34	20.42	4.57	0.05	-	0.00	-	-	100.49	Garnet
83J-06	70	G	7	42.21	0.21	20.98	3.42	8.05	0.38	20.17	4.97	0.07	-	0.00	-	-	100.46	Garnet

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
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Tel: 274-2777 Fax: 275-0541

File No. : 36302
Client: Takla Star
Microprobe Data

Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83J-06	70	J	7	51.59	0.36	7.33	0.99	2.74	0.08	15.60	20.40	1.84	0.00	--	--	--	100.83	Pyroxene
83J-06	70	A	8	36.32	0.26	8.78	12.18	5.17	1.00	0.67	31.92	0.00	--	0.29	--	--	96.59	Garnet
83J-06	70	B	8	53.33	0.07	1.84	0.67	4.34	0.06	16.41	22.90	0.79	0.00	--	--	--	100.41	Pyroxene
83J-06	70	D	8	52.33	0.38	6.04	1.17	2.62	0.02	15.67	21.15	1.50	0.00	--	--	--	100.88	Pyroxene
83J-06	70	A	9	38.50	0.00	22.17	0.05	30.52	0.46	8.34	1.75	0.00	--	0.00	--	--	101.79	Garnet
83J-06	70	B	9	42.36	0.30	21.28	3.40	7.81	0.41	20.40	4.97	0.07	--	0.00	--	--	101.00	Garnet
83J-06	70	C	9	52.85	0.01	1.14	0.38	5.50	0.15	14.96	24.37	0.48	0.00	--	--	--	99.84	Pyroxene
83J-06	70	F	9	53.12	0.04	1.52	0.45	3.96	0.14	17.06	22.76	0.64	0.00	--	--	--	99.69	Pyroxene
83J-06	70	H	9	53.99	0.07	0.80	0.70	2.09	0.13	18.85	23.98	0.12	0.00	--	--	--	100.72	Pyroxene
83J-06	70	I	9	37.12	0.50	12.85	7.81	6.11	2.04	0.43	31.72	0.00	--	1.02	--	--	99.60	Garnet
83J-11	71	B	1	38.74	0.00	22.04	0.03	31.55	0.56	7.09	1.20	0.00	--	0.00	--	--	101.21	Garnet
83J-11	71	C	1	37.49	0.05	21.75	0.02	35.23	2.14	3.78	0.92	0.01	--	0.00	--	--	101.39	Garnet
83J-11	71	D	1	54.45	0.01	2.27	1.74	1.76	0.13	16.30	21.93	1.97	0.00	--	--	--	100.56	Pyroxene
83J-11	71	E	1	53.09	0.14	2.04	0.51	4.06	0.08	16.64	23.50	0.52	0.00	--	--	--	100.58	Pyroxene

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
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Tel: 274-2777 Fax: 275-0541

File # 36302

Client: Taiga Star

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
83G-02	72	B	1	0.30	5.73	7.13	20.19	5.96	0.05												
83G-02	72	C	1	0.06	0.00	28.13	7.26	4.08	0.01									9			
83G-02	72	F	1	0.00	0.00	16.18	13.41	7.44	0.01					(5)							
83G-02	72	G	1	0.98	2.05	9.16	20.46	5.10	0.09			3									
83G-02	72	H	1	0.06	0.00	31.51	2.82	7.16	0.02		2										
83G-03	72	A	2	0.07	4.32	7.60	19.76	5.59	0.04					5							
83G-03	72	B	2	0.27	0.18	6.90	0.26	35.79	0.04									9			
83G-03	72	C	2	0.41	11.52	5.67	0.46	32.26	0.01								8				
83G-03	72	D	2	0.09	7.77	6.73	0.36	34.01	0.03							7					
83G-04	69	D	1	0.28	5.53	7.55	20.27	5.62	0.02							7					
83G-04	69	E	1	0.00	2.90	8.82	20.03	4.35	0.04									9			
83G-04	69	F	1	0.14	6.37	7.35	19.55	5.85	0.06									9			
83G-04	69	G	1	0.48	8.06	5.12	0.40	33.55	0.03									9			
83G-04	69	H	1	0.32	4.75	5.44	0.37	33.29	0.06							7					
83G-07	69	A	4	0.61	4.47	7.70	20.12	6.02	0.08											11	
83G-07	69	B	4	0.00	5.87	7.58	19.27	5.98	0.02									8			
83G-07	69	D	4	0.62	2.59	7.65	21.22	5.24	0.06									9			
83G-07	69	F	4	0.00	0.00	30.18	2.65	8.95	0.00	1											
83G-07	69	G	4	0.87	3.93	7.69	20.53	5.40	0.12					5							
83G-07	69	I	4	0.07	0.10	29.89	4.62	6.94	0.01	1											
83G-08	72	A	4	0.09	0.05	23.70	4.83	11.36	0.08					(5)							
83G-08	72	B	4	0.01	0.13	25.88	7.32	6.50	0.03			(3)									
83G-08	72	C	4	0.09	0.02	29.61	4.49	7.38	0.03					(5)							
83G-10	69	A	6	0.22	5.44	8.16	20.03	5.55	0.04					(5)							
83G-10	69	C	6	0.81	3.34	7.43	20.94	5.23	0.08									9			
83G-10	69	D	6	0.08	0.09	27.96	4.97	8.12	0.05	1											
83G-10	69	G	6	0.13	0.00	20.43	7.77	10.99	0.00					(5)							
83G-11	69	C	8	0.24	0.04	27.46	6.71	6.78	0.00			3									
83G-11	69	D	8	0.06	0.04	30.89	4.38	6.92	0.08					(5)							
83G-12	66	B	10	0.10	0.05	27.89	8.80	2.77	0.01					5							
83G-12	69	C	10	0.00	0.02	37.63	3.68	2.37	0.03					(5)							
83G-14	67	A	7	0.00	5.75	7.71	18.15	7.07	0.01					5							
83G-14	67	B	7	0.01	0.04	29.60	8.13	0.82	0.00									9			
83G-14	67	C	7	0.03	0.00	27.54	8.78	1.88	0.00					(5)							
83G-14	67	D	7	0.00	0.00	31.79	6.41	1.77	0.01					(5)							
83G-14	67	F	7	0.00	0.11	25.30	10.28	2.27	0.00					5							
83G-15	67	B	9	0.06	0.03	29.54	7.47	1.52	0.02					(5)							
√ 83G-15	67	C	9	0.00	0.09	28.34	8.78	1.46	0.01					(5)							
83G-17	70	D	1	0.26	4.56	7.22	20.24	5.60	0.10					(5)							
83G-17	70	E	1	0.02	0.00	29.67	5.25	6.59	0.01									9			
√ 83G-17	70	F	1	0.06	0.00	34.68	2.04	6.80	0.06					(5)							
83G-18	68	C	1	0.16	0.01	22.99	7.32	8.34	0.00					5							
83G-18	68	D	1	0.03	0.02	25.99	5.13	7.73	0.04			3									
83G-18	68	E	1	0.18	0.00	28.01	5.20	6.88	0.00					(5)							
√ 83G-18	68	F	1	0.09	0.00	25.80	5.51	8.80	0.04					(5)							
83G-19	70	A	3	0.00	0.03	34.75	5.32	1.00	0.03					(5)							
														5							

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File # 36302

Client: Takla Star

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
83G-19	70	C	3	0.05	3.91	6.99	20.25	5.56	0.03									9			
83G-19	70	G	3	0.35	8.33	7.78	0.46	33.09	0.00							7					
83G-20	70	A	4	0.07	6.62	7.83	18.45	7.06	0.04									9			
83G-20	70	F	4	0.32	6.73	6.10	0.34	33.43	0.06											11	
83G-21	70	A	6	0.21	4.43	6.01	19.87	5.09	0.04									9			
83G-21	70	B	6	0.99	7.05	7.19	19.55	6.51	0.08											11	
83G-21	70	C	6	0.15	0.02	17.35	8.19	12.37	0.04			3									
83G-23	72	A	5	0.06	0.00	29.98	3.87	7.14	0.00					5							
83G-25	72	D	7	0.11	0.01	32.19	2.58	7.82	0.00					5							
83G-26	72	A	8	0.02	0.00	29.32	2.74	6.97	0.03					5							
83G-26	72	B	8	0.06	0.02	31.46	2.73	7.11	0.00					5							
83G-28	72	E	8	0.08	0.14	27.79	0.24	31.35	0.04					(5)							
83G-29	67	B	1	0.15	3.41	8.88	17.89	6.50	0.08									9			
83G-29	67	D	1	0.10	0.03	32.15	2.34	7.63	0.03					5							
83G-29	67	F	1	0.21	0.00	19.52	9.04	9.74	0.00			3									
83G-29	67	G	1	0.24	1.43	9.24	19.09	5.50	0.04									9			
83G-29	67	H	1	0.05	0.06	32.04	2.78	7.31	0.06					5							
83G-29	67	J	1	0.03	0.00	33.26	5.96	0.72	0.00					5							
83G-29	67	A	2	0.08	0.03	27.88	8.48	1.77	0.01					(5)							
83G-30	66	A	3	1.10	3.34	6.84	20.78	5.98	0.08	1											
83G-30	66	C	3	0.16	0.00	30.78	4.76	4.63	0.03					5							
83H-03	71	A	2	0.72	7.83	6.75	20.01	6.36	0.06											11	
83H-03	71	B	2	0.36	3.92	4.17	0.36	35.17	0.03									9			
83H-04	71	A	3	0.00	0.33	31.27	6.54	2.47	0.04					5							
83I-01	71	C	5	0.48	7.66	4.78	0.38	33.80	0.02											11	
83I-01	71	D	5	0.45	10.25	8.90	0.57	30.82	0.00							7					
83I-02	71	A	6	0.04	0.03	29.85	7.44	2.55	0.01					(5)							
83I-02	71	B	6	0.22	5.27	7.62	19.77	5.70	0.10									9			
83I-02	71	C	6	0.15	5.20	6.89	19.62	6.36	0.00									9			
83I-02	71	E	6	0.64	4.43	7.20	21.49	5.39	0.07									9			
83I-02	71	F	6	0.71	6.80	6.89	19.94	6.52	0.09											11	
83I-02	71	G	6	0.02	0.00	36.49	3.18	3.82	0.02					5							
83I-02	71	H	6	0.43	11.38	3.43	0.41	33.68	0.02							7					
83I-02	71	I	6	0.20	4.17	7.55	20.35	5.18	0.08									9			
83I-03	71	A	8	0.15	3.34	8.11	20.47	4.88	0.07									9			
83I-03	71	B	8	0.13	3.08	8.39	20.29	4.61	0.04									9			
83I-03	71	C	8	0.05	3.76	8.67	18.92	6.08	0.05									9			
83I-05	71	A	9	0.21	3.38	7.53	20.81	4.91	0.03									9			
83J-01	67	A	4	0.83	2.62	7.67	19.67	5.07	0.05	1											
83J-01	67	B	4	0.04	0.01	35.41	3.47	1.28	0.03					5							
83J-02	67	B	5	0.35	10.80	2.95	0.47	33.90	0.00							7					
83J-02	67	D	5	0.19	0.01	25.44	5.77	8.08	0.00					(5)							
83J-02	67	E	5	0.05	0.00	31.33	2.35	7.72	0.07					5							
83J-02	67	G	5	0.00	0.02	33.32	5.89	1.02	0.00					5							
83J-03	66	A	5	0.43	3.44	6.82	20.87	5.68	0.06	1											
83J-03	66	B	5	0.44	6.53	5.71	20.69	6.20	0.07									9			

Loring Laboratories Ltd.

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Tel: 274-2777 Fax 275-0541

File # 36302

Client: Takla Star

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
83J-03	68	C	5	0.34	5.44	6.63	19.99	6.11	0.09									9			
83J-03	68	D	5	0.46	2.59	8.06	20.01	4.87	0.05	1											
83J-03	68	G	5	0.17	8.05	4.17	0.35	35.15	0.01							7					
83J-03	68	D	6	0.40	4.79	12.24	0.28	33.96	0.02											11	
83J-04	68	A	8	0.39	2.61	7.35	19.81	5.72	0.07	1											
83J-04	68	B	8	0.00	0.09	28.47	7.03	3.62	0.00					(5)							
83J-04	68	C	8	0.15	3.64	7.82	20.07	5.33	0.04									9			
83J-04	68	D	8	0.04	0.02	28.77	5.94	4.38	0.00					(5)							
83J-04	68	E	8	0.13	0.08	23.79	9.57	5.02	0.02			3									
83J-06	70	A	7	0.00	5.91	8.81	17.17	7.49	0.01									9			
83J-06	70	B	7	0.11	6.56	5.35	17.81	6.96	0.02									9			
83J-06	70	D	7	0.19	6.23	10.11	16.25	7.54	0.02									9			
83J-06	70	E	7	0.00	0.06	32.33	2.22	6.99	0.02					5							
83J-06	70	F	7	0.27	1.97	8.74	20.42	4.57	0.05									9			
83J-06	70	G	7	0.21	3.42	8.05	20.17	4.97	0.07									9			
83J-06	70	A	8	0.26	12.18	5.17	0.67	31.92	0.00							7					
83J-08	70	A	9	0.00	0.05	30.52	8.34	1.75	0.00					6							
83J-08	70	B	9	0.30	3.40	7.81	20.40	4.97	0.07									9			
83J-08	70	I	9	0.50	7.81	6.11	0.43	31.72	0.00							7					
83J-11	71	B	1	0.00	0.03	31.55	7.09	1.20	0.00					5							
83J-11	71	C	1	0.05	0.02	35.23	3.78	0.92	0.01					5							
										8	1	7	0	46	0	10	1	33	0	7	0
										G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

Loring Laboratories Ltd.

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Tel: 274-2777 Fax 275-0541

File # 36302

Client: Takla Star

FIPKE MAGNESIAN - ALMANDINE GARNETS

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
83G-14	67	F	7	0.00	0.11	25.30	10.28	2.27	0.00	..	..	..	..	5	..	..	..	..	..	..	..
83J-02	67	D	5	0.19	0.01	25.44	5.77	8.06	0.00	..	..	..	..	5	..	..	..	..	..	..	.
83G-18	68	F	1	0.09	0.00	25.80	5.51	8.80	0.04	..	..	..	..	5	..	..	..	..	..	..	..
83G-08	72	B	4	0.01	0.13	25.88	7.32	6.50	0.03	.	..	..	..	5	..	..	..	..	..	..	.
83G-16	68	D	1	0.03	0.02	25.99	5.13	7.73	0.04	..	..	..	..	5	..	..	..	..	..	..	..
83G-11	69	C	8	0.24	0.04	27.46	6.71	6.78	0.00	.	..	..	..	5	..	..	..	..	..	..	.
83G-14	67	C	7	0.03	0.00	27.54	8.78	1.88	0.00	..	..	..	..	5	..	..	..	..	..	..	
83G-26	72	E	8	0.08	0.14	27.79	0.24	31.35	0.04	..	..	..	..	5	..	..	..	..	..	..	.
83G-29	67	A	2	0.08	0.03	27.88	8.48	1.77	0.01	..	..	..	..	5	..	..	..	..	..	..	..
83G-12	69	B	10	0.10	0.05	27.89	8.80	2.77	0.01	..	..	..	..	5	..	..	..	..	..	..	..
83G-10	69	D	6	0.08	0.09	27.96	4.97	8.12	0.05	..	..	..	..	5	..	..	..	..	..	.	..
83G-18	68	E	1	0.18	0.00	28.01	5.20	6.86	0.00	..	..	..	..	5	..	.	..	..	..	.	.
83G-02	72	C	1	0.06	0.00	28.13	7.26	4.06	0.01	..	.	..	..	5	..	..	..	..	.	..	
83G-15	67	C	9	0.00	0.09	28.34	8.78	1.46	0.01	..	..	..	..	5	..	..	..	..	.	..	.
83J-04	68	B	8	0.00	0.09	28.47	7.03	3.62	0.00	..	..	..	..	5	..	..	..	..	.	.	.
83J-04	68	D	8	0.04	0.02	28.77	5.94	4.38	0.00	..	..	..	..	5	..	..	.	..	.	..	.
83G-26	72	A	8	0.02	0.00	29.32	2.74	6.97	0.03	..	..	..	..	5	..	..	.	..	.	..	.
83G-15	67	B	9	0.06	0.03	29.54	7.47	1.52	0.02		..	..	..	5	..	..	..	..	..	..	..
83G-14	67	B	7	0.01	0.04	29.60	8.13	0.92	0.00	..	..	..	..	5	..	..	..	..	..	..	..
83G-08	72	C	4	0.09	0.02	29.61	4.49	7.38	0.03	..	..	..	..	5	..	..	..	..	..	..	.
83G-17	70	E	1	0.02	0.00	29.87	5.25	6.59	0.01	.	..	..	..	5	..	..	.	..	..		.
83I-02	71	A	6	0.04	0.03	29.85	7.44	2.56	0.01	..	..	..	..	5	..	..	..	..			.
83G-07	69	I	4	0.07	0.10	29.89	4.62	6.94	0.01	..	..	..	..	5	..	..	..	..	.		.

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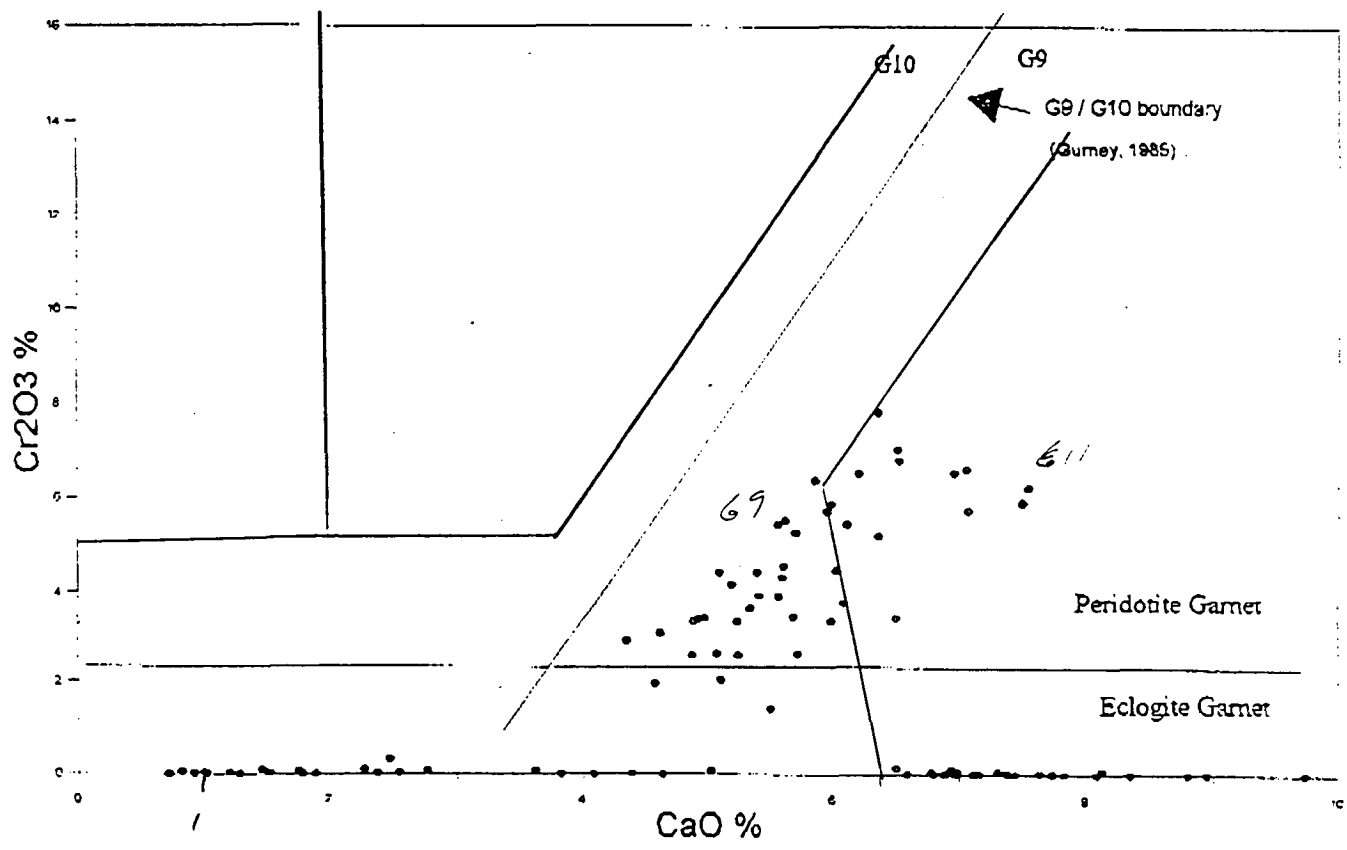
Pyrope Garnet Indicators



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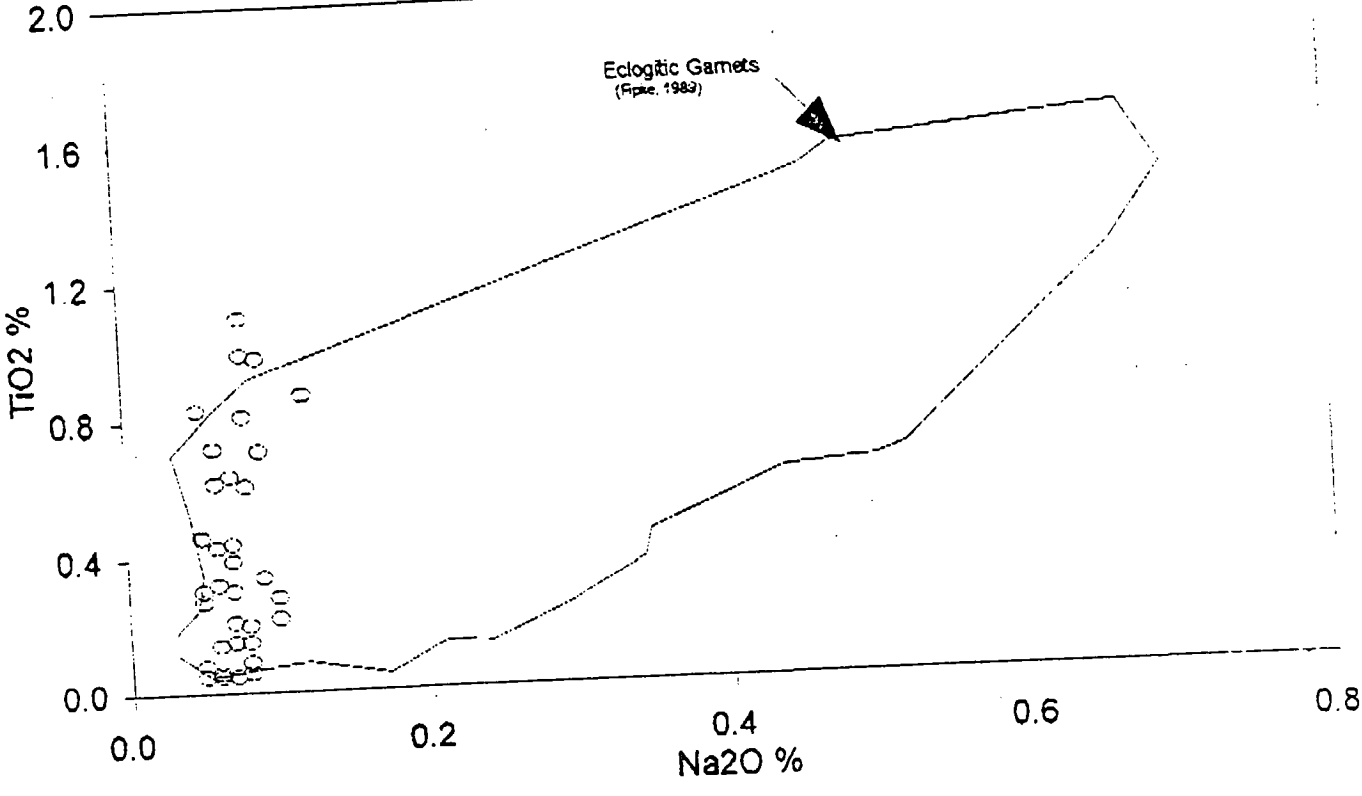
Eclogite Garnet Indicators



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629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File #36302
Client: Takla Star

Pyroxene Classification (after Stephens and Dawson, 1977)

Location				Data in wt %							ORTHOPYROXENE					CLINOPYROXENE								
Sample #	P#	C#	R#	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	1	2	3	4	5	1	2	3	4	5	6	7	8	9
83G-03	72	C	3	0.11	1.19	0.00	7.14	15.06	23.76	0.49									4					
83G-03	72	C	3	0.09	1.36	0.15	6.48	15.82	22.50	0.52							2							
83G-04	69	I	1	0.16	2.19	0.60	4.04	16.58	22.41	0.94							2							
83G-04	69	A	2	0.06	1.42	0.56	7.22	13.90	22.32	2.04							2							
83G-04	69	D	2	0.09	2.47	0.86	3.40	16.91	22.95	0.66										5				
83G-04	69	E	2	0.04	0.82	0.13	5.47	15.68	23.81	0.65							2							
83G-04	69	F	2	0.00	0.59	0.49	3.23	17.57	24.24	0.58										5				
83G-04	69	G	2	0.08	0.81	0.17	4.00	16.66	24.77	0.50										5				
83G-07	69	B	5	0.13	1.89	0.84	3.82	17.06	23.04	0.56							2							
83G-10	69	J	6	0.09	0.78	0.11	6.58	15.15	23.60	0.90							2							
83G-11	69	G	8	0.08	0.98	1.02	3.13	17.47	23.42	0.64										5				
83G-12	69	E	10	0.17	6.99	0.83	2.55	15.69	21.05	1.66										5				
83G-14	67	G	7	0.04	1.29	0.58	6.87	13.57	24.11	0.59							2							
83G-14	67	I	7	0.43	6.85	0.86	2.94	16.17	20.70	1.36							2							
83G-14	67	A	8	0.06	1.85	0.32	5.69	14.38	22.34	1.78							2							
83G-15	67	D	9	0.06	1.53	0.37	4.00	16.41	23.85	0.77										5				
83G-15	67	H	9	0.04	1.52	0.07	7.40	15.32	22.04	0.71							2							
83G-17	70	I	1	0.08	1.04	0.51	2.99	18.48	23.74	0.22										5				
83G-19	70	E	3	0.28	2.74	0.20	4.97	15.90	24.02	0.38							2							
83G-20	70	C	4	0.08	0.71	0.58	6.68	14.34	21.88	1.72							2							
83G-20	70	D	4	0.03	1.09	0.41	4.52	15.75	23.95	0.55							2							
83G-20	70	I	4	0.05	1.72	0.14	5.96	15.79	22.51	0.66							2							
83G-25	72	H	7	0.02	0.81	0.02	10.07	12.75	23.11	0.81									4					
83G-29	67	B	2	0.03	0.58	0.59	6.94	14.73	23.73	0.66							2							
83G-29	67	D	2	0.10	1.28	0.42	3.86	16.36	23.99	0.56										5				
83G-29	67	G	2	0.21	2.65	0.64	6.41	14.91	21.53	1.33									4					
83G-29	67	H	2	0.02	1.71	0.15	6.39	14.80	23.40	0.24							2							
83G-29	67	J	2	0.04	1.85	0.11	5.22	15.07	24.23	0.55							2							
83G-30	68	E	3	0.17	3.00	1.24	3.15	16.06	23.05	0.90										5				
83H-08	71	A	4	0.06	1.81	0.86	2.94	16.84	23.47	0.62										5				
83I-01	71	E	5	0.09	1.87	1.04	3.77	18.08	20.40	0.83							2							
83I-01	71	G	5	0.04	1.78	0.48	5.51	15.34	21.72	1.35							2							
83I-02	71	A	7	0.04	1.78	1.01	2.52	16.80	23.88	0.55										5				
83I-02	71	B	7	0.07	0.94	0.13	5.21	16.36	23.10	0.36							2							
83I-02	71	D	7	0.02	2.31	1.14	3.83	16.28	22.79	0.82										5				
83I-02	71	E	7	0.04	1.09	0.53	3.96	16.73	23.67	0.41										5				
83I-03	71	E	8	0.25	6.76	0.72	2.71	15.59	20.59	1.66							2							

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Tel: 274-2777 Fax: 275-0541

File #36302
Client: Takla Star

Pyroxene Classification (after Stephens and Dawson, 1977)

831 Location

Sample #	P#	C#	R#	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	ORTHOPYROXENE 1	2	3	4	5	CLINOPYROXENE 1	2	3	4	5	6	7	8	9	10
				Data in wt %																					
831-03	71	F	8	0.47	6.65	0.78	2.72	15.23	21.13	1.71								3							
831-05	71	E	9	0.07	0.83	0.05	7.96	14.04	23.77	0.57									4						
831-05	71	F	9	0.10	1.49	1.39	3.53	16.34	22.85	0.99										5					
831-05	71	G	9	0.17	2.45	1.16	4.77	15.65	22.13	1.13							2								
83J-01	67	E	4	0.19	2.33	0.00	4.90	15.14	24.69	0.42							2								
83J-01	67	F	4	0.04	1.38	0.36	5.38	16.47	23.35	0.48							2								
83J-03	68	H	5	0.00	0.97	0.11	4.81	17.22	23.12	0.49							2								
83J-03	68	J	5	0.09	0.91	0.20	4.77	16.46	22.77	0.78							2								
83J-03	66	A	6	0.24	2.93	1.13	2.91	16.38	23.77	0.66										5					
83J-04	66	G	8	0.15	1.35	0.00	11.72	11.31	23.97	0.24									4						
83J-04	66	H	8	0.01	1.39	0.23	8.04	14.84	23.18	1.04							2								
83J-04	66	B	9	0.01	0.67	0.20	7.73	13.89	23.71	0.56							2								
83J-05	68	B	10	0.16	3.68	0.14	4.92	14.79	24.95	0.09							2								
83J-06	70	J	7	0.36	7.33	0.89	2.74	15.80	20.40	1.84							2								
83J-06	70	B	8	0.07	1.84	0.67	4.34	16.41	22.90	0.79							2								
83J-06	70	D	8	0.36	6.04	1.17	2.62	15.67	21.15	1.50							2								
83J-08	70	C	9	0.01	1.14	0.38	5.50	14.96	24.37	0.48							2								
83J-08	70	F	9	0.04	1.52	0.45	3.96	17.06	22.76	0.64							2								
83J-08	70	H	9	0.07	0.80	0.70	2.08	18.85	23.98	0.12										5					
83J-11	71	D	1	0.01	2.27	1.74	1.76	16.30	21.93	1.97										5					
83J-11	71	E	1	0.14	2.04	0.51	4.06	16.64	23.50	0.52							2								
											--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
											ORTHOPYROXENE 1	2	3	4	5	CLINOPYROXENE 1	2	3	4	5	6	7	8	9	10
											--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Pyroxene =			58								0	0	0	0	0	0	35	1	5	17	0	0	0	0	0

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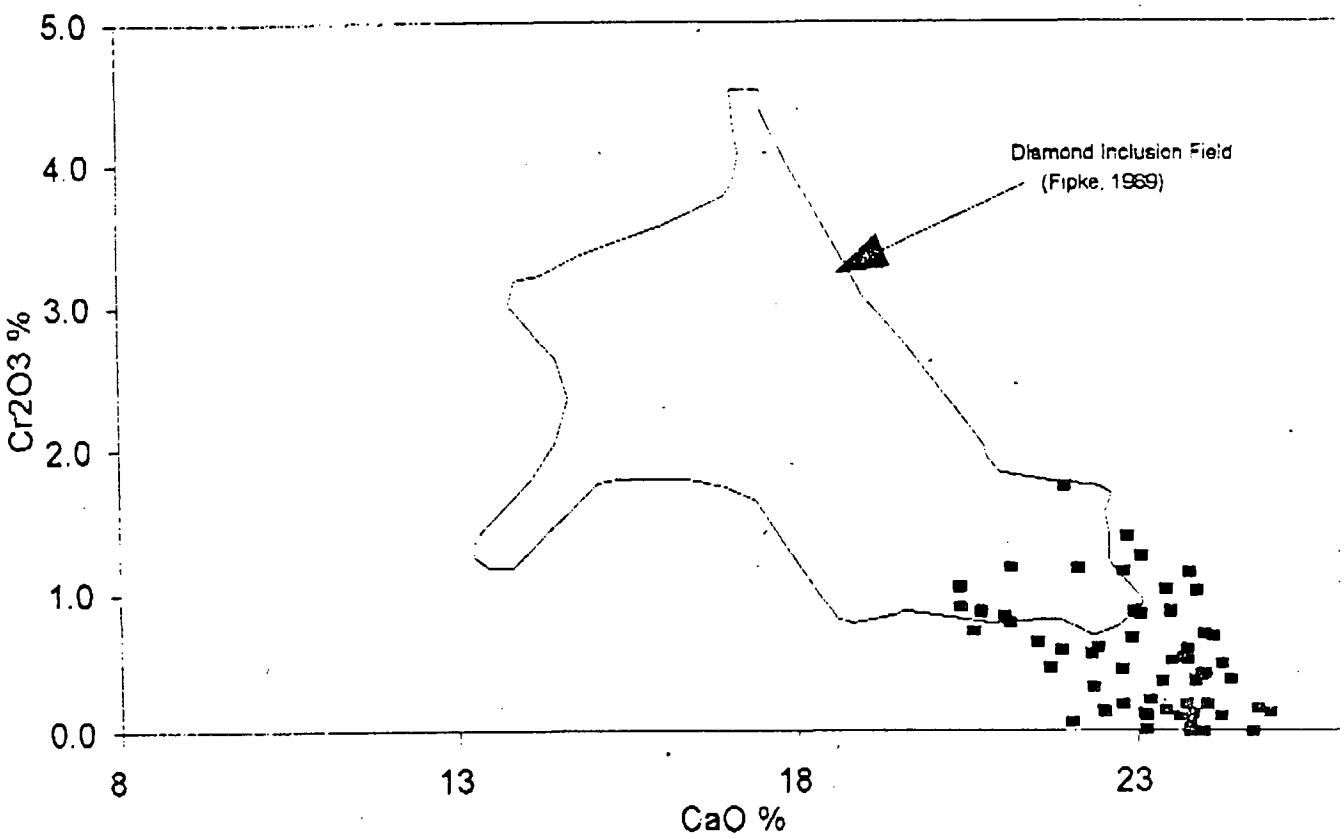
Clinopyroxene



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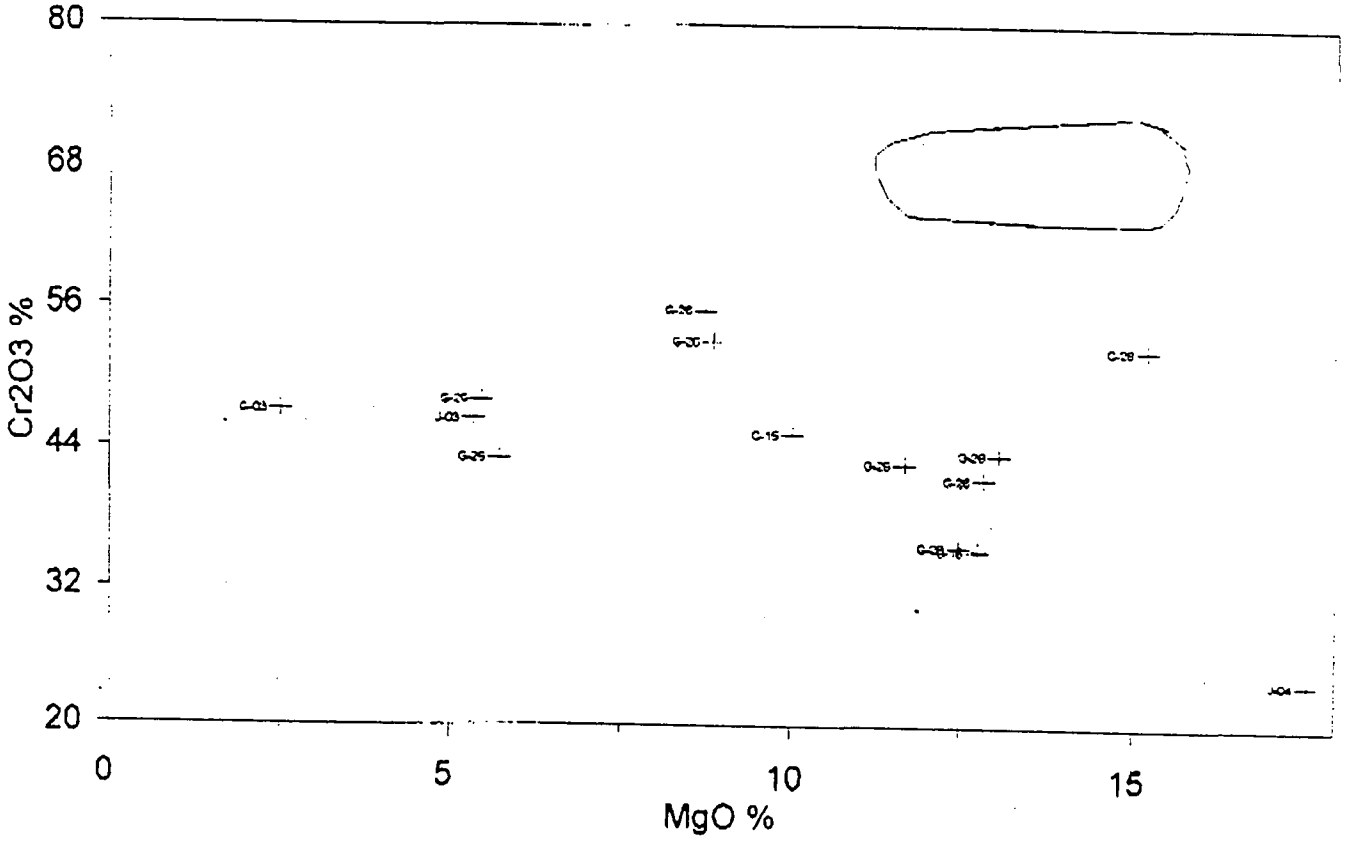
Chromite Indicator



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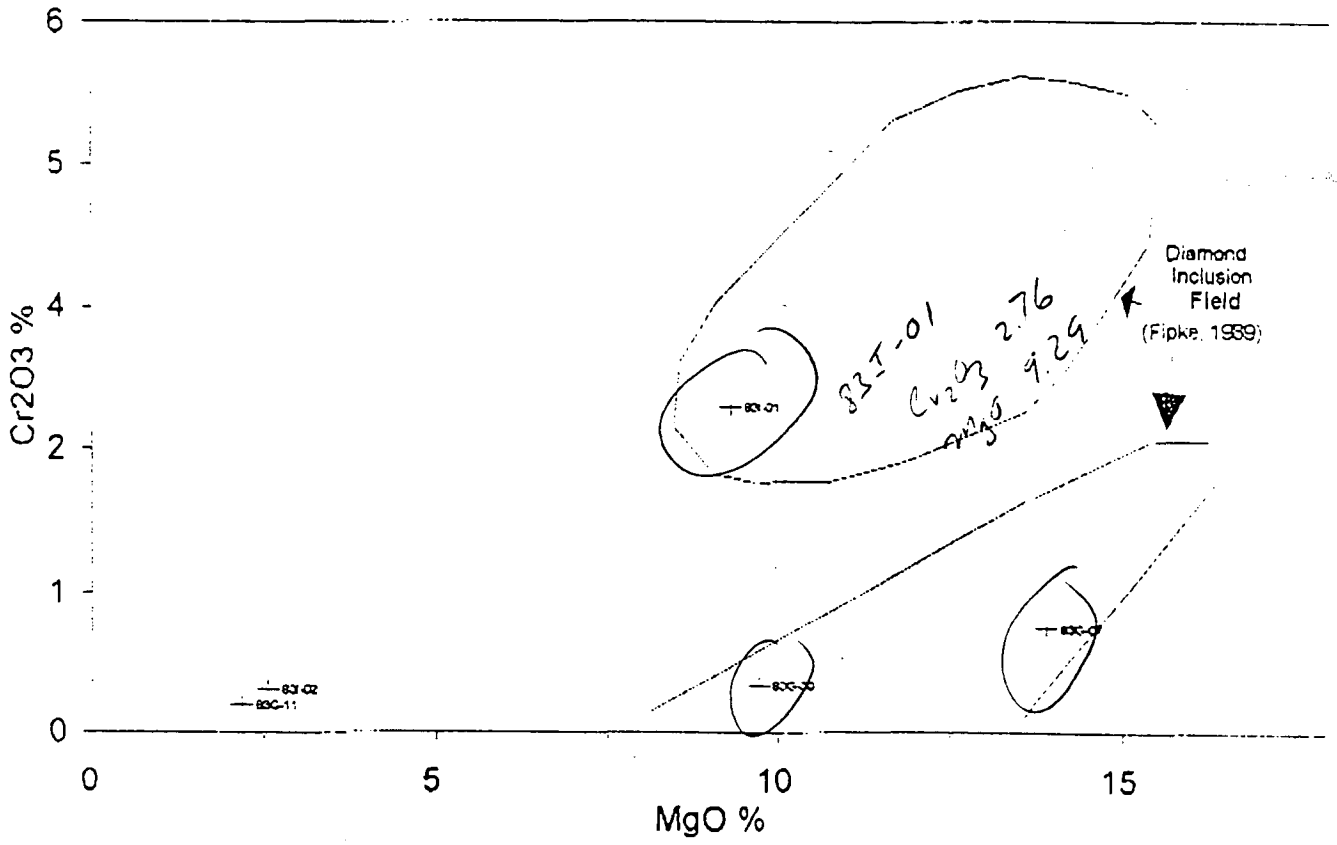
Ilmenite Indicators



Intensity & Wt. % Group : Laflamme Sample : TAKLA

U known Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 218 Comment : 83G-2-1
tage : X= 16.8550 Y= 75.0195 Z= 10.7810
ated on Dec 11 06:47 1993
WDS only No. of accumulation : 1

C rr.(A) : 2.009E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	-2.3	30.8	26.4	4.20
Fe	134.820	3579.9	39.4	34.2	0.37
Ni	115.380	14.1	63.4	51.8	1.84
Zn	99.785	38.5	76.4	81.4	1.45
Mg	107.500	1042.1	12.4	8.4	0.49
Al	90.585	4066.1	20.4	11.8	0.35
Mn	146.420	51.0	32.0	29.4	1.73
Ti	191.487	19.8	12.2	10.8	2.74
Cr	159.500	4800.6	26.4	23.6	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	23.956	3.8228	22.267	1.0758	1.0254	1.0495	0.9997
NiO	0.090	0.0137	0.080	1.1223	1.0699	1.0494	0.9995
ZnO	0.298	0.0420	0.271	1.1015	1.0698	1.0297	1.0000
MgO	10.253	2.9163	6.942	1.4768	0.9518	1.5478	1.0024
Al2O3	25.083	5.6413	20.591	1.2181	0.9575	1.2722	1.0000
MnO	0.360	0.0581	0.368	0.9760	1.0299	0.9479	0.9997
TiO2	0.232	0.0332	0.232	0.9994	1.0291	1.0140	0.9576
Cr2O3	38.085	5.7457	39.353	0.9678	0.9866	1.0040	0.9770
Total	98.357	18.2733	90.104	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 19.39

Fe_2O_3 5.08

New Total : 98.87

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 219 Comment : 83G-3-1
Stage : X= 24.3865 Y= 74.5925 Z= 10.8030
Dated on Dec 11 06:51 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.009E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-2.9	30.8	26.4	4.25
2 Fe	134.820	4197.4	39.4	34.2	0.34
3 Ni	115.380	12.1	63.4	51.8	1.87
4 Zn	99.785	11.0	76.4	81.4	1.65
5 Mg	107.500	962.5	12.4	8.4	0.51
6 Al	90.585	3733.2	20.4	11.8	0.37
7 Mn	146.420	52.3	32.0	29.4	1.72
8 Ti	191.487	14.1	12.2	10.8	3.01
9 Cr	159.500	4716.2	26.4	23.6	0.32

ZAF Acc. Voltage : 20.0 (kV)

Oxide		Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO		0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO		27.981	4.5412	26.108	1.0718	1.0230	1.0479	0.9998
NiO		0.077	0.0120	0.069	1.1234	1.0672	1.0528	0.9999
ZnO		0.085	0.0122	0.077	1.1008	1.0669	1.0317	1.0000
MgO	X	9.684	2.8013	6.412	1.5102	0.9498	1.5857	1.0027
Al2O3	X	23.297	5.3288	18.905	1.2323	0.9555	1.2897	1.0000
MnO		0.368	0.0604	0.378	0.9738	1.0275	0.9479	0.9999
TiO2		0.165	0.0241	0.166	0.9969	1.0268	1.0141	0.9574
Cr2O3	X	37.069	5.6876	38.661	0.9588	0.9843	1.0039	0.9703
Total		98.726	18.4677	90.776	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 20.30

Fe_2O_3 8.53

New Total 99.59

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 223 Comment : 83G-7-1
Stage : X= 25.7650 Y= 85.1725 Z= 10.7565
Dated on Dec 14 21:47 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.017E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-0.9	29.2	25.0	4.20
2 Fe	134.810	4045.5	43.6	34.0	0.35
3 Ni	115.380	33.9	67.6	47.0	1.64
4 Zn	99.785	3.1	90.0	79.2	1.67
5 Mg	107.519	1309.9	15.0	4.8	0.62
6 Al	90.590	3070.8	23.4	13.0	0.40
7 Mn	146.420	38.0	28.8	27.0	1.92
8 Ti	191.487	164.7	13.8	10.4	1.18
9 Cr	159.468	4563.8	24.8	22.8	0.33

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.970	4.4226	25.140	1.0728	1.0238	1.0482	0.9997
NiO	0.215	0.0340	0.192	1.1236	1.0681	1.0520	1.0000
ZnO	0.024	0.0035	0.022	1.1014	1.0679	1.0314	1.0000
MgO	13.053	3.8151	8.692	1.5016	0.9505	1.5747	1.0033
Al2O3	19.523	4.5121	15.523	1.2577	0.9562	1.3153	1.0000
MnO	0.267	0.0443	0.273	0.9762	1.0283	0.9496	0.9998
TiO2	1.923	0.2836	1.922	1.0007	1.0276	1.0134	0.9609
Cr2O3	35.887	5.5635	37.244	0.9636	0.9851	1.0063	0.9720
Total	97.862	18.6786	89.008	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 15.93
Fe_2O_3 12.27
New Total : 99.09

X

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 224 Comment : 83G-7-2
Stage : X= 24.9820 Y= 85.1110 Z= 10.7555
Dated on Dec 14 21:51 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.016E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	8.7	29.2	25.0	3.64
2 Fe	134.810	2897.1	43.6	34.0	0.41
3 Ni	115.380	35.8	67.6	47.0	1.62
4 Zn	99.785	-1.8	90.0	79.2	1.72
5 Mg	107.519	1537.0	15.0	4.8	0.57
6 Al	90.590	2802.6	23.4	13.0	0.42
7 Mn	146.420	33.6	28.8	27.0	1.98
8 Ti	191.487	90.1	13.8	10.4	1.55
9 Cr	159.468	5561.4	24.8	22.8	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.033	0.0068	0.033	0.9975	0.9763	1.0210	1.0008
FeO	19.528	3.1424	18.012	1.0842	1.0251	1.0579	0.9997
NiO	0.227	0.0352	0.202	1.1225	1.0695	1.0496	1.0000
ZnO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
MgO	14.999	4.3019	10.204	1.4699	0.9515	1.5395	1.0035
Al2O3	17.793	4.0352	14.175	1.2553	0.9572	1.3114	1.0000
MnO	0.236	0.0384	0.242	0.9758	1.0296	0.9480	0.9997
TiO2	1.040	0.1504	1.052	0.9885	1.0288	1.0121	0.9494
Cr2O3	44.355	6.7477	45.408	0.9768	0.9863	1.0041	0.9864
Total	98.211	18.4581	89.328	Total O = 24.0		Iteration = 5	

Ca .0011
Fe2 .3128
Fe3 .1979
Ni .0057
Zn .0000
Mg .6992
Al .6558
Mn .0063
Ti .0245
Cr 1.0967

recalculate wt% FeO 11.96
Fe_2O_3 8.41
New Total : 99.06

Mg# .691
Ti# .028
Fe2# .309
Fe3# .101
Cr# .562

Zn ppm 0
Ni ppm 1763

P3 *

* Ni is high

U known Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 2 Comment : 83G18-4
tage : X= 25.0435 Y= 80.0575 Z= 10.8260
ated on Dec 24 11:10 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.002E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	-0.3	31.0	26.4	100.00 ?
Fe	134.832	3562.3	41.8	36.8	0.38
3 Ni	115.360	38.9	66.4	46.4	7.28
4 Zn	99.775	8.1	83.0	77.4	39.48 ?
Mg	107.496	1279.1	10.8	10.2	0.45
Al	90.598	2350.6	25.2	12.4	0.47
7 Mn	146.388	36.7	32.6	29.2	5.96
Ti	191.475	155.8	12.2	9.8	1.47
Cr	159.478	5519.7	29.0	23.2	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.102	3.9971	22.343	1.0787	1.0209	1.0570	0.9996
iO	0.251	0.0400	0.223	1.1225	1.0650	1.0541	0.9999
nO	0.063	0.0092	0.057	1.0994	1.0646	1.0327	1.0000
MgO	13.122	3.8790	8.614	1.5233	0.9481	1.6005	1.0039
l2O3	15.255	3.5657	12.012	1.2700	0.9538	1.3315	1.0000
nO	0.254	0.0426	0.261	0.9726	1.0255	0.9488	0.9997
TiO2	1.793	0.2673	1.820	0.9851	1.0249	1.0119	0.9499
Cr2O3	43.154	6.7659	44.621	0.9671	0.9824	1.0052	0.9794
otal	97.994	18.5669	89.951	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 14.99

Fe_2O_3 10.12

New Total: 98.99

Mg # .609
Ti # .056
Fe2 # .391
Fe3 # .128
Cr # .571

Zn ppm 506
Ni ppm 1972

Ca .0000
Fe2 .4017
Fe3 .2440
Ni .0065
Zn .0015
Mg .6267
Al .5761
Mn .0069
Ti .0432
Cr 1.0933

P3

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 225 Comment : 83G-7-3
Stage : X= 25.3885 Y= 86.1755 Z= 10.7495
Dated on Dec 15 13:01 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.022E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	3.2	31.8	23.6	63.94 ?
2 Fe	134.810	3396.7	42.0	34.0	0.39
3 Ni	115.380	31.4	65.6	50.6	9.03
4 Zn	99.785	3.5	78.8	86.2	92.13 ?
5 Mg	107.519	1406.0	15.4	6.6	0.60
6 Al	90.590	2817.1	22.0	13.8	0.43
7 Mn	146.420	39.0	26.6	29.6	5.43
8 Ti	191.487	128.4	12.0	10.0	1.67
9 Cr	159.468	5411.4	23.8	26.0	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.012	0.0025	0.012	0.9969	0.9749	1.0215	1.0011
FeO	22.744	3.6606	21.056	1.0802	1.0235	1.0557	0.9997
NiO	0.199	0.0308	0.177	1.1227	1.0678	1.0515	1.0000
ZnO	0.027	0.0038	0.024	1.1007	1.0675	1.0311	1.0000
MgO	13.893	3.9856	9.306	1.4929	0.9502	1.5656	1.0035
Al2O3	17.866	4.0527	14.206	1.2577	0.9559	1.3157	1.0000
MnO	0.273	0.0444	0.280	0.9749	1.0280	0.9485	0.9998
TiO2	1.480	0.2141	1.495	0.9900	1.0273	1.0123	0.9520
Cr2O3	42.784	6.5099	44.052	0.9712	0.9848	1.0049	0.9814
Total	99.278	18.5045	90.608	Total O =	24.0	Iteration =	5

Ca .0004
Fe2 .3758
Fe3 .2177
Ni .0050
Zn .0006
Mg .6461
Al .6570
Mn .0072
Ti .0347
Cr 1.0555

Recalculate wt% FeO 14.40
Fe_2O_3 9.27
New Total: 100.20

mg # .632
Ti # .038
Fe2 # .368
Fe3 # .113
Cr # .547

Zn ppm 216
Ni ppm 1563

+

Chromite

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 4 Comment : 83G19-9
Stage : X= 31.5905 Y= 75.5795 Z= 10.8505
Dated on Dec 24 11:21 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	0.8	35.8	21.8	245.73 ?
Fe	134.832	5771.7	42.8	44.6	0.30
Ni	115.360	7.6	73.0	55.4	37.83 ?
Zn	99.775	43.9	94.4	84.6	7.98
Mg	107.496	284.1	8.2	4.8	0.99
Al	90.598	514.2	21.2	13.0	1.03
Mn	146.388	79.2	37.2	34.2	3.21
Ti	191.475	17.8	17.2	12.6	8.53
Cr	159.478	6792.7	32.2	28.2	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.003	0.0008	0.003	0.9665	0.9545	1.0182	0.9944
FeO	38.568	7.3811	36.219	1.0649	1.0002	1.0649	0.9997
NiO	0.049	0.0090	0.043	1.1204	1.0425	1.0752	0.9996
ZnO	0.336	0.0568	0.309	1.0885	1.0411	1.0456	1.0000
MgO	✗ 3.361	1.1466	1.914	1.7560	0.9310	1.8759	1.0054
Al2O3	✗ 3.466	0.9348	2.629	1.3184	0.9366	1.4076	1.0000
MnO	0.536	0.1040	0.564	0.9511	1.0050	0.9465	0.9998
TiO2	0.196	0.0337	0.208	0.9418	1.0053	1.0106	0.9270
Cr2O3	50.967	9.2214	54.939	0.9277	0.9631	1.0020	0.9612
Total	97.482	18.8882	96.828	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 26.20

Fe_2O_3 13.75

New total: 98.88

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 10 Comment : 83G20-11
Stage : X= 15.6520 Y= 81.9475 Z= 10.8090
Dated on Jan 5 12:57 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.014E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-7.2	37.8	34.4	100.00 ?
2 Fe	134.820	4618.7	48.2	34.4	0.33
3 Ti	115.360	10.7	74.2	53.2	26.75
4 Zn	99.805	30.5	98.0	80.4	11.32
5 Mg	107.520	628.5	12.0	8.6	0.66
6 Al	90.598	1335.7	24.4	13.2	0.62
7 Mn	146.397	69.7	31.8	31.2	3.42
8 Ti	191.484	21.2	12.4	12.2	6.78
9 Cr	159.457	6635.0	28.8	27.0	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
Ca	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	30.919	5.4791	28.794	1.0738	1.0089	1.0646	0.9998
NiO	0.069	0.0117	0.061	1.1212	1.0519	1.0661	0.9997
Zn	0.233	0.0364	0.213	1.0930	1.0509	1.0400	1.0000
MgO	7.009	2.2137	4.233	1.6555	0.9381	1.7563	1.0048
Al2O3	8.763	2.1884	6.784	1.2917	0.9438	1.3687	1.0000
MnO	0.473	0.0849	0.493	0.9593	1.0136	0.9466	0.9998
TiO2	0.235	0.0375	0.247	0.9544	1.0135	1.0109	0.9316
Cr2O3	51.002	8.5443	53.906	0.9461	0.9712	1.0022	0.9721
Total	98.703	18.5961	94.732	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 21.95
Fe_2O_3 9.96
New Total: 99.70

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 9 Comment : 83G20-9
Stage : X= 17.8755 Y= 81.1470 Z= 10.8170
Dated on Jan 5 10:26 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.011E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-0.2	28.8	26.0	100.00 ?
2 Fe	134.820	3911.6	37.6	34.0	0.36
3 Ni	115.360	10.2	65.4	59.8	27.93
4 Zn	99.805	23.4	85.2	80.6	14.17
5 Mg	107.520	841.8	13.2	8.0	0.56
6 Al	90.598	2030.6	24.4	12.4	0.50
7 Mn	146.397	59.1	28.4	28.8	3.80
8 Ti	191.484	17.3	13.4	11.8	8.21
9 Cr	159.457	6354.6	28.8	26.0	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.337	4.4731	24.422	1.0784	1.0147	1.0629	0.9998
NiO	0.065	0.0106	0.058	1.1216	1.0583	1.0601	0.9998
ZnO	0.179	0.0269	0.164	1.0959	1.0576	1.0362	1.0000
MgO	9.015	2.7291	5.679	1.5875	0.9430	1.6765	1.0042
Al2O3	13.116	3.1396	10.328	1.2700	0.9486	1.3387	1.0000
MnO	0.404	0.0696	0.419	0.9649	1.0194	0.9467	0.9998
TiO2	0.194	0.0296	0.201	0.9651	1.0190	1.0113	0.9365
Cr2O3	49.500	7.9481	51.705	0.9574	0.9766	1.0024	0.9779
Total	98.810	18.4265	92.976	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 19.63
Fe_2O_3 7.46
New total 99.57

Mg # .450
Ti # .007
Fe2 # .550
Fe3 # .093
Cr # .650

Zn ppm 1438
Ni ppm 510

Ca .0000
Fe2 .5428
Fe3 .1856
Ni .0017
Zn .0044
Mg .4443
Al .5111
Mn .0113
Ti .0048
Cr 1.2940

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 8 Comment : 83G20-5
Stage : X= 15.6990 Y= 80.3215 Z= 10.8210
Dated on Dec 24 11:44 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	-0.4	29.4	24.4	100.00 ?
2 Fe	134.832	3655.4	33.2	29.4	0.37
3 Ni	115.360	31.1	59.4	53.4	9.00
4 Zn	99.775	14.7	75.4	66.2	20.62
5 Mg	107.496	1262.7	15.2	8.4	0.46
6 Al	90.598	3463.0	23.8	12.0	0.38
7 Mn	146.388	37.4	30.4	28.4	5.75
8 Ti	191.475	91.2	11.4	10.6	2.10
9 Cr	159.478	4875.5	25.8	24.2	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.678	3.9433	22.938	1.0758	1.0251	1.0498	0.9996
NiO	0.200	0.0308	0.178	1.1230	1.0696	1.0501	0.9998
ZnO	0.114	0.0161	0.104	1.1017	1.0694	1.0302	1.0000
MgO	12.609	3.5913	8.509	1.4819	0.9516	1.5528	1.0029
Al2O3	21.971	4.9479	17.706	1.2409	0.9573	1.2963	1.0000
MnO	0.260	0.0421	0.266	0.9764	1.0296	0.9486	0.9997
TiO2	1.065	0.1530	1.065	0.9995	1.0289	1.0135	0.9585
Cr2O3	38.167	5.7657	39.433	0.9679	0.9863	1.0050	0.9765
Total	99.064	18.4902	90.199	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4280
Fe3 .2118
Ni .0056
Zn .0026
Mg .5826
Al .8028
Mn .0068
Ti .0248
Cr .9355

Recalculate wt% FeO 16.51
Fe_2O_3 9.08
New total: 99.98

Mg .576
Ti .024
Fe2 .424
Fe3 .109
Cr .480

Zn ppm 915
Ni ppm 1571

Unknown Specimen
Group : Laflamme Sample : TAKLAII
PIK No. : 7 Comment : 83G20-4
Stage : X= 16.2080 Y= 80.2855 Z= 10.8210
Dated on Dec 24 11:38 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	-0.8	30.4	23.2	100.00 ?
2 Fe	134.832	3473.7	43.0	34.6	0.39
3 Ni	115.360	6.7	65.4	47.8	40.17 ?
4 Zn	99.775	60.9	78.4	72.2	5.43
5 Mg	107.496	951.0	11.4	9.0	0.53
6 Al	90.598	4135.9	23.0	13.2	0.35
7 Mn	146.388	56.8	26.8	27.8	3.87
8 Ti	191.475	20.8	11.8	10.4	6.65
9 Cr	159.478	4981.0	25.4	22.6	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	23.464	3.7245	21.798	1.0764	1.0251	1.0505	0.9996
N O	0.043	0.0066	0.038	1.1216	1.0695	1.0494	0.9993
Z O	0.471	0.0660	0.428	1.1011	1.0694	1.0296	1.0000
MgO	9.480	2.6822	6.408	1.4794	0.9515	1.5512	1.0024
A 203	25.640	5.7360	21.146	1.2125	0.9572	1.2668	1.0000
N O	0.395	0.0635	0.405	0.9756	1.0296	0.9479	0.9997
TiO2	0.242	0.0346	0.243	0.9980	1.0288	1.0140	0.9567
Cr203	39.024	5.8560	40.286	0.9687	0.9862	1.0040	0.9783
Total	98.759	18.1694	90.753	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 20.61
Fe_2O_3 3.16
New Total: 99.07

X

Close to PI

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 6 Comment : 83G20-3
Stage : X= 16.8345 Y= 80.2520 Z= 10.8210
Dated on Dec 24 11:32 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1 Ca	107.747	-0.8	32.2	25.4	100.00 ?	✓
2 Fe	134.832	2812.9	39.8	31.8	0.43	
3 Ni	115.360	26.7	63.8	51.6	10.50	
4 Zn	99.775	3.7	89.2	82.6	88.34 ?	✓
5 Mg	107.496	1151.5	14.0	10.4	0.48	
6 Al	90.598	1263.4	20.0	17.0	0.64	
7 Mn	146.388	68.5	28.4	25.4	3.29	
8 Ti	191.475	16.1	13.6	8.4	8.29	
9 Cr	159.478	7424.6	22.8	26.6	0.26	

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	19.231	3.2522	17.652	1.0895	1.0149	1.0737	0.9998
NiO	0.172	0.0279	0.153	1.1208	1.0585	1.0589	1.0000
ZnO	0.029	0.0043	0.026	1.0955	1.0579	1.0356	1.0000
MgO	12.166	3.6671	7.760	1.5678	0.9431	1.6545	1.0048
Al2O3	8.302	1.9788	6.460	1.2853	0.9488	1.3547	1.0000
MnO	0.470	0.0806	0.488	0.9642	1.0196	0.9459	0.9998
TiO2	0.178	0.0271	0.188	0.9496	1.0192	1.0093	0.9231
Cr2O3	58.150	9.2969	60.050	0.9684	0.9768	1.0012	0.9902
Total	98.698	18.3350	92.776	Total O = 24.0		Iteration = 4	

Ca .0000
Fe2 .3858
Fe3 .1962
Ni .0046
Zn .0007
Mg .6000
Al .3238
Mn .0132
Ti .0044
Cr 1.5214

Recalculate wt% FeO 13.94
Fe_2O_3 5.87
New Total: 99.29

Mg # .609
Ti # .009
Fe2 # .391
Fe3 # .073
Cr # .764

Zn ppm 232
Ni ppm 1351

T_{Zn} · 1493 °C

U known Specimen
roup : Laflamme Sample : TAKLAII
UNK No. : 11 Comment : 83G21-4
Stage : X= 20.9995 Y= 81.4510 Z= 10.8175
ated on Jan 5 13:56 1994
nOS only No. of accumulation : 1

Corr.(A) : 2.016E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-1.9	31.0	29.4	100.00 ?
Fe	134.820	3702.3	40.4	34.4	0.37
Ni	115.360	23.1	67.2	51.6	12.25
4 Zn	99.805	20.9	92.2	82.4	16.18
5 Mg	107.520	789.5	11.8	7.4	0.58
Al	90.598	1132.7	24.0	14.6	0.68
Mn	146.397	60.4	28.8	36.8	3.92
8 Ti	191.484	107.2	13.6	14.0	1.96
Cr	159.457	7025.9	29.2	27.8	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.942	4.3934	23.059	1.0817	1.0105	1.0708	0.9997
NiO	0.147	0.0250	0.132	1.1205	1.0537	1.0636	0.9998
nO	0.160	0.0248	0.146	1.0933	1.0528	1.0385	1.0000
gO	< 8.632	2.7100	5.313	1.6247	0.9394	1.7211	1.0049
Al2O3	< 7.405	1.8382	5.747	1.2885	0.9451	1.3634	1.0000
nO	0.411	0.0733	0.428	0.9613	1.0151	0.9472	0.9998
O2	1.185	0.1877	1.246	0.9508	1.0150	1.0096	0.9278
Cr2O3	54.609	9.0939	57.025	0.9576	0.9727	1.0030	0.9817
otal	97.491	18.3463	93.095	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 19.71
Fe_2O_3 5.81
New total 98.08

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 234 Comment : 83G-23-4
Stage : X= 21.7445 Y= 80.9290 Z= 10.7720
Dated on Dec 11 07:54 1993
WDS only No. of accumulation : 1

Tube.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	1.0	30.8	26.4	3.97
2 Fe	134.820	3225.7	39.4	34.2	0.39
3 Ni	115.380	17.6	63.4	51.8	1.80
4 Zn	99.785	8.3	76.4	81.4	1.67
5 Mg	107.500	1284.6	12.4	8.4	0.44
6 Al	90.585	1675.0	20.4	11.8	0.54
7 Mn	146.420	42.8	32.0	29.4	1.82
8 Ti	191.487	43.3	12.2	10.8	2.10
9 Cr	159.500	6483.3	26.4	23.6	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.004	0.0008	0.004	0.9844	0.9698	1.0184	0.9968
FeO	21.816	3.6610	20.114	1.0846	1.0177	1.0659	0.9998
NiO	0.112	0.0181	0.100	1.1218	1.0616	1.0569	0.9999
ZnO	0.064	0.0095	0.058	1.0974	1.0610	1.0343	1.0000
MgO	13.286	3.9740	8.579	1.5485	0.9454	1.6306	1.0044
Al2O3	10.925	2.5839	8.503	1.2848	0.9511	1.3508	1.0000
MnO	0.300	0.0510	0.310	0.9677	1.0223	0.9467	0.9998
TiO2	0.491	0.0741	0.509	0.9653	1.0219	1.0106	0.9347
Cr2O3	51.524	8.1743	53.280	0.9670	0.9794	1.0024	0.9850
Total	98.522	18.5468	91.457	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 13.13
Fe_2O_3 9.66
New Total : 99.49

U known Specimen
roup : Laflamme Sample : TAKLA
UNK No. : 235 Comment : 83G-23-5
tage : X= 20.4250 Y= 81.1545 Z= 10.7655
ated on Dec 17 12:40 1993
wDS only No. of accumulation : 1

See Repeat

Repeat, another spot

C rr.(A) : 2.019E-08

E ement	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	1.6	30.8	24.6	124.76 ?
Fe	134.802	3424.6	42.8	30.8	0.39
Ni	115.380	17.9	62.8	51.4	15.43
4 Zn	99.785	10.4	87.8	74.4	31.00
5 Mg	107.518	1054.5	15.0	6.8	0.70
Al	90.594	2257.8	22.6	11.0	0.48
Mn	146.420	44.7	34.8	30.2	5.09
8 Ti	191.487	49.1	15.0	10.6	3.42
Cr	159.498	6118.1	23.0	22.2	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

F ement	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.006	0.0013	0.006	0.9877	0.9702	1.0198	0.9982
FeO	22.943	3.8996	21.215	1.0814	1.0182	1.0623	0.9998
NiO	0.113	0.0185	0.101	1.1219	1.0621	1.0565	0.9999
nO	0.080	0.0120	0.073	1.0977	1.0616	1.0341	1.0000
gO	10.808	3.2744	6.990	1.5462	0.9458	1.6282	1.0040
Al2O3	14.223	3.4070	11.253	1.2639	0.9515	1.3283	1.0000
nO	0.311	0.0536	0.321	0.9686	1.0228	0.9472	0.9998
iO2	0.556	0.0850	0.573	0.9717	1.0223	1.0114	0.9398
Cr2O3	47.547	7.6401	49.273	0.9650	0.9799	1.0030	0.9819
otal	96.587	18.3914	89.806	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 16.81

Fe_2O_3 6.81

New Total: 97.26

X

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 235 Comment : 83G-23-5
Stage : X= 20.4250 Y= 81.1545 Z= 10.7655
Dated on Dec 11 07:58 1993
WDS only No. of accumulation : 1

see repeat.

Curr.(A) : 2.005E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	1.5	30.8	26.4	3.94
2 Fe	134.820	3329.2	39.4	34.2	0.39
3 Ni	115.380	16.4	63.4	51.8	1.81
4 Zn	99.785	13.4	76.4	81.4	1.63
5 Mg	107.500	907.5	12.4	8.4	0.52
6 Al	90.585	2288.9	20.4	11.8	0.47
7 Mn	146.420	45.6	32.0	29.4	1.79
8 Ti	191.487	49.2	12.2	10.8	2.00
9 Cr	159.500	6114.9	26.4	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.006	0.0013	0.006	0.9860	0.9695	1.0195	0.9976
FeO	22.452	3.8407	20.749	1.0821	1.0173	1.0639	0.9998
NiO	0.104	0.0172	0.093	1.1215	1.0611	1.0570	0.9999
ZnO	0.104	0.0157	0.094	1.0971	1.0606	1.0344	1.0000
MgO	9.405	2.8675	6.058	1.5524	0.9451	1.6362	1.0039
Al2O3	14.580	3.5151	11.614	1.2554	0.9508	1.3204	1.0000
MnO	0.319	0.0554	0.330	0.9677	1.0219	0.9471	0.9998
TiO2	0.559	0.0860	0.577	0.9687	1.0215	1.0112	0.9379
Cr2O3	48.470	7.8385	50.227	0.9650	0.9791	1.0029	0.9828
Total	95.999	18.2372	89.749	Total O = 24.0		Iteration = 5	

Ca .0002
Fe2 .5279
Fe3 .1039
Ni .0028
Zn .0026
Mg .4717
Al .5782
Mn .0091
Ti .0141
Cr 1.2815

Recalculate wt% FeO 18.76
Fe_2O_3 4.10
New Total: 96.41

Mg # .472
Ti # .020
Fe2 # .528
Fe3 # .053
Cr # .654

Zn ppm 835
Ni ppm 817

X

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 236 Comment : 83G-25-1
Stage : X= 31.7655 Y= 78.7570 Z= 10.7955
Dated on Dec 11 08:03 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.006E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-1.8	30.8	26.4	4.16
2 Fe	134.820	3811.5	39.4	34.2	0.36
3 Ni	115.380	33.2	63.4	51.8	1.64
4 Zn	99.785	14.4	76.4	81.4	1.62
5 Mg	107.500	1076.5	12.4	8.4	0.48
6 Al	90.585	2735.5	20.4	11.8	0.43
7 Mn	146.420	39.6	32.0	29.4	1.86
8 Ti	191.487	98.5	12.2	10.8	1.49
9 Cr	159.500	5458.3	26.4	23.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	25.569	4.2060	23.743	1.0769	1.0201	1.0560	0.9997
NiO	0.212	0.0335	0.189	1.1224	1.0642	1.0549	0.9998
ZnO	0.112	0.0162	0.101	1.0990	1.0638	1.0332	1.0000
MgO	11.012	3.2289	7.183	1.5332	0.9475	1.6125	1.0036
Al2O3	17.430	4.0409	13.873	1.2563	0.9531	1.3181	1.0000
MnO	0.278	0.0463	0.286	0.9714	1.0247	0.9482	0.9997
TiO2	1.138	0.1683	1.156	0.9843	1.0241	1.0124	0.9494
Cr2O3	43.174	6.7142	44.811	0.9635	0.9817	1.0044	0.9771
Total	98.925	18.4542	91.342	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4870
Fe3 .1968
Ni .0055
Zn .0026
Mg .5248
Al .6569
Mn .0075
Ti .0274
Cr 1.0915

recalculate wt% FeO 18.21

Fe_2O_3 8.18

New Total: 99.74

Mg # .519
Ti # .031
Fe2 # .481
Fe3 # .101
Cr # .561

Zn ppm 877
Ni ppm 1665

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 237 Comment : 83G-25-2
Stage : X= 31.2030 Y= 78.7185 Z= 10.7955
Dated on Dec 11 08:07 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.006E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.763	-0.6	30.8	26.4	4.08
	Fe	134.820	3585.3	39.4	34.2	0.37
	Ni	115.380	34.2	63.4	51.8	1.63
4	Zn	99.785	9.7	76.4	81.4	1.66
	Mg	107.500	1232.9	12.4	8.4	0.45
	Al	90.585	2323.2	20.4	11.8	0.46
7	Mn	146.420	38.7	32.0	29.4	1.87
	Ti	191.487	122.8	12.2	10.8	1.35
	Cr	159.500	5650.8	26.4	23.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.106	3.9944	22.334	1.0793	1.0200	1.0585	0.9997
NiO	0.218	0.0348	0.195	1.1223	1.0641	1.0549	0.9999
ZnO	0.075	0.0110	0.068	1.0989	1.0636	1.0332	1.0000
MgO	12.597	3.7206	8.226	1.5314	0.9474	1.6102	1.0039
Al2O3	14.957	3.4930	11.782	1.2694	0.9530	1.3320	1.0000
MnO	0.272	0.0457	0.280	0.9713	1.0246	0.9483	0.9997
TiO2	1.414	0.2108	1.442	0.9811	1.0241	1.0118	0.9470
Cr2O3	44.823	7.0217	46.392	0.9662	0.9816	1.0045	0.9799
Total	98.462	18.5319	90.719	Total O = 24.0		Iteration = 5	

Recalculate Wt% FeO 15.54
Fe_2O_3 9.53
New Total 99.42

Mg# .519
Ti# .031
Fe2# .481
Fe3# .101
Cr# .561

Zn ppm 879
Ni ppm 1665

Ca .0000
Fe2 .4870
Fe3 .1969
Ni .0055
Zn .0026
mg .5248
Al .6569
mn .0075
Ti .0279
Cr 1.0915

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 238 Comment : 83G-25-3
Stage : X= 30.6495 Y= 78.7580 Z= 10.7955
Dated on Dec 11 08:11 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.006E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-0.2	30.8	26.4	4.06
2 Fe	134.820	3970.3	39.4	34.2	0.35
3 Ni	115.380	18.2	63.4	51.8	1.79
4 Zn	99.785	6.6	76.4	81.4	1.69
5 Mg	107.500	1205.8	12.4	8.4	0.45
6 Al	90.585	1845.9	20.4	11.8	0.52
7 Mn	146.420	48.9	32.0	29.4	1.75
8 Ti	191.487	68.6	12.2	10.8	1.74
9 Cr	159.500	5821.9	26.4	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.643	4.5184	24.732	1.0773	1.0173	1.0591	0.9998
N O	x 0.116	0.0189	0.103	1.1227	1.0611	1.0581	0.9999
Z O	x 0.051	0.0076	0.046	1.0977	1.0605	1.0351	1.0000
MgO	12.591	3.8060	8.045	1.5650	0.9452	1.6486	1.0043
Al2O3	12.065	2.8838	9.362	1.2888	0.9509	1.3554	1.0000
M O	0.342	0.0588	0.353	0.9682	1.0220	0.9475	0.9999
TiO2	0.785	0.1196	0.805	0.9744	1.0215	1.0116	0.9430
Cr2O3	45.844	7.3502	47.796	0.9592	0.9791	1.0034	0.9763
Total	98.437	18.7633	91.243	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4870
Fe3 .1968
Ni .0055
Zn .0026
Mg .5249
Al .6565
Mn .0075
Ti .0274
Cr 1.0915

recalculate wt% FeO 14.65
Fe_2O_3 13.33
New Total : 99,78

Mg .519
Ti .031
Fe2 .481
Fe3 .101
Cr .561

Zn ppm 899
Ni ppm 1665

Intensity & Wt. % Group : Laflamme Sample : TAKLA

known Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 239 Comment : 83G-25-4
tage : X= 30.1495 Y= 78.9000 Z= 10.7935
ated on Dec 11 08:15 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	-2.8	30.8	26.4	4.24
Fe	134.820	4307.3	39.4	34.2	0.34
Ni	115.380	32.0	63.4	51.8	1.65
Zn	99.785	10.9	76.4	81.4	1.65
Mg	107.500	1004.4	12.4	8.4	0.50
Al	90.585	2286.8	20.4	11.8	0.47
Mn	146.420	42.8	32.0	29.4	1.82
Ti	191.487	156.5	12.2	10.8	1.21
Cr	159.500	5336.2	26.4	23.6	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	28.823	4.8665	26.858	1.0732	1.0174	1.0551	0.9997
NiO	x 0.204	0.0331	0.182	1.1227	1.0612	1.0581	0.9999
ZnO	x 0.084	0.0126	0.077	1.0979	1.0606	1.0351	1.0000
MgO	10.521	3.1663	6.708	1.5684	0.9452	1.6528	1.0040
Al2O3	14.777	3.5164	11.609	1.2729	0.9509	1.3386	1.0000
MnO	0.300	0.0513	0.309	0.9695	1.0220	0.9489	0.9997
TiO2	1.806	0.2742	1.838	0.9825	1.0216	1.0122	0.9501
Cr2O3	41.962	6.6981	43.853	0.9569	0.9791	1.0054	0.9721
Total	98.477	18.6185	91.435	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .5186
Fe3 .2654
Ni .0053
Zn .0020
Mg .5102
Al .5666
Mn .0083
Ti .0442
Cr 1.0794

recalculate wt% FeO 19.06
Fe_2O_3 10.84
New Total: 99.56

Mg # .496
Ti # .056
Fe2 # .504
Fe3 # .139
Cr # .565

Zn ppm 674
Ni ppm 1602

ntensity & Wt. % Group : Laflamme Sample : TAKLA

nk own Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 240 Comment : 83G-25-5
St ge : X= 29.4430 Y= 78.9880 Z= 10.7935
Da ed on Dec 11 08:19 1993
WDS only No. of accumulation : 1

ur .(A) : 2.004E-08

	lement	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.763	-1.7	30.8	26.4	4.16
2	e	134.820	3158.1	39.4	34.2	0.40
3	Ni	115.380	8.2	63.4	51.8	1.92
4	Zn	99.785	30.5	76.4	81.4	1.50
5	g	107.500	1036.8	12.4	8.4	0.49
6	l	90.585	2401.2	20.4	11.8	0.45
7	Mn	146.420	50.9	32.0	29.4	1.73
8	i	191.487	5.7	12.2	10.8	3.61
9	r	159.500	6387.5	26.4	23.6	0.28

AF Oxide Acc. Voltage : 20.0 (kV)

le ent	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
Ca	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	21.350	3.5225	19.692	1.0842	1.0186	1.0646	0.9998
Ni	0.052	0.0082	0.046	1.1212	1.0625	1.0556	0.9997
Zn	0.236	0.0344	0.215	1.0975	1.0620	1.0335	1.0000
MgO	10.648	3.1314	6.924	1.5378	0.9461	1.6192	1.0039
Al 03	15.303	3.5585	12.190	1.2554	0.9518	1.3190	1.0000
Mn	0.357	0.0596	0.368	0.9682	1.0231	0.9465	0.9998
TiO2	0.065	0.0096	0.067	0.9681	1.0226	1.0112	0.9362
Cr203	50.807	7.9247	52.492	0.9679	0.9802	1.0021	0.9854
Tc al	98.818	18.2488	91.995	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 17.33
Fe_2O_3 4.47
New Total: 99.28

mg# .523
Ti # .002
Fe2 # .477
Fe3 # .055
Cr # .652

Zn ppm 1896
Ni ppm 408

Ca .0000
Fe2 .4700
Fe3 .1091
Ni .0016
Zn .0057
Mg .5147
Al .5849
Mn .0098
Ti .0016
Cr 1.3029

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 241 Comment : 83G-25-6
Stage : X= 30.2015 Y= 79.8475 Z= 10.7890
Dated on Dec 11 08:24 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	2.0	30.8	26.4	3.91
3 Fe	134.820	4465.5	39.4	34.2	0.33
3 Ni	115.380	16.4	63.4	51.8	1.81
4 Zn	99.785	249.5	76.4	81.4	0.87
5 Mg	107.500	376.0	12.4	8.4	0.80
6 Al	90.585	1268.0	20.4	11.8	0.62
7 Mn	146.420	66.4	32.0	29.4	1.59
8 Ti	191.487	10.2	12.2	10.8	3.25
9 Cr	159.500	6931.0	26.4	23.6	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.008	0.0018	0.008	0.9727	0.9592	1.0192	0.9949
FeO	29.867	5.3535	27.845	1.0726	1.0055	1.0681	0.9987
NiO	0.104	0.0179	0.093	1.1159	1.0483	1.0670	0.9976
ZnO	1.917	0.3035	1.760	1.0896	1.0472	1.0405	1.0000
MgO	x 4.268	1.3635	2.511	1.6996	0.9354	1.8082	1.0048
Al2O3	x 8.326	2.1034	6.437	1.2935	0.9410	1.3745	1.0000
MnO	0.459	0.0833	0.481	0.9553	1.0103	0.9466	0.9989
TiO2	0.113	0.0183	0.120	0.9482	1.0104	1.0111	0.9281
Cr2O3	53.838	9.1232	56.959	0.9452	0.9681	1.0022	0.9742
Total	98.900	18.3684	96.212	Total O = 24.0		Iteration = 4	

recalculate wt% FeO 24.39
Fe_2O_3 6.09
New Total : 99.51

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 242 Comment : 83G-25-7
Stage : X= 30.9995 Y= 79.8065 Z= 10.7890
Dated on Dec 11 08:28 1993
EDS only No. of accumulation : 1

Curr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	-3.0	30.8	26.4	4.26
Fe	134.820	2558.7	39.4	34.2	0.44
Ni	115.380	22.1	63.4	51.8	1.75
Zn	99.785	3.5	76.4	81.4	1.72
Mg	107.500	1606.3	12.4	8.4	0.39
Al	90.585	4062.7	20.4	11.8	0.35
Mn	146.420	34.9	32.0	29.4	1.92
Ti	191.487	13.4	12.2	10.8	3.05
Cr	159.500	5037.9	26.4	23.6	0.31

Z.A.F Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	17.306	2.6668	15.955	1.0847	1.0307	1.0526	0.9998
NiO	0.141	0.0209	0.126	1.1227	1.0757	1.0438	1.0000
ZnO	0.027	0.0037	0.025	1.1040	1.0758	1.0262	1.0000
MgO	15.082	4.1424	10.728	1.4058	0.9561	1.4669	1.0024
Al2O3	25.127	5.4570	20.625	1.2183	0.9618	1.2667	1.0000
MnO	0.247	0.0386	0.252	0.9806	1.0351	0.9475	0.9998
TiO2	0.158	0.0218	0.157	1.0024	1.0341	1.0134	0.9566
Cr2O3	40.721	5.9322	41.402	0.9836	0.9915	1.0035	0.9886
Total	98.809	18.2836	89.270	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 12.40

Fe_2O_3 5.45

New Total: 99.37

P3

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 243 Comment : 83G-26-1
Stage : X= 17.1525 Y= 84.3640 Z= 10.7380
Dated on Dec 11 08:32 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-2.3	30.8	26.4	4.20
Fe	134.820	3055.6	39.4	34.2	0.40
3 Ni	115.380	22.3	63.4	51.8	1.75
4 Zn	99.785	7.2	76.4	81.4	1.68
Mg	107.500	1246.3	12.4	8.4	0.45
Al	90.585	2510.8	20.4	11.8	0.44
7 Mn	146.420	42.3	32.0	29.4	1.83
Ti	191.487	26.4	12.2	10.8	2.50
Cr	159.500	6084.8	26.4	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	20.662	3.3768	19.053	1.0844	1.0211	1.0622	0.9998
NiO	0.142	0.0224	0.127	1.1220	1.0652	1.0534	0.9999
ZnO	0.056	0.0081	0.051	1.0991	1.0649	1.0321	1.0000
MgO	12.578	3.6641	8.324	1.5111	0.9482	1.5877	1.0037
Al2O3	16.024	3.6909	12.747	1.2571	0.9539	1.3179	1.0000
MnO	0.297	0.0492	0.306	0.9710	1.0257	0.9469	0.9998
TiO2	0.302	0.0444	0.310	0.9753	1.0250	1.0115	0.9407
Cr2O3	48.560	7.5029	50.005	0.9711	0.9826	1.0026	0.9858
Total	98.621	18.3587	90.922	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3953
Fe3 .1565
Ni .0036
Zn .0013
Mg .5987
Al .6031
Mn .0080
Ti .0073
Cr 1.2261

recalculate wt% FeO 14.80
Fe_2O_3 6.51
New total : 99.27

mg # .602
Ti # .009
Fe2 # .398
Fe3 # .079
Cr # .617

Zn ppm 449
Ni ppm 1115

P3 *

(Ni is high)

Intensity & Wt. % Group : Laflamme Sample : TAKLA

U known Specimen
Group : Laflamme Sample : TAKLA
"NK No. : 244 Comment : 83G-26-2
tage : X= 16.4435 Y= 84.4260 Z= 10.7350
Dated on Dec 11 08:36 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	-3.0	30.8	26.4	4.25
Fe	134.820	3612.5	39.4	34.2	0.37
Ni	115.380	35.6	63.4	51.8	1.62
Zn	99.785	7.9	76.4	81.4	1.68
Mg	107.500	1250.3	12.4	8.4	0.44
Al	90.585	2565.9	20.4	11.8	0.44
Mn	146.420	40.9	32.0	29.4	1.84
Ti	191.487	129.1	12.2	10.8	1.32
Cr	159.500	5368.1	26.4	23.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.287	4.0082	22.525	1.0782	1.0213	1.0561	0.9997
NiO	0.227	0.0361	0.202	1.1226	1.0655	1.0537	0.9999
ZnO	0.061	0.0089	0.055	1.0997	1.0651	1.0325	1.0000
MgO	12.686	3.7318	8.351	1.5192	0.9484	1.5959	1.0037
Al2O3	16.461	3.8287	13.026	1.2637	0.9541	1.3244	1.0000
MnO	0.288	0.0481	0.296	0.9728	1.0259	0.9485	0.9997
TiO2	1.496	0.2220	1.516	0.9864	1.0253	1.0122	0.9505
Cr2O3	42.644	6.6533	44.114	0.9667	0.9828	1.0049	0.9788
Total	98.150	18.5370	90.087	Total O = 24.0		Iteration = 5	

(NiO and ZnO: × [0.227 / 0.061])

recalculate wt% FeO 15.61

Fe_2O_3 9.65

New total: 99.13

Mg # .592
Ti # .040
Fe2 # .408
Fe3 # .126
Cr # .558

Zn ppm 496
Ni ppm 1783

Ca .0000
Fe2 .4169
Fe3 .2319
Ni .0058
Zn .0014
Mg .6039
Al .6196
Mn .0078
Ti .0359
Cr 1.0767

P4

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 245 Comment : 83G-26-3
Stage : X= 15.7085 Y= 84.3345 Z= 10.7325
Dated on Dec 11 08:41 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-0.8	30.8	26.4	4.09
Fe	134.820	2862.9	39.4	34.2	0.42
3 Ni	115.380	9.9	63.4	51.8	1.90
4 Zn	99.785	18.4	76.4	81.4	1.59
Mg	107.500	1265.3	12.4	8.4	0.44
Al	90.585	3125.2	20.4	11.8	0.40
7 Mn	146.420	43.7	32.0	29.4	1.81
8 Ti	191.487	8.9	12.2	10.8	3.34
Cr	159.500	5757.4	26.4	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	19.363	3.1132	17.852	1.0847	1.0240	1.0594	0.9998
NiO	0.063	0.0097	0.056	1.1219	1.0684	1.0503	0.9998
ZnO	0.143	0.0203	0.130	1.1005	1.0682	1.0302	1.0000
MgO	12.496	3.5813	8.450	1.4788	0.9506	1.5507	1.0032
Al2O3	19.646	4.4519	15.866	1.2383	0.9563	1.2949	1.0000
MnO	0.308	0.0502	0.317	0.9738	1.0285	0.9469	0.9998
TiO2	0.102	0.0148	0.104	0.9832	1.0278	1.0121	0.9452
Cr2O3	46.129	7.0119	47.314	0.9750	0.9853	1.0027	0.9869
Total	98.250	18.2533	90.088	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4006
Fe3 .1110
Ni .0016
Zn .0033
Mg .5886
Al .7317
Mn .0082
Ti .0024
Cr .1525
1.1525

recalculate wt% FeO 15.16
Fe_2O_3 4.67
New Total : 98.72

Mg # .595
Ti # .003
Fe2 # .405
Fe3 # .056
Cr # .578

Zn ppm 1148
Ni ppm 995

T_{2n} 822

Intensity & Wt. % Group : Laflamme Sample : TAKLA

U known Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 246 Comment : 83G-26-4
tage : X= 15.0135 Y= 84.3015 Z= 10.7295
ated on Dec 11 08:45 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	-1.5	30.8	26.4	4.15
Fe	134.820	2550.3	39.4	34.2	0.44
Ni	115.380	10.2	63.4	51.8	1.89
Zn	99.785	9.2	76.4	81.4	1.67
Mg	107.500	1386.8	12.4	8.4	0.42
Al	90.585	3305.4	20.4	11.8	0.39
Mn	146.420	42.5	32.0	29.4	1.82
Ti	191.487	18.4	12.2	10.8	2.80
Cr	159.500	5731.1	26.4	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	17.286	2.7434	15.902	1.0870	1.0260	1.0596	0.9999
NiO	0.065	0.0099	0.058	1.1220	1.0706	1.0482	0.9999
ZnO	0.071	0.0100	0.065	1.1014	1.0705	1.0289	1.0000
MgO	13.455	3.8060	9.262	1.4527	0.9522	1.5210	1.0030
Al2O3	20.665	4.6222	16.781	1.2315	0.9579	1.2856	1.0000
MnO	0.300	0.0482	0.308	0.9758	1.0305	0.9470	0.9999
TiO2	0.213	0.0303	0.216	0.9860	1.0296	1.0121	0.9462
Cr2O3	46.160	6.9257	47.098	0.9801	0.9871	1.0028	0.9901
Total	98.215	18.1957	89.688	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3660
Fe3 .0864
Ni .0016
Zn .0016
Mg .6275
Al .7620
Mn .0086
Ti .0056
Cr 1.1918

recalculate wt% FeO 13.99
Fe_2O_3 3.67
New Total: 98.60

Mg # .632
Ti # .006
Fe2 # .368
Fe3 # .043
Cr # .579

Zn ppm 570
Ni ppm 510

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 247 Comment : 83G-26-5
Stage : X= 14.8895 Y= 85.0510 Z= 10.7245
Dated on Dec 11 08:49 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-1.0	30.8	26.4	4.11
2 Fe	134.820	5025.8	39.4	34.2	0.31
3 Ni	115.380	19.8	63.4	51.8	1.77
4 Zn	99.785	38.0	76.4	81.4	1.45
5 Mg	107.500	685.4	12.4	8.4	0.60
6 Al	90.585	2963.4	20.4	11.8	0.41
7 Mn	146.420	63.2	32.0	29.4	1.61
8 Ti	191.487	28.3	12.2	10.8	2.44
9 Cr	159.500	4853.0	26.4	23.6	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	X33.399	5.6760	31.338	1.0658	1.0166	1.0487	0.9996
NiO	0.127	0.0207	0.113	1.1228	1.0603	1.0593	0.9996
ZnO	0.294	0.0441	0.268	1.0977	1.0597	1.0359	1.0000
MgO	X 7.274	2.2034	4.578	1.5890	0.9446	1.6765	1.0034
Al2O3	18.912	4.5297	15.044	1.2571	0.9503	1.3229	1.0000
MnO	0.443	0.0762	0.458	0.9678	1.0213	0.9480	0.9997
TiO2	0.328	0.0502	0.333	0.9867	1.0209	1.0138	0.9534
Cr2O3	37.696	6.0565	39.882	0.9452	0.9784	1.0041	0.9621
Total	98.473	18.6567	92.013	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 23.10

Fe_2O_3 11.44

New Total : 99.62

X

Close to P3 and P4

Intensity & Wt. % Group : Laflamme Sample : TAKLA

U known Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 248 Comment : 83G-26-6
tage : X= 15.3320 Y= 85.1320 Z= 10.7265
ated on Dec 11 08:53 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.005E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-1.9	30.8	26.4	4.17
Fe	134.820	2871.1	39.4	34.2	0.41
3 Ni	115.380	35.8	63.4	51.8	1.62
4 Zn	99.785	5.6	76.4	81.4	1.70
Mg	107.500	1544.2	12.4	8.4	0.40
Al	90.585	2746.0	20.4	11.8	0.43
7 Mn	146.420	33.4	32.0	29.4	1.94
8 Ti	191.487	104.8	12.2	10.8	1.45
Cr	159.500	5527.1	26.4	23.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	19.401	3.1241	17.893	1.0842	1.0250	1.0581	0.9997
NiO	0.229	0.0354	0.204	1.1224	1.0695	1.0495	0.9999
MnO	0.043	0.0061	0.039	1.1013	1.0693	1.0298	1.0000
MgO	15.157	4.3505	10.308	1.4704	0.9515	1.5400	1.0035
Al2O3	17.515	3.9750	13.934	1.2570	0.9572	1.3133	1.0000
ZnO	0.236	0.0384	0.242	0.9758	1.0295	0.9481	0.9997
TiO2	1.216	0.1762	1.231	0.9885	1.0288	1.0119	0.9495
Cr2O3	44.363	6.7537	45.398	0.9772	0.9862	1.0043	0.9866
Total	98.160	18.4595	89.249	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3086
Fe3 .1992
Ni .0058
Zn .0010
Mg .7070
Al .6466
Mn .0063
Ti .0286
Cr 1.0976

recalculate wt% FeO 11.79
Fe_2O_3 8.46
NewTotal: 99.02

Mg# .696
Ti# .033
Fe2# .304
Fe3# .103
Cr# .565

Zn ppm 345
Ni ppm 1799

X

close to P4

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 249 Comment : 83G-26-7
Stage : X= 16.0035 Y= 84.9490 Z= 10.7305
Dated on Dec 11 08:57 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-2.4	30.8	26.4	4.21
2 Fe	134.820	3971.3	39.4	34.2	0.35
3 Ni	115.380	18.2	63.4	51.8	1.79
4 Zn	99.785	26.4	76.4	81.4	1.53
5 Mg	107.500	1016.2	12.4	8.4	0.49
6 Al	90.585	2962.1	20.4	11.8	0.41
7 Mn	146.420	51.6	32.0	29.4	1.72
8 Ti	191.487	26.6	12.2	10.8	2.50
9 Cr	159.500	5279.0	26.4	23.6	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.578	4.3973	24.726	1.0749	1.0204	1.0537	0.9997
NiO	0.116	0.0185	0.103	1.1225	1.0645	1.0548	0.9997
ZnO	0.204	0.0298	0.186	1.0992	1.0641	1.0331	1.0000
MgO	10.397	3.0660	6.776	1.5342	0.9477	1.6134	1.0034
Al2O3	18.805	4.3848	15.015	1.2524	0.9534	1.3136	1.0000
MnO	0.362	0.0607	0.373	0.9710	1.0250	0.9476	0.9998
TiO2	0.308	0.0458	0.312	0.9859	1.0244	1.0130	0.9501
Cr2O3	41.594	6.5059	43.317	0.9602	0.9820	1.0035	0.9744
Total	98.364	18.5088	90.810	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 18.38
Fe_2O_3 9.11
New Total: 99.28

Mg # .502
Ti # .008
Fe2 # .498
Fe3 # .111
Cr # .531

Zn ppm 1638
Ni ppm 911

Cr .0000
Fe2 .4929
Fe3 .2198
Ni .0030
Zn .0048
Mg .4969
Al .7107
Mn .0098
Ti .0079
Cr 1.0545

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 250 Comment : 83G-26-8
Stage : X= 16.6885 Y= 85.1620 Z= 10.7305
Dated on Dec 11 09:02 1993
WDS only No. of accumulation : 1

Corr.(A) : 2.006E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.763	1.2	30.8	26.4	3.96
Fe	134.820	4514.5	39.4	34.2	0.33
Ni	115.380	13.0	63.4	51.8	1.86
Zn	99.785	7.4	76.4	81.4	1.68
Mg	107.500	1433.6	12.4	8.4	0.42
Al	90.585	4948.8	20.4	11.8	0.32
Mn	146.420	30.6	32.0	29.4	1.99
Ti	191.487	69.6	12.2	10.8	1.73
Cr	159.500	2876.5	26.4	23.6	0.41

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.005	0.0010	0.005	1.0219	0.9825	1.0295	1.0103
FeO	x 29.918	4.6973	28.122	1.0639	1.0322	1.0309	0.9998
NiO	0.083	0.0126	0.074	1.1253	1.0772	1.0448	0.9999
ZnO	0.058	0.0080	0.052	1.1062	1.0774	1.0268	1.0000
MgO	13.628	3.8138	9.565	1.4248	0.9574	1.4858	1.0016
Al2O3	x 30.604	6.7720	25.098	1.2193	0.9632	1.2660	1.0000
MnO	0.218	0.0346	0.221	0.9844	1.0366	0.9498	0.9999
TiO2	0.843	0.1191	0.817	1.0321	1.0356	1.0168	0.9802
Cr2O3	x 22.621	3.3577	23.616	0.9579	0.9929	1.0066	0.9584
Total	97.978	18.8161	87.570	Total O = 24.0		Iteration = 6	

recalculate wt% FeO 16.05

Fe_2O_3 15.41

New Total: 99.52

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 251 Comment : 83G-26-9
Stage : X= 17.2365 Y= 85.0835 Z= 10.7345
Dated on Dec 11 09:06 1993
WDS only No. of accumulation : 1

Coor.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-4.2	30.8	26.4	4.35
Fe	134.820	3246.3	39.4	34.2	0.39
3 Ni	115.380	13.8	63.4	51.8	1.85
4 Zn	99.785	29.5	76.4	81.4	1.50
Mg	107.500	1210.9	12.4	8.4	0.45
Al	90.585	3453.2	20.4	11.8	0.38
7 Mn	146.420	43.5	32.0	29.4	1.81
Ti	191.487	4.7	12.2	10.8	3.70
Cr	159.500	5292.0	26.4	23.6	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	21.832	3.5092	20.212	1.0801	1.0247	1.0544	0.9997
NiO	0.088	0.0136	0.078	1.1222	1.0691	1.0501	0.9997
ZnO	0.229	0.0324	0.208	1.1010	1.0689	1.0301	1.0000
MgO	11.951	3.4241	8.075	1.4800	0.9511	1.5515	1.0029
Al2O3	21.613	4.8961	17.505	1.2347	0.9568	1.2904	1.0000
MnO	0.306	0.0498	0.314	0.9747	1.0292	0.9473	0.9998
TiO2	0.055	0.0079	0.055	0.9909	1.0284	1.0131	0.9511
Cr2O3	42.164	6.4072	43.424	0.9710	0.9859	1.0032	0.9818
Total	98.238	18.3404	89.871	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4255
Fe3 .1484
Ni .0022
Zn .0053
Mg .5601
Al .8009
Mn .0081
Ti .0013
Cr 1.0482

recalculate wt% FeO 16.18
Fe_2O_3 6.27
New Total: 98.87

Mg .568
Ti .001
Fe2 .432
Fe3 .674
Cr .525

Zn ppm 1839
Ni ppm 691

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 252 Comment : 83G-26-10
Stage : X= 16.1835 Y= 85.6870 Z= 10.7275
Dated on Dec 11 09:10 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-0.5	30.8	26.4	4.08
2 Fe	134.820	3583.6	39.4	34.2	0.37
3 Ni	115.380	9.1	63.4	51.8	1.91
4 Zn	99.785	48.8	76.4	81.4	1.39
5 Mg	107.500	764.1	12.4	8.4	0.57
6 Al	90.585	1728.2	20.4	11.8	0.54
7 Mn	146.420	62.7	32.0	29.4	1.62
8 Ti	191.487	6.9	12.2	10.8	3.50
9 Cr	159.500	6851.8	26.4	23.6	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.139	4.1476	22.312	1.0819	1.0127	1.0686	0.9997
NiO	0.058	0.0095	0.052	1.1202	1.0561	1.0612	0.9995
ZnO	0.376	0.0570	0.343	1.0944	1.0553	1.0370	1.0000
MgO	8.166	2.5010	5.095	1.6026	0.9413	1.6951	1.0044
Al2O3	11.138	2.6972	8.761	1.2713	0.9469	1.3426	1.0000
MnO	0.436	0.0759	0.453	0.9624	1.0174	0.9463	0.9997
TiO2	0.077	0.0119	0.081	0.9546	1.0171	1.0105	0.9288
Cr2O3	53.924	8.7596	56.223	0.9591	0.9747	1.0017	0.9823
Total	98.314	18.2597	93.320	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 20.10

Fe_2O_3 4.49

New Total: 98.78

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 253 Comment : 83G-26-11
Stage : X= 15.7300 Y= 85.6580 Z= 10.7260
Dated on Dec 11 09:14 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.008E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-2.3	30.8	26.4	4.20
Fe	134.820	3647.4	39.4	34.2	0.37
3 Ni	115.380	12.5	63.4	51.8	1.86
4 Zn	99.785	33.4	76.4	81.4	1.48
Mg	107.500	885.2	12.4	8.4	0.53
Al	90.585	2100.9	20.4	11.8	0.49
7 Mn	146.420	58.9	32.0	29.4	1.65
8 Ti	191.487	11.6	12.2	10.8	3.15
Cr	159.500	6392.9	26.4	23.6	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.523	4.1457	22.698	1.0804	1.0155	1.0642	0.9997
NiO	0.079	0.0129	0.071	1.1212	1.0592	1.0589	0.9997
ZnO	X→ 0.258	0.0385	0.235	1.0961	1.0585	1.0355	1.0000
MgO	9.299	2.8021	5.900	1.5761	0.9436	1.6634	1.0041
Al2O3	13.476	3.2108	10.644	1.2660	0.9493	1.3337	1.0000
MnO	0.411	0.0703	0.425	0.9655	1.0201	0.9466	0.9998
TiO2	0.131	0.0199	0.136	0.9645	1.0198	1.0112	0.9354
Cr2O3	50.367	8.0497	52.432	0.9606	0.9774	1.0022	0.9807
Total	98.544	18.3499	92.541	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .5252
Fe3 .1525
Ni .0021
Zn .0063
Mg .4581
Al .5249
Mn .0115
Ti .0033
Cr 1.3162

recalculate wt% FeO 19.00
Fe_2O_3 6.13
New Total: 99.16

Mg# .466
Ti# .005
Fe2# .534
Fe3# .076
V# .660

Zn ppm 2072
Ni ppm 620

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 254 Comment : 83G-26-12
Stage : X= 15.0990 Y= 85.8190 Z= 10.7220
Dated on Dec 11 09:18 1993
WDS only No. of accumulation : 1

Cor.(A) : 2.009E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	1.9	30.8	26.4	3.92
Fe	134.820	4336.7	39.4	34.2	0.34
3 Ni	115.380	13.5	63.4	51.8	1.85
4 Zn	99.785	31.1	76.4	81.4	1.49
Mg	107.500	694.7	12.4	8.4	0.59
Al	90.585	1559.2	20.4	11.8	0.56
7 Mn	146.420	70.4	32.0	29.4	1.56
Ti	191.487	16.2	12.2	10.8	2.90
Cr	159.500	6468.4	26.4	23.6	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element		Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO		0.007	0.0016	0.007	0.9785	0.9637	1.0190	0.9964
FeO		29.010	5.1013	26.974	1.0755	1.0108	1.0643	0.9997
NiO	✗	0.086	0.0145	0.076	1.1212	1.0540	1.0641	0.9997
ZnO	✗	0.239	0.0371	0.218	1.0939	1.0531	1.0388	1.0000
MgO	✗	7.560	2.3695	4.628	1.6334	0.9397	1.7303	1.0046
Al2O3		10.140	2.5132	7.896	1.2842	0.9454	1.3585	1.0000
MnO		0.488	0.0870	0.508	0.9610	1.0154	0.9466	0.9998
TiO2		0.181	0.0287	0.190	0.9575	1.0153	1.0110	0.9329
Cr2O3		50.375	8.3746	53.025	0.9500	0.9729	1.0022	0.9743
Total		98.086	18.5274	93.522	Total O = 24.0		Iteration = 5	

recalculate wt% FeO 21.01
Fe_2O_3 8.89
New Total: 98.99

U nown Specimen
roup : Laflamme Sample : TAKLA
UNK No. : 255 Comment : 83G-26-13
tage : X= 14.6150 Y= 85.6835 Z= 10.7220
ated on Dec 14 22:12 1993
WDS only No. of accumulation : 1

Cr.(A) : 2.016E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.763	-0.5	29.2	25.0	4.18
2	Fe	134.810	3490.7	43.6	34.0	0.38
3	Ni	115.380	29.8	67.6	47.0	1.68
4	Zn	99.785	4.0	90.0	79.2	1.66
5	Mg	107.519	1447.6	15.0	4.8	0.59
	Al	90.590	3353.6	23.4	13.0	0.38
7	Mn	146.420	36.9	28.8	27.0	1.93
8	Ti	191.487	133.8	13.8	10.4	1.30
	Cr	159.468	4833.4	24.8	22.8	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
reO	23.388	3.7205	21.703	1.0776	1.0261	1.0505	0.9997
NiO	0.189	0.0289	0.168	1.1232	1.0707	1.0491	1.0000
nO	0.031	0.0043	0.028	1.1022	1.0706	1.0296	1.0000
gO	14.108	4.0003	9.611	1.4680	0.9524	1.5367	1.0030
Al2O3	21.131	4.7375	16.962	1.2458	0.9581	1.3003	1.0000
nO	0.260	0.0419	0.266	0.9779	1.0306	0.9490	0.9998
iO2	1.564	0.2237	1.562	1.0008	1.0298	1.0132	0.9592
Cr2O3	38.347	5.7670	39.464	0.9717	0.9873	1.0055	0.9788
otal	99.018	18.5241	89.764	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3761
Fe3 .2265
Ni .0047
Zn .0007
mg .6478
Al .7672
mn .0068
Ti .0362
Cr .9340

Recalculate wt% FeO 14.60
Fe_2O_3 9.77
New total: 100.00

mg # .633
Ti # .035
Fe2 # .367
Fe3 # .117
Cr # .485

Zn ppm 249
Ni ppm 1485

Close to P3, Zn is high

Intensity & Wt. % Group : Laflamme Sample : TAKLA

Unknown Specimen
Group : Laflamme Sample : TAKLA
UNK No. : 256 Comment : 83G-27-1
Stage : X= 21.3300 Y= 85.5125 Z= 10.7450
Dated on Dec 11 09:27 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.011E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.763	-0.5	30.8	26.4	4.08
2 Fe	134.820	3965.9	39.4	34.2	0.35
3 Ni	115.380	31.7	63.4	51.8	1.66
4 Zn	99.785	10.7	76.4	81.4	1.65
5 Mg	107.500	1088.3	12.4	8.4	0.48
6 Al	90.585	2383.2	20.4	11.8	0.46
7 Mn	146.420	46.8	32.0	29.4	1.77
8 Ti	191.487	138.3	12.2	10.8	1.28
9 Cr	159.500	5467.5	26.4	23.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.515	4.4393	24.643	1.0760	1.0188	1.0565	0.9997
NiO	0.201	0.0324	0.179	1.1225	1.0627	1.0564	0.9999
ZnO	0.082	0.0122	0.075	1.0984	1.0622	1.0341	1.0000
MgO	11.224	3.3495	7.243	1.5495	0.9463	1.6311	1.0039
Al2O3	15.290	3.6080	12.057	1.2682	0.9520	1.3321	1.0000
MnO	0.328	0.0556	0.338	0.9705	1.0233	0.9486	0.9997
TiO2	1.590	0.2394	1.619	0.9823	1.0228	1.0121	0.9489
Cr2O3	43.045	6.8134	44.775	0.9614	0.9804	1.0050	0.9758
Total	98.275	18.5499	90.929	Total O = 24.0		Iteration = 5	

Zn .0000
Fe2 .4823
Fe3 .2376
Ni .0052
Zn .0020
Mg .5430
Al .5849
Mn .0096
Ti .0315
Cr 1.1045

recalcalate wt% FeO 17.77
Fe_2O_3 9.73

New Total : 99.25

Mg .536
Ti .037
Fe2 .470
Fe3 .123
Cr .573

Zn ppm 658
Ni ppm 1579

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 12 Comment : 83G30-1
Stage : X= 32.3040 Y= 79.4860 Z= 10.8250
Dated on Dec 24 12:06 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	1.8	28.2	25.4	115.81 ?
2 Fe	134.832	3611.0	41.6	31.6	0.38
3 Ni	115.360	29.0	58.2	51.8	9.52
4 Zn	99.775	8.6	85.8	81.0	38.03 ?
5 Mg	107.496	1057.1	10.8	6.0	0.50
6 Al	90.598	2860.0	22.8	12.6	0.42
7 Mn	146.388	40.5	32.0	31.2	5.50
8 Ti	191.475	81.9	11.8	11.6	2.29
9 Cr	159.478	5536.9	20.2	25.6	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.007	0.0014	0.007	0.9944	0.9726	1.0216	1.0007
FeO	24.430	4.0185	22.660	1.0781	1.0209	1.0563	0.9997
NiO	0.186	0.0295	0.166	1.1224	1.0650	1.0540	0.9999
ZnO	0.066	0.0096	0.060	1.0994	1.0646	1.0326	1.0000
MgO	10.843	3.1791	7.123	1.5221	0.9481	1.6000	1.0034
Al2O3	18.265	4.2344	14.623	1.2491	0.9538	1.3097	1.0000
MnO	0.280	0.0467	0.288	0.9719	1.0255	0.9480	0.9998
TiO2	0.942	0.1394	0.957	0.9847	1.0249	1.0124	0.9490
Cr2O3	43.233	6.7232	44.783	0.9654	0.9824	1.0042	0.9786
Total	98.252	18.3818	90.667	Total O = 24.0		Iteration = 5	

Ca .0002
Fe2 .4900
Fe3 .1644
Ni .0048
Zn .0016
Mg .5192
Al .6915
Mn .0076
Ti .0228
Cr 1.0980

Recalculate Wt% FeO 18.24
Fe_2O_3 6.88
New Total: 98.94

Mg # .514
Ti # .026
Fe2 # .486
Fe3 # .084
Cr # .562

Zn ppm 530
Ni ppm 1461

P3 *

* Ni is low

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 14 Comment : 83G30-4
Stage : X= 30.2270 Y= 79.6900 Z= 10.8250
Dated on Jan 5 10:43 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.008E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.737	-1.8	32.8	24.0	100.00 ?
	Fe	134.820	3399.7	35.8	38.8	0.39
	Ni	115.360	19.2	64.0	42.2	13.91
4	Zn	99.805	6.4	90.2	79.4	51.05 ?
5	Mg	107.520	1064.1	13.8	5.8	0.50
	Al	90.598	1577.9	24.2	12.6	0.57
	Mn	146.397	57.4	29.6	34.4	4.06
8	Ti	191.484	28.2	15.6	12.4	5.56
	Cr	159.457	6765.8	25.2	26.2	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	23.036	3.9091	21.258	1.0836	1.0152	1.0676	0.9998
NiO	0.123	0.0201	0.110	1.1215	1.0588	1.0593	0.9999
nO	0.049	0.0074	0.045	1.0961	1.0582	1.0358	1.0000
gO	11.320	3.4240	7.189	1.5747	0.9434	1.6617	1.0045
Al2O3	10.308	2.4652	8.038	1.2824	0.9490	1.3513	1.0000
nO	0.393	0.0676	0.408	0.9651	1.0198	0.9465	0.9998
iO2	0.315	0.0481	0.329	0.9591	1.0195	1.0103	0.9312
Cr2O3	53.098	8.5185	55.133	0.9631	0.9771	1.0020	0.9837
otal	98.642	18.4600	92.509	Total O = 24.0		Iteration = 5	

Ca .0006
Fe2 .4365
Fe3 .1496
Ni .0033
Zn .0012
Mg .5564
Al .4006
Mn .0110
Ti .0078
Cr 1.3843

Recalculate wt% FeO 15.83
Fe_2O_3 8.02
New Total: 99.44

Mg # .566
Ti # .013
Fe2 # .446
Fe3 # .100
Cr # .698

Zn ppm 393
Ni ppm 966

P3*

*Problem with Zn analysis

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 15 Comment : 83G30-5
Stage : X= 29.7355 Y= 79.6400 Z= 10.8275
Dated on Dec 24 12:23 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1 Ca	107.747	0.8	31.0	24.2	272.52	?
2 Fe	134.832	3118.9	41.4	37.8	0.41	
3 Ni	115.360	23.8	66.0	53.6	11.93	
4 Zn	99.775	0.6	89.6	84.6	508.43	? ←
5 Mg	107.496	1156.9	13.8	7.4	0.48	
6 Al	90.598	1608.8	23.8	14.4	0.57	
7 Mn	146.388	44.8	30.0	33.0	5.02	
8 Ti	191.475	24.0	10.6	11.0	5.82	
9 Cr	159.478	6855.7	28.6	18.4	0.27	

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.003	0.0006	0.003	0.9817	0.9687	1.0178	0.9957
FeO	21.252	3.5888	19.572	1.0859	1.0165	1.0685	0.9998
NiO	0.153	0.0249	0.137	1.1216	1.0602	1.0579	1.0000
ZnO	0.005	0.0007	0.005	1.0967	1.0596	1.0350	1.0000
MgO	12.147	3.6561	7.795	1.5582	0.9444	1.6425	1.0045
Al2O3	10.532	2.5066	8.226	1.2804	0.9501	1.3477	1.0000
MnO	0.309	0.0528	0.319	0.9661	1.0211	0.9463	0.9998
TiO2	0.269	0.0409	0.280	0.9596	1.0207	1.0102	0.9306
Cr2O3	53.597	8.5564	55.448	0.9666	0.9783	1.0019	0.9862
Total	98.267	18.4277	91.785	Total O = 24.0		Iteration = 5	

Ca .0001
Fe2 .3986
Fe3 .1858
Ni .0040
Zn .0001
Mg .5951
Al .4080
Mn .0086
Ti .0067
Cr 1.3929

Recalculate wt% FeO 14.50
Fe_2O_3 7.51
New Total: 99.02

Mg# .599
Ti# .011
Fe2# .401
Fe3# .094
Cr# .701

Zn ppm 40
Ni ppm 1202

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 16 Comment : 83G30-6
Stage : X= 29.6855 Y= 80.3035 Z= 10.8225
Dated on Dec 24 12:29 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	5.2	28.6	25.0	40.16 ?
2 Fe	134.832	3758.6	46.0	33.8	0.37
3 Ni	115.360	13.8	65.2	55.6	20.39
4 Zn	99.775	5.2	86.2	83.8	63.36 ?
5 Mg	107.496	1038.2	12.6	7.6	0.50
6 Al	90.598	1187.6	18.2	13.6	0.66
7 Mn	146.388	50.9	35.0	29.4	4.52
8 Ti	191.475	29.1	12.0	9.6	4.95
9 Cr	159.478	6823.3	26.6	30.0	0.27

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.019	0.0043	0.020	0.9783	0.9657	1.0177	0.9954
FeO	25.498	4.4287	23.586	1.0811	1.0130	1.0674	0.9999
NiO	0.089	0.0148	0.079	1.1217	1.0564	1.0619	0.9999
ZnO	0.040	0.0061	0.036	1.0951	1.0556	1.0374	1.0000
MgO	11.216	3.4724	6.996	1.6033	0.9415	1.6946	1.0048
Al2O3	7.884	1.9299	6.072	1.2984	0.9472	1.3708	1.0000
MnO	0.349	0.0614	0.363	0.9630	1.0176	0.9464	0.9999
TiO2	0.325	0.0508	0.340	0.9561	1.0174	1.0103	0.9302
Cr2O3	52.845	8.6772	55.187	0.9576	0.9750	1.0020	0.9802
Total	98.265	18.6456	92.678	Total O = 24.0		Iteration = 4	

Ca .0007
Fe2 .4360
Fe3 .2766
Ni .0029
Zn .0010
Mg .5586
Al .3105
Mn .0099
Ti .0082
Cr 1.3962

Recalculate wt% FeO 15.60
Fe_2O_3 11.00
New Total: 99.36

Mg # .562
Ti # .014
Fe2 # .438
Fe3 # .139

Zn ppm 321
Ni ppm 699

X

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 17 Comment : 83G30-8
Stage : X= 31.0495 Y= 80.3245 Z= 10.8195
Dated on Dec 24 12:34 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	-2.4	30.6	23.2	100.00 ?
Fe	134.832	2914.4	34.8	31.2	0.42
Ni	115.360	39.1	59.6	51.6	7.20
Zn	99.775	4.7	82.4	73.4	66.77 ?
Mg	107.496	1436.7	13.0	9.0	0.43
Al	90.598	2572.1	26.4	13.6	0.45
Mn	146.388	37.0	28.0	26.6	5.62
Ti	191.475	104.7	13.6	10.6	1.94
Cr	159.478	5794.8	26.8	22.8	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	19.829	3.2153	18.289	1.0842	1.0235	1.0597	0.9996
NiO	0.252	0.0392	0.224	1.1222	1.0679	1.0510	0.9999
ZnO	0.036	0.0052	0.033	1.1005	1.0676	1.0308	1.0000
MgO	14.389	4.1587	9.681	1.4863	0.9502	1.5585	1.0037
Al2O3	16.559	3.7843	13.151	1.2592	0.9559	1.3173	1.0000
MnO	0.257	0.0422	0.264	0.9743	1.0280	0.9480	0.9997
TiO2	1.204	0.1755	1.223	0.9842	1.0273	1.0117	0.9470
Cr2O3	45.714	7.0078	46.868	0.9754	0.9848	1.0041	0.9864
Total	98.240	18.4284	89.733	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3371
Fe3 .1862
Ni .0064
Zn .0008
Mg .6770
Al .6161
Mn .0069
Ti .0296
Cr 1.1409

Recalculate wt% FeO 12.77
Fe_2O_3 7.84
New Total: 99.03

Mg # .668
Ti # .034
Fe2 # .332
Fe3 # .096
Cr # .587

Zn ppm 289
Ni ppm 1980

P4*

*MgO is low

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 18 Comment : 83G30-10
Stage : X= 32.2505 Y= 80.1800 Z= 10.8195
Dated on Jan 5 10:48 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.008E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-1.1	27.0	27.0	100.00 ?
2 Fe	134.820	3447.0	44.0	36.4	0.39
3 Ni	115.360	15.3	61.0	49.0	17.66
4 Zn	99.805	21.7	79.8	82.4	15.04
5 Mg	107.520	1099.8	11.0	6.8	0.49
6 Al	90.598	2672.9	28.0	9.8	0.44
7 Mn	146.397	51.4	32.2	30.4	4.44
8 Ti	191.484	7.4	12.4	12.4	17.74
9 Cr	159.457	5829.5	27.4	23.0	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	23.283	3.8424	21.554	1.0802	1.0204	1.0589	0.9998
NiO	0.098	0.0155	0.087	1.1221	1.0645	1.0544	0.9998
ZnO	0.167	0.0244	0.152	1.0989	1.0641	1.0327	1.0000
MgO	11.336	3.3345	7.430	1.5256	0.9477	1.6041	1.0036
Al2O3	17.091	3.9750	13.615	1.2553	0.9533	1.3167	1.0000
MnO	0.354	0.0592	0.365	0.9704	1.0250	0.9469	0.9998
TiO2	0.085	0.0126	0.087	0.9784	1.0244	1.0121	0.9437
Cr2O3	45.876	7.1575	47.503	0.9658	0.9819	1.0027	0.9809
Total	98.290	18.4211	90.793	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4429
Fe3 .1828
Ni .0025
Zn .0040
Mg .5430
Al .6474
Mn .0096
Ti .0021
Cr 1.1657

Recalculate wt% FeO 16.48
Fe_2O_3 7.56
New Total: 99.06

Mg # .551
Ti #
Ti # .002
Fe3 # .449
Cr # .092
Cr # .584

Zn ppm 1341
Ni ppm 770

T.. = 790°C

U known Specimen
roup : Laflamme Sample : TAKLAII
NK No. : 19 Comment : 83G30-11
Stage : X= 32.5295 Y= 80.7315 Z= 10.8155
ated on Jan 5 10:54 1994
DS only No. of accumulation : 1

Corr.(A) : 2.008E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.737	2.1	27.2	23.8	94.40 ?
	Fe	134.820	4054.4	40.2	33.8	0.36
	Ni	115.360	18.7	68.0	56.8	15.37
4	Zn	99.805	12.6	91.0	75.2	26.01
5	Mg	107.520	937.4	12.6	7.2	0.53
	Al	90.598	2250.1	23.8	13.4	0.48
	Mn	146.397	48.6	29.8	30.0	4.58
8	Ti	191.484	90.7	14.2	12.8	2.19
	Cr	159.457	5769.9	25.2	22.0	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.008	0.0017	0.008	0.9883	0.9690	1.0206	0.9992
eO	27.277	4.6093	25.352	1.0759	1.0168	1.0584	0.9998
NiO	0.120	0.0195	0.107	1.1223	1.0605	1.0584	0.9999
nO	0.097	0.0144	0.088	1.0973	1.0599	1.0353	1.0000
gO	9.942	2.9946	6.333	1.5699	0.9447	1.6552	1.0040
Al2O3	14.539	3.4627	11.462	1.2685	0.9504	1.3348	1.0000
nO	0.334	0.0572	0.345	0.9680	1.0214	0.9479	0.9998
iO2	1.033	0.1570	1.059	0.9759	1.0210	1.0119	0.9446
Cr2O3	45.048	7.1968	47.017	0.9581	0.9786	1.0040	0.9752
otal	98.398	18.5133	91.771	Total O = 24.0		Iteration = 5	

Ca .0003
Fe2 .5254
Fe3 .2217
Ni .0032
Zn .0023
Mg .4852
Al .5610
Mn .0093
Ti .0254
Cr .1661

Recalculate wt% FeO 19.19
Fe_2O_3 9.00
New total 99.31

Zn ppm 779
Ni ppm 942

Mg = .486
Ti = .031
Fe2 = .526
Fe3 = .114
Cr = .598

U known Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 20 Comment : 83G30-13
tage : X= 31.3725 Y= 80.9630 Z= 10.8155
ated on Dec 24 12:51 1993
WDS only No. of accumulation : 1

C rr.(A) : 2.001E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	0.0	31.8	24.4	4107.45 ?
Fe	134.832	4169.2	42.0	35.6	0.35
Ni	115.360	29.0	56.0	49.2	9.32
Zn	99.775	11.2	80.8	67.2	27.62
Mg	107.496	1277.2	14.0	8.4	0.45
Al	90.598	3069.4	22.8	11.2	0.41
Mn	146.388	41.4	29.6	29.4	5.25
Ti	191.475	172.0	11.6	10.8	1.39
Cr	159.478	4470.6	28.8	24.6	0.34

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	1.0021	0.9751	1.0239	1.0038
FeO	28.025	4.5949	26.163	1.0712	1.0237	1.0467	0.9997
NiO	0.187	0.0295	0.166	1.1237	1.0680	1.0523	0.9999
ZnO	0.087	0.0125	0.079	1.1014	1.0677	1.0315	1.0000
MgO	12.960	3.7875	8.606	1.5058	0.9504	1.5793	1.0032
Al2O3	19.760	4.5661	15.693	1.2591	0.9561	1.3169	1.0000
MnO	0.288	0.0478	0.295	0.9763	1.0282	0.9498	0.9997
TiO2	2.015	0.2971	2.010	1.0024	1.0275	1.0136	0.9625
Cr2O3	34.771	5.3896	36.158	0.9616	0.9850	1.0065	0.9700
Total	98.093	18.7250	89.171	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 16.23

Fe_2O_3 13.11

New Total: 99.42

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 21 Comment : 83G30-14
Stage : X= 30.7675 Y= 80.9680 Z= 10.8155
Dated on Jan 5 10:59 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.008E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.737	-1.6	32.8	25.6	100.00 ?
2	Fe	134.820	3988.8	39.2	35.2	0.36
3	Ni	115.360	13.6	65.2	55.8	20.63
4	Zn	99.805	15.3	84.4	79.0	21.31
5	Mg	107.520	940.5	12.2	8.6	0.53
6	Al	90.598	2290.1	25.6	13.2	0.47
7	Mn	146.397	61.6	30.6	26.2	3.66
8	Ti	191.484	22.0	12.8	10.0	6.38
9	Cr	159.457	5952.0	28.0	23.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.857	4.5128	24.942	1.0768	1.0168	1.0592	0.9998
NiO	0.087	0.0141	0.078	1.1222	1.0605	1.0583	0.9998
ZnO	0.118	0.0174	0.107	1.0973	1.0600	1.0352	1.0000
MgO	9.969	2.9856	6.354	1.5688	0.9447	1.6541	1.0040
Al2O3	14.787	3.5017	11.665	1.2676	0.9504	1.3338	1.0000
MnO	0.423	0.0720	0.438	0.9672	1.0214	0.9470	0.9998
TiO2	0.250	0.0378	0.257	0.9729	1.0210	1.0119	0.9417
Cr2O3	46.458	7.3800	48.501	0.9579	0.9786	1.0028	0.9761
Total	98.949	18.5214	92.342	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .5057
Fe3 .2253
Ni .0023
Zn .0028
Mg .4836
Al .5672
Mn .0117
Ti .0061
Cr 1.1954

Recalculate wt% FeO 18.58
Fe_2O_3 9.20
New total: 99.88

Mg# .489
Ti# .008
Fe2# .571
Fe3# .113
Cr# .661

Zn ppm 948
Ni ppm 683

U known Specimen
roup : Laflamme Sample : TAKLAII
UNK No. : 22 Comment : 83G30-18
tage : X= 30.2465 Y= 81.6155 Z= 10.8130
ated on Jan 5 11:05 1994
wDS only No. of accumulation : 1

Corr.(A) : 2.008E-08

	Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1	Ca	107.737	-3.0	35.0	28.2	100.00	?
2	Fe	134.820	4626.6	40.8	37.4	0.33	
3	Ni	115.360	35.1	59.8	54.6	8.07	
4	Zn	99.805	0.2	90.6	87.8	2219.17	?
5	Mg	107.520	1063.4	11.8	7.2	0.50	
6	Al	90.598	2160.5	22.0	12.2	0.49	
7	Mn	146.397	40.2	35.6	29.4	5.60	
8	Ti	191.484	237.9	12.0	11.8	1.15	
9	Cr	159.457	5066.5	24.2	22.0	0.32	

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	30.966	5.2241	28.930	1.0704	1.0174	1.0524	0.9997
NiO	0.225	0.0366	0.201	1.1233	1.0611	1.0586	1.0000
nO	0.001	0.0002	0.001	1.0981	1.0606	1.0354	1.0000
gO	11.302	3.3985	7.184	1.5731	0.9452	1.6576	1.0041
Al2O3	14.108	3.3545	11.005	1.2820	0.9509	1.3482	1.0000
nO	0.277	0.0473	0.285	0.9707	1.0220	0.9500	0.9998
iO2	2.742	0.4159	2.777	0.9873	1.0216	1.0123	0.9547
Cr2O3	39.415	6.2865	41.286	0.9547	0.9791	1.0069	0.9684
otal	99.036	18.7636	91.669	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .5098
Fe3 .3257
Ni .0058
Zn .0000
Mg .5433
Al .5363
Mn .0076
Ti .0665
Cr 1.0050

Recalculate wt% FeO 18.90
Fe_2O_3 13.42
New Total: 100.39

Mg# .516
Ti# .072
Fe2# .484
Fe3# .174
Cr# .538

Zn ppm 8 ?
Ni ppm 1768

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 24 Comment : 83G30-21
Stage : X= 32.3515 Y= 81.4365 Z= 10.8115
Dated on Jan 5 11:11 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.008E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-1.6	28.4	25.4	100.00 ?
Fe	134.820	3592.7	42.0	34.8	0.38
Ni	115.360	25.7	61.8	57.8	11.11
4 Zn	99.805	14.0	78.6	72.8	22.33
5 Mg	107.520	1263.2	12.4	7.2	0.45
Al	90.598	2541.8	23.0	10.0	0.45
Mn	146.397	41.3	30.4	28.8	5.26
8 Ti	191.484	131.1	9.8	10.6	1.63
Cr	159.457	5516.0	27.8	23.4	0.30

ZAF Oxide Acc. Voltage : 20.0 (KV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.234	3.9605	22.465	1.0788	1.0213	1.0566	0.9997
NiO	0.165	0.0259	0.147	1.1225	1.0654	1.0537	0.9998
ZnO	0.108	0.0156	0.098	1.0996	1.0651	1.0324	1.0000
MgO	12.961	3.7753	8.534	1.5187	0.9484	1.5954	1.0037
Al2O3	16.374	3.7714	12.947	1.2647	0.9541	1.3255	1.0000
MnO	0.286	0.0473	0.294	0.9728	1.0259	0.9485	0.9998
TiO2	1.509	0.2217	1.530	0.9857	1.0252	1.0121	0.9499
Cr2O3	43.474	6.7167	44.949	0.9672	0.9828	1.0048	0.9794
Total	99.111	18.5343	90.964	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4103
Fe3 .2307
Ni .0042
Zn .0025
Mg .6111
Al .6104
Mn .0077
Ti .0359
Cr 1.0873

Recalculate wt% FeO 15.51
Fe_2O_3 9.69
New total: 100.08

Mg# = .598
Ti# = .041
Fe2 # = .402
Fe3# = .120
Cr # = .564

Zn ppm 867
Ni ppm 1296

X

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 59 Comment : 83H8-1
Stage : X= 69.3370 Y= 82.2230 Z= 10.6370
Dated on Jan 5 12:24 1994
WDS only No. of accumulation : 1

Cur.(A) : 2.012E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-1.6	33.6	23.6	100.00 ?
2 Fe	134.820	3685.2	42.2	37.2	0.37
3 Ni	115.360	36.9	57.0	47.6	7.41
4 Zn	99.805	4.5	81.6	80.4	70.70 ?
5 Mg	107.520	1388.9	15.6	8.4	0.43
6 Al	90.598	2656.4	19.8	12.2	0.44
7 Mn	146.397	36.4	32.4	30.0	6.02
8 Ti	191.484	169.8	11.4	12.4	1.41
9 Cr	159.457	5128.2	26.0	25.4	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	24.771	4.0354	22.998	1.0771	1.0230	1.0533	0.9997
NiO	0.236	0.0370	0.210	1.1231	1.0672	1.0524	0.9999
ZnO	0.035	0.0050	0.032	1.1007	1.0669	1.0316	1.0000
MgO	14.086	4.0902	9.365	1.5042	0.9498	1.5779	1.0036
Al2O3	17.105	3.9273	13.504	1.2667	0.9555	1.3257	1.0000
MnO	0.252	0.0416	0.258	0.9750	1.0275	0.9492	0.9997
TiO2	1.964	0.2878	1.978	0.9931	1.0268	1.0125	0.9553
Cr2O3	40.362	6.2162	41.705	0.9678	0.9843	1.0058	0.9776
Total	98.811	18.6405	90.050	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3742
Fe3 .2751
Ni .0060
Zn .0008
Mg .6583
Al .6321
Mn .0067
Ti .0463
Cr 1.006

Recalculate wt% FeO 14.27
Fe_2O_3 11.66
New Total: 99.99

Mg # .638
Ti # .049
Fe2 # .362
Fe3 # .144
Cr # .524

Zn ppm 281
Ni ppm 1854

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 61 Comment : 83H8-3
Stage : X= 67.9650 Y= 82.4335 Z= 10.6370
Dated on Jan 5 12:29 1994
WDS only No. of accumulation : 1

Cnstr.(A) : 2.013E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1 Ca	107.737	1.1	23.6	19.6	172.73	?
Fe	134.820	2700.8	41.2	34.6	0.44	
Ni	115.360	25.1	54.6	42.8	10.34	
4 Zn	99.805	29.3	71.6	72.0	10.65	
Mg	107.520	1735.6	13.0	8.4	0.39	
Al	90.598	6022.7	30.6	13.0	0.29	
7 Mn	146.397	30.5	30.2	26.0	6.79	
8 Ti	191.484	0.9	11.4	13.0	146.29	?
Cr	159.457	3580.7	19.0	21.4	0.38	

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.004	0.0008	0.004	1.0273	0.9883	1.0288	1.0103
FeO	18.156	2.6717	16.846	1.0777	1.0390	1.0378	0.9995
NiO	0.160	0.0227	0.143	1.1229	1.0846	1.0357	0.9996
ZnO	0.227	0.0295	0.205	1.1082	1.0852	1.0212	1.0000
MgO	15.486	4.0619	11.697	1.3239	0.9628	1.3742	1.0006
Al2O3	✗35.952	7.4564	30.602	1.1748	0.9686	1.2129	1.0000
MnO	0.213	0.0318	0.216	0.9892	1.0433	0.9486	0.9996
TiO2	0.010	0.0014	0.010	1.0351	1.0419	1.0163	0.9776
Cr2O3	✗28.725	3.9962	29.105	0.9869	0.9992	1.0049	0.9829
Total	98.933	18.2723	88.827	Total O = 24.0		Iteration = 6	

Recalculate wt% FeO 13.22
Fe_2O_3 5.49
New Total: 99.49

X

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 62 Comment : 83H8-4
Stage : X= 67.3485 Y= 82.4465 Z= 10.6370
Dated on Jan 5 12:35 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.012E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	1.3	26.0	25.0	151.72 ?
2 Fe	134.820	3034.8	37.4	36.2	0.41
3 Ni	115.360	8.8	61.6	51.8	30.63
4 Zn	99.805	23.5	85.6	76.6	13.93
5 Mg	107.520	1014.5	12.6	8.0	0.51
6 Al	90.598	2308.1	20.6	14.2	0.47
7 Mn	146.397	56.0	32.2	30.6	4.12
8 Ti	191.484	4.1	15.0	14.6	34.28 ?
9 Cr	159.457	6624.5	26.4	24.8	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.005	0.0010	0.005	0.9856	0.9702	1.0190	0.9969
FeO	20.560	3.3993	18.939	1.0856	1.0182	1.0664	0.9998
NiO	0.056	0.0090	0.050	1.1211	1.0620	1.0559	0.9997
ZnO	0.180	0.0263	0.164	1.0973	1.0616	1.0336	1.0000
MgO	→10.527	3.1024	6.840	1.5390	0.9458	1.6210	1.0039
Al2O3	14.726	3.4313	11.733	1.2550	0.9514	1.3191	1.0000
MnO	0.384	0.0643	0.397	0.9677	1.0227	0.9464	0.9998
TiO2	0.046	0.0068	0.047	0.9650	1.0222	1.0109	0.9338
Cr2O3	52.192	8.1581	53.874	0.9688	0.9798	1.0019	0.9869
Total	98.676	18.1985	92.050	Total O = 24.0		Iteration = 5	

Ca .0002
Fe2 .4734
Fe3 .0871
Ni .0015
Zn .0043
Mg .5114
Al .5656
Mn .0106
Ti .0011
Cr 1.3448

Recalculate wt% Fe_2O 17.37
Fe_2O_3 3.55
New total: 99.04

mg # .519
Ti # .002
Fe2 # .481
Fe3 # .044
Cr # .673

Zn ppm 1446
Ni ppm 440

X

Close to P3

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 63 Comment : 83H8-6
Stage : X= 68.0475 Y= 83.1415 Z= 10.6345
Dated on Jan 5 12:41 1994
WDS only No. of accumulation : 1

Cur.(A) : 2.012E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-0.9	30.8	24.8	100.00 ?
2 Fe	134.820	2898.2	35.4	32.8	0.42
3 Ni	115.360	36.9	58.4	56.8	7.72
4 Zn	99.805	3.8	82.6	73.8	83.22 ?
5 Mg	107.520	1508.5	12.8	7.0	0.41
6 Al	90.598	2793.8	18.8	10.6	0.43
7 Mn	146.397	35.5	29.2	26.0	5.87
8 Ti	191.484	74.3	11.0	11.8	2.44
9 Cr	159.457	5748.4	25.6	25.8	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	19.614	3.1217	18.086	1.0845	1.0247	1.0587	0.9997
NiO	0.236	0.0362	0.211	1.1224	1.0692	1.0498	1.0000
ZnO	0.029	0.0041	0.026	1.1011	1.0690	1.0300	1.0000
MgO	14.986	4.2514	10.171	1.4734	0.9512	1.5436	1.0035
Al2O3	17.832	3.9999	14.203	1.2555	0.9569	1.3121	1.0000
MnO	0.245	0.0395	0.251	0.9751	1.0292	0.9477	0.9997
TiO2	0.854	0.1222	0.865	0.9864	1.0285	1.0119	0.9478
Cr2O3	45.649	6.8686	46.749	0.9765	0.9859	1.0037	0.9867
Total	99.445	18.4436	90.562	Total O =	24.0	Iteration =	5

Ca .0000
Fe2 .3151
Fe3 .1927
Ni .0059
Zn .0007
Mg .6915
Al .6506
Mn .0064
Ti .0199
Cr 1.1173

Recalculate wt% FeO 12.17
Fe_2O_3 8.27
New Total: 100.28

Mg # .687
Ti # .023
Fe2 # .313
Al # .098
Cr # .570

Zn ppm 232
Ni ppm 1854

X

TMAC

known Specimen
Group : Laflamme Sample : TAKLAII
NK No. : 28 Comment : 83J3-1
tage : X= 23.1345 Y= 85.3625 Z= 10.7890
Dated on Dec 24 13:36 1993
WDS only No. of accumulation : 1

rr.(A) : 2.002E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	-0.9	31.6	25.4	100.00 ?
Fe	134.832	4590.8	37.4	39.4	0.33
Ni	115.360	30.1	66.4	54.8	9.59
Zn	99.775	-0.1	89.4	85.6	100.00 ?
Mg	107.496	1265.9	15.2	6.6	0.45
Al	90.598	1497.2	23.2	12.6	0.59
Mn	146.388	40.9	38.6	30.4	5.64
Ti	191.475	471.0	14.6	12.2	0.78
Cr	159.478	4891.4	30.4	24.0	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

ement	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	✗ 30.824	5.2870	28.794	1.0705	1.0168	1.0531	0.9998
NiO	0.194	0.0320	0.172	1.1232	1.0605	1.0591	1.0000
ZnO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
MgO	13.455	4.1137	8.526	1.5781	0.9447	1.6628	1.0046
Al2O3	9.981	2.4127	7.651	1.3045	0.9504	1.3726	1.0000
MnO	0.284	0.0493	0.291	0.9729	1.0214	0.9527	0.9998
TiO2	✗ 5.447	0.8402	5.501	0.9902	1.0210	1.0114	0.9589
Cr2O3	37.899	6.1457	39.542	0.9585	0.9786	1.0105	0.9693
Total	98.084	18.8806	90.477	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 17.13
Fe_2O_3 15.21
New total: 99.60

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 49 Comment : 83I2-2
Stage : X= 72.7825 Y= 76.3235 Z= 10.6485
Dated on Dec 24 15:34 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	1.9	30.2	21.0	107.16 ?
2 Fe	134.832	4041.0	37.2	29.8	0.36
3 Ni	115.360	23.4	65.4	51.2	12.01
4 Zn	99.775	9.6	77.2	88.6	33.92 ?
5 Mg	107.496	1005.2	14.2	8.2	0.51
6 Al	90.598	2407.8	21.8	11.6	0.46
7 Mn	146.388	43.6	29.8	32.0	5.11
8 Ti	191.475	144.7	12.6	13.8	1.59
9 Cr	159.478	5596.5	26.0	24.4	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.007	0.0015	0.007	0.9904	0.9702	1.0210	0.9999
FeO	27.191	4.5415	25.282	1.0755	1.0181	1.0566	0.9998
NiO	0.150	0.0241	0.134	1.1225	1.0620	1.0571	0.9999
ZnO	0.074	0.0109	0.067	1.0981	1.0615	1.0345	1.0000
MgO	10.508	3.1281	6.753	1.5559	0.9458	1.6388	1.0038
Al2O3	15.528	3.6552	12.274	1.2651	0.9515	1.3297	1.0000
MnO	0.300	0.0508	0.309	0.9700	1.0227	0.9487	0.9998
TiO2	1.655	0.2485	1.686	0.9815	1.0223	1.0121	0.9487
Cr2O3	43.332	6.8422	45.129	0.9602	0.9798	1.0050	0.9750
Total	98.745	18.5028	91.642	Total O = 24.0		Iteration = 5	

Ca .0006
Fe2 .4103
Fe3 .1307
Ni .0042
Zn .0025
Mg .6111
Al .6104
Mn .0077
Ti .0359
Cr 1.0873

Recalculate wt% FeO 19.18
Fe_2O_3 8.91
New Total: 99.63

Mg .598
Ti .041
Fe2 .402
Fe3 .120
Cr .564

Zn ppm 867
Ni ppm 1296

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 50 Comment : 83I2-3
Stage : X= 72.2345 Y= 76.5395 Z= 10.6495
Dated on Dec 24 15:40 1993
WDS only No. of accumulation : 1

Cor.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1 Ca	107.747	0.6	27.0	25.0	305.09	?
Fe	134.832	3386.5	41.2	37.2	0.39	
3 Ni	115.360	8.8	63.4	52.6	31.14	
4 Zn	99.775	31.1	82.6	77.8	10.57	
Mg	107.496	794.1	11.2	6.0	0.58	
Al	90.598	1721.4	23.8	12.0	0.55	
7 Mn	146.388	60.8	36.2	34.4	4.00	
8 Ti	191.475	3.9	13.8	11.8	33.62	?
Cr	159.478	7110.1	24.0	28.6	0.27	

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.002	0.0005	0.002	0.9779	0.9658	1.0177	0.9948
FeO	22.964	3.9206	21.187	1.0839	1.0132	1.0700	0.9998
NiO	0.056	0.0092	0.050	1.1205	1.0567	1.0607	0.9997
ZnO	0.239	0.0360	0.218	1.0946	1.0559	1.0366	1.0000
MgO	8.500	2.5867	5.335	1.5932	0.9417	1.6845	1.0044
Al2O3	11.132	2.6785	8.775	1.2686	0.9473	1.3391	1.0000
MnO	0.416	0.0719	0.432	0.9628	1.0178	0.9461	0.9998
TiO2	0.043	0.0066	0.045	0.9531	1.0176	1.0102	0.9272
Cr2O3	55.118	8.8961	57.335	0.9613	0.9752	1.0015	0.9843
Total	98.470	18.2061	93.380	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 19.74
Fe_2O_3 3.58
New Total: 98.83

DI*

* Zn and Ni in Diamond Inclusion field but analysis is questionable.

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 51 Comment : 83I2-4
Stage : X= 71.6375 Y= 76.5830 Z= 10.6510
Dated on Jan 5 13:44 1994
WDS only No. of accumulation : 1

Cur.(A) : 2.015E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	1.6	27.2	23.2	119.11 ?
Fe	134.820	2303.4	41.6	36.8	0.48
Ni	115.360	26.0	61.8	55.0	10.83
4 Zn	99.805	4.2	84.6	82.2	76.80 ?
5 Mg	107.520	1410.1	12.8	8.4	0.43
Al	90.598	822.9	22.8	15.0	0.81
7 Mn	146.397	41.5	33.2	35.6	5.57
8 Ti	191.484	16.7	9.8	13.4	8.20
Cr	159.457	7808.4	29.2	24.8	0.25

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.006	0.0013	0.006	0.9739	0.9680	1.0146	0.9916
FeO	15.719	2.6594	14.353	1.0951	1.0157	1.0785	0.9998
NiO	0.166	0.0270	0.148	1.1205	1.0594	1.0578	1.0000
ZnO	0.032	0.0048	0.030	1.0957	1.0588	1.0349	1.0000
MgO	14.747	4.4474	9.493	1.5535	0.9437	1.6377	1.0051
Al2O3	5.429 ✓	1.2945	4.177	1.2997	0.9494	1.3690	1.0000
MnO	0.283	0.0485	0.293	0.9645	1.0203	0.9455	0.9998
TiO2	0.183 ✓	0.0278	0.194	0.9434	1.0199	1.0084	0.9173
Cr2O3	61.745 ✓	9.8761	63.407	0.9738	0.9775	1.0007	0.9955
Total	98.310	18.3869	92.102	Total O = 24.0		Iteration = 4	

Ca .0004
Fe2 .5555
Fe3 .3523
Ni
Zn .0092
Mg 1.5178
Al .4418
Mn .0166
Ti .0095
Cr .0953

Recalculate wt% FeO 9.62
Fe_2O_3 6.78
New Total: 98.99

Mg# .732 ✓
Ti# .017
Fe2# .268
Fe3# .185
Cr# .809 ✓

Zn ppm 257
Ni ppm 1304

T_{Zn} : 1428

X

P1 except Zn and Ni are high temperature

U nown Specimen
Group : Laflamme Sample : TAKLAII
NK No. : 52 Comment : 83I2-5
tage : X= 71.5960 Y= 77.3215 Z= 10.6495
ated on Dec 24 15:51 1993
WDS only No. of accumulation : 1

Cr.(A) : 2.008E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	0.2	30.4	22.8	1000.01 ?
Fe	134.832	2322.1	42.2	34.2	0.48
Ni	115.360	28.7	62.4	52.4	9.78
Zn	99.775	4.2	92.0	74.0	77.07 ?
Mg	107.496	1417.1	14.2	5.6	0.43
Al	90.598	1232.5	22.6	14.0	0.65
Mn	146.388	41.1	29.0	30.6	5.31
Ti	191.475	17.6	11.8	12.2	7.92
Cr	159.478	7498.5	27.2	29.6	0.26

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.001	0.0002	0.001	0.9784	0.9697	1.0158	0.9933
FeO	15.883	2.6575	14.521	1.0938	1.0176	1.0752	0.9998
NiO	0.184	0.0296	0.164	1.1208	1.0614	1.0560	1.0000
ZnO	0.032	0.0048	0.029	1.0968	1.0609	1.0338	1.0000
MgO	14.608	4.3563	9.516	1.5351	0.9453	1.6162	1.0048
Al2O3	8.090	1.9077	6.280	1.2883	0.9510	1.3547	1.0000
MnO	0.282	0.0477	0.291	0.9665	1.0222	0.9458	0.9998
TiO2	0.195	0.0293	0.205	0.9511	1.0217	1.0091	0.9225
Cr2O3	58.938	9.3226	60.436	0.9752	0.9793	1.0011	0.9948
Total	98.213	18.3556	91.443	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 10.22
Fe_2O_3 6.29
New Total: 98.84

Mg # .718
Mn # .016
Fe2 # .282
Fe3 # .078
Cr # .766

Zn ppm 257
Ni ppm 1445

Ca .0006
Fe2 .2795
Fe3 .1548
Ni .0048
Zn .0008
Mg .7120
Al .3118
Mn .0078
Ti .0048
Cr 1.5237

Chromite

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 55 Comment : 83I3-2
Stage : X= 59.0550 Y= 83.0425 Z= 10.6340
Dated on Jan 5 13:25 1994
WDS only No. of accumulation : 1

Coor.(A) : 2.013E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-5.3	44.0	27.8	100.00 ?
Fe	134.820	4968.3	47.8	37.6	0.32
Ni	115.360	8.7	61.4	59.6	32.24
4 Zn	99.805	146.9	94.0	90.4	2.65
Mg	107.520	62.1	9.8	6.2	2.57
Al	90.598	941.5	26.2	11.8	0.75
7 Mn	146.397	158.3	35.2	37.8	1.84
8 Ti	191.484	16.2	15.2	11.6	8.93
Cr	159.457	7417.2	31.6	26.4	0.26

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
NiO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	33.173	6.1219	30.989	1.0705	1.0002	1.0710	0.9993
MnO	0.055	0.0098	0.049	1.1171	1.0426	1.0729	0.9987
TiO	1.117	0.1821	1.028	1.0872	1.0412	1.0442	1.0000
MgO	0.730	0.2400	0.418	1.7446	0.9309	1.8645	1.0051
Al2O3	6.165	1.6035	4.784	1.2888	0.9366	1.3761	1.0000
ZnO	1.067	0.1993	1.122	0.9505	1.0050	0.9463	0.9994
SiO2	0.176	0.0292	0.188	0.9356	1.0053	1.0102	0.9212
Cr2O3	56.489	9.8555	60.291	0.9369	0.9631	1.0018	0.9711
Total	98.972	18.2413	98.869	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 29.69

Fe_2O_3 3.87

New Total: 99.38

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 29 Comment : 83J3-2
Stage : X= 22.4315 Y= 85.5680 Z= 10.7870
Dated on Jan 5 11:16 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.009E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-2.1	33.2	28.0	100.00 ?
2 Fe	134.820	4050.2	43.4	37.2	0.36
3 Ni	115.360	-0.2	64.4	60.8	100.00 ?
4 Zn	99.805	135.9	86.4	82.8	2.75
5 Mg	107.520	540.7	11.4	7.2	0.71
6 Al	90.598	2263.7	27.0	14.0	0.48
7 Mn	146.397	78.0	31.4	29.0	3.07
8 Ti	191.484	132.4	13.8	9.6	1.65
9 Cr	159.457	6228.8	28.2	26.2	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	27.221	4.6225	25.313	1.0754	1.0126	1.0627	0.9993
NiO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
ZnO	1.042	0.1562	0.952	1.0940	1.0553	1.0367	1.0000
MgO	5.891	1.7832	3.651	1.6137	0.9412	1.7076	1.0040
Al2O3	14.498	3.4699	11.525	1.2580	0.9469	1.3286	1.0000
MnO	0.534	0.0918	0.554	0.9642	1.0173	0.9483	0.9994
TiO2	1.494	0.2282	1.545	0.9674	1.0171	1.0116	0.9403
Cr2O3	48.524	7.7901	50.731	0.9565	0.9747	1.0045	0.9769
Total	99.204	18.1419	94.271	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 24.99
Fe_2O_3 2.48
New Total: 99.44

P3*

*Ni is low

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 30 Comment : 83J3-5
Stage : X= 20.7210 Y= 85.6730 Z= 10.7855
Dated on Dec 24 13:47 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.002E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	2.1	29.0	22.0	96.67 ?
Fe	134.832	2834.5	42.0	33.4	0.43
Ni	115.360	19.4	66.0	53.4	14.51
Zn	99.775	8.2	83.4	73.2	38.78 ?
Mg	107.496	1315.4	12.4	6.6	0.44
Al	90.598	2247.7	22.6	10.6	0.48
Mn	146.388	41.5	29.0	32.6	5.32
Ti	191.475	25.3	10.0	12.4	5.63
Cr	159.478	6371.0	23.4	18.6	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.008	0.0016	0.008	0.9894	0.9727	1.0193	0.9980
FeO	19.318	3.1777	17.778	1.0866	1.0210	1.0645	0.9998
NiO	0.125	0.0198	0.111	1.1218	1.0651	1.0533	0.9999
ZnO	0.063	0.0091	0.057	1.0989	1.0647	1.0321	1.0000
MgO	13.375	3.9216	8.859	1.5098	0.9481	1.5862	1.0039
Al2O3	14.516	3.3653	11.486	1.2638	0.9538	1.3250	1.0000
MnO	0.287	0.0478	0.296	0.9707	1.0255	0.9467	0.9998
TiO2	0.287	0.0425	0.295	0.9718	1.0249	1.0110	0.9378
Cr2O3	50.111	7.7930	51.503	0.9730	0.9824	1.0024	0.9880
Total	98.090	18.3784	90.394	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 13.19
Fe_2O_3 6.82
New total: 98.78

Mg # .644
Ti # .010
Fe2 # .356
Fe3 # .083
Cr # .640

Zn ppm 506
Ni ppm 982

Ca .0003
Fe2 .3542
Fe3 .1648
Ni .0032
Zn .0015
Mg .6400
Al .5493
Mn .0078
Ti .0069
Cr 1.2720

TMAC

U known Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 31 Comment : 83J3-6
tage : X= 20.5295 Y= 86.3570 Z= 10.7795
ated on Dec 24 13:53 1993
WDS only No. of accumulation : 1

Curr.(A) : 2.003E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.747	0.0	30.0	24.2	100.00 ?
Fe	134.832	4757.7	40.6	35.8	0.33
Ni	115.360	18.7	62.2	56.2	15.00
Zn	99.775	1.2	93.8	81.0	281.57 ?
Mg	107.496	1082.2	11.6	9.4	0.49
Al	90.598	1532.2	18.4	13.2	0.58
Mn	146.388	60.5	35.2	29.4	3.89
Ti	191.475	423.2	16.0	12.0	0.83
Cr	159.478	5005.4	26.4	24.2	0.32

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	31.893	5.5393	29.826	1.0693	1.0150	1.0537	0.9998
NiO	0.120	0.0201	0.107	1.1231	1.0586	1.0609	1.0000
ZnO	0.009	0.0014	0.008	1.0968	1.0579	1.0368	1.0000
MgO	11.633	3.6015	7.285	1.5969	0.9433	1.6853	1.0046
Al2O3	10.171	2.4897	7.826	1.2996	0.9489	1.3696	1.0000
MnO	0.418	0.0736	0.431	0.9707	1.0197	0.9521	0.9999
TiO2	4.871	0.7608	4.940	0.9860	1.0193	1.0115	0.9563
Cr2O3	38.602	6.3386	40.443	0.9545	0.9769	1.0097	0.9677
Total	97.717	18.8250	90.866	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 19.22
Fe_2O_3 14.08
New total : 99.12

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 32 Comment : 83J3-7
Stage : X= 21.1325 Y= 86.3135 Z= 10.7795
Dated on Dec 24 13:59 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	-1.2	32.2	24.4	100.00 ?
2 Fe	134.832	3435.7	37.2	40.2	0.39
3 Ni	115.360	10.1	66.0	54.2	27.66
4 Zn	99.775	26.4	85.4	80.2	12.58
5 Mg	107.496	916.2	10.2	5.8	0.53
6 Al	90.598	2203.7	24.4	10.2	0.48
7 Mn	146.388	55.0	30.6	29.8	4.13
8 Ti	191.475	12.2	13.6	11.2	11.21
9 Cr	159.478	6526.7	28.0	24.2	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	23.294	3.9008	21.528	1.0821	1.0165	1.0647	0.9998
NiO	0.065	0.0104	0.058	1.1212	1.0603	1.0578	0.9997
ZnO	0.203	0.0300	0.185	1.0966	1.0597	1.0348	1.0000
MgO	9.629	2.8740	6.164	1.5621	0.9444	1.6473	1.0040
Al2O3	14.182	3.3472	11.250	1.2606	0.9501	1.3268	1.0000
MnO	0.378	0.0641	0.391	0.9664	1.0212	0.9466	0.9998
TiO2	0.137	0.0206	0.142	0.9654	1.0207	1.0111	0.9353
Cr2O3	50.780	8.0391	52.709	0.9634	0.9783	1.0022	0.9826
Total	98.668	18.2862	92.427	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .5146
Fe3 .1251
Ni .0017
Zn .0049
Mg .4715
Al .5491
Mn .0105
Ti .0034
Cr 1.3191

Recalculate wt% FeO 18.73
Fe_2O_3 5.06
New Total: 99.18

Mg # .478
Ti # .005
Fe2 # .522
Fe3 # .063
Cr # .662

Zn ppm 1630
Ni ppm 510

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 33 Comment : 83J3-8
Stage : X= 21.7145 Y= 86.3960 Z= 10.7795
Dated on Dec 24 14:04 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.004E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	0.9	25.6	22.6	212.57 ?
2 Fe	134.832	3119.1	33.2	34.6	0.41
3 Ni	115.360	18.0	62.4	52.2	15.31
4 Zn	99.775	4.7	79.8	74.8	66.53 ?
5 Mg	107.496	1361.0	13.2	5.8	0.44
6 Al	90.598	4281.8	26.2	9.6	0.34
7 Mn	146.388	47.5	23.0	25.4	4.32
8 Ti	191.475	15.2	10.2	10.8	8.56
9 Cr	159.478	4762.3	25.0	18.6	0.33

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.003	0.0007	0.003	1.0093	0.9800	1.0247	1.0050
FeO	21.092	3.2763	19.544	1.0792	1.0294	1.0486	0.9998
NiO	0.116	0.0173	0.103	1.1231	1.0742	1.0456	0.9999
ZnO	0.036	0.0050	0.033	1.1037	1.0743	1.0273	1.0000
MgO	13.074	3.6199	9.158	1.4277	0.9550	1.4917	1.0022
Al2O3	26.530	5.8081	21.859	1.2137	0.9607	1.2633	1.0000
MnO	0.331	0.0521	0.338	0.9798	1.0339	0.9478	0.9998
TiO2	0.178	0.0249	0.177	1.0059	1.0329	1.0141	0.9604
Cr2O3	37.529	5.5111	38.460	0.9758	0.9903	1.0039	0.9815
Total	98.889	18.3155	89.675	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 15.68

Fe_2O_3 6.01

New Total: 99.49

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 34 Comment : 83J3-9
Stage : X= 22.1710 Y= 86.1520 Z= 10.7820
Dated on Jan 5 13:08 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.013E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-1.2	30.4	29.6	100.00 ?
2 Fe	134.820	5250.7	41.6	39.8	0.31
3 Ni	115.360	8.0	74.2	54.2	36.07 ?
4 Zn	99.805	53.7	92.6	83.2	6.54
5 Mg	107.520	424.9	11.2	3.4	0.80
6 Al	90.598	2593.2	22.6	14.2	0.44
7 Mn	146.397	64.3	35.8	32.2	3.77
8 Ti	191.484	55.9	12.2	11.6	3.04
9 Cr	159.457	5382.5	27.0	19.6	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	34.895	6.0370	32.751	1.0655	1.0122	1.0530	0.9997
NiO	0.051	0.0085	0.045	1.1218	1.0555	1.0634	0.9995
ZnO	0.411	0.0629	0.376	1.0951	1.0547	1.0383	1.0000
MgO	4.677	1.4423	2.863	1.6335	0.9409	1.7295	1.0038
Al2O3	16.598	4.0471	13.176	1.2597	0.9466	1.3308	1.0000
MnO	0.439	0.0769	0.455	0.9638	1.0169	0.9480	0.9997
TiO2	0.635	0.0988	0.651	0.9761	1.0167	1.0131	0.9476
Cr2O3	41.184	6.7361	43.751	0.9413	0.9743	1.0041	0.9622
Total	98.890	18.5096	94.068	Total O = 24.0		Iteration = 4	

Recalculate wt% FeO 27.04

Fe_2O_3 8.73

New Total: 99.77

Unknown Specimen
Group : Laflamme Sample : TAKLAII
NK No. : 35 Comment : 83J3-10
Stage : X= 22.7485 Y= 86.1345 Z= 10.7820
Dated on Jan 5 11:28 1994
EDS only No. of accumulation : 1

Curr.(A) : 2.009E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.737	-1.2	28.6	27.2	100.00 ?
Fe	134.820	4526.6	42.2	32.6	0.34
Ni	115.360	9.2	76.2	58.4	31.87
Zn	99.805	29.8	86.2	85.0	11.34
Mg	107.520	784.0	9.8	7.0	0.58
Al	90.598	2625.6	23.2	14.6	0.44
Mn	146.397	64.2	32.4	33.8	3.73
Ti	191.484	40.5	12.2	11.0	3.88
Cr	159.457	5325.4	23.4	26.2	0.31

FeO Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	30.292	5.1593	28.291	1.0707	1.0166	1.0535	0.9998
NiO	0.059	0.0097	0.053	1.1225	1.0603	1.0590	0.9997
ZnO	0.229	0.0345	0.209	1.0974	1.0597	1.0356	1.0000
MgO	8.367	2.5400	5.294	1.5805	0.9446	1.6671	1.0037
Al2O3	16.865	4.0483	13.368	1.2616	0.9502	1.3277	1.0000
MnO	0.441	0.0761	0.456	0.9677	1.0212	0.9477	0.9998
TiO2	0.463	0.0709	0.472	0.9809	1.0208	1.0129	0.9486
Cr2O3	41.262	6.6440	43.374	0.9513	0.9784	1.0037	0.9687
Total	97.978	18.5829	91.516	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 21.16
Fe_2O_3 10.15
New Total: 99.00

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 36 Comment : 83J3-14
Stage : X= 22.0385 Y= 87.0300 Z= 10.7750
Dated on Jan 5 11:33 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.010E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	-0.4	24.8	26.4	100.00 ?
2 Fe	134.820	3772.3	39.2	36.0	0.37
3 Ni	115.360	21.5	63.8	47.6	12.75
4 Zn	99.805	9.6	78.0	74.2	32.44
5 Mg	107.520	1341.2	17.4	8.4	0.44
6 Al	90.598	3804.9	26.4	12.8	0.37
7 Mn	146.397	39.3	33.8	28.4	5.61
8 Ti	191.484	123.0	10.0	9.2	1.68
9 Cr	159.457	4328.8	24.0	21.8	0.34

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	25.301	4.0242	23.565	1.0737	1.0273	1.0454	0.9997
NiO	0.138	0.0211	0.123	1.1236	1.0719	1.0483	0.9999
ZnO	0.074	0.0104	0.067	1.1030	1.0719	1.0290	1.0000
MgO	13.226	3.7497	9.052	1.4612	0.9533	1.5287	1.0026
Al2O3	23.915	5.3609	19.362	1.2352	0.9591	1.2879	1.0000
MnO	0.273	0.0440	0.279	0.9793	1.0318	0.9493	0.9998
TiO2	1.447	0.2070	1.435	1.0088	1.0309	1.0142	0.9649
Cr2O3	✗ 34.118	5.1301	35.239	0.9682	0.9883	1.0059	0.9738
Total	98.492	18.5474	89.121	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 16.13
Fe_2O_3 10.19
New Total 99.52

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 39 Comment : 83J5-7
Stage : X= 31.3775 Y= 86.1360 Z= 10.7785
Dated on Dec 24 14:38 1993
WDS only No. of accumulation : 1

Cur.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	-5.4	27.2	28.2	100.00 ?
2 Fe	134.832	3997.4	43.2	32.8	0.36
3 Ni	115.360	17.6	63.0	53.8	15.83
4 Zn	99.775	43.4	76.2	72.6	7.43
5 Mg	107.496	1025.0	11.0	7.2	0.50
6 Al	90.598	4190.7	24.2	18.0	0.35
7 Mn	146.388	53.7	30.0	27.6	4.14
8 Ti	191.475	30.4	9.6	10.8	4.69
Cr	159.478	4403.2	25.4	17.4	0.34

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	26.789	4.2860	25.009	1.0712	1.0258	1.0447	0.9996
NiO	0.113	0.0174	0.101	1.1228	1.0703	1.0497	0.9995
ZnO	0.335	0.0473	0.304	1.1020	1.0701	1.0298	1.0000
MgO	10.206	2.9105	6.886	1.4820	0.9521	1.5531	1.0023
Al2O3	26.085	5.8818	21.362	1.2211	0.9578	1.2749	1.0000
MnO	0.373	0.0604	0.381	0.9767	1.0302	0.9484	0.9997
TiO2	0.357	0.0513	0.354	1.0060	1.0294	1.0148	0.9630
Cr2O3	✗ 34.173	5.1688	35.507	0.9624	0.9869	1.0046	0.9707
Total	98.431	18.4234	89.905	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 19.73
Fe_2O_3 7.84
New Total: 99.23

X

Close to P3

U known Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 42 Comment : 83J8-1
tage : X= 59.3065 Y= 77.9980 Z= 10.6525
ated on Dec 24 14:55 1993
WDS only No. of accumulation : 1

C rr.(A) : 2.007E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.747	-0.7	31.2	22.2	100.00 ?
Fe	134.832	2794.6	38.8	34.0	0.43
3 Ni	115.360	36.0	60.2	47.6	7.68
4 Zn	99.775	8.3	77.0	70.8	36.92 ?
Mg	107.496	1520.1	12.4	5.8	0.41
Al	90.598	2572.5	22.8	11.4	0.45
7 Mn	146.388	36.0	31.2	25.6	5.86
Ti	191.475	107.9	12.2	11.6	1.90
Cr	159.478	5818.5	27.8	25.4	0.30

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	18.975	3.0648	17.485	1.0853	1.0243	1.0599	0.9996
NiO	0.231	0.0359	0.206	1.1221	1.0686	1.0502	0.9999
ZnO	0.064	0.0092	0.058	1.1008	1.0684	1.0302	1.0000
MgO	15.087	4.3434	10.213	1.4773	0.9508	1.5480	1.0037
Al2O3	16.525	3.7617	13.113	1.2601	0.9565	1.3175	1.0000
MnO	0.250	0.0408	0.256	0.9750	1.0288	0.9480	0.9997
TiO2	1.239	0.1799	1.257	0.9849	1.0280	1.0116	0.9471
Cr2O3	45.858	7.0024	46.919	0.9774	0.9855	1.0041	0.9877
Total	98.229	18.4381	89.507	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .3088
Fe3 .1901
Ni .0058
Zn .0015
Mg .7066
Al .6126
Mn .0067
Ti .0293
Cr 1.1393

Recalculate wt% FeO 11.75
Fe_2O_3 8.04
New Total: 99.05

mg # .696
Ti # .035
Fe2 # .304
Fe3 # .098
Cr # .587

Zn ppm 514
Ni ppm 1815

P3*

Zn, is low

Ni & Mg are high

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 43 Comment : 83J11-1
Stage : X= 64.0515 Y= 77.1460 Z= 10.6575
Dated on Jan 5 13:38 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.014E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	0.9	28.6	26.6	227.31 ?
Fe	134.820	2696.1	42.8	32.0	0.44
Ni	115.360	34.5	58.6	50.8	8.05
4 Zn	99.805	2.6	81.4	75.4	123.14 ?
5 Mg	107.520	1432.3	16.4	4.6	0.43
Al	90.598	2693.4	23.0	13.6	0.44
Mn	146.397	38.7	29.2	28.2	5.51
8 Ti	191.484	16.2	11.8	11.8	8.45
Cr	159.457	6091.5	26.8	24.6	0.29

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
aO	0.003	0.0007	0.003	0.9943	0.9751	1.0202	0.9994
eO	18.268	2.9359	16.808	1.0869	1.0238	1.0619	0.9997
NiO	0.220	0.0341	0.196	1.1221	1.0682	1.0505	1.0000
nO	0.020	0.0028	0.018	1.1005	1.0680	1.0304	1.0000
gO	14.271	4.0880	9.648	1.4792	0.9504	1.5508	1.0036
Al2O3	17.144	3.8830	13.678	1.2533	0.9561	1.3109	1.0000
nO	0.267	0.0435	0.274	0.9734	1.0283	0.9468	0.9997
iO2	0.185	0.0267	0.189	0.9792	1.0276	1.0116	0.9421
Cr2O3	48.342	7.3447	49.491	0.9768	0.9851	1.0025	0.9891
otal	98.720	18.3594	90.306	Total O = 24.0		Iteration = 5	

Ca .0001
Fe2 .3233
Fe3 .1564
Ni .0056
Zn .0005
Mg .6686
Al .6345
Mn .0071
Ti .0044
Cr 1.2002

Recalculate wt% FeO 12.31
Fe_2O_3 6.62
New Total: 99.38

Mg # .674
Ti # .005
Fe2 # .326
Fe3 # .079
Cr # .603

Zn ppm 160
Ni ppm 1728

X

Close to P3
Al_2O_3 is high

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 44 Comment : 83J11-3
Stage : X= 62.6135 Y= 77.3475 Z= 10.6565
Acted on Jan 5 11:44 1994
WDS only No. of accumulation : 1

Cur.(A) : 2.010E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	0.5	31.4	23.6	407.44 ?
2 Fe	134.820	3454.9	40.0	30.8	0.39
3 Ni	115.360	33.5	64.2	52.6	8.52
4 Zn	99.805	8.5	80.4	74.0	37.05 ?
5 Mg	107.520	1278.3	11.6	6.8	0.45
6 Al	90.598	2936.0	21.0	14.0	0.42
7 Mn	146.397	38.6	35.0	26.6	5.68
8 Ti	191.484	91.3	10.2	12.6	2.11
9 Cr	159.457	5313.3	24.8	27.6	0.31

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.002	0.0004	0.002	0.9977	0.9747	1.0220	1.0016
FeO	23.286	3.7824	21.582	1.0789	1.0233	1.0547	0.9997
NiO	0.215	0.0335	0.191	1.1227	1.0676	1.0517	0.9999
ZnO	0.065	0.0094	0.059	1.1006	1.0673	1.0312	1.0000
MgO	12.916	3.7397	8.627	1.4971	0.9500	1.5706	1.0034
Al2O3	18.716	4.2847	14.940	1.2527	0.9557	1.3108	1.0000
MnO	0.267	0.0439	0.274	0.9743	1.0278	0.9482	0.9997
TiO2	1.054	0.1540	1.065	0.9902	1.0271	1.0126	0.9521
Cr2O3	41.918	6.4371	43.254	0.9691	0.9846	1.0044	0.9799
Total	98.439	18.4851	89.995	Total O = 24.0		Iteration = 5	

Ca .0001
Fe2 .4036
Fe3 .2104
Ni
Zn .0055
Mg .0015
Al .6068
Mn .6953
Ti .0071
Cr .0256
1.0447

Recalculate wt% FeO 15.31
Fe_2O_3 8.87
New total: 99.35

mg # .601
Ti #
Fe2 # .027
Fe3 # .395
Cr # .108
.536

Zn ppm 522
Ni ppm 1689

P3*

*Zn is high

cnown Specimen
:oup : Laflamme Sample : TAKLAII
UNK No. : 45 Comment : 83J11-5
:tage : X= 62.0560 Y= 78.2370 Z= 10.6540
ited on Jan 5 11:50 1994
WDS only No. of accumulation : 1

:r.(A) : 2.010E-08

	ement	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)	
1	Ca	107.737	-1.1	30.8	26.4	100.00	?
	Fe	134.820	3745.4	38.4	36.4	0.37	
	Ni	115.360	30.3	62.0	49.2	9.17	
4	Zn	99.805	12.3	76.8	75.4	25.52	←
5	Mg	107.520	1201.0	17.4	6.6	0.47	
	Al	90.598	2720.7	22.4	10.8	0.43	
7	Mn	146.397	42.7	28.6	30.6	5.12	
8	Ti	191.484	107.3	11.2	11.8	1.89	
		159.457	5358.7	30.8	24.2	0.31	

ZAF Oxide Acc. Voltage : 20.0 (kV)

ment	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
:O	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	25.199	4.1270	23.397	1.0770	1.0214	1.0548	0.9997
NiO	0.194	0.0306	0.173	1.1227	1.0655	1.0538	0.9999
:.O	0.095	0.0137	0.086	1.0998	1.0652	1.0325	1.0000
MgO	12.323	3.5973	8.106	1.5203	0.9485	1.5971	1.0036
Al2O3	17.450	4.0279	13.845	1.2604	0.9542	1.3209	1.0000
I :O	0.294	0.0488	0.303	0.9728	1.0260	0.9484	0.9997
:.O2	1.235	0.1819	1.251	0.9877	1.0254	1.0125	0.9514
Cr2O3	42.097	6.5180	43.623	0.9650	0.9829	1.0046	0.9773
:tal	98.887	18.5451	90.783	Total O = 24.0		Iteration = 5	

Ca .0000
Fe2 .4329
Fe3 .2348
Ni .0049
Zn .0022
Mg .5819
Al .6515
Mn .0079
Ti .0294
Cr 1.0544

Recalculate wt% FeO 16.34
Fe_2O_3 9.85
New Total: 99.88

Mg# .573
Ti# .032
Fe2# .427
Fe3# .121
Cr# .543

Zn ppm 763
Ni ppm 1524

nown Specimen
oup : Laflamme Sample : TAKLAII
JNK No. : 46 Comment : 83J11-6
tage : X= 62.6495 Y= 78.2995 Z= 10.6540
ted on Jan 5 11:56 1994
S only No. of accumulation : 1

r.(A) : 2.010E-08

ment	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
Ca	107.737	-0.8	31.8	23.4	100.00 ?
Fe	134.820	3819.4	38.6	33.4	0.37
Ni	115.360	11.8	60.8	57.8	23.57
Zn	99.805	17.8	95.0	84.2	19.14
Mg	107.520	800.5	12.0	5.8	0.57
Al	90.598	1686.3	24.0	13.2	0.55
Mn	146.397	67.8	31.4	30.0	3.47
Ti	191.484	21.1	10.6	12.2	6.64
[illegible]	159.457	6763.5	30.6	24.2	0.27

AF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
[illegible]	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	25.772	4.4124	23.859	1.0802	1.0128	1.0667	0.9998
NiO	0.075	0.0124	0.067	1.1212	1.0562	1.0617	0.9998
Zn[illegible]	0.137	0.0207	0.125	1.0948	1.0554	1.0373	1.0000
Mg[illegible]	8.664	2.6440	5.402	1.6037	0.9414	1.6960	1.0045
Al2O3	10.948	2.6418	8.581	1.2758	0.9470	1.3472	1.0000
Mn[illegible]	0.463	0.0803	0.481	0.9629	1.0175	0.9465	0.9998
[illegible]2	0.235	0.0362	0.245	0.9572	1.0172	1.0106	0.9311
Cr2O3	52.700	8.5301	55.059	0.9571	0.9748	1.0020	0.9799
Total	98.994	18.3779	93.820	Total O = 24.0		Iteration = 5	

Recalculate wt% FeO 19.89
Fe_2O_3 6.53
New Total: 99.65

Unknown Specimen
Group : Laflamme Sample : TAKLAII
UNK No. : 47 Comment : 83J11-7
Stage : X= 63.3640 Y= 78.1330 Z= 10.6540
Dated on Jan 5 12:01 1994
WDS only No. of accumulation : 1

Curr.(A) : 2.010E-08

Element	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1 Ca	107.737	0.9	28.8	23.0	208.75 ?
2 Fe	134.820	2932.9	43.0	33.2	0.42
3 Ni	115.360	5.6	64.0	58.6	49.88 ?
4 Zn	99.805	26.4	82.4	75.8	12.29
5 Mg	107.520	1063.5	12.8	5.4	0.50
6 Al	90.598	2389.5	23.8	11.6	0.46
7 Mn	146.397	56.1	31.2	29.0	4.05
8 Ti	191.484	6.7	13.8	10.6	19.56
9 Cr	159.457	6656.4	24.8	23.2	0.28

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.004	0.0007	0.004	0.9863	0.9708	1.0190	0.9970
FeO	19.906	3.2496	18.321	1.0865	1.0189	1.0665	0.9998
NiO	0.036	0.0056	0.032	1.1210	1.0629	1.0550	0.9997
ZnO	0.203	0.0293	0.185	1.0976	1.0624	1.0331	1.0000
MgO	10.980	3.1950	7.178	1.5297	0.9464	1.6102	1.0039
Al2O3	15.234	3.5050	12.159	1.2528	0.9520	1.3159	1.0000
MnO	0.386	0.0638	0.398	0.9685	1.0235	0.9464	0.9998
TiO2	0.075	0.0110	0.078	0.9660	1.0229	1.0109	0.9342
Cr2O3	52.597	8.1177	54.188	0.9706	0.9805	1.0019	0.9880
Total	99.421	18.1777	92.543	Total O = 24.0		Iteration = 5	

Recalculate Wt% FeO 17.01
Fe_2O_3 3.22
New total: 99.75

mg # .535
Ti # .003
Fe2 # .465
Fe3 # .039
Cr # .671

Zn ppm 1630
Ni ppm 282

Ca .0001
Fe2 .4583
Fe3 .0781
Ni .0009
Zn .0048
mg .5272
Al .5784
Mn .0105
Ti .0018
Cr 1.3397

Diamond Inclusion

known Specimen
roup : Laflamme Sample : TAKLAII
UNK No. : 48 Comment : 83J11-8
tage : X= 64.0560 Y= 77.9985 Z= 10.6540
ated on Jan 5 12:07 1994
WDS only No. of accumulation : 1

rr.(A) : 2.011E-08

	ement	Peak(mm)	Net(cps)	Bg-(cps)	Bg+(cps)	S.D.(%)
1	Ca	107.737	-2.2	33.4	25.0	100.00 ?
	Fe	134.820	2145.2	38.4	33.0	0.49
	Ni	115.360	20.9	66.6	54.2	13.59
4	Zn	99.805	3.3	90.2	79.0	99.68 ?
5	Mg	107.520	1513.7	16.6	10.2	0.42
	Al	90.598	1045.0	24.0	12.4	0.71
	Mn	146.397	38.8	30.0	30.4	5.62
8	Ti	191.484	17.7	12.0	10.2	7.63
	Cr	159.457	7664.9	23.6	23.4	0.26

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF	Z	A	F
CaO	0.000	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
FeO	14.680 ✓	2.4421	13.394	1.0961	1.0177	1.0772	0.9998
NiO	0.134	0.0214	0.119	1.1207	1.0615	1.0558	1.0000
ZnO	0.025	0.0037	0.023	1.0967	1.0610	1.0336	1.0000
MgO	15.633 ✓	4.6354	10.211	1.5310	0.9454	1.6115	1.0050
Al2O3	6.878 ✓	1.6126	5.315	1.2941	0.9510	1.3607	1.0000
MnO	0.266	0.0448	0.275	0.9665	1.0223	0.9456	0.9998
TiO2	0.196 ✓	0.0293	0.207	0.9479	1.0218	1.0086	0.9198
Cr2O3	60.936 ✓	9.5834	62.366	0.9771	0.9794	1.0008	0.9968
Total	98.748	18.3727	91.910	Total O = 24.0		Iteration = 4	

Ca .0000
Fe2 .2366
Fe3 .1621
Ni .0035
Zn .0006
Mg .7569
Al .2633
Mn .0073
Ti .0048
Cr 1.5649

Recalculate Wt% FeO 8.71
Fe_2O_3 6.63
New Total: 99.42

Mg # .762
Ti # .011
Fe2 # .238
Fe3 # .081
Cr # .786 ✓

Zn ppm 200 ✓
Ni ppm 1052 OK

T_{Zn}

Appendix 12.2

Electron Microprobe Results

Loring Laboratories Ltd.

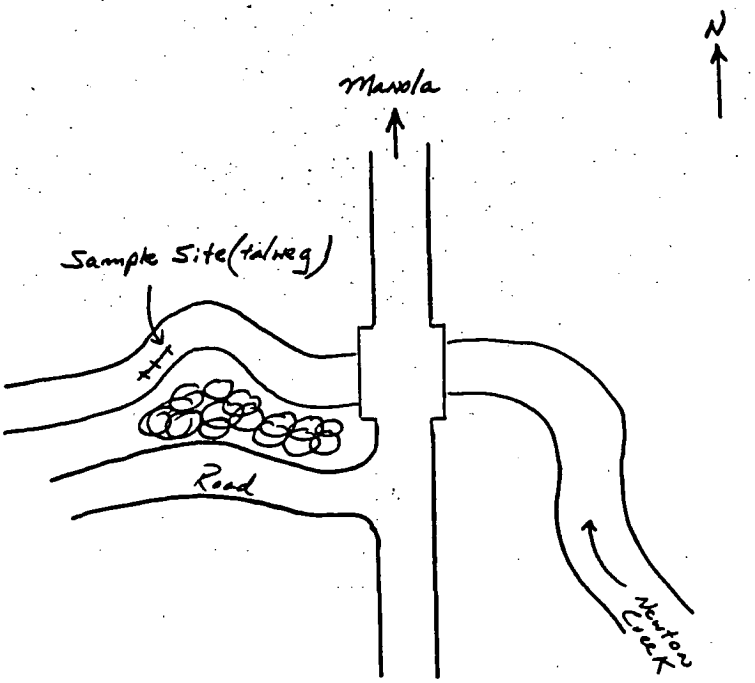
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax 275-0541

File No. : 36302
Client: Takla Star
Microprobe Data

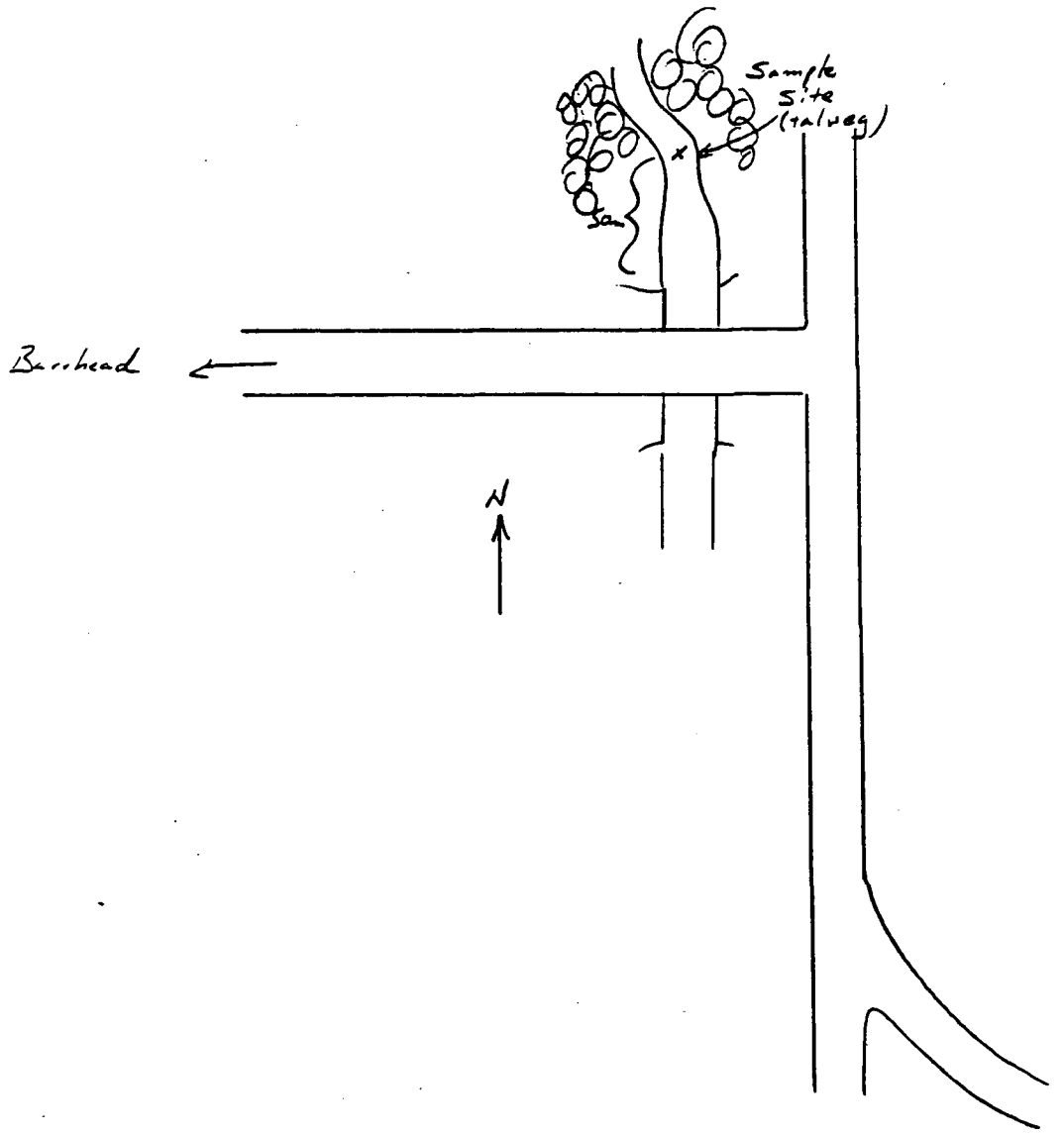
Sample#	Location P#	C#	R#	Data in wt % SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	V2O3	ZnO	NiO	Total	Mineral
83G-03	71	C	2	0.17	0.09	11.94	47.13	36.13	0.45	2.52	-	-	-	-	0.66	0.00	99.09	Chromite
83G-15	67	A	10	0.18	0.25	17.26	45.22	22.06	0.31	10.03	-	-	-	-	0.15	0.16	95.82	Chromite
83G-15	67	B	10	0.04	0.42	26.31	35.40	21.83	0.30	12.76	-	-	-	-	0.19	0.20	97.45	Chromite
83G-23	72	E	5	0.42	2.69	18.71	35.64	28.26	0.19	12.48	-	-	-	-	0.01	0.17	98.57	Chromite
83G-25	72	F	7	0.01	0.10	22.76	42.70	21.32	0.40	11.69	-	-	-	-	0.28	0.07	99.35	Chromite
83G-26	72	H	8	0.07	0.04	22.91	43.49	18.94	0.38	13.07	-	-	-	-	0.00	0.14	99.04	Chromite
83G-26	72	I	8	0.14	0.35	6.44	48.07	37.44	0.58	5.48	-	-	-	-	0.25	0.10	98.85	Chromite
83G-26	72	J	8	0.10	0.02	12.70	53.17	23.77	0.37	8.85	-	-	-	-	0.19	0.03	99.20	Chromite
83G-26	72	A	9	0.06	0.23	8.22	55.71	22.85	0.45	8.74	-	-	-	-	0.07	0.00	96.33	Chromite
83G-26	72	B	9	0.16	1.36	18.67	41.36	24.40	0.25	12.85	-	-	-	-	0.00	0.24	99.29	Chromite
83G-26	72	C	9	0.02	0.39	14.67	43.06	33.68	0.37	5.74	-	-	-	-	0.42	0.04	98.39	Chromite
83G-26	72	D	9	0.12	0.29	7.76	52.53	21.96	0.27	15.22	-	-	-	-	0.05	0.28	98.48	Chromite
83J-03	68	A	7	0.16	0.26	8.50	46.43	37.29	0.52	5.36	-	-	-	-	0.15	0.13	98.79	Chromite

Sample	Map	Map #	Date	Comments
83J-1	83J/1	1	Oct.4	Sampled.
83J-2	83J/1	2	Oct.4	Sampled.
83J-3	83J/1	3	Oct.8	Alternate sample.
83J-4	83J/2	-	Oct.7	Alternate sample.
83J-5	83J/2	5	Oct.5	Sampled.
83J-6	83J/2	6	Oct.5	Alternate sample.
83J-7	83J/2	7	Oct.5	No sample.
83J-8	83J/2	8	Oct.7	Alternate sample.
83J-9	83J/7	9	Oct.6	No sample.
83J-10	83J/8	10	Oct.6	No sample.
83J-11	83J/7	11	Oct.6	Alternate.
83G-1	83G/16	1	Oct.13	No sample.
83G-22	83G/16	2	Oct.14	Sampled.
Site 83G/16-4	83G/16	4	Oct.13	No sample.
83G-3	83G/9	-	Oct.17	Alternate/sampled.
Site 83G/16 - 384 Alternate	83G/9	X	Oct.13	No sample.
83G-4	83G/9	1	Oct.14	Sampled.
83G-36	83G/9	3	Oct.16	Sampled.
83G-29	83G/9	4	Oct.16	Sampled.
83G-2	83G/9	2	Oct.18	Sampled.
83G-26	83G/10	1	Oct.18	Sampled.
83G-17	83G/10	2	Oct.19	Sampled.
83G-25	83G/10	6	Oct.19	Sampled.
83G-7	83G/10	3	Oct.20	Sampled.
83G-8	83G/10	?7	Oct.20	Sampled.
83G-20	83G/10	4	Oct.21	Sampled.
83G-24	83G/10	5	Oct.21	Sampled.
83G-23	83G/10	-	Oct.15	Sampled.
83G-10	83G/15	9	Oct.15	Sampled.
83G-19	83G/15	7	Oct.15	Sampled.
83G-18	83G/15	5	Oct.17	Sampled.
83G-27	83G/15	10	Oct.17	Sampled.
83G-28	83G/15	4	Oct.18	Sampled.
83G-11	83G/15	6	Oct.18	Sampled.
83G-12	83G/15	2	Oct.18	Sampled.
83G-21	83G/15	1	Oct.19	Sampled.
Site 83G/15-3	83G/15	3	Oct.19	No sample.
83G-14	83G/15	7	Oct. 9	Sampled.
83G-15	83G/15	8	Oct. 9	Sampled.
83G-16	83G/11	-	Oct. 9	No sample.
83G-30	83G/9	-	Oct.29	Sampled.
83H-5	83H	5	Oct.21	Sampled.
83H-4	83H	4	Oct.21/25	Sampled.
83H-8	83H	8	Oct.25	Sampled.
83H-7	83H	7	Oct.25	Sampled.
83H-3	83H	3	Oct.26	Alternate site.
83H-2	83H	2	Oct.26	No sample.
83H-6	83H	6	Oct.26	No sample.
83I-1	83I	1	Oct.27	
83I-2	83I	2	Oct.27	
83I-3	83I	3	Oct.28	
83I-4	83I	4	Oct.28	No sample.
83I-5	83I	5	Oct.28	

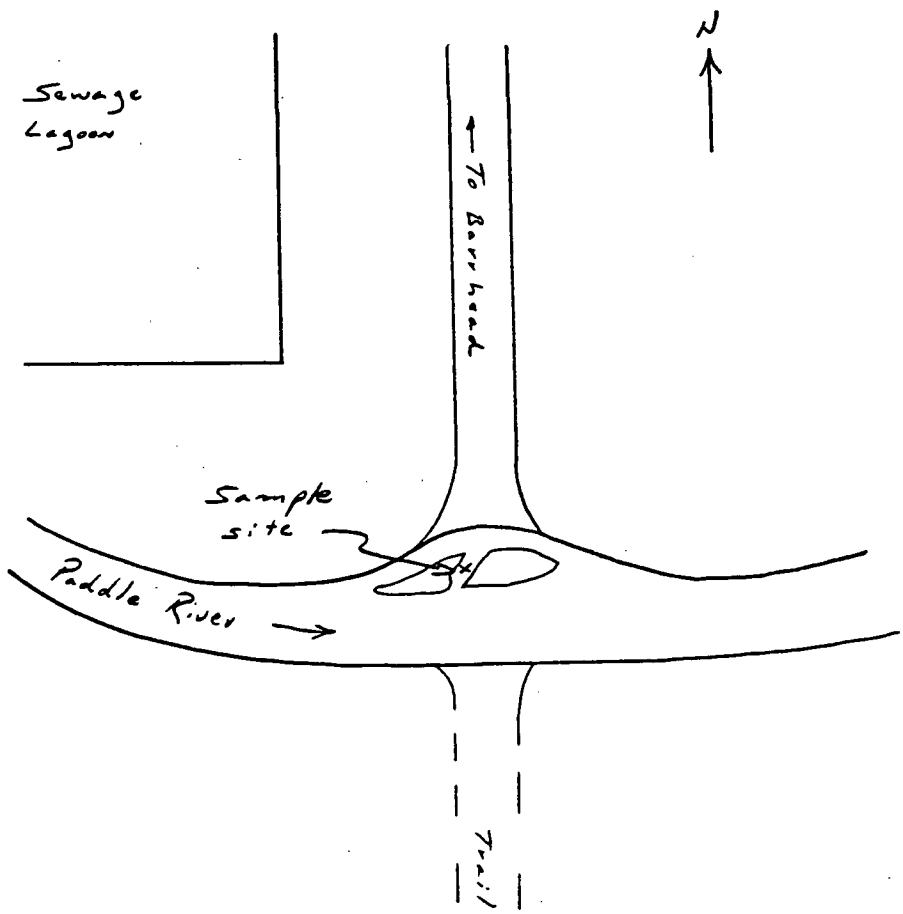
83J-1 The sample was taken on Newton Creek 8 miles south east of Barrhead (83J/1). The sample was taken 50 meters upstream from the bridge on the road north. The sample is a thalweg sample. A local farmer informed us that the creek last flowed 3 years ago. The thalweg consisted of 6 inches of clay overlying gravel.



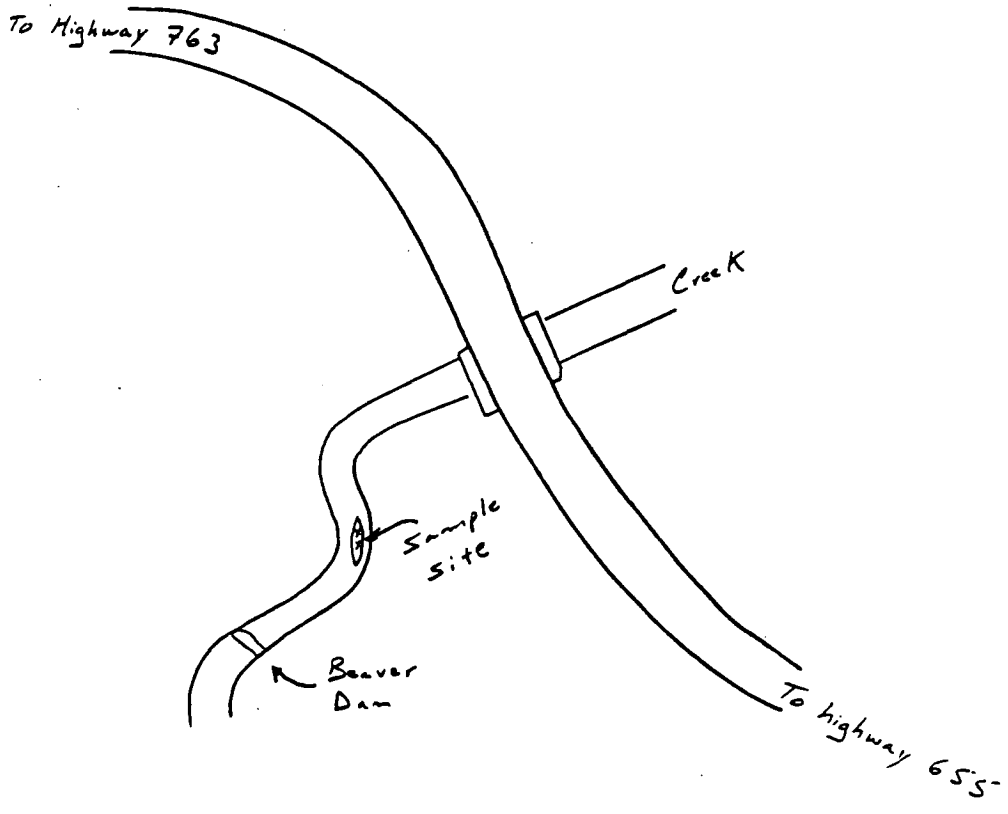
83J-2 The sample site is 3-1/2 miles east of Barrhead on an unnamed creek sourcing Neville Lake. The sample is a thalweg sample from gravel found 6 inches to 1 foot below the uppermost clay layer. The site is 40 m. upstream from the culvert on the road to Barrhead. The creek is incised 20 meters into the plane.



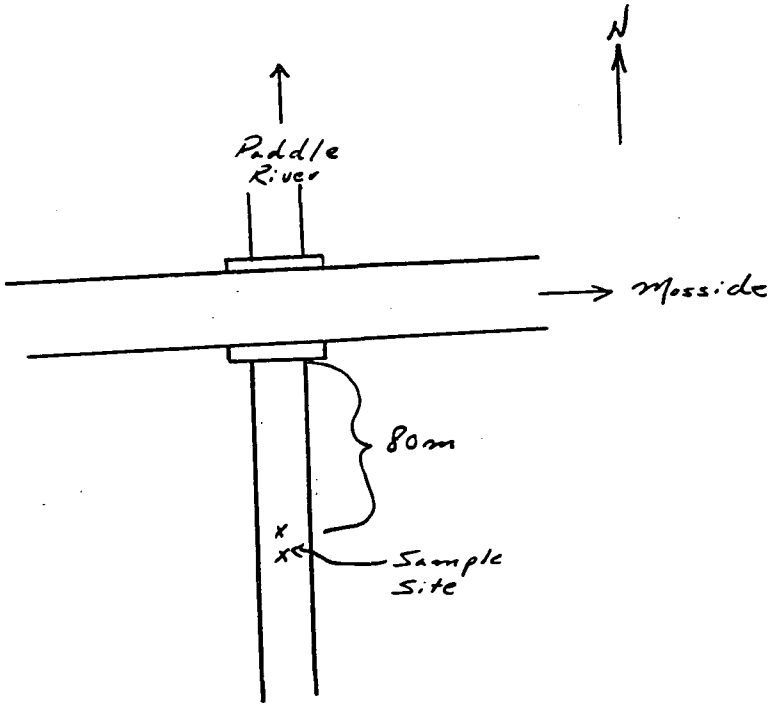
83J-3 The original sample site could not be sampled due to clay and excessive depth of the Paddle River immediately south of Barrhead. The alternate sample site is on the road near the sewage lagoon on the Paddle River. The sample is a thalweg sample from a stretch in the river with fast moving water and prominent boulders in the river.



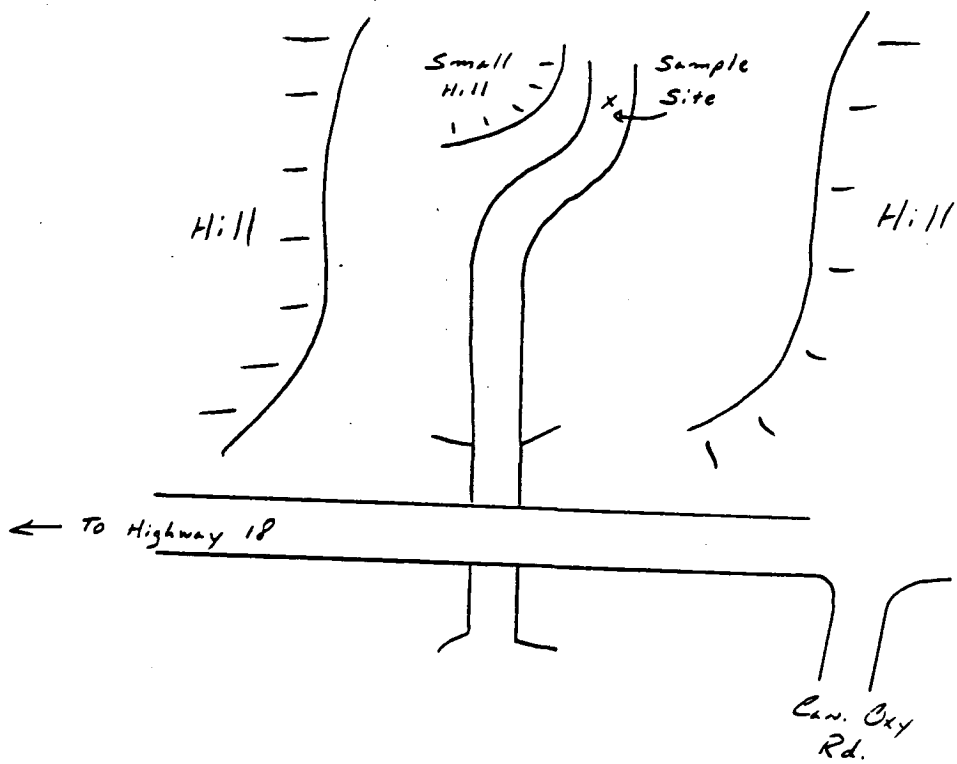
83J-4 The original sample site southeast of Thunder Lake could not be sampled due to a lack of suitable sediment. Further work on the creek found a suitable sediment northeast of Thunder Lake. The new sample site is 2.5 km. west of the junction of Highway 763 and 655 on a road 1 km. north of Highway 655. The sample was derived from a boulder supported brown gravelly clay layer 6 inches below a dark grey clay layer from the middle of the channel.



83J-5 The sample is from the Paddle River 80 meters upstream from the bridge on the east-west road running through the hamlet of Mosside. The sample is a thalweg sample. The river in this area has incised into the plane 20 meters and its thalweg consists predominantly of clayey sand with minor pebbles.

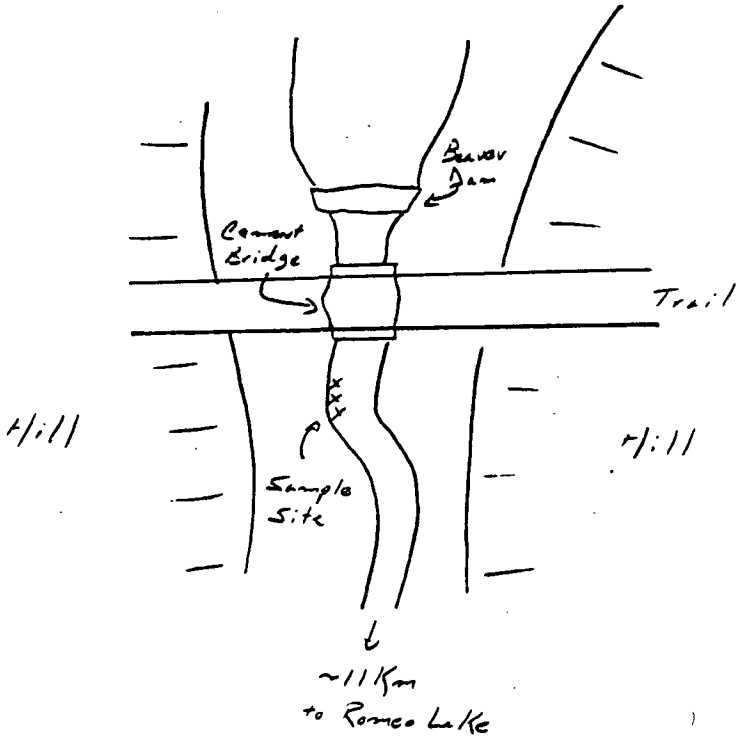


83J-6 The sample is from Romeo Creek 2 km. of Romeo Lake. The sample site is 70 m. north of the culvert on Romeo Creek in the Thalweg consisting of a boulder supported gravel overlain by a matt black clay. The creek has incised into a small valley to depth of 30 to 40 meters.



83J-7 A suitable sample site was not found due to lack of suitable dediment to sample. Locally the consists of a mixture of clay and organic matter in deep channels with some beaver dams.

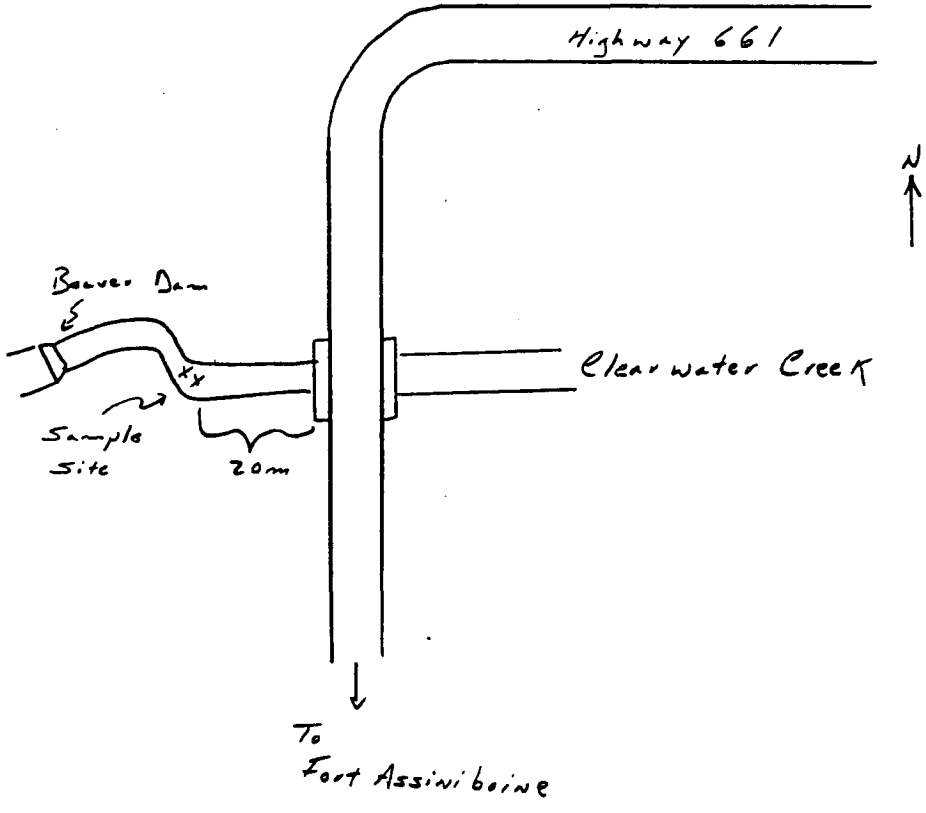
83J-8 The sample is from Romeo Creek 6 km. north west of Romeo Lake. The original sample site contained clay and organic matter. A suitable site with coarse sediment was found by tracing the creek upstream until a suitable sample site was found. The new sample site is a thalweg sample from brown clayey gravels from the creek channel approximately 11 km. upstream from Romeo Lake at a point where the channel has incised 50 m. into the surrounding topography.



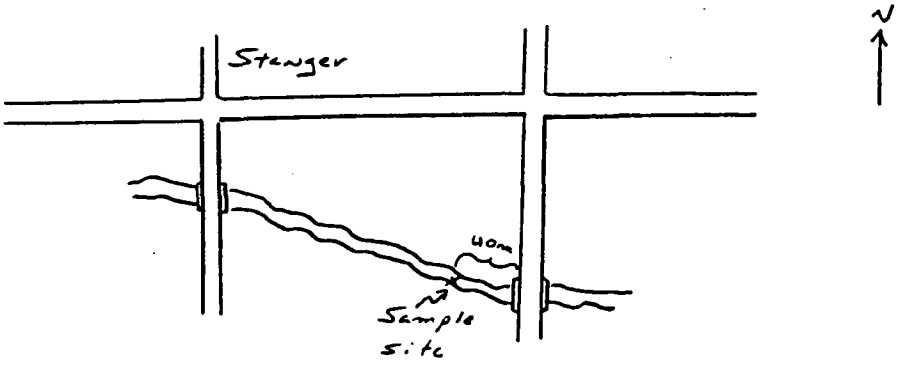
83J-9 A suitable sample site could not be found on Camp Creek west of Shoal Lake. The creek was tested in two places and found to contain dark brown organic clays. A farmer informed us that there were no sands in the creek.

83J-10 The Shoal Creek meanders across a flat plane. It is greater than 4 ft. deep and its bottom consists of clays and organic matter. The creek was tested at 4 places over a stretch of 7 km. and no suitable sample site found.

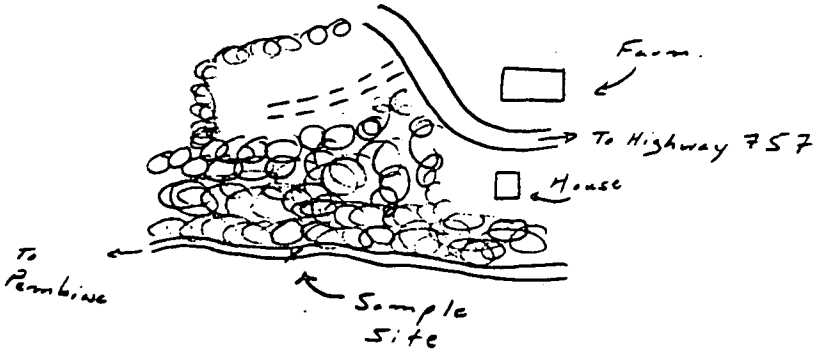
83J-11 The sample area consists of clean brown sands of glacio-delta provenance which have subsequently been reworked into eolian deposits. The original sample site on Doris Creek consisted of clay and silt. An alternate site on Clearwater Creek north of Fort Assiniboine yielded a gravel of predominantly quartzite with minor shield derived rocks. A sample was taken 20 m. upstream from the bridge.



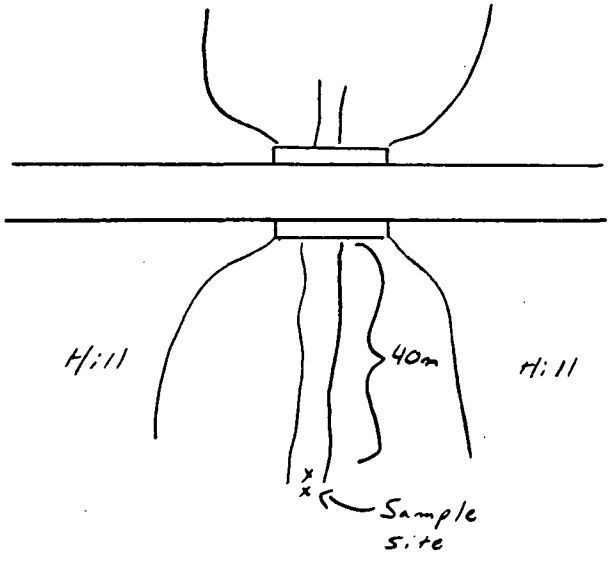
83G-10 The original site was not accessible and an alternate was found 2-1/2 km. upstream on an unnamed creek southeast of the hamlet of Stanger. The sample was derived from a pebble gravel in the channel 40 m. west of the road culvert.



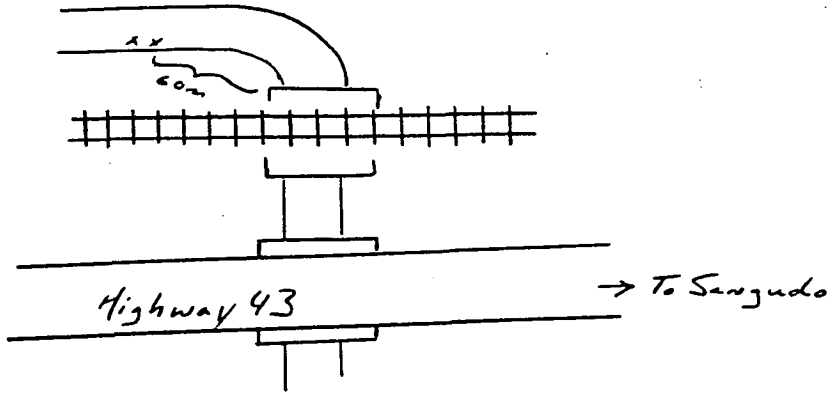
83G-19 The sample is from an unnamed creek 7 km. west of Brock Lake 1 km. upstream from the Pembina River. The sample is derived from gravel in the stream bed.



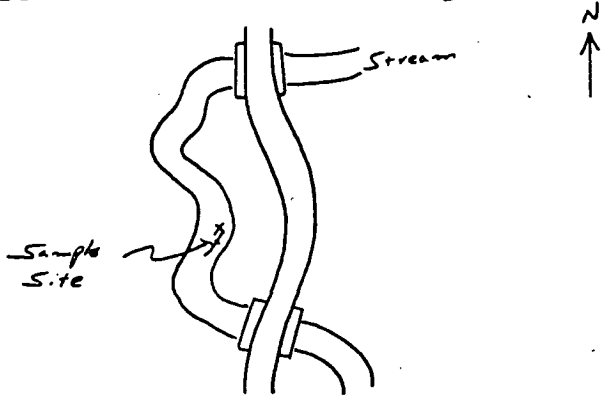
83G-18 The sample site is 40 km. south of Sangudo on a creek with source at Brock Lake. The sample is derived from gravel 40 m. upstream from the higway culvert.



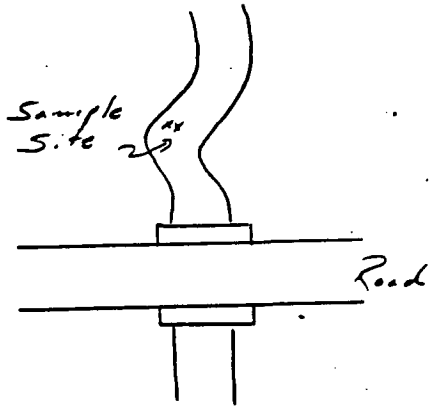
83G-27 The sample site is 2 km. northwest of Cherhill on Highway 43 on the south side of the railroad tracks. The sample is derived from thalweg gravels 100 m. upstream from the tracks.



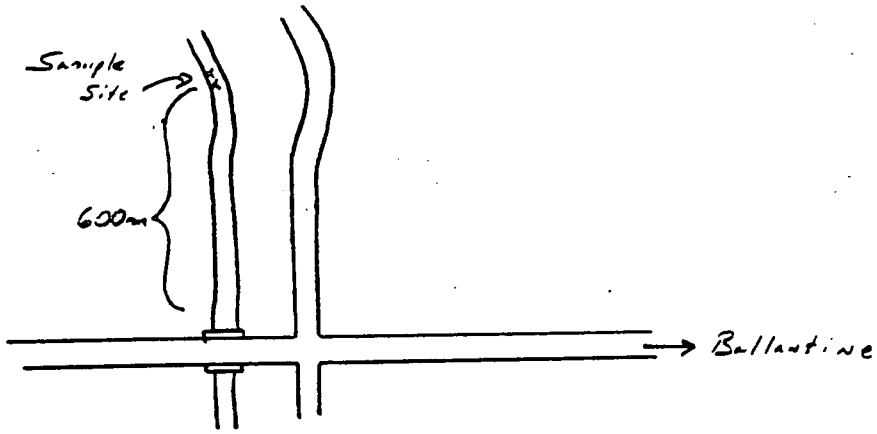
83G-11 The sample is from a gravel in the thalweg of an unnamed stream 10 km. east of Sangudo.



83G-12 The sample site is 2 km. northeast of the hamlet of Pembridge 30 m. downstream from the road culvert on an unnamed creek. The sample is derived from sandy gravel in the creek bed.

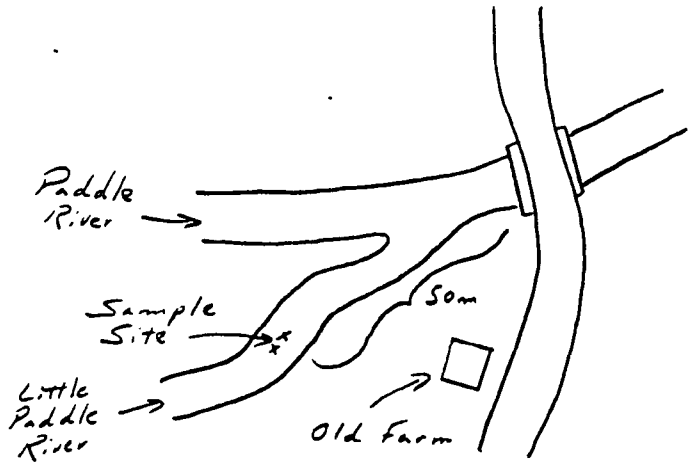


83G-21 The sample site 1 km. north west of the hamlet of Ballantine 1 km. upstream from the Pembina River. The sample is from the thalweg gravel of an incised creek.

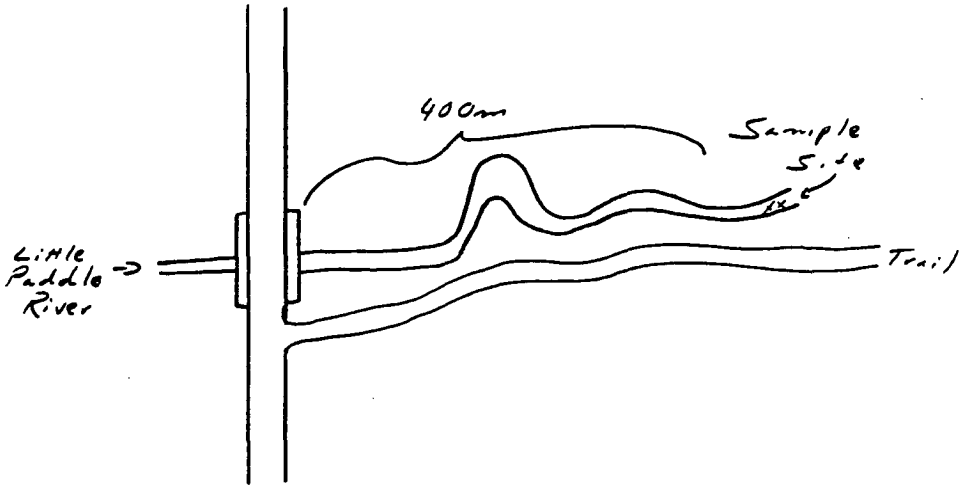


83G/15-3 The creek contained mud and was tested upstream as far as Meadowview.

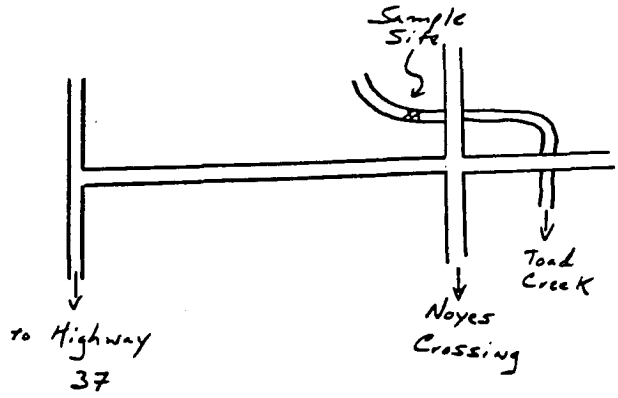
83G-14 The Paddle River 50 m. upstream from the confluence with the Little Paddle River. The thalweg sample is derived from pebbly sand. The sand is the coarsest sample available and is of dubious quality.



83G-15 The sample is from the Little Paddle River which is incised and meanders in the plain. The banks have been stabilized with boulders on bends and the sediment is well sorted. The sample is from pebbly-gritty sands and is of dubious quality.



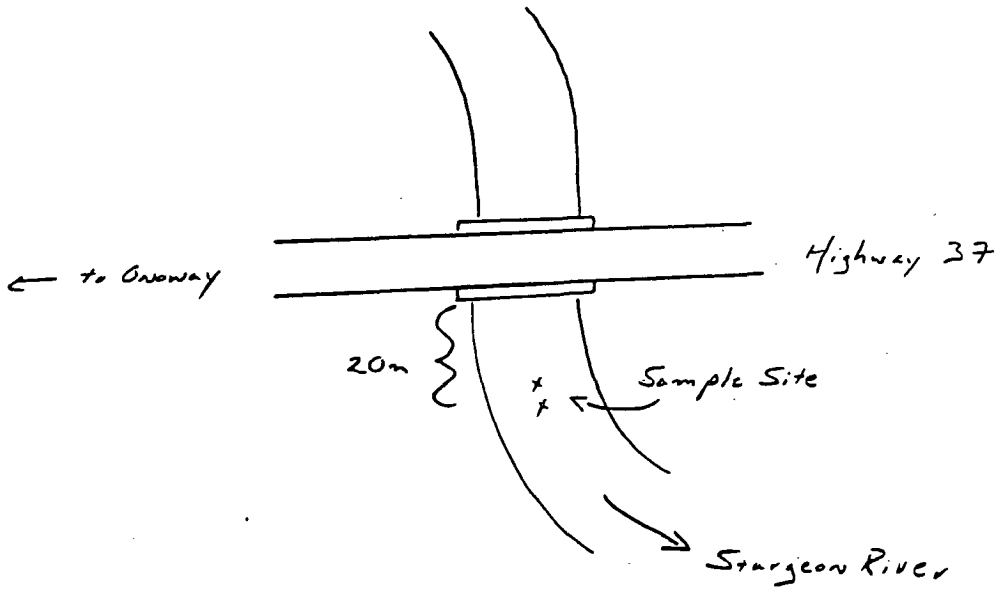
83G-3 An alternate for site 83G/14-3 was found downstream on Toad Creek on map 83G/9. The site is a new road 2 km. north west of Noyes Creek. The sample was derived from pebbly gravel in the creek 30 m. upstream from the bridge.



Site 83G/6 - 3 & 4 alternate

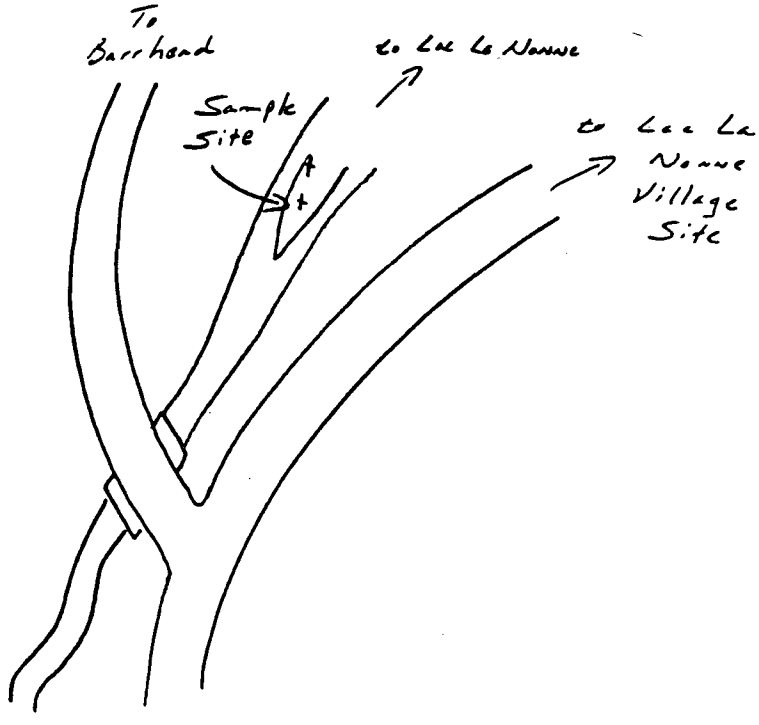
A suitable sample site was not found. The creek was found to contain mud and silt.

83G-4 The Sturgeon River was sampled 20 m. downstream from the Highway 37 bridge. The sample is a thalweg sample from sandy gravel in the middle of the river.



83G-1 No suitable sample site was found. Newton Creek was tested at the designated point and upstream 1 mile and found to contain mud.

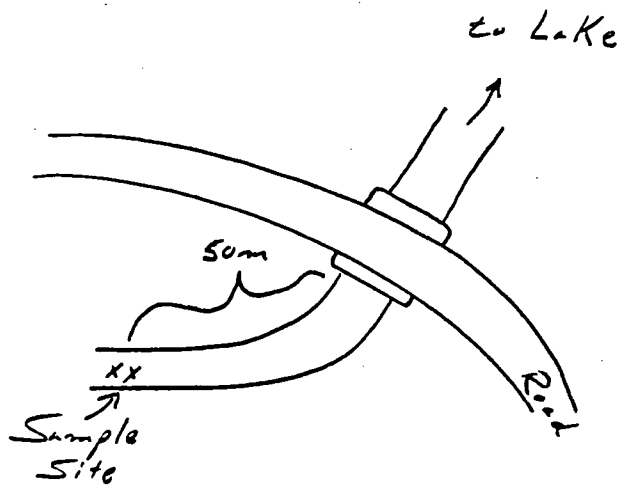
83G-22 A creek draining into Lac la Nonne near the summer svillage of Lac la Nonne. The sample site is 1 km. south east of the village by road near the intersection with the road leading to Highway 33. The sample site is 40 m. downstream from the culvert in the thalweg and derived from sandy gravels.



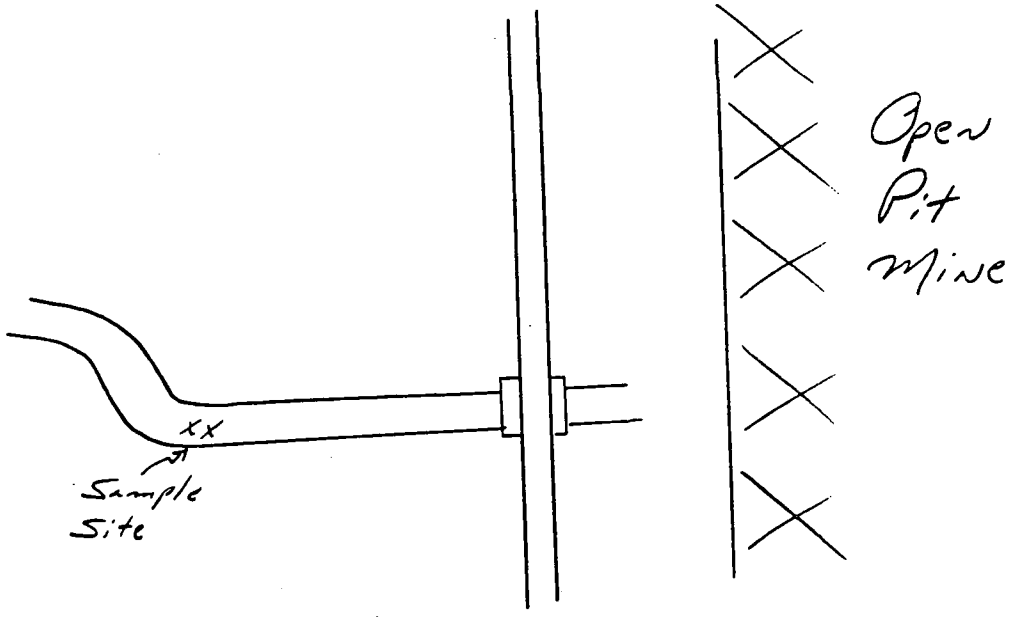
Site 83G/6-4

No suitable sample site was found. The creek was traced upstream and only organicy mud was found.

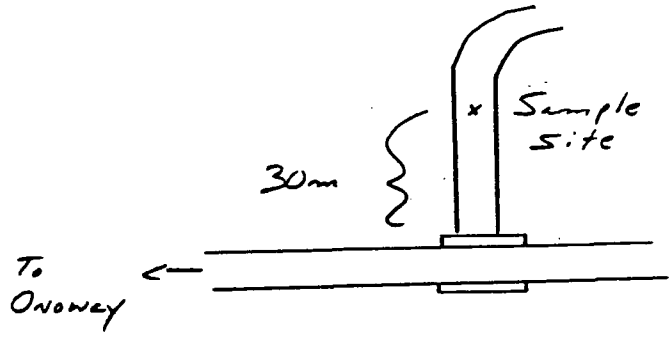
83G-29 An unnamed creek passing through the hamlet of Lac St. Anne was sampled. The sample is from clayey gravel in the thalweg of the creek 50 m. upstream from the small bridge of the road which rings the lake.



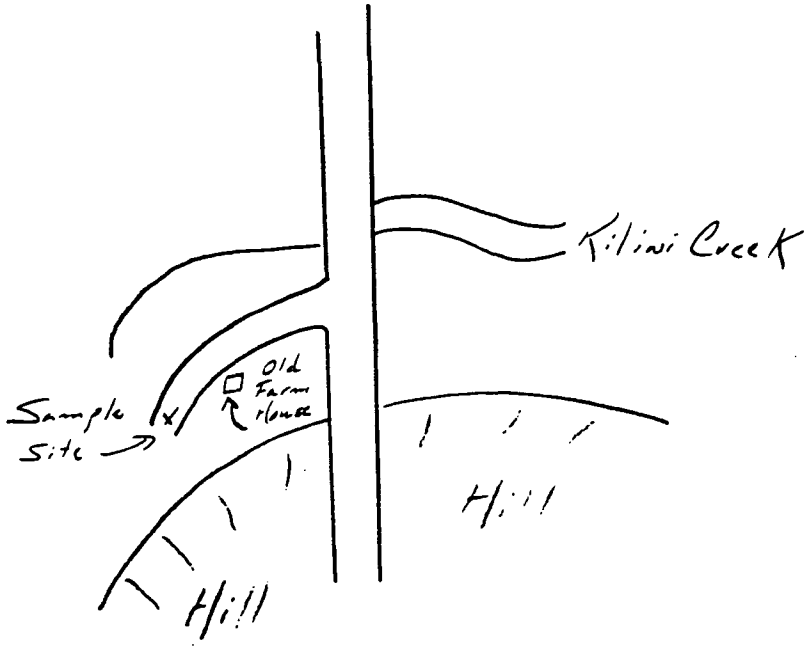
83G-26 A creek directly south of Seba Beach on Highway 759. The sample site is opposite the open pit coal mine and 50 m. upstream from the culvert. The creek was straightened near the road and the sample site was moved back to where the creek curves. The sample is a thalweg derived from sandy gravel. Locally there are sandstones subcropping.



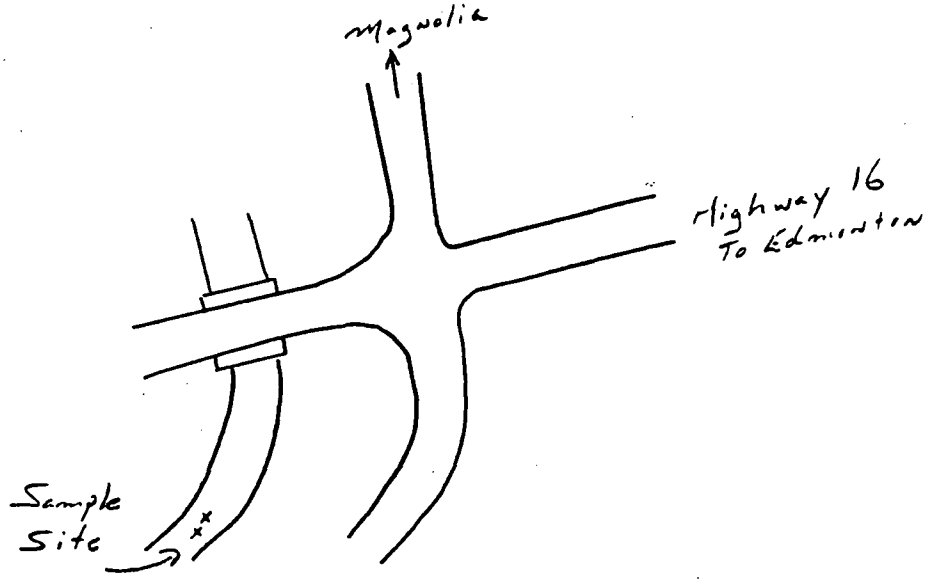
83G-2 Kilini Creek was sampled 2 km. south of Metchayan Creek. The sample was derived from gravel 1 ft. below the surface 30 m. downstream from the road culvert.



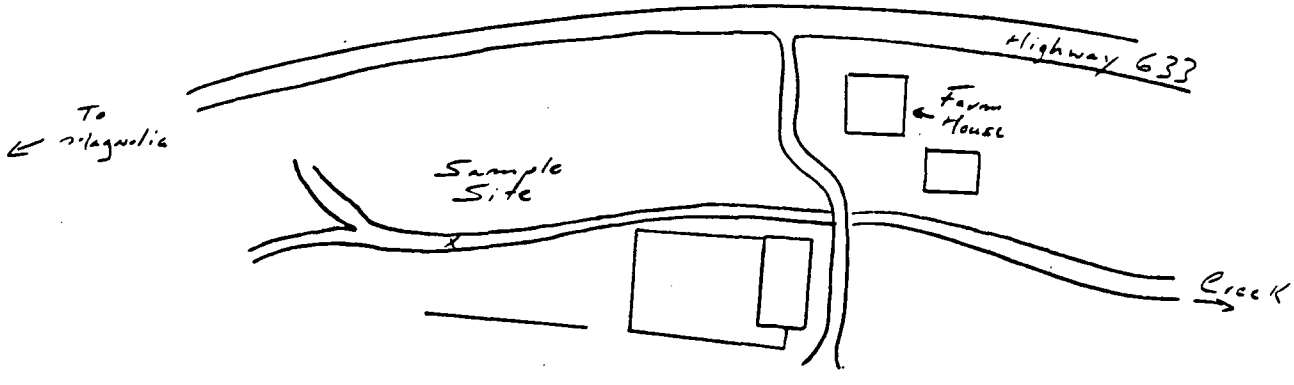
83G-30 Kilini Creek was sampled 5 km. north of Lake Eden and south of the gravel pits to avoid contamination. The sample was derived from sandy gravel in the middle of the stream.



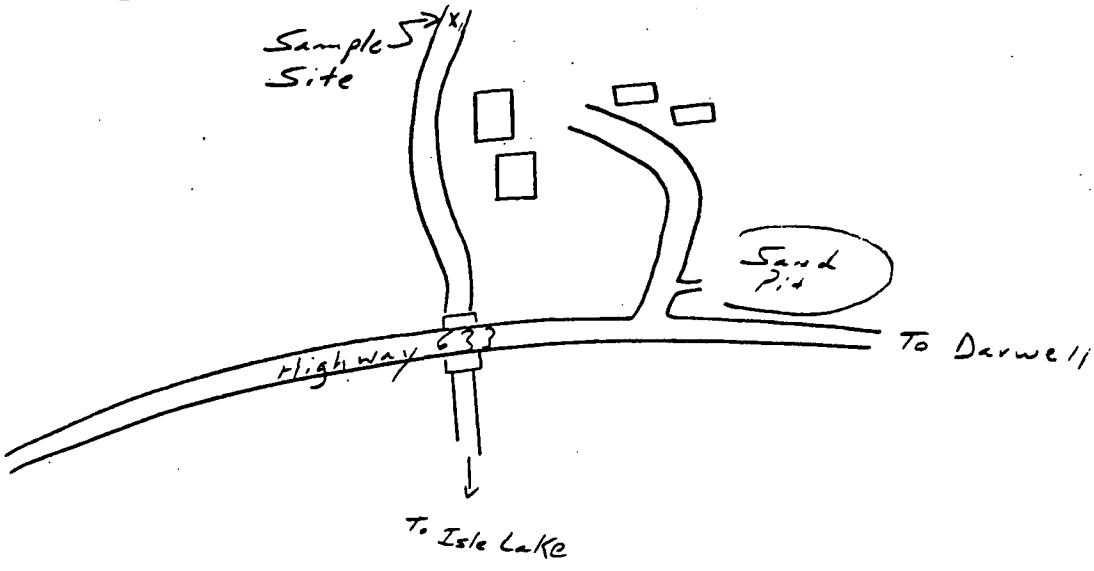
83G-17 An unnamed tributary to Isle Lake was sampled south of the Yellowhead Highway at Magnolia. The thalweg sample is from a clayey gravel 50 m. south of the bridge on the highway and downstream from the beaver dam. The sample contained a large amount of semilithified clay.



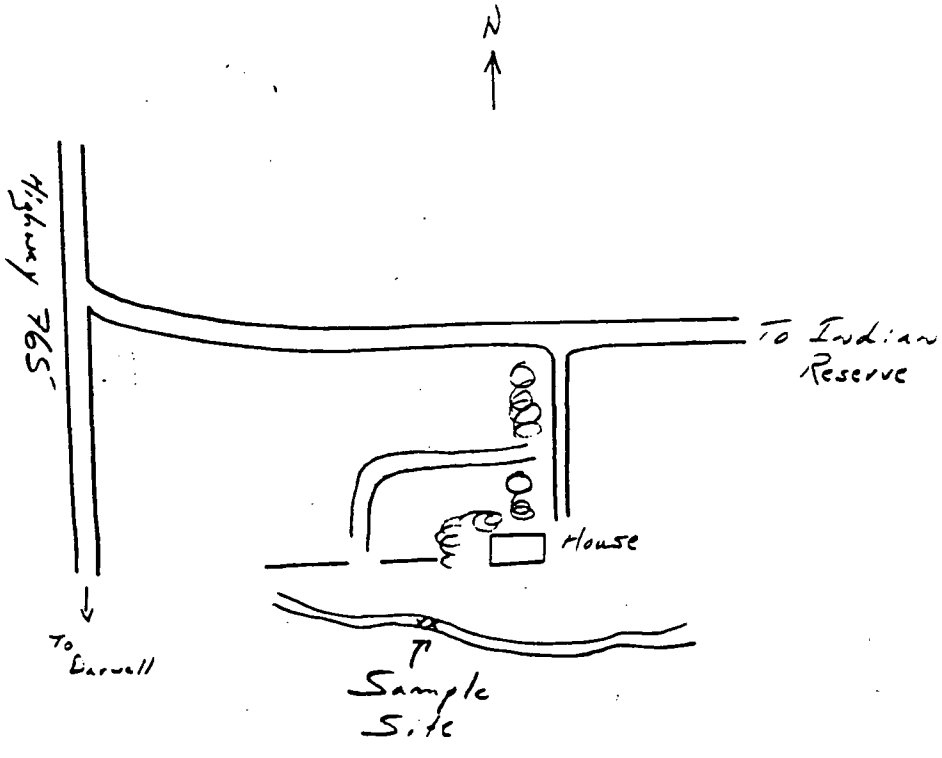
83G-25 An unnamed tributary to Isle Lake is sampled 1 km. east of Magnolia and 100 m. south of Highway 633. Access is through the farm to the creek. The thalweg sample is from gravel in the creek.



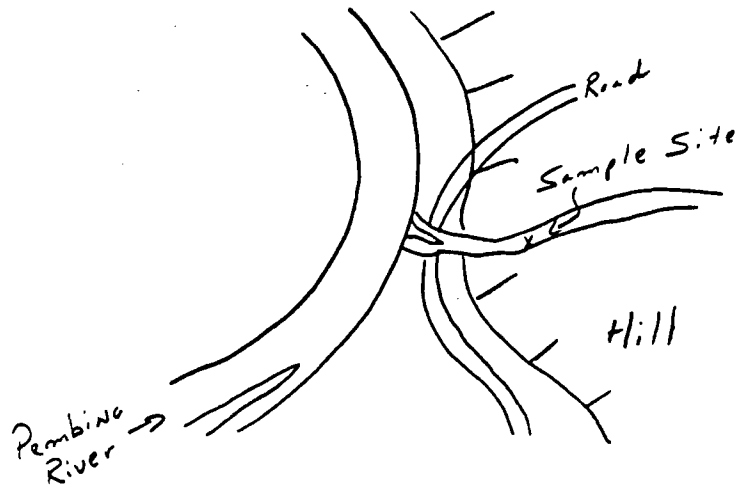
83G-7 Unnamed creek 2 km. west of Darwell on Highway 633. The sample site is from the channel of the creek 300 m. upstream from the highway. The sample was derived from sandy gravel in the creek.



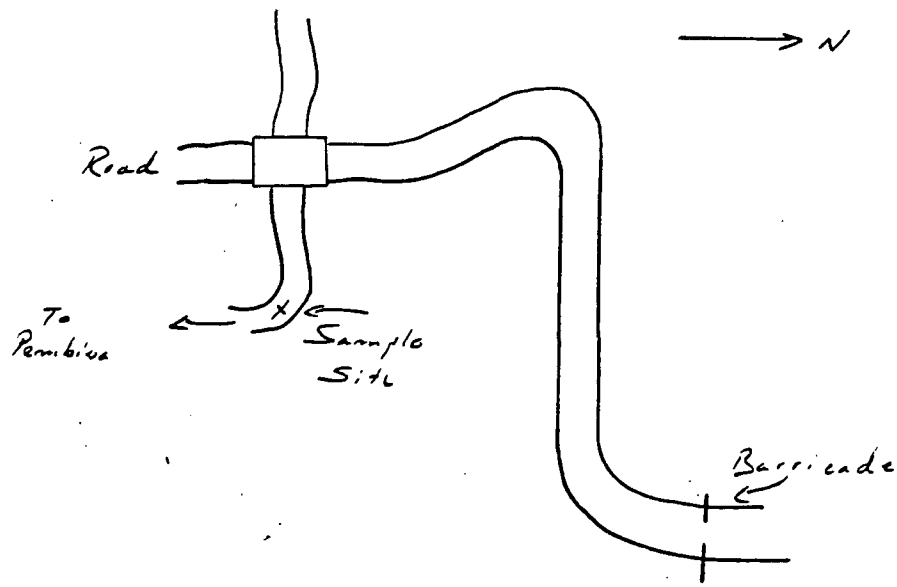
83G-8 The sample is from an unnamed tributary of Lac Ste. Anne and is upstream of the Alexis Reserve. The sample represents the coarsest sediment available derived from a pebbly sand and is of dubious quality. The sample site is 500 m. east of Highway 765 and immediately south of the farm house.



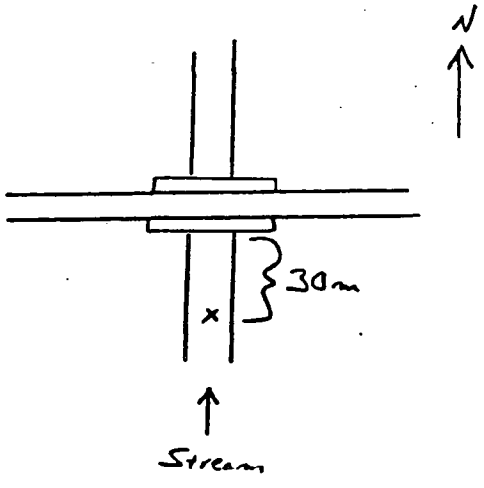
83G-20 The sample site is from a creek crossing Highway 757 12 km. north of Magnolia Bridge. The sample site is 200 m. upstream from the Pembina River. Locally the stream cuts glacial deposits. The sample is from stream gravels.



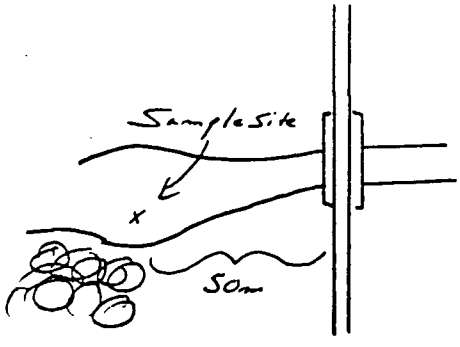
83G-24 The sample is from an unnamed creek 3 km. south east of Rangeton 2 km. upstream from the Pembina River. The road is now closed and there is partial access to the site. The sample is from an incised valley 30 m. downstream from the bridge. The sample is derived from channel pebbly gravel.



83G-23 The sample is from an unnamed creek 3 km. north east of Rangeton. The sample is from thalweg gravel 30 m. upstream from the road culvert.



83G-28 Tributary of Oldman Lake. The sample site consisted of gravelly sands and is of dubious qualily.



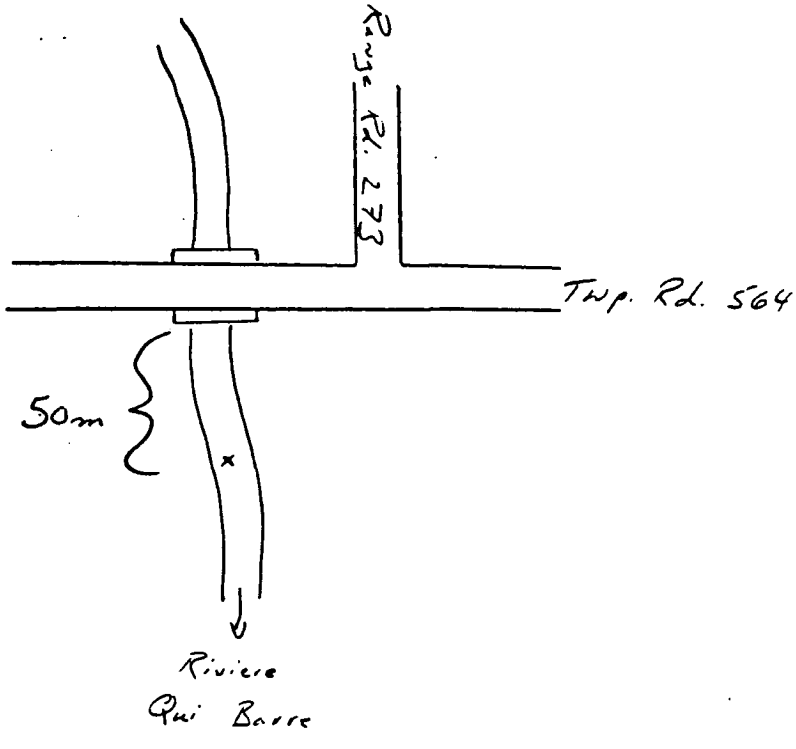
Site 83G/11-16

Unnamed tributary to Lobstick River north of Wildwood. The creek contained mud and is deep.

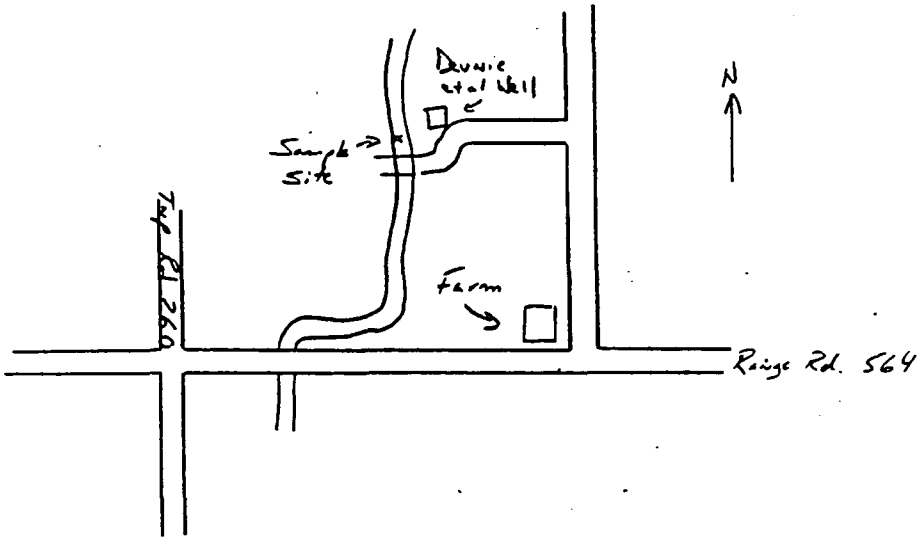
83H-1 No suitable sample site was found. The Riviere Qui Barre was tested from 3 km. north of Highway 651 to 5 km. south of the highway. To the north the river is a continuous bog which grades into a creek carrying mud and silt to the south. Locally there are good outcrops of glacio lacustrine deposits.

83H-2 No suitable sample site was found. The tributary to the Riviere Qui Barre was tested from the Alexander Reserve east to Highway 794 and the creek was found to contain mud.

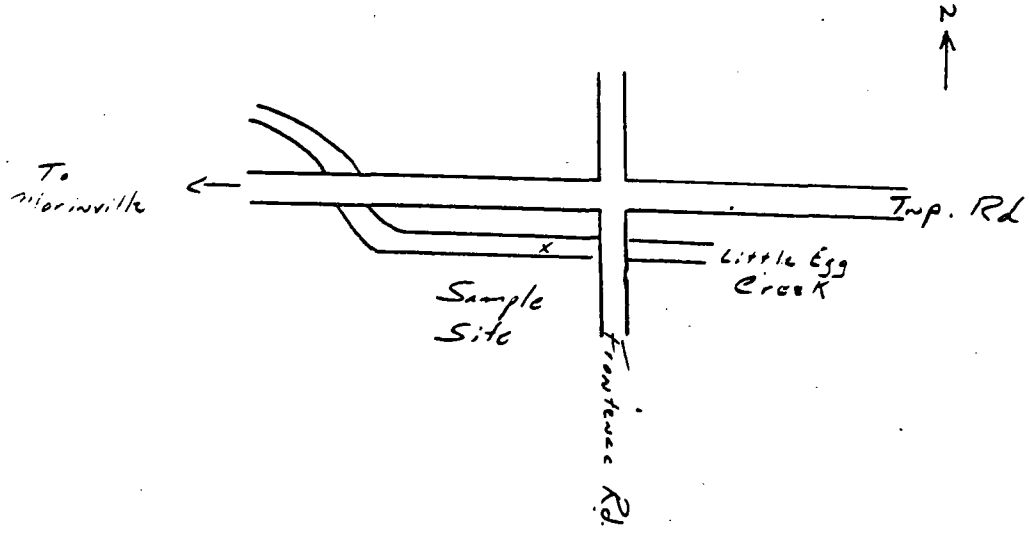
83H-3 The Riviere Qui Barre was tested on the Alexander Reserve and traced northward until a suitable sample site was found north of the reserve near the crossroads of Twp. Rd. 273 and 564. The sample site is 50 m. south of the bridge on Twp. Rd. 564 on the Riviere Qui Barre in a pebbly gravel.



83H-4 The sample was taken on a creek directly south of Manawan Lake. The sample site is north Twp. Rd. 564 on a leading to the lake. The sample was taken from the stream bed and transported to water 1 mile away, over two days, to be washed and sifted. The sample site is a clayey gravel found 6 inches below the surface 10 m. north of a culvert in the stream near a Devnie et al natural gas well.

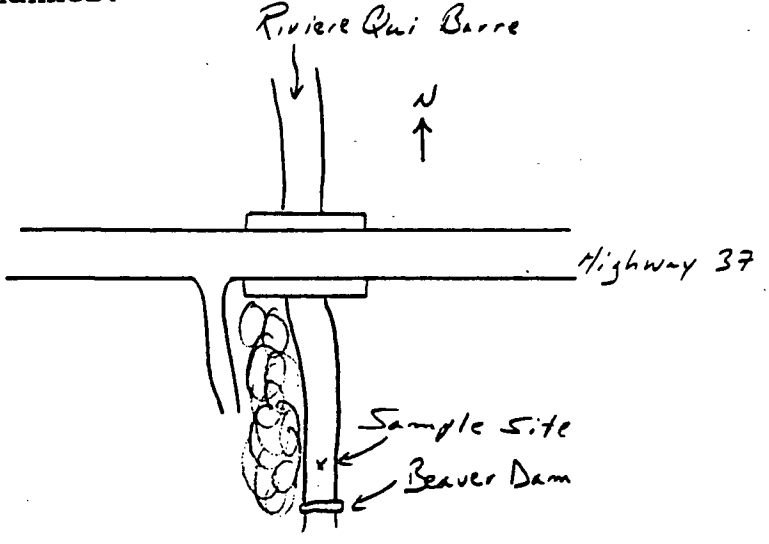


83H-5 The sample site is east of Morinville on Twp. Rd. 642 on Little Egg Creek. The sample was taken 30 m. upstream from the culvert on Frontenac Road from the clayey gravel thalweg.

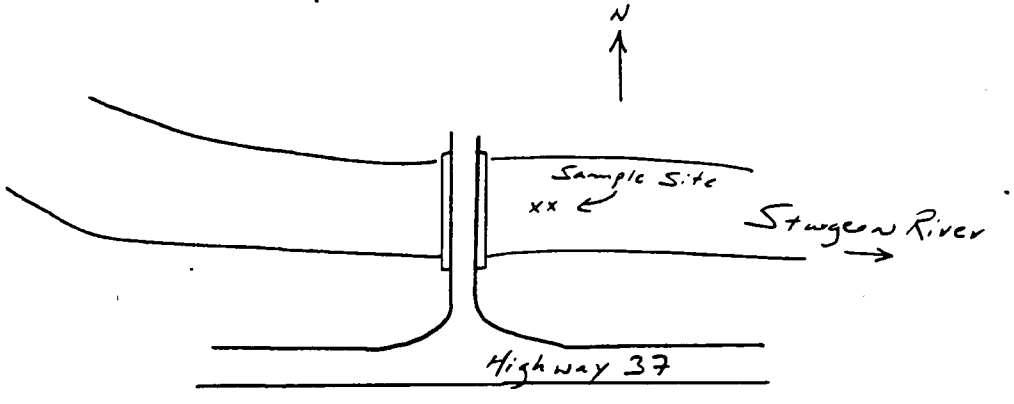


83H-6 No suitable sample site was found. The creek is seasonal and does not have an easily recognizable channel. No sand or gravel was found, only mud.

83H-7 The sample site is 40 m. south of Highway 37 on Riviere Qui Barre. The sample was taken 40 m. downstream from the bridge to avoid road contamination near a beaver dam. The sample is a thalweg sample from clayey gravel found in the channel.



83H-8 The sample site is from the Sturgeon River on Twp. Rd. 273 north of Highway 37 and 20 m. downstream of the bridge. The sample is a thalweg channel from sandy gravel in the middle of the channel.



APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030205

AGGREGATE AREA:

8 942.64 HECTARES

DESCRIPTION OF LOCATION:

4-26-055: 6;18;30
4-27-053: 6;8;18;20S,NW,NEP;30;31
4-27-054: 5EP;6;8W,EP;17EP;18;20W,EP;29W,EP;30;32W,EP
PORTION(S) LYING OUTSIDE SURRENDERED MICHEL INDIAN RESERVE NO. 132.
33NP
PORTION(S) DESIGNATED AS STURGEON RIVER.
34NP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
35NP
PORTION(S) DESIGNATED AS THE SAID RIVER.
36NP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
4-27-055: 2;3SWP
PORTION(S) DESIGNATED AS THE SAID RIVER.
4N,SW,SEP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
5SP
PORTION(S) DESIGNATED AS LAKE NO. 1.
6EF;8;10-12;14;16;18EF;20;22;24;26SP;28SP;29SP;30SEFP
PORTION(S) LYING OUTSIDE ALEXANDER INDIAN RESERVE NO. 134.
36E,WP
PORTION(S) LYING OUTSIDE SURRENDERED ALEXANDER INDIAN RESERVE NO. 134
4-28-053: 12E,WF;24E,WF;36E,WF
4-28-054: 12E,WF;24E,WF;36E,WF
5-01-054: 12;24;25NWP;36
PORTION(S) DESIGNATED AS LAKE NO. 2.

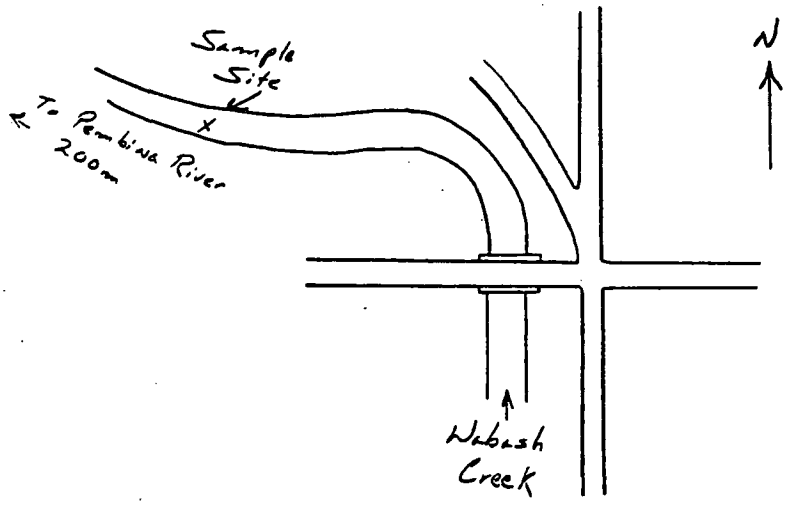
PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

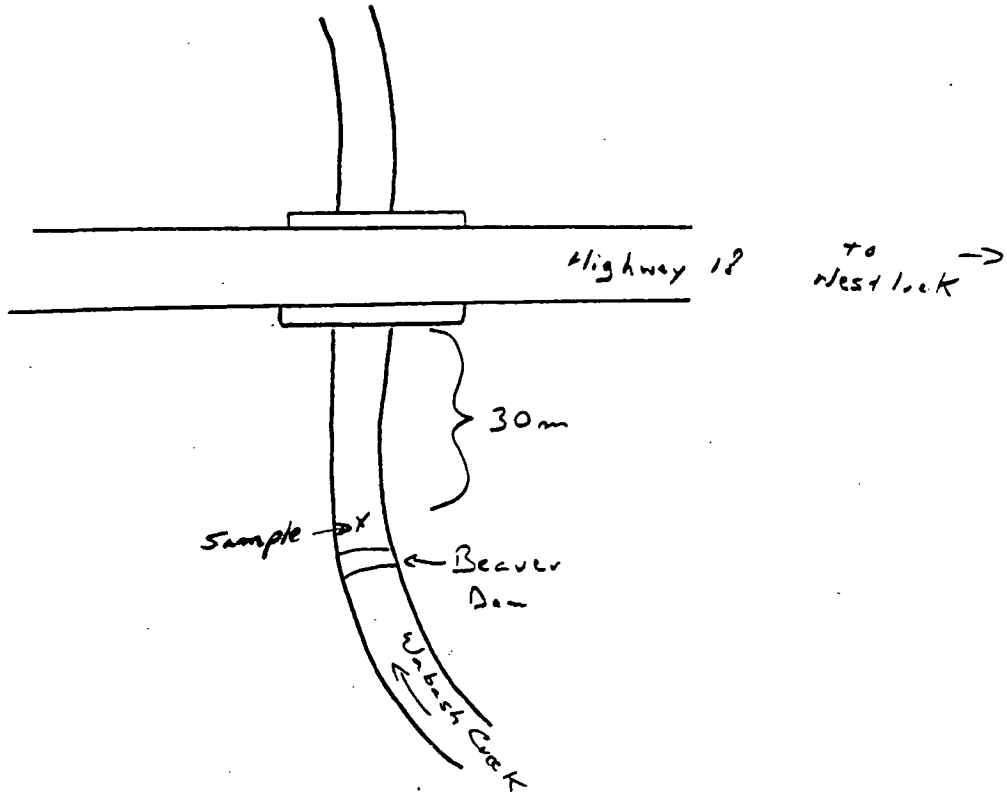
SPECIAL PROVISIONS:

NIL

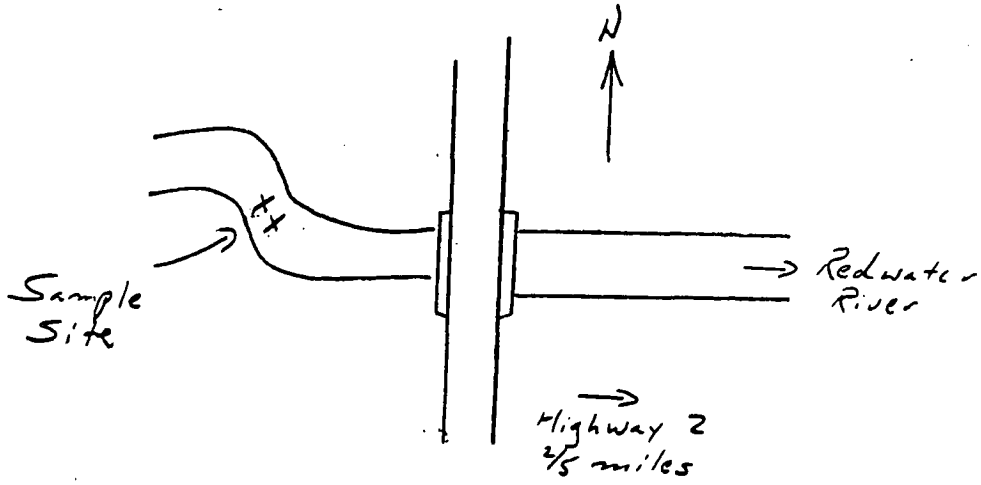
83I-1 The sample is from Wabash Creek 200 m. before it meets the Pembina River. The sample is a thalweg sample from a clayey gravel which is overlain by 4 to 6 inches of clay.



83I-2 The sample site is 30 m. south of Highway 18 and 2 m. below a beaver dam. The sample is a thalweg sample from sandy gravel in the middle of the creek.

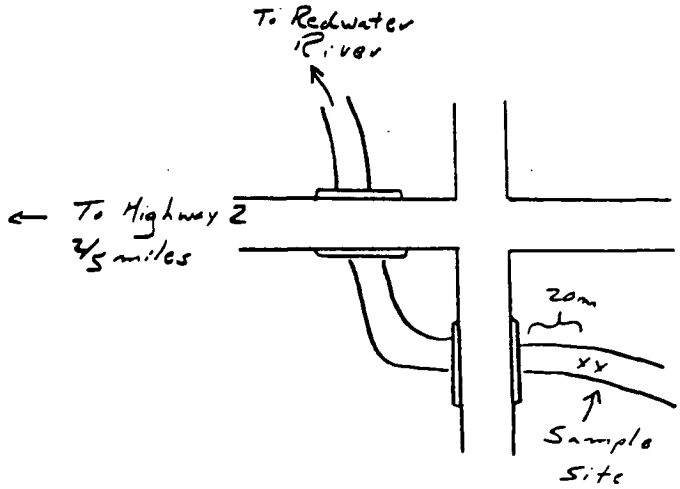


83I-3 The sample is from the Redwater River 2/5 miles west of Highway 2. The sample site is gravels 30 m. upstream from the bridge.



83I-4 No suitable sample site was found. The proposed sample site and another site 400 m. upstream only contained soil, mud and silty clay. The drainage is seasonal and overgrown with vetatation.

83I-5 The sample site is from an unnamed tributary of the Redwater River. The sample is from a gravel layer 1 ft. below the surface and 20 m. upstream from the bridge.



Appendix III

Description of the Locations of Permits

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030203

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

4-27-051: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030204

AGGREGATE AREA:

8 884.28 HECTARES

DESCRIPTION OF LOCATION:

4-27-052: 2;4;5WP
PORTION(S) DESIGNATED AS LAKE NO. 5.
6;8;9NWP
PORTION(S) DESIGNATED AS LAKE NO. 3.
10-12;14;16;17SEP
PORTION(S) DESIGNATED AS LAKE NO. 1 AND THE SAID LAKE NO. 3.
SWP
PORTION(S) DESIGNATED AS THE SAID LAKE NO. 1.
18;20;22;24;26;28-30;32;33L13;34
4-27-053: 2;4;10-12;14;16;22S,NP;24S,NWP
PORTION(S) LYING OUTSIDE SURRENDERED MICHEL INDIAN RESERVE NO. 132.
4-28-051: 1E,WF;12E,WF;13E,WF;24E,WF;25E,WF;36E,WF
4-28-052: 12E,WF;24NE,WF;36E,WF
5-01-051: 12E

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030205

AGGREGATE AREA:

8 942.64 HECTARES

DESCRIPTION OF LOCATION:

4-26-055: 6;18;30
4-27-053: 6;8;18;20S,NW,NEP;30;31
4-27-054: 5EP;6;8W,EP;17EP;18;20W,EP;29W,EP;30;32W,EP
PORTION(S) LYING OUTSIDE SURRENDERED MICHEL INDIAN RESERVE NO. 132.
33NP
PORTION(S) DESIGNATED AS STURGEON RIVER.
34NP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
35NP
PORTION(S) DESIGNATED AS THE SAID RIVER.
36NP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
4-27-055: 2;3SWP
PORTION(S) DESIGNATED AS THE SAID RIVER.
4N,SW,SEP
PORTION(S) LYING OUTSIDE THE SAID RESERVE.
5SP
PORTION(S) DESIGNATED AS LAKE NO. 1.
6EF;8;10-12;14;16;18EF;20;22;24;26SP;28SP;29SP;30SEFP
PORTION(S) LYING OUTSIDE ALEXANDER INDIAN RESERVE NO. 134.
36E,WP
PORTION(S) LYING OUTSIDE SURRENDERED ALEXANDER INDIAN RESERVE NO. 134
4-28-053: 12E,WF;24E,WF;36E,WF
4-28-054: 12E,WF;24E,WF;36E,WF
5-01-054: 12;24;25NWP;36
PORTION(S) DESIGNATED AS LAKE NO. 2.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030206

AGGREGATE AREA:

8 853.58 HECTARES

DESCRIPTION OF LOCATION:

4-25-055: 2;4SE,NW,L16;6N,SE,L3,L4;8;10N;11;12;14;16SW,NE,L2,L7,L8N;
18;20;22;24S,L9,L10S,L10NE,L15E,L16;26;28-30;32;33NE,SEP
PORTION(S) DESCRIBED IN CERTIFICATE OF TITLE NO. 72-X-186 AS SHOWN ON RAILWAY PLANS 5773 A.Y. AND 9201 S.
NWP;36
PORTION(S) DESCRIBED IN CERTIFICATE OF TITLE NOS. 12-W-186 AND 181-Q-186 AS SHOWN ON SUBDIVISION PLAN 8779 S.
4-26-054: 1NP,SEP,L5P;2SP,NW;3SEP
PORTION(S) SHOWN AS A SURVEYED ROADWAY.
4S,NW;6E,WP;7WP;8;10N;11;12E,L5N,L6N;14N;16;17L4;18E,WP
PORTION(S) LYING OUTSIDE SURRENDERED MICHEL INDIAN RESERVE NO. 132.
19WP
PORTION(S) SHOWN AS A SURVEYED ROADWAY LYING OUTSIDE AND ADJOINING THE SAID RESERVE AND THE MOST SOUTHERLY 10.0584 METRES.
SEP
PORTION(S) BEING THE MOST SOUTHERLY 10.0584 METRES.
20NEP,L1S,L3,L4
PORTION(S) LYING OUTSIDE BLOCK A AS SHOWN ON SUBDIVISION PLAN 5643 N.Y.
22;24SP;26N,SW,SEP;28;29N,SE,L3,L4
PORTION(S) LYING OUTSIDE THE HUDSON'S BAY COMPANY RESERVE.
30NE,SEP
PORTION(S) BEING THE MOST NORTHERLY 503.832 METRES.
31SWP
PORTION(S) DESIGNATED AS STURGEON RIVER AND A SURVEYED ROADWAY LYING OUTSIDE AND ADJOINING THE SAID RESERVE EXCEPTING THAT PORTION OF THE SAID RIVER LYING TO THE EAST OF THE EAST BOUNDARY OF THE SAID SURVEYED ROADWAY.
NWP
PORTION(S) DESIGNATED AS THE SAID RIVER.
32SE,L9,L16;34N,SW;36N
4-26-055: 2;11;12;14

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030207

AGGREGATE AREA:

8 983.2 HECTARES

DESCRIPTION OF LOCATION:

4-25-056: 6;18;30
4-26-055: 4;8;10;16;20;22;24;26;28;29;32;34;36
4-26-056: 2;4;6;8;10-12;14;16;18;20;22;24;26;28-30;32;33SEP;34
PORTION(S) DESIGNATED AS LAKE NO. 1.
35L8E,L8SWSE,L8SWNE,L8NWSE,L8NWNE

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030207

AGGREGATE AREA:

8 983.2 HECTARES

DESCRIPTION OF LOCATION:

4-25-056: 6;18;30
4-26-055: 4;8;10;16;20;22;24;26;28;29;32;34;36
4-26-056: 2;4;6;8;10-12;14;16;18;20;22;24;26;28-30;32;33SEP;34
PORTION(S) DESIGNATED AS LAKE NO. 1.
36L8E,L8SWSE,L8SWNE,L8NWSE,L8NWNE

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

Replacement

BM

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030208

AGGREGATE AREA:

8 837.38 HECTARES

DESCRIPTION OF LOCATION:

4-25-056: 8;11;12;13N,SEP
PORTION(S) DESIGNATED AS LAKE NO. 1.
14;16;20;22;24;26;28;29;32;33NWP,L4P;34;36
4-25-057: 2;4;5S,NW,NEP;6;7SE,SWP,NEP,L11P;8;10-12;14;16;17SWP
PORTION(S) DESIGNATED AS MANAWAN LAKE.
18;20;22;24;25L3;26L1-L5,L12,L13;28-30;32;34

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030209

AGGREGATE AREA:

9 120.44 HECTARES

DESCRIPTION OF LOCATION:

4-26-057: 2;3L4;4;6;8;10-12;14;16;18;20;22;24;26;28-30;32;34;36
4-27-056: 32N,SP;34N,SP;36N,SE,SWP
PORTION(S) LYING OUTSIDE SURRENDERED ALEXANDER INDIAN RESERVE NO. 134.
4-27-057: 2;4;6EF;8;10-12;14;16;18EF;20;22;24;26

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030210

AGGREGATE AREA:

8 826.48 HECTARES

DESCRIPTION OF LOCATION:

4-27-057: 32;34;36
4-27-058: 1-5;6EF;7EF;8-12;14-17;18EF;19EF;20-23;25-29;30EF;31EF; 32-36
4-27-059: 4;5EF

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030211

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

4-24-058: 2;4;6;8;10-16;18;20;22-24;26-34;36
4-25-058: 2;10-12;14;22;24;26;34;36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030212

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

4-25-058: 4;6;8;16;18;20;28-30;32
4-25-059: 2;4;10;11
4-26-058: 2;4;5SW;6;8;10-12;14;16;18;20;22;24;26;28-30;32;34;36
4-27-058: 13N,SW;24

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030213

AGGREGATE AREA:

9 124.56 HECTARES

DESCRIPTION OF LOCATION:

4-26-059: 4;6;8;10;16;18;20;22;28-30;32
4-26-060: 6SW
4-27-059: 1-3;8EF;9-16;17EF;20EF;21-28;29EF;32EF;33-36
4-27-060: 1SE

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030214

AGGREGATE AREA:

9 162.4 HECTARES

DESCRIPTION OF LOCATION:

4-25-059: 6;8;18;30
4-26-059: 2;11;12;14;24;26;34;36
4-26-060: 2;4;6N,SE;8;10-14;16;18-20;22;24;26-32;34;35SWP
PORTION(S) DESIGNATED AS LAKE NO. 1.
35NWP;36
PORTION(S) DESIGNATED AS LAKE NO. 2.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030215

AGGREGATE AREA:

9 212.2 HECTARES

DESCRIPTION OF LOCATION:

4-27-060: 1N,SW;2-4;5EF;8EF;9-16;17EF;20EF;21-28;29EF;32EF;33-36
4-27-061: 1-4;9-16

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030216

AGGREGATE AREA:

9 144.88 HECTARES

DESCRIPTION OF LOCATION:

5-01-051: 2;4;6;8;10;11;12W;14;16;18;20;22;24;26;28-30;32;33L4P;
34;36
PORTION(S) DESIGNATED AS LAKE NO. 2.
5-01-052: 2;4;6;8
5-02-051: 2;4;5SP;6;7SEP,NWP,L6P,L10P;8;10-12
PORTION(S) DESIGNATED AS NORTH SASKATCHEWAN RIVER.
14;16;18S,NE,NWP
PORTION(S) LYING TO THE EAST OF THE RIGHT BANK OF THE SAID RIVER.
19SWP,NEP,L7P,L11P;20;22S,NW
PORTION(S) DESIGNATED AS THE SAID RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030217

AGGREGATE AREA:

9 176.35 HECTARES

DESCRIPTION OF LOCATION:

5-02-051: 22NE;24;26;28;29;30N,SP;31;32;34;36
PORTION(S) LYING TO THE NORTH OF THE RIGHT BANK OF THE NORTH SASKATCHEWAN RIVER.
5-02-052: 1SWP
PORTION(S) DESIGNATED AS LAKE NO. 7.
NWP
PORTION(S) DESIGNATED AS LAKE NO. 2 AND THE SAID LAKE NO. 7.
2;4;5NWP;6
PORTION(S) DESIGNATED AS JACKFISH LAKE.
7SP,NWP,L10P
PORTION(S) DESIGNATED AS MAYATAN LAKE.
8;9WP,L15P
PORTION(S) DESIGNATED AS THE SAID JACKFISH LAKE.
10-12;13SEP
PORTION(S) DESIGNATED AS LAKE NO. 15 AND LAKE NO. 16.
SWP
PORTION(S) DESIGNATED AS HASSE LAKE AND THE SAID LAKE NO. 15.
NWP
PORTION(S) DESIGNATED AS THE SAID HASSE LAKE AND THE SAID LAKE NO. 16.
NEP
PORTION(S) DESIGNATED AS THE SAID LAKE NO. 16.
14W,SEP,L9P
PORTION(S) LYING OUTSIDE THE HASSE LAKE PROVINCIAL PARK.
15SEP
PORTION(S) DESIGNATED AS LAKE NO. 3 AND LAKE NO. 4.
NEP
PORTION(S) DESIGNATED AS THE SAID LAKE NO. 4.
16;17SEP
PORTION(S) DESIGNATED AS THE SAID JACKFISH LAKE.
18;20S;22;23NEP
PORTION(S) DESIGNATED AS LAKE NO. 5.

CONTINUED...

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030218

AGGREGATE AREA:

9 205.48 HECTARES

DESCRIPTION OF LOCATION:

5-01-052: 10-12;14;16;18;20;22;24;25NP
PORTION(S) DESCRIBED IN CERTIFICATE OF TITLE NO. 197-U-194 AND
PORTION OF BLOCK A AS SHOWN ON SUBDIVISION PLAN 4180 R.
26;27L4;28-30;32;34;36
5-01-053: 2;4;8;10-12;13SWP
PORTION(S) SHOWN AS LAKE.
14;16;20;22;24;25SE;26;27L13P
PORTION(S) DESIGNATED AS CHICHAKO LAKE.
28;29;32;33WP
PORTION(S) DESIGNATED AS ROY LAKE.
SEP,L9P
PORTION(S) DESIGNATED AS THE SAID CHICHAKO LAKE.
L16P;34;36
PORTION(S) DESIGNATED AS MERE LAKE.
5-01-054: 2;4

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030219

AGGREGATE AREA:

8 677.4 HECTARES

DESCRIPTION OF LOCATION:

5-01-053: 6;18;19SP,NWP;30S,NE
PORTION(S) DESIGNATED AS LAKE A.
5-01-054: 6S,NE
5-02-052: 19NEP
PORTION(S) DESIGNATED AS LAKE NO. 20.
20N;24;25SWP
PORTION(S) DESIGNATED AS LAKE NO. 5.
26;27WP
PORTION(S) DESIGNATED AS LAKE NO. 10.
SEP
PORTION(S) DESIGNATED AS LAKE NO. 12.
28-30;31NP,SWP
PORTION(S) DESIGNATED AS JOHNNYS LAKE.
32;33SEP
PORTION(S) DESIGNATED AS LAKE NO. 10.
34;35NWP;36
PORTION(S) DESIGNATED AS LAKE NO. 13.
5-02-053: 1NWP,L5P
PORTION(S) DESIGNATED AS LAKE NO. 1.
2;3SEP,L3P
PORTION(S) DESIGNATED AS LAKE NO. 2.
4;6;8;10-12;13NEP
PORTION(S) DESIGNATED AS LAKE NO. 3.
14;16;20;22;24;26;28;29;32;34;36
5-02-054: 2SW,L13-L16;10;11SW;12

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030220

AGGREGATE AREA:

9 026.07 HECTARES

DESCRIPTION OF LOCATION:

5-02-053: 18;30
5-02-054: 4;6;8
5-03-053: 14;16;18;20;22;23NWP,L15P;24;25L5P,L12P;26;27EP;28-30;32;
34;35L2P,L4P;36
PORTION(S) DESIGNATED AS MUSKEG LAKE.
5-03-054: 2;4;6;8;10-12;14;15NWP
PORTION(S) DESIGNATED AS LAC STE ANNE AND LOT 19 OF THE LAC ST. ANNE SETTLEMENT.
NEP
PORTION(S) DESIGNATED AS THE SAID LOT 19 OF THE SAID SETTLEMENT.
16E,WP
PORTION(S) LYING OUTSIDE LOT 18 OF THE SAID SETTLEMENT.
17EP
PORTION(S) LYING OUTSIDE LOTS 16 AND 17 OF THE SAID SETTLEMENT.
18;21N,SE,SWP;22S,NW,NEP
PORTION(S) DESIGNATED AS THE SAID LAC STE ANNE.
24S,NE,NWP
PORTION(S) LYING OUTSIDE THE HUDSON'S BAY COMPANY RESERVE.
26SP,NE
PORTION(S) LYING OUTSIDE THE SAID RESERVE AND LOT 20 OF THE SAID SETTLEMENT.
NWP
PORTION(S) LYING OUTSIDE THE SAID LOT 20 OF THE SAID SETTLEMENT.
27W,EP;28;33;34
PORTION(S) DESIGNATED AS THE SAID LAC STE ANNE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030221

AGGREGATE AREA:

9 187.55 HECTARES

DESCRIPTION OF LOCATION:

5-05-054: 2;3NWP,L5P;4;5S,NE,NWP;6;7SEP,L3P;8;9S,NP;10-12;14;16;18
5-06-053: 2;4;6;8;10-12;14;16W;18;20;21NP;22;23NP,SWP;24;25WP,L15P;
26;27SP;28-30
PORTION(S) DESIGNATED AS ISLE LAKE.
31SWP
PORTION(S) DESIGNATED AS ROUND LAKE.
32;33L14P,L15P
PORTION(S) DESIGNATED AS DUSSAULT LAKE.
34;35EP;36
5-06-054: 1SEP,L3P;2;4;6
PORTION(S) DESIGNATED AS THE SAID ISLE LAKE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030222

DATE OF AMENDMENT: 1993 August 26

AGGREGATE AREA:

5 466.56 HECTARES

DESCRIPTION OF LOCATION:

5-05-054: 20;22;28-30;31SWP,L12P
PORTION(S) DESIGNATED AS ARNAULT LAKE.
32;33EP;34
PORTION(S) DESIGNATED AS LILY LAKE.
5-05-055: 4;6;7EP
PORTION(S) DESIGNATED AS LITTLE ISLAND LAKE.
WP
PORTION(S) DESIGNATED AS THE SAID LITTLE ISLAND LAKE AND SCOTT LAKE.
8;10;16;17SWP
PORTION(S) DESIGNATED AS THE SAID LITTLE ISLAND LAKE.
18;20;22;27SP,NWP,NE;28-30;32;34
PORTION(S) DESIGNATED AS LESSARD LAKE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

B. Hudson

FOR: MINISTER OF ENERGY

NDA

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030223

DATE OF AMENDMENT: 1993 August 26

AGGREGATE AREA:

8 012.42 HECTARES

DESCRIPTION OF LOCATION:

5-03-054: 19SEP
PORTION(S) OF LOTS 12 AND 13 OF THE LAC ST. ANNE SETTLEMENT.
NEP
PORTION(S) OF THE SAID LOTS 12 AND 13 AND A SURVEYED ROADWAY OF THE SAID SETTLEMENT.
L14P
PORTION(S) SHOWN AS THE SAID SURVEYED ROADWAY.
20EP,W;29
PORTION(S) LYING OUTSIDE LOT 16 OF THE SAID SETTLEMENT.
30SEP
PORTION(S) DESIGNATED AS LAC STE. ANNE AND LYING OUTSIDE LOT 11 OF TH SAID SETTLEMENT.
SWP
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE AND THE SAID SURVEYED ROADWAY OF THE SAID SETTLEMENT.
NWP,NE;31;32
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE.
5-04-054: 2;3NWP;4;5NEP;6;8;9SP
PORTION(S) DESIGNATED AS LAKE NO. 1.
10-12;14;16-18;19S,NWP,NE
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE.
20;22;24;25EP
PORTION(S) LYING TO THE EAST OF LOT 3 OF THE SAID STETTLEMENT.
WP
PORTION(S) LYING TO THE WEST OF LOT 2 OF THE SAID SETTLEMENT.

CONTINUED...

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030223

DESCRIPTION OF LOCATION:

26;28S,NWP,NE;29SP,NP;30SP,NP;31SEP;32SP,NP;33SP,NP;34;
35WP;36N,SEP
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE.
SWP
PORTION(S) LYING OUTSIDE THE SAID LOT 2 OF THE SAID SETTLEMENT.
5-04-055: 1;2S,NWP,NE;3S,NP;4SE,SWP,NEP,L11P;11SEP,L3P;12NP,SE,SWP
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

B. Hudson

FOR: MINISTER OF ENERGY

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030224

AGGREGATE AREA:

9 162.51 HECTARES

DESCRIPTION OF LOCATION:

5-01-054: 8;10;11;14;16;18;20;22;26;28-30;32S,NEP;33WP;34
PORTION(S) DESIGNATED AS MATCHAYAW LAKE.
5-01-055: 1SWP
PORTION(S) DESIGNATED AS LAKE NO. 6.
2;4;5SEP
PORTION(S) DESIGNATED AS THE SAID MATCHAYAW LAKE.
6;8;10-12;13NWP
PORTION(S) DESIGNATED AS SANDY LAKE.
L8P,L9P
PORTION(S) DESIGNATED AS LAKE NO. 3
L15P
PORTION(S) DESIGNATED AS THE SAID SANDY LAKE.
14-18;19S,NE;20-24;26-28;29S;30SE

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030225

AGGREGATE AREA:

9 165.72 HECTARES

DESCRIPTION OF LOCATION:

5-02-054: 14;16;18;20;22;24;26;27SW;28-30;32;33SW;34;36
5-02-055: 2;4;6;8;10-12;14;15WP
PORTION(S) DESIGNATED AS LAKE NO. 1.
16;18;20;22;24;26;27WP,L2P
PORTION(S) DESIGNATED AS TOAD LAKE.
28-30;32-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030226

AGGREGATE AREA:

9 109.316 HECTARES

DESCRIPTION OF LOCATION:

5-03-054: 35WP,SE
PORTION(S) DESIGNATED AS LAC STE ANNE.
NEP
PORTION(S) DESIGNATED AS STURGEON RIVER.
36
5-03-055: 2;3S,NW,NEP
PORTION(S) DESIGNATED AS THE SAID LAC STE ANNE.
4-6;7S,NE,NWP;8-12;14;16;17;18E,WP;19E,WP;20-29;30E,WP;
31-35
5-04-055: 25NP;35;36
PORTION(S) LYING OUTSIDE ALEXIS INDIAN RESERVE NO. 133.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030226

DATE OF AMENDMENT: August 26, 1993

AGGREGATE AREA:

6 205.09 HECTARES

DESCRIPTION OF LOCATION:

5-03-054: 35WP,SE
PORTION(S) DESIGNATED AS LAC STE. ANNE.
NEP
PORTION(S) DESIGNATED AS STURGEON RIVER AND THE SAID LAC STE. ANNE AND PORTION(S) DESCRIBED IN CERTIFICATE OF TITLE NOS. 57 M. 20, 156 C. 24 AND 157 C. 20.
36
5-03-055: 2;3S,NW,NEP;4-6;7SP,NWP;8SP;9-12;14;16;21-28;33-35
PORTION(S) DESIGNATED AS THE SAID LAC STE. ANNE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

D. Hudson

FOR: MINISTER OF ENERGY

124

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030227

AGGREGATE AREA:

8 960 HECTARES

DESCRIPTION OF LOCATION:

5-06-054: 34;36
5-06-055: 2;4-12;14-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030228

AGGREGATE AREA:

9 119.6 HECTARES

DESCRIPTION OF LOCATION:

5-06-054: 8;10-12;14;15SEP,L3P
PORTION(S) DESIGNATED AS DUHAMEL LAKE.
16;18;19NWP
PORTION(S) DESIGNATED AS PEMBINA RIVER.
20;22;24;25NEP
PORTION(S) DESIGNATED AS ARNAULT LAKE.
26;28-30;31WP;32
5-07-054: 10NE,SWP,L7P;11;12N,L4N,L5;13NP;14-17;20-24;25N;26-29;
32-36
PORTION(S) DESIGNATED AS THE SAID RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030229

AGGREGATE AREA:

9 216 HECTARES

TRACT ONE

DESCRIPTION OF LOCATION:

5-07-055: 1-18;22-27;34-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

TRACT TWO

DESCRIPTION OF LOCATION:

5-07-055: 19-21;28-33

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030230

AGGREGATE AREA:

9 150.58 HECTARES

DESCRIPTION OF LOCATION:

5-01-055: 29N;30N,SW;31-35
5-01-056: 2-11;14-16;17SW,SEP,L9,L10SE,L16S,L16NE
PORTION(S) DESIGNATED AS DECHENE LAKE AND LAKE NO. 5.
18;19;20L12-L14;21-23;26-35;36N,SP
PORTION(S) LYING OUTSIDE SURRENDERED ALEXANDER INDIAN RESERVE NO. 134.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030231

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-02-055: 31
5-02-056: 1-4;5S,NW;6;8NE;9-36
5-03-055: 36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030232

DATE OF AMENDMENT: August 26, 1993

AGGREGATE AREA:

8 698 HECTARES

DESCRIPTION OF LOCATION:

5-03-056: 1-4;7-27;28S,NW,NEP;29-36
PORTION(S) LYING OUTSIDE THE BUGNET PLANTATION HISTORICAL SITE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

B. Hudson

FOR: MINISTER OF ENERGY

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030233

DATE OF AMENDMENT: August 26, 1993

AGGREGATE AREA:

7 680 HECTARES

DESCRIPTION OF LOCATION:

5-04-056: 7-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

B. Hudson

FOR: MINISTER OF ENERGY

BM

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030234

DATE OF AMENDMENT: August 26, 1993

AGGREGATE AREA:

8 704 HECTARES

DESCRIPTION OF LOCATION:

5-05-056: 3-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

B. Hudson

FOR: MINISTER OF ENERGY

BM

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030235

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-06-056: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030236

AGGREGATE AREA:

8 640 HECTARES

DESCRIPTION OF LOCATION:

5-07-056: 1-4;5N;6N;7;8N,SW;9-13;14N,SW;15-18;19S,NW;20-29;30N;
31-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030237

AGGREGATE AREA:

9 074.56 HECTARES

DESCRIPTION OF LOCATION:

4-27-057: 28;29;30EF
5-01-057: 2;3SWP
PORTION(S) DESIGNATED AS LAKE NO. 3.
4;5L1P
PORTION(S) SHOWN AS LAKE.
6-18;19S,NW,L9,L10,L15;20-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030238

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-057: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030239

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-058: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030240

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-059: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030241

AGGREGATE AREA:

6 093.75 HECTARES

DESCRIPTION OF LOCATION:

5-02-057: 2;3SP
PORTION(S) DESIGNATED AS NAKAMUN LAKE.
4;6;7NP;8;10-14;15SW;16;18;19NW,SWP
PORTION(S) DESIGNATED AS LAC LA NONNE.
20;22;24-26;28;29;30S,NE,NWP
PORTION(S) LYING OUTSIDE THE HUDSON'S BAY COMPANY RESERVE.
31SWP
PORTION(S) BEING A SURVEYED ROADWAY LYING TO THE NORTH AND EAST AND ADJOINING THE SAID HUDSON'S BAY COMPANY RESERVE.
32;34-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030242

AGGREGATE AREA:

8 986.16 HECTARES

DESCRIPTION OF LOCATION:

5-03-057: 1-24;25S,NP;26-34;35N,SE;36N,SP
PORTION(S) LYING OUTSIDE THE HUDSON'S BAY COMPANY RESERVE.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030243

AGGREGATE AREA:

9 024.48 HECTARES

DESCRIPTION OF LOCATION:

5-05-057: 1-7;8S,NW,L15P;9-31;32S,NE;33-35;36S,NW
PORTION(S) DESIGNATED AS PEMBINA RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030244

AGGREGATE AREA:

9 152 HECTARES

TRACT ONE

DESCRIPTION OF LOCATION:

5-06-057: 1-3;10-15;22-27;34-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

TRACT TWO

DESCRIPTION OF LOCATION:

5-06-057: 4-9;16-18;19N,SW;20;21;28-33

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030245

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-07-057: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030247

AGGREGATE AREA:

9 169.521 HECTARES

DESCRIPTION OF LOCATION:

5-02-058: 1;2S,NW,L9,L10,L15,L16S,L16NW;3-10;11N,SWP,L1SW,L2,L7,L8;
12-36
PORTION(S) LYING OUTSIDE THE NEWTON LAKE PROPOSED NATURAL AREA.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030248

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-03-058: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030249

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

5-05-058: 1-4;5SE;6;7;8W;9E;10-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030250

AGGREGATE AREA:

8 896 HECTARES

TRACT ONE

DESCRIPTION OF LOCATION:

5-06-058: 1-3;10-12;13N,SW;14;15;19-26;27S,NE;28S,NW;29-33;34E;35;36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

TRACT TWO

DESCRIPTION OF LOCATION:

5-06-058: 4-9;16-18

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030251

AGGREGATE AREA:

9 216 HECTARES

TRACT ONE

DESCRIPTION OF LOCATION:

5-07-058: 1-18

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

TRACT TWO

DESCRIPTION OF LOCATION:

5-07-058: 19-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030252

AGGREGATE AREA:

9 152 HECTARES

TRACT ONE

DESCRIPTION OF LOCATION:

5-08-058: 33-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

TRACT TWO

DESCRIPTION OF LOCATION:

5-08-058: 1-26;27N,SE;28-32

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS
EXCEPTING METALLIC AND INDUSTRIAL MINERALS IN THE NORDEGG MBR
AS DESIGNATED IN ZD 238-1
INTERVAL: 5 050.00 - 5 130.00 FEET
KEY WELL: 00/10-24-056-09W5/0
LOG TYPE: INDUCTION ELECTRICAL

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030253

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-01-059: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030254

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-02-059: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030255

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-03-059: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030256

AGGREGATE AREA:

8 688.12 HECTARES

DESCRIPTION OF LOCATION:

5-05-059: 1;2;3W;4;5SW;6-19;20S,NP;21-28;29E,SWP;30SP,NP;31-36
PORTION(S) LYING OUTSIDE THE THUNDER LAKE PROVINCIAL PARK.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030257

AGGREGATE AREA:

8 704 HECTARES

DESCRIPTION OF LOCATION:

5-06-059: 1;2;3N,SE;4N,SW;6;7;8S,NW;9-14;15N,SW;16-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030258

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-07-059: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030259

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-01-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030260

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-02-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030261

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-03-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030262

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030263

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-05-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030264

AGGREGATE AREA:

9 122.153 HECTARES

DESCRIPTION OF LOCATION:

5-06-060: 1-31;32N,SWP;33-36
PORTION(S) LYING OUTSIDE THE BEAR LAKE NATURAL AREA.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030265

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-07-060: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030266

AGGREGATE AREA:

9 152 HECTARES

DESCRIPTION OF LOCATION:

5-02-061: 1S,NW;2-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030267

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-03-061: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030268

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-061: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030269

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-05-061: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030270

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-06-061: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030271

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-03-062: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030272

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-062: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030273

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-05-062: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030274

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-04-063: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030275

AGGREGATE AREA:

9 216 HECTARES

DESCRIPTION OF LOCATION:

5-05-063: 1-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030586

AGGREGATE AREA:

8 314 HECTARES

DESCRIPTION OF LOCATION:

5-07-051: 28-30;31S,NW,L9S,L10,L15;32S,NE,L11,L12S,L14;33;34
5-07-052: 1-4;5S,NE,NWP;6SP,NWP,L9P;7WP;8SP,NEP;9-12
5-08-051: 13-15;23;24;25S,NE,NWP;26S,NP;35SP,NP;36SP,NP
5-08-052: 1SP,NP;2;11;12N,SE,SWP;13;14;24;25
PORTION(S) LYING OUTSIDE A PROPOSED PEMBINA RIVER RESERVOIR.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030587

AGGREGATE AREA:

7 526 HECTARES

DESCRIPTION OF LOCATION:

5-07-052: 13-15;16E,WP;18WP;19WP;20NEP,L14P;21N,SE,SWP;22-27;28E,WP;
29EP;30WP;31WP;32EP;33-36
5-07-053: 1-4;5SP,NP;9-15
PORTION(S) LYING OUTSIDE A PROPOSED PEMBINA RIVER RESERVOIR.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

Appendix IV

Statement of Expenditures

TAKLA STAR RESOURCES LTD.
STATEMENT OF EXPENDITURES
DECEMBER 31, 1994
EDMONTON BLOCK

	EDMONTON
GEOPHYSICAL SURVEY COSTS	
FIELD STAFF EXPENSES	
ACCOUNTING FEES	
SUPPLIES	
COMMUNICATIONS	
DELIVERY AND FREIGHT	
TRAVEL AND ACCOMODATION	
AUTOMOTIVE EXPENSE	
CONSULTING FEES	
GEOPHYSICAL CONTRACTS	
EQUIPMENT EXPENSE	
EQUIPMENT RENTAL	
MEALS/ENTERTAINMENT/SUSTENANCE	
REFERENCE MATERIALS	
ASSAYING	
FIELD STAFF WAGES	
MANAGEMENT SALARIES	
SUBTOTAL	0.00
OVERHEAD COMPONENT - 15%	0.00
TOTAL GEOPHYSICAL SURVEY COSTS	**0.00**
GEOCHEMICAL SURVEY COSTS	
FIELD STAFF EXPENSES	1,138.90
ACCOUNTING FEES	240.00
SUPPLIES	12.96
COMMUNICATIONS	52.09
DELIVERY AND FREIGHT	19.79
TRAVEL AND ACCOMODATION	3.92
AUTOMOTIVE EXPENSE	859.35
CONSULTING FEES	3,500.00
GEOPHYSICAL CONTRACTS	0.00
EQUIPMENT EXPENSE	1,871.08
EQUIPMENT RENTAL	0.00
MEALS/ENTERTAINMENT/SUSTENANCE	24.84
REFERENCE MATERIALS	19.60
ASSAYING	24,041.80
FIELD STAFF WAGES	14,824.40
MANAGEMENT SALARIES	2,546.00
	49,154.73
OVERHEAD COMPONENT - 15%	7,373.21
TOTAL GEOCHEMICAL SURVEY COSTS	**56,527.94**
GRAND TOTALS	**56,527.94**

Compiled by L.R. Abrams, CMA