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Sulphurets

R. W. KIRKHAM

GEOLOGICAL SURVEY OF CANADA  
 MINERAL RESOURCES DIVISION  
 ANALYTICAL CHEMISTRY SECTION  
 X-RAY FLUORESCENCE LABORATORY

503-596

## REPORT OF XRF ANALYSIS

DATE: 14-JAN-88

REPORT NO.: 150-87

SUBMITTED BY: S.B. BALLANTYNE

PROJECT NO.: 790003

METHOD: XRF WAVELENGTH DISPERSIVE ANALYSIS ON FUSED DISKS.

ELEMENT	CALIBRATION RANGE (%)	ESTIMATE OF ERROR (ABSOLUTE + RELATIVE %)		DETERMINATION LIMIT (%)
SI02	0 - 100	0.40	1	0.40
TIO2	0 - 3	0.02	1	0.2
AL2O3	0 - 60	0.40	1	0.40
CR2O3	0 - 4	0.02	1	0.02
FE2O3	0 - 90	0.10	1	0.10
FEO	0 - 30	0.20	2	0.20
MNO	0 - 1	0.01	2	0.01
MGO	0 - 50	0.10	1	0.10
CAO	0 - 35	0.10	1	0.10
NA2O	0 - 10	0.50	1	0.50
K2O	0 - 15	0.05	1	0.05
H2OT	0 - 5	0.10	5	0.10
CO2T	0 - 20	0.05	3	0.05
C				
P2O5	0 - 1	0.02	1	0.02
S	0 - 3	0.04	5	0.04
BA	0 - 0.3000	0.002	10	0.002
NE	0 - 0.0400	0.003	10	0.003
RE	0 - 0.0600	0.002	2	0.002
SR	0 - 0.2000	0.002	10	0.002
Y	0 - 0.0200	0.003	10	0.003
ZR	0 - 0.2000	0.002	10	0.002

ANALYST: DD

SUPERVISOR: DD meson

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LAB. NO.		1		2		3		4		5		6	
SPL. NO.		93L	8795	93L	8795	104B	879	104B	879	104B	879	104B	879
		01		02		503		504		505		506	
<i>major minor</i>													
SiO2	( % )	72.2		57.2		59.7		55.8		56.6		74.9	
TiO2	( % )	0.58		1.28		0.63		0.58		0.13		0.49	
Al2O3	( % )	16.2		22.0		17.7		16.4		4.5		12.4	
CR2O3	( % )	0.00		0.00		0.00		0.00		0.00		0.00	
FE2O3T	( % )	2.3		0.3		5.9		4.8		1.5		4.0	
FE2O3	( % )	0.9		0.3		0.9		4.8		1.5		4.0	
FeO	( % )	1.2				4.5							
MNC	( % )	0.01		0.03		0.16		0.23		0.68		0.00	
MGO	( % )	0.53		0.11		2.75		2.23		0.25		0.44	
CaO	( % )	0.20		4.36		2.19		6.57		<u>17.69</u>		0.15	
NA2O	( % )	0.1		<u>7.3</u>		<u>5.6</u>		0.2		0.1		0.1	
K2O	( % )	5.12		1.24		1.22		3.76		1.10		3.41	
H2OT	( % )	2.7		2.1		2.7							
CO2T	( % )	0.1		3.1		0.7		5.0		<u>14.6</u>		0.0	
P2O5	( % )	0.26		0.03		0.28		0.21		0.06		0.12	
S	( % )	0.42		0.03		0.84		1.90		1.01		3.22	
BA	(PPM)	<u>2119.</u>		377.		1016.		1914.		485.		1241.	
NB	(PPM)	0.		0.		0.		0.		0.		0.	
RE	(PPM)	151.		99.		52.		137.		33.		136.	
SR	(PPM)	29.		397.		642.		157.		455.		30.	
Y	(PPM)	0.		48.		0.		0.		29.		0.	
ZR	(PPM)	87.		162.		88.		96.		24.		81.	
TOTAL	( % )	100.8		99.1		100.2		97.8		98.4		99.5	

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FeO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FeO(VOLUMETRIC)$ .

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LAB. NO.		7	8	9	10	11	12
SPL. NO.		104B 879 507	104B 879 508	104B 879 509	104B 879 510	104B 879 512	104B 879 513
SI02	( % )	58.9	56.8	57.4	55.3	56.3	72.1
Ti02	( % )	1.06	0.59	0.58	0.53	0.67	0.58
AL2O3	( % )	12.7	16.8	16.6	12.5	17.0	16.0
CR2O3	( % )	0.06	0.00	0.00	0.00	0.00	0.00
FE2O3T	( % )	7.6	4.4	5.2	6.4	7.1	2.3
FE2O3	( % )	3.9	0.6	5.2	6.4	0.8	1.0
FEO	( % )	3.3	3.4			5.6	1.1
MNO	( % )	0.14	0.24	0.26	0.40	0.23	0.01
MGO	( % )	6.15	2.22	3.53	2.62	4.49	0.53
CAO	( % )	4.17	6.83	4.54	7.02	4.13	0.20
NA2O	( % )	2.4	0.3	0.3	0.1	0.1	0.1
K2O	( % )	1.82	3.53	2.97	2.62	2.96	5.10
H2OT	( % )	3.8	3.8			4.8	2.6
CO2T	( % )	1.8	5.1	3.3	6.8	2.9	0.1
P2O5	( % )	0.26	0.21	0.21	0.22	0.27	0.24
S	( % )	0.00	0.07	1.09	1.48	0.43	0.38
BA	(PPM)	734.	1709.	1760.	1261.	1215.	2105.
NE	(PPM)	7.	0.	0.	0.	0.	0.
RB	(PPM)	109.	112.	99.	75.	84.	147.
SR	(PPM)	433.	171.	157.	109.	80.	30.
Y	(PPM)	53.	0.	0.	0.	0.	0.
ZR	(PPM)	160.	100.	96.	50.	74.	83.
TOTAL	( % )	100.7	100.6	96.2	96.1	100.9	100.3

COMMENTS:

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LAB. NO.		13	14	15	16	17	18
SPL. NO.		104B 879 514	104B 879 515	104B 879 516	104B 879 517	104B 879 518	104B 879 519
SI02	( % )	62.6	53.6	47.2	59.0	58.9	61.0
TIO2	( % )	0.53	0.45	1.85	1.04	0.63	0.63
AL2O3	( % )	14.7	12.5	13.2	12.9	16.9	17.2
CR2O3	( % )	0.00	0.00	0.02	0.06	0.00	0.00
FE2O3T	( % )	4.7	8.4	11.8	7.7	5.7	5.8
FE2O3	( % )	1.2	8.4	5.0	4.3	4.7	3.6
FEO	( % )	3.2		6.1	3.1	0.9	1.9
MNO	( % )	0.28	1.04	0.24	0.14	0.11	0.18
MGO	( % )	1.04	1.63	6.22	6.14	0.75	2.46
CAO	( % )	3.78	6.77	9.06	4.17	4.39	1.93
NA2O	( % )	0.1	0.1	2.9	2.4	0.6	6.5
K2O	( % )	4.42	3.02	2.38	1.83	5.59	1.42
H2OT	( % )	2.6		2.6	3.6	2.6	1.9
CO2T	( % )	2.8	5.8	1.6	1.7	3.2	1.1
P2O5	( % )	0.24	0.19	0.79	0.25	0.28	0.27
S	( % )	0.96	4.64	0.06	0.00	0.01	0.00
BA	(PPM)	968.	1275.	2734.	738.	2755.	1311.
NB	(PPM)	0.	0.	0.	25.	0.	0.
RE	(PPM)	155.	79.	56.	109.	199.	76.
SR	(PPM)	43.	101.	1103.	432.	162.	444.
Y	(PPM)	0.	0.	17.	74.	0.	0.
ZR	(PPM)	72.	58.	208.	160.	101.	110.
TOTAL	( % )	98.5	98.4	99.6	100.8	100.0	100.3

COMMENTS:

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LAB. NO.		19	20	21	22	23	24
SPL. NO.		104B 879 520	104B 879 521	104B 879 522	104B 879 523	104B 879 524	104B 879 525
SI02	( % )	63.0	57.4	65.1	64.7	62.1	55.5
TI02	( % )	0.52	0.53	0.50	0.54	0.60	0.80
AL2O3	( % )	17.2	15.6	16.0	17.6	18.6	19.4
CR2O3	( % )	0.00	0.00	0.00	0.00	0.00	0.00
FE2O3T	( % )	5.2	4.9	5.2	5.7	6.3	7.5
FE2O3	( % )	4.8	4.9	3.5	5.0	4.8	7.0
FE0	( % )	0.3		1.6	0.7	1.3	0.5
MNO	( % )	0.12	0.47	0.12	0.08	0.07	0.18
MGO	( % )	1.22	1.11	2.30	1.90	2.37	0.96
CA0	( % )	3.77	5.27	3.21	1.16	2.47	3.62
NA2O	( % )	1.9	0.2	2.1	1.0	4.3	3.3
K2O	( % )	2.90	4.17	2.34	3.83	0.80	3.50
H2OT	( % )	2.5		2.8	3.3	3.0	2.6
CO2T	( % )	1.6	4.7	0.4	0.0	0.1	2.1
P2O5	( % )	0.19	0.19	0.17	0.18	0.20	0.32
S	( % )	0.01	<u>3.60</u>	0.00	0.00	0.00	0.01
BA	(PPM)	2604.	1581.	1520.	2417.	892.	2801.
NB	(PPM)	0.	0.	0.	0.	0.	0.
RB	(PPM)	83.	151.	48.	83.	35.	76.
SR	(PPM)	463.	88.	660.	245.	860.	320.
Y	(PPM)	0.	0.	0.	0.	1.	0.
ZR	(PPM)	108.	76.	98.	96.	115.	125.
TOTAL	( % )	100.4	98.3	100.4	100.2	100.8	100.1

COMMENTS:

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LAB. NO.		25	26	27	28	29	30
SPL. NO.		104B 879 526	104B 879 527	104B 879 528	104B 879 529	104B 879 530	104B 879 532
SI02	( % )	60.6	59.1	50.9	57.5	57.4	60.2
TI02	( % )	0.56	1.05	0.74	0.52	0.54	0.46
AL2O3	( % )	16.1	12.9	20.0	15.5	16.7	16.7
CR2O3	( % )	0.00	0.06	0.00	0.00	0.00	0.00
FE2O3T	( % )	5.3	7.7	8.1	4.9	4.5	4.5
FE2O3	( % )	3.6	4.2	8.1	4.9	0.5	1.4
FE0	( % )	1.6	3.1			3.6	2.9
MNO	( % )	0.20	0.14	0.13	0.47	0.17	0.15
MGO	( % )	1.02	6.14	1.34	1.11	1.79	1.26
CAO	( % )	5.02	4.18	3.45	5.22	4.79	4.20
NA2O	( % )	0.5	2.5	0.4	0.2	0.1	2.1
K2O	( % )	3.90	1.83	4.01	4.16	6.13	3.57
H2OT	( % )	3.0	3.6			3.2	2.9
CO2T	( % )	3.7	1.7	2.3	4.6	3.6	3.1
P2O5	( % )	0.25	0.25	0.32	0.20	0.21	0.21
S	( % )	0.02	0.00	6.62	3.69	0.71	0.40
BA	(PPM)	2882.	750.	2430.	1565.	3159.	2711.
NB	(PPM)	0.	3.	0.	0.	0.	0.
RB	(PPM)	123.	113.	125.	147.	214.	86.
SR	(PPM)	165.	434.	145.	84.	124.	222.
Y	(PPM)	0.	76.	0.	0.	0.	0.
ZR	(PPM)	86.	163.	106.	78.	77.	104.
TOTAL	( % )	100.4	100.8	98.6	98.1	99.8	99.9

COMMENTS:

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LAB. NO.	31	32	33	34	35	36
SPL. NO.	104B 879 533	104B 879 534	104B 879 535	104B 879 536	104B 879 537	104B 879 538
SI02 ( % )	58.4	55.5	9.9	50.0	59.1	55.2
TIO2 ( % )	0.40	1.12	0.04	0.57	1.06	0.67
AL2O3 ( % )	17.0	19.4	0.9	12.9	12.9	17.6
CR2O3 ( % )	0.00	0.00	0.00	0.01	0.06	0.00
FE2O3T ( % )	4.6	7.3	0.6	5.1	7.7	12.0
FE2O3 ( % )	0.0	1.5	0.6	0.9	4.2	2.1
FEO ( % )	4.3	5.2		3.8	3.1	8.9
MNO ( % )	0.06	0.14	0.19	0.14	0.14	0.10
MGO ( % )	2.23	3.19	15.91	4.01	6.17	4.47
CAO ( % )	3.16	1.78	30.29	9.97	4.17	0.73
NA2O ( % )	3.4	5.9	0.0	4.5	2.4	0.2
K2O ( % )	2.98	1.90	0.00	1.00	1.82	3.54
H2OT ( % )	2.9	3.4	1.1	2.4	3.6	5.6
CO2T ( % )	2.8	0.6	42.1	9.6	1.6	1.1
P2O5 ( % )	0.31	0.85	0.10	0.17	0.25	0.47
S ( % )	0.47	0.01	0.00	0.00	0.00	0.01
BA (PPM)	940.	916.	104.	533.	702.	1569.
NB (PPM)	0.	0.	0.	0.	5.	0.
RB (PPM)	75.	44.	0.	11.	110.	79.
SR (PPM)	266.	278.	1868.	1002.	437.	39.
Y (PPM)	0.	61.	0.	0.	64.	
ZR (PPM)	73.	156.	69.	152.	168.	10.
TOTAL ( % )	98.5	100.6	101.3	100.2	100.8	100.9

COMMENTS:

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LAB. NO.		37	38	39	40	41	42
SPL. NO.		104B 879 539	104B 879 540	104B 879 541	104B 879 542	104B 879 543	104B 879 544
SiO2	( % )	57.3	53.0	58.2	52.2	42.7	69.1
TiO2	( % )	0.53	0.66	0.45	0.67	0.45	0.40
Al2O3	( % )	16.4	16.4	16.7	14.7	12.4	8.6
CR2O3	( % )	0.01	0.01	0.00	0.01	0.00	0.00
FE2O3T	( % )	8.8	8.8	4.4	9.2	7.3	7.4
FE2O3	( % )	2.4	1.8	0.8	1.4	7.3	7.4
FeO	( % )	5.8	6.3	3.2	7.0		
MnO	( % )	0.16	0.13	0.14	0.12	0.22	0.02
MgO	( % )	<u>5.48</u>	<u>6.02</u>	1.41	<u>7.11</u>	0.81	0.76
CaO	( % )	1.01	2.79	5.79	4.36	<u>15.71</u>	1.58
Na2O	( % )	<u>4.6</u>	3.1	3.1	1.3	0.0	0.5
K2O	( % )	1.71	3.20	3.08	2.94	3.58	3.22
H2OT	( % )	4.0	4.5	2.7	4.6		
CO2T	( % )	0.4	1.9	4.4	3.0	<u>12.0</u>	0.6
P2O5	( % )	0.33	0.34	0.19	0.39	<u>0.30</u>	0.17
S	( % )	0.31	0.01	0.01	0.18	<u>2.17</u>	<u>5.65</u>
BA	(PPM)	1643.	1777.	2800.	1983.	770.	1323.
NB	(PPM)	0.	0.	0.	0.	0.	0.
RB	(PPM)	55.	54.	72.	61.	123.	80.
SR	(PPM)	245.	151.	372.	205.	185.	58.
Y	(PPM)	0.	0.	0.	0.	0.	64.
ZR	(PPM)	26.	37.	91.	34.	52.	32.
TOTAL	( % )	100.5	100.4	100.4	100.2	97.8	98.2

COMMENTS:

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LAB. NO.	43	44	45	46	47	48
SPL. NO.	104B 879 545	104B 879 546	104B 879 547	104B 879 548	104B 879 549	104B 879 550
SI02 ( % )	56.6	57.6	58.8	58.7	56.8	58.0
TIO2 ( % )	0.64	0.74	1.05	0.55	0.40	0.45
AL2O3 ( % )	18.3	13.8	12.8	14.4	14.5	16.5
CR2O3 ( % )	0.00	0.01	0.06	0.00	0.00	0.00
FE2O3T ( % )	8.1	6.4	7.7	7.7	4.2	4.5
FE2O3 ( % )	1.6	1.0	4.2	0.9	0.8	4.5
FEO ( % )	5.9	4.9	3.1	5.8	3.0	
MNO ( % )	0.09	0.10	0.14	0.13	0.18	0.14
MGO ( % )	3.14	2.66	6.14	3.18	1.68	1.44
CAO ( % )	2.44	5.03	4.16	4.24	<u>8.39</u>	5.80
NA2O ( % )	1.9	<u>5.2</u>	2.4	<u>3.6</u>	0.2	2.5
K2O ( % )	3.29	<u>0.53</u>	1.80	<u>1.39</u>	3.50	3.25
H2OT ( % )	4.2	2.7	3.8	3.4	3.1	2.9
CO2T ( % )	1.3	6.3	1.8	4.0	3.4	4.3
P2O5 ( % )	0.55	0.18	0.25	0.19	0.18	0.20
S ( % )	0.02	0.01	0.00	0.07	0.08	0.10
BA (PPM)	<u>2721.</u>	293.	714.	517.	<u>2353.</u>	<u>2056.</u>
NB (PPM)	0.	0.	12.	0.	0.	0.
RB (PPM)	54.	0.	116.	90.	98.	86.
SR (PPM)	160.	666.	429.	410.	224.	366.
Y (PPM)	0.	0.	57.	0.	0.	0.
ZR (PPM)	41.	149.	153.	96.	89.	99.
TOTAL ( % )	100.3	100.8	100.7	100.7	99.4	100.3

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FEO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FEO(VOLUMETRIC)$ .

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SUBMITTER'S NAME: S.B. BALLANTYNE

PROJECT: 790003

REPORT: 150-87

LAB. NO.		49	50	51	52	53	54
SPL. NO.		104B 879 552	104B 879 553	104B 879 554	104B 879 555	104B 879 556	104B 879 557
SI02	( % )	59.7	56.4	54.6	55.7	58.5	58.9
TI02	( % )	0.56	0.47	0.51	0.29	0.44	1.06
AL203	( % )	17.6	15.1	15.9	5.6	16.2	12.8
CR203	( % )	0.00	0.00	0.00	0.00	0.00	0.06
FE203T	( % )	6.3	5.5	5.6	3.0	4.3	7.6
FE203	( % )	2.5	0.6	1.8	3.0	0.7	4.1
FEO	( % )	3.4	4.4	3.4		3.2	3.2
MNO	( % )	0.16	0.17	0.17	0.46	0.14	0.14
HGO	( % )	2.27	1.93	2.17	0.58	1.36	6.16
CAO	( % )	4.19	<u>7.05</u>	<u>7.02</u>	<u>16.07</u>	5.59	4.17
NA2O	( % )	<u>5.1</u>	2.3	0.9	0.5	3.1	2.5
K2O	( % )	1.85	2.82	4.53	1.52	2.99	1.82
H2OT	( % )	2.3	2.9	3.3		2.8	3.7
CO2T	( % )	0.5	5.4	5.3	12.7	4.3	1.8
P2O5	( % )	0.22	0.19	0.21	0.13	0.20	0.25
S	( % )	0.00	0.44	0.01	<u>1.98</u>	0.00	0.00
BA	(PPM)	<u>2076.</u>	1142.	<u>2430.</u>	955.	<u>2666.</u>	722.
NB	(PPM)	0.	0.	0.	0.	0.	0.
RE	(PPM)	87.	83.	165.	43.	81.	111.
SR	(PPM)	853.	212.	230.	270.	368.	430.
Y	(PPM)	1.	0.	0.	0.	0.	69.
ZR	(PPM)	95.	73.	83.	27.	101.	165.
TOTAL	( % )	100.7	100.3	100.1	98.6	99.9	100.8

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FEO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE203 IS CALCULATED USING  $FE203 = FE203(XRF) - 1.11134 * FEO(VOLUMETRIC)$ .

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LAB. NO.	55	56	57	58	59	60
SPL. NO.	104B 879 558	104B 879 559	104B 879 560	104B 879 561	104B 879 562	104B 879 563
SI02 ( % )	64.4	67.1	60.3	57.7	34.9	48.2
TIO2 ( % )	0.49	0.29	0.58	0.62	0.57	0.03
AL2O3 ( % )	14.1	14.3	17.0	16.6	15.5	0.6
CR2O3 ( % )	0.00	0.00	0.00	0.00	0.00	0.00
FE2O3I ( % )	5.0	2.8	5.3	5.4	7.8	8.6
FE2O3 ( % )	0.9	0.4	0.9	4.7	0.8	8.6
FEO ( % )	3.7	2.2	4.0	0.6	6.3	
MNO ( % )	0.09	0.05	0.23	0.20	0.27	0.56
MGO ( % )	1.18	1.21	1.67	1.37	4.45	4.19
CAO ( % )	4.15	3.69	4.55	<u>6.28</u>	<u>12.05</u>	<u>13.45</u>
NA2O ( % )	3.4	3.6	5.4	0.4	0.2	<u>0.7</u>
K2O ( % )	1.90	2.18	2.06	4.57	4.86	<u>0.08</u>
H2OT ( % )	2.4	2.1	2.0	2.8	2.5	
CO2T ( % )	3.3	2.9	0.9	4.3	<u>16.7</u>	<u>19.1</u>
P2O5 ( % )	0.10	0.10	0.24	0.26	0.41	<u>0.03</u>
S ( % )	0.02	0.01	0.35	0.00	0.31	<u>1.59</u>
BA (PPM)	603.	726.	1873.	<u>3348.</u>	506.	61.
NB (PPM)	0.	0.	0.	0.	0.	0.
RE (PPM)	45.	50.	70.	117.	92.	0.
SR (PPM)	274.	364.	968.	113.	916.	633.
Y (PPM)	0.	0.	2.	0.	0.	36.
ZR (PPM)	94.	57.	107.	94.	39.	5.
TOTAL ( % )	100.3	100.2	100.5	100.8	100.0	97.2

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FEO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FEO(VOLUMETRIC)$ .

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LAB. NO.	61	62	63	64	65	66
SPL. NO.	104B 879 564	104B 879 565	104B 879 566	104B 879 567	104B 879 568	104B 879 569
SiO2 ( % )	52.3	57.5	59.5	59.1	63.1	61.7
TiO2 ( % )	0.65	0.30	0.50	1.06	0.50	0.64
Al2O3 ( % )	14.6	12.4	16.0	12.9	16.8	18.2
CR2O3 ( % )	0.01	0.00	0.00	0.06	0.00	0.00
FE2O3T ( % )	9.3	2.8	4.5	7.6	4.8	6.2
FE2O3 ( % )	4.4	2.8	1.1	4.1	3.3	4.8
FeO ( % )	4.4		3.0	3.2	1.3	1.3
MnO ( % )	0.17	0.33	0.14	0.14	0.15	0.21
MgO ( % )	<u>5.14</u>	1.16	1.18	<u>6.18</u>	1.59	1.27
CaO ( % )	<u>8.00</u>	<u>9.33</u>	4.86	4.20	3.56	2.48
Na2O ( % )	1.7	1.6	1.7	2.4	<u>4.5</u>	<u>5.1</u>
K2O ( % )	5.01	2.95	3.83	1.82	2.76	2.12
H2OT ( % )	2.5		3.0	3.5	2.0	2.0
CO2T ( % )	1.2	<u>8.4</u>	<u>3.3</u>	1.7	0.5	0.1
P2O5 ( % )	0.41	0.10	0.17	0.25	0.17	0.19
S ( % )	0.00	<u>1.04</u>	0.05	0.00	0.00	0.00
BA (PPM)	<u>3404.</u>	615.	<u>2169.</u>	753.	<u>2234.</u>	1586.
NB (PPM)	0.	0.	0.	17.	0.	0.
BB (PPM)	65.	98.	114.	114.	62.	53.
SR (PPM)	396.	340.	203.	434.	565.	587.
Y (PPM)	0.	0.	0.	57.	0.	0.
ZR (PPM)	30.	76.	91.	157.	102.	110.
TOTAL ( % )	100.9	98.1	98.6	100.8	100.5	100.4

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FeO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FeO(VOLUMETRIC)$ .

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LAB. NO.	67	68	69	70	71	72
SPL. NO.	104B 879 570	104B 879 572	104B 879 573	104B 879 574	104B 879 575	104B 879 576
SiO2 ( % )	58.7	57.2	73.7	65.1	77.8	72.3
TiO2 ( % )	0.69	0.61	0.33	0.63	0.17	0.37
Al2O3 ( % )	18.8	16.6	14.4	17.7	10.9	14.1
CR2O3 ( % )	0.00	0.00	0.00	0.00	0.00	0.00
FE2O3T ( % )	5.8	5.4	1.8	5.8	3.0	3.2
FE2O3 ( % )	5.6	4.7	1.8	5.8	3.0	3.2
FeO ( % )	0.2	0.6				
MNO ( % )	0.20	0.20	0.03	0.07	0.01	0.01
MGO ( % )	0.80	1.35	0.46	0.88	0.49	0.58
CAO ( % )	<u>4.64</u>	<u>6.21</u>	0.55	0.54	0.11	0.14
NA2O ( % )	<u>4.7</u>	0.4	1.5	0.1	0.1	0.1
K2O ( % )	2.69	4.53	3.82	5.12	4.59	<u>6.94</u>
H2OT ( % )	1.7	2.6				
CO2T ( % )	1.1	4.3	0.3	0.1	0.2	0.1
P2O5 ( % )	0.29	0.26	0.02	0.37	0.07	0.09
S ( % )	0.00	0.00	<u>1.05</u>	<u>1.54</u>	<u>2.24</u>	<u>2.11</u>
BA (PPM)	<u>2305.</u>	<u>3317.</u>	776.	1503.	1097.	1617.
NB (PPM)	0.	0.	0.	0.	0.	0.
RE (PPM)	49.	116.	106.	175.	133.	195.
SR (PPM)	972.	110.	99.	67.	58.	81.
Y (PPM)	0.	7.	0.	0.	0.	0.
ZR (PPM)	107.	98.	65.	103.	43.	65.
TOTAL ( % )	100.4	99.9	98.1	98.0	99.8	100.3

COMMENTS:

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\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FE0(VOLUMETRIC)$ .

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LAB. NO.	73	74	75	76	77	78
SPL. NO.	104B 879 577	104B 879 578	104B 879 579	104B 879 580	104B 879 581	104B 879 582
SiO2 ( % )	58.7	58.6	73.1	52.2	56.2	54.2
TiO2 ( % )	1.08	0.55	0.43	0.98	0.46	0.81
Al2O3 ( % )	12.8	16.4	11.4	19.0	14.9	17.7
CR2O3 ( % )	0.06	0.00	0.00	0.00	0.00	0.00
Fe2O3T ( % )	7.5	4.8	3.0	8.0	5.1	6.8
Fe2O3 ( % )	4.0	1.2	3.0	8.0	1.4	6.8
FeO ( % )	3.1	3.2			3.4	
MnO ( % )	0.14	0.18	0.15	0.13	0.11	0.28
MgO ( % )	6.12	1.62	1.67	2.71	1.85	2.68
CaO ( % )	4.16	4.78	1.13	1.73	8.46	4.97
Na2O ( % )	2.4	2.5	2.5	2.7	0.5	3.6
K2O ( % )	1.80	3.95	2.93	6.15	3.03	3.42
H2OT ( % )	3.4	2.9			3.3	
CO2T ( % )	1.7	3.5	0.8	0.1	5.5	1.3
P2O5 ( % )	0.25	0.23	0.18	0.44	0.15	0.38
S ( % )	0.00	0.14	1.74	3.17	0.03	1.25
BA ( PPM )	748.	1220.	1046.	3648.	2939.	1749.
NB ( PPM )	15.	0.	0.	0.	0.	0.
RB ( PPM )	111.	111.	69.	147.	58.	68.
SR ( PPM )	442.	215.	196.	366.	382.	385.
Y ( PPM )	64.	0.	0.	19.	0.	10.
ZR ( PPM )	157.	87.	54.	113.	86.	96.
TOTAL ( % )	100.0	99.9	99.1	97.8	99.6	97.7

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FeO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* Fe2O3 IS CALCULATED USING  $Fe2O3 = Fe2O3(XRF) - 1.11134 * FeO(VOLUMETRIC)$ .

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LAB. NO.	79	80	81	82	83	84
SPL. NO.	104B 879 583	104B 879 584	104B 879 585	104B 879 586	104B 879 587	104B 879 588
SiO2 ( % )	56.5	60.1	70.5	22.3	59.0	55.6
TiO2 ( % )	0.71	0.42	0.36	0.12	1.06	0.53
Al2O3 ( % )	15.5	17.3	15.5	3.0	12.8	16.8
CR2O3 ( % )	0.00	0.00	0.00	0.00	0.06	0.01
FE2O3T ( % )	6.0	4.4	3.0	2.9	7.7	6.0
FE2O3 ( % )	6.0	4.4	3.0	2.9	4.1	6.0
FeO ( % )					3.2	
MnO ( % )	0.29	0.06	0.01	1.16	0.14	0.08
MgO ( % )	1.77	1.62	0.73	0.58	<u>6.18</u>	1.70
CaO ( % )	<u>5.82</u>	2.31	0.24	<u>34.14</u>	4.19	2.24
Na2O ( % )	4.5	4.4	3.0	0.5	2.4	1.9
K2O ( % )	2.49	4.74	4.37	0.91	1.82	6.09
H2O ( % )					3.6	
CO2T ( % )	2.5	0.5	0.1	<u>28.5</u>	1.7	1.3
P2O5 ( % )	0.32	0.28	0.09	0.04	0.25	0.19
S ( % )	<u>1.59</u>	<u>2.51</u>	<u>1.65</u>	<u>3.37</u>	0.00	<u>4.62</u>
BA (PPM)	<u>2060.</u>	<u>3804.</u>	1569.	213.	747.	<u>2021.</u>
NB (PPM)	0.	0.	0.	0.	19.	0.
RE (PPM)	83.	90.	105.	0.	108.	152.
SR (PPM)	601.	608.	173.	286.	426.	169.
Y (PPM)	11.	0.	0.	9.	64.	0.
ZR (PPM)	91.	76.	77.	37.	170.	87.
TOTAL ( % )	98.3	99.2	99.7	97.5	100.7	97.4

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FeO, H2O, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FeO(VOLUMETRIC)$ .

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LAB. NO.	85	86	87	88	89	90
SPL. NO.	104B 879 589	104B 879 590	104B 879 592	104B 879 593	104B 879 594	104B 879 595
SI02 ( % )	64.3	17.3	59.1	81.3	52.2	64.7
TI02 ( % )	0.25	0.07	0.52	0.11	0.99	0.55
AL2O3 ( % )	12.6	1.4	14.7	2.6	15.5	18.0
CR2O3 ( % )	0.00	0.00	0.00	0.00	0.00	0.00
FE2O3T ( % )	3.4	1.5	6.2	3.7	7.7	5.2
FE2O3 ( % )	3.4	1.5	6.2	0.5	7.7	4.0
FE0 ( % )				2.9		1.1
MNO ( % )	0.17	1.44	0.23	0.14	0.16	0.08
MGO ( % )	1.58	0.44	2.51	1.11	1.29	1.51
CAO ( % )	2.15	<u>40.89</u>	3.60	<u>5.35</u>	<u>5.59</u>	1.32
NA2O ( % )	1.2	0.0	2.7	0.7	2.8	3.9
K2O ( % )	3.32	0.33	2.99	0.07	<u>7.03</u>	2.59
H2OT ( % )				0.9		2.4
CO2T ( % )	1.7	<u>34.5</u>	2.7	4.0	1.9	0.1
P2O5 ( % )	0.09	0.01	0.12	0.04	0.61	0.20
S ( % )	<u>1.72</u>	<u>1.08</u>	<u>1.06</u>	0.39	<u>3.54</u>	0.00
BA (PPM)	1178.	125.	587.	84.	<u>3374.</u>	1808.
NB (PPM)	0.	0.	0.	0.	0.	0.
RE (PPM)	90.	0.	117.	0.	123.	58.
SR (PPM)	108.	526.	197.	105.	569.	447.
Y (PPM)	0.	28.	0.	0.	0.	0.
ZR (PPM)	53.	15.	107.	0.	70.	107.
TOTAL ( % )	92.6	99.0	96.5	100.1	99.7	100.7

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FE0, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FE0(VOLUMETRIC)$ .



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LAB. NO.	91	92	93	94	95	96
SPL. NO.	104B 879 596	104B 879 597	150-87-9 <i>Balt</i>	150-87-9 <i>36</i>	150-87-9 <i>43</i>	150-87-9 <i>75</i>
SiO2 ( % )	56.7	59.2	71.9	55.5	56.8	72.8
TiO2 ( % )	0.45	1.07	0.58	0.68	0.65	0.42
Al2O3 ( % )	15.0	13.0	16.2	17.5	18.3	11.0
CR2O3 ( % )	0.00	0.06	0.00	0.00	0.00	0.00
FE2O3T ( % )	5.2	7.7	2.2	11.9	8.1	3.0
FE2O3 ( % )	1.3	4.1	1.1	1.8	1.6	3.0
FeO ( % )	3.5	3.2	1.0	9.1	5.9	
MnO ( % )	0.11	0.14	0.01	0.10	0.09	0.15
MgO ( % )	1.87	6.16	0.53	4.45	3.15	1.63
CaO ( % )	8.56	4.19	0.19	0.73	2.42	1.12
Na2O ( % )	0.5	2.5	0.1	0.2	1.9	2.4
K2O ( % )	3.08	1.83	5.10	3.54	3.26	2.87
H2OT ( % )	3.2	3.1	2.5	5.3	4.0	
CO2T ( % )	5.5	1.7	0.1	1.1	1.3	0.9
P2O5 ( % )	0.16	0.25	0.25	0.47	0.56	0.18
S ( % )	0.02	0.00	0.37	0.00	0.02	1.73
BA (PPM)	<u>3116.</u>	730.	2141.	1549.	2615.	1003.
NB (PPM)	0.	9.	0.	0.	0.	0.
RB (PPM)	62.	114.	151.	73.	51.	72.
SR (PPM)	373.	444.	30.	42.	161.	197.
Y (PPM)	0.	71.	0.	0.	0.	1.
ZR (PPM)	87.	159.	83.	41.	42.	49.
TOTAL ( % )	100.4	100.6	100.3	100.6	100.3	98.3

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FeO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FeO(VOLUMETRIC)$ .

GEOLOGICAL SURVEY OF CANADA  
MINERAL RESOURCES DIVISION  
ANALYTICAL CHEMISTRY SECTION  
X-RAY FLUORESCENCE LABORATORY

REPORT OF XRF ANALYSIS

DATE: 14-JAN-88

SUBMITTER'S NAME: S.B. BALLANTYNE

PROJECT: 790003

REPORT: 150-87

LAB. NO. 97  
SPL. NO. 150-87-9

791

SI02	( % )	56.5
TI02	( % )	0.45
AL2O3	( % )	15.1
CR2O3	( % )	0.00
FE2O3T	( % )	5.2
FE2O3	( % )	1.3
FEO	( % )	3.5
MNO	( % )	0.11
MGO	( % )	1.98
CAO	( % )	8.59
NA2O	( % )	0.5
K2O	( % )	3.07

H2OT	( % )	3.0
CO2T	( % )	5.5
P2O5	( % )	0.15
S	( % )	0.03

BA	(PPM)	3093.
NB	(PPM)	0.
RE	(PPM)	62.
SR	(PPM)	383.
Y	(PPM)	0.
ZR	(PPM)	84.

TOTAL ( % ) 100.0

COMMENTS:

\* ALL ANALYSIS BY XRF, EXCEPT FEO, H2OT, CO2T, CO2, C AND S BY RAPID CHEMICAL METHODS.

\* FE2O3 IS CALCULATED USING  $FE2O3 = FE2O3(XRF) - 1.11134 * FEO(VOLUMETRIC)$ .