

GEOLOGICAL SURVEY OF CANADA  
 ECONOMIC GEOLOGY AND MINERALOGY DIVISION  
 ANALYTICAL CHEMISTRY SECTION  
 ICP - EMISSION SPECTROMETRY LABORATORY

803864  
 Sulphurets

R. V. KIRKHAM

792-922

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 \* REPORT OF ANALYSIS \*  
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DATE: 2 MARCH 88  
 REPORT NO. 153-87  
 SUBMITTED BY: BALLANTYNE B.  
 PROJECT NO. 790003  
 METHOD: DISSOLUTION F-HCl-10 ; ICP-TR1 , Ag & Pb BY AA.

ESTIMATE OF VALIDITY OF RESULTS

ELEMENT	+/-	( ABSOLUTE	+	RELATIVE )
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Be	+/-	( 0.5 PPM	+	5% OF CONC. )
Co	+/-	( 5 PPM	+	5% OF CONC. )
Cr	+/-	( 10 PPM	+	5% OF CONC. )
Cu	+/-	( 10 PPM	+	5% OF CONC. )
La	+/-	( 10 PPM	+	5% OF CONC. )
Ni	+/-	( 10 PPM	+	5% OF CONC. )
Pb	+/-	( 20 PPM	+	10% OF CONC. )
V	+/-	( 5 PPM	+	5% OF CONC. )
Yb	+/-	( 0.5 PPM	+	5% OF CONC. )
Zn	+/-	( 5 PPM	+	5% OF CONC. )

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## REPORT OF ANALYSIS

NAME: BALLANTYNE B.

PROJECT: 790003

REQN. NO: 153-87

LAB. NO.	1	2	3	4	5	6	7	8
SAMPLE NO:	104B-879 792	104B-879 793	104B-879 794	104B-879 795	104B-879 796	104B-879 797	104B-879 798	104B-879 799
BE ppm :	1.3	1.1	0.6	1.0	1.1	6.0	1.1	1.0
CD ppm :	16	30	40	15	13	39	19	15
CR ppm :	17	39	97	22	16	380	96	29
CU ppm :	73	1700	31000	190	53	68	69	120
LA ppm :	11	12	1000	14	16	33	15	18
NI ppm :	0	0	43	0	7	310	61	8
V ppm :	190	220	420	250	160	130	180	130
YB ppm :	0.9	1.0	1.3	1.2	1.4	4.0	1.3	2.2
ZN ppm :	83	85	1300	46	33	150	82	3900

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	9	10	11	12	13	14	15	16
SAMPLE NO:	104B-879 800	104B-879 801	104B-879 802	104B-879 803	104B-879 804	104B-879 805	104B-879 806	104B-879 807
BE ppm :	0.8	1.6	0.9	0.9	1.5	1.2	1.6	6.2
CD ppm :	19	20	22	39	20	13	20	39
CR ppm :	30	20	40	160	23	29	21	400
CU ppm :	100	530	160	710	1000	68	510	66
LA ppm :	9	7	10	11	20	10	6	32
NI ppm :	0	0	6	0	0	0	0	300
V ppm :	220	190	240	210	140	160	180	130
YB ppm :	1.2	1.1	1.3	0.9	1.9	1.5	0.9	3.9
ZN ppm :	54	100	59	56	77	74	100	150

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	17	18	19	20	21	22	23	24
SAMPLE NO:	104B-879 808	104B-879 809	104B-879 810	104B-879 812	104B-879 813	104B-879 814	104B-879 815	104B-879 816
BE ppm :	0.8	1.2	0.4	0.9	1.3	2.4	1.7	0.2
CO ppm :	26	72	3	6	5	12	31	3
CR ppm :	20	50	5	16	11	14	28	8
CU ppm :	110	73	3	24	5	20	64	20
LA ppm :	8	6	4	6	13	15	24	5
NI ppm :	0	16	0	0	0	0	7	1
V ppm :	140	250	39	130	94	160	230	45
YB ppm :	2.0	0.4	0.5	1.4	1.1	2.6	2.0	0.3
ZN ppm :	79	140	34	16	15	12	83	4

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	25	26	27	28	29	30	31	32
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879
	817	818	819	820	821	822	823	824
BE ppm :	6.0	0.3	0.6	1.5	1.1	1.4	1.0	1.3
CD ppm :	40	3	3	18	28	10	20	17
CR ppm :	370	6	6	14	15	13	23	14
CU ppm :	67	5	4	24	28	26	38	24
LA ppm :	33	4	4	17	19	11	9	18
NI ppm :	310	3	0	2	4	0	10	7
V ppm :	130	23	69	80	130	91	150	110
YB ppm :	4.0	0.2	0.4	1.5	1.4	1.2	1.2	1.4
ZN ppm :	150	3	1	77	80	42	110	80

COMMENTS:

\* ICP-IRI DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

## ANALYTICAL CHEMISTRY SECTION

DATE: 2 MARCH 88

## ICP-ES LABORATORY

LAB. NO.	33	34	35	36	37	38	39	40
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879
	825	826	827	828	829	830	832	833
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	1.8	1.4	6.4	1.1	0.4	0.0	2.5	1.4
CD ppm :	13	21	41	26	6	12	18	12
CR ppm :	30	17	400	16	19	8	26	36
CU ppm :	77	33	67	28	9	31000	58	29
LA ppm :	31	15	34	19	4	4	27	16
NI ppm :	4	0	310	4	0	0	3	8
V ppm :	240	190	130	130	70	10	92	100
YB ppm :	2.0	1.8	4.0	1.4	0.2	1.6	3.6	1.5
ZN ppm :	110	87	150	93	28	4600	160	55

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
 ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	41	42	43	44	45	46	47	48
SAMPLE NO:	104B-879 834	104B-879 835	104B-879 836	104B-879 837	104B-879 838	104B-879 839	104B-879 840	104B-879 841
BE ppm :	1.1	1.7	1.2	6.4	1.6	1.3	1.5	1.1
CO ppm :	11	22	36	43	23	18	27	21
CR ppm :	42	20	82	410	15	11	28	18
CU ppm :	17	14	5	66	23	23	7	320
LA ppm :	14	33	19	35	24	19	12	10
NI ppm :	7	0	22	310	0	9	25	0
V ppm :	96	190	320	130	180	160	210	120
YB ppm :	1.4	4.5	0.9	4.0	2.2	1.3	0.9	0.9
ZN ppm :	53	93	98	160	82	75	88	86

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
 DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

## ANALYTICAL CHEMISTRY SECTION

DATE: 2 MARCH 88

## ICP-ES LABORATORY

LAB. NO.	49	50	51	52	53	54	55	56
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879
	842	843	844	845	846	847	848	849
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	2.6	1.6	1.3	1.4	0.3	6.0	0.3	1.5
CD ppm :	4	10	8	35	7	38	6	29
CR ppm :	7	7	12	17	10	390	8	23
CU ppm :	0	18	30	86	3600	67	400	120
LA ppm :	29	12	17	9	7	31	4	9
NI ppm :	0	0	0	0	0	310	0	0
V ppm :	4	120	100	200	44	130	45	290
YB ppm :	2.1	1.4	1.4	0.6	1.5	3.9	0.3	0.7
ZN ppm :	42	24	100	63	47000	160	1700	37

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.



ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	57	58	59	60	61	62	63	64
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879
	850	852	853	854	855	856	857	858
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	0.2	1.4	1.1	2.5	1.5	2.0	6.1	1.3
CD ppm :	6	14	19	17	17	13	39	12
CR ppm :	8	27	17	29	25	25	390	23
CU ppm :	130	71	320	100	110	20	70	20
LA ppm :	4	6	10	5	10	7	31	13
NI ppm :	0	0	0	0	0	0	310	0
V ppm :	41	160	120	220	220	140	130	160
YB ppm :	0.4	0.6	0.8	0.3	1.0	1.6	3.9	0.9
ZN ppm :	9000	41	88	31	120	44	160	55

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	65	66	67	68	69	70	71	72
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104E-879	104B-879
	859	860	861	862	863	864	865	866
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	1.2	0.8	1.0	0.8	1.0	1.0	1.3	1.5
CO ppm :	12	10	14	11	13	14	8	9
CR ppm :	11	11	14	9	14	14	14	9
CU ppm :	12	13	19	14	13	19	11	15
LA ppm :	6	10	13	7	12	13	11	14
NI ppm :	0	0	3	0	0	2	0	0
V ppm :	95	100	97	76	85	97	69	82
YB ppm :	0.6	1.2	1.3	1.1	1.2	1.3	1.6	2.1
ZN ppm :	3	35	57	28	50	56	34	25

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	73	74	75	76	77	78	79	80
SAMPLE NO:	104B-879 867	104B-879 868	104B-879 869	104B-879 870	104B-879 872	104B-879 873	104B-879 874	104B-879 875

BE	ppm :	5.9	0.9	1.5	0.6	1.0	0.9	0.4	0.7
CO	ppm :	38	8	12	3	12	15	4	10
CR	ppm :	330	7	14	37	45	15	7	18
CU	ppm :	64	32	20	12	32	16	35	61
LA	ppm :	30	8	16	5	10	10	0	6
NI	ppm :	300	0	0	0	18	0	0	0
V	ppm :	130	48	97	83	120	110	110	72
YB	ppm :	3.8	1.1	1.5	0.5	0.9	1.3	0.2	0.6
ZN	ppm :	150	10	57	0	34	79	30	58

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	81	82	83	84	85	86	87	88
SAMPLE NO:	104B-879 876	104B-879 877	104B-879 878	104B-879 879	104B-879 880	104B-879 881	104B-879 882	104B-879 883
BE ppm :	1.5	6.2	1.3	1.3	1.3	1.2	1.4	1.3
CO ppm :	14	39	17	15	17	16	19	14
CR ppm :	10	360	15	12	26	17	12	13
CU ppm :	14	63	59	34	120	43	34	69
LA ppm :	13	31	20	17	6	21	14	15
NI ppm :	0	300	0	0	0	0	0	0
V ppm :	160	120	150	160	140	150	170	160
YB ppm :	1.8	3.8	1.4	1.8	0.7	1.7	1.6	1.3
ZN ppm :	92	160	63	91	62	160	59	120

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	89	90	91	92	93	94	95	96
SAMPLE NO:	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879	104B-879
	884	885	886	887	888	889	890	892
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	1.3	1.2	1.3	6.0	1.3	0.3	1.2	1.7
CO ppm :	22	18	19	38	14	7	18	13
CR ppm :	13	14	11	390	23	23	10	13
CU ppm :	110	49	82	70	2600	1200	7200	780
LA ppm :	14	20	10	29	5	3	7	13
NI ppm :	0	0	0	300	0	0	0	0
V ppm :	170	160	170	130	140	48	120	120
YB ppm :	1.7	1.8	1.7	3.8	0.4	0.1	1.3	1.2
ZN ppm :	160	150	150	200	210	29	650	150

## COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	97	98	99	100	101	102	103	104
SAMPLE NO:	104B-879 893	104B-879 894	104B-879 895	104B-879 896	104B-879 897	104B-879 898	104B-879 899	104B-879 900
BE ppm :	0.8	1.1	1.4	1.1	6.1	0.4	1.5	2.1
CO ppm :	14	18	17	17	38	7	23	20
CR ppm :	5	14	13	34	390	14	11	13
CU ppm :	480	130	160	78	64	79	620	300
LA ppm :	19	8	17	28	30	2	11	13
NI ppm :	0	0	0	0	300	0	0	0
V ppm :	70	140	150	110	130	75	190	170
YB ppm :	1.6	1.7	1.7	2.6	3.9	0.3	2.0	1.3
ZN ppm :	110	430	510	32	160	15	180	190

## COMMENTS:

\* ICP-TRI DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	105	106	107	108	109	110	111	112
SAMPLE NO:	104B-879 901	104B-879 902	104B-879 903	104B-879 904	104B-879 905	104B-879 906	104B-879 907	104B-879 908
BE ppm :	1.2	2.0	1.0	0.7	0.8	1.1	6.0	1.3
CD ppm :	18	18	14	15	13	14	38	18
CR ppm :	77	13	11	26	8	7	350	79
CU ppm :	41	140	75	260	130	40	71	45
LA ppm :	12	13	6	7	11	13	32	14
NI ppm :	6	0	0	0	0	0	300	8
V ppm :	140	170	140	81	120	140	130	140
YB ppm :	1.2	1.1	1.0	1.5	1.5	1.9	3.9	1.3
ZN ppm :	34	340	210	66	130	180	150	25

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	113	114	115	116	117	118	119	120
SAMPLE NO:	104B-879 909	104B-879 910	104B-879 912	104B-879 913	104B-879 914	104B-879 915	104B-879 916	104B-879 917
	-----	-----	-----	-----	-----	-----	-----	-----
BE ppm :	1.1	1.0	0.9	0.6	0.8	1.2	1.3	6.0
CD ppm :	12	29	23	15	7	8	10	38
CR ppm :	8	110	90	18	14	34	35	330
CU ppm :	20000	160	92	24	45	25	28	68
LA ppm :	12	7	9	6	6	8	11	31
NI ppm :	0	0	0	0	0	11	7	300
V ppm :	170	230	190	170	140	75	93	130
YB ppm :	1.6	1.2	1.3	0.9	0.5	0.6	0.7	3.8
ZN ppm :	85	180	310	37	28	41	41	150

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.



ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	121	122	123	124	125	126	127	128
SAMPLE NO:	104B-879 918	104B-879 919	104B-879 920	104B-879 921	104B-879 922	153-87-1 26 #28	153-87-1 27 #43	153-87-1 28 #63
BE ppm :	1.1	0.9	1.2	1.1	1.1	1.4	1.1	6.0
CO ppm :	7	12	17	14	14	16	32	37
CR ppm :	25	46	38	17	22	16	62	380
CU ppm :	12	17	150	30	31	25	7	71
LA ppm :	8	8	11	12	12	16	17	32
NI ppm :	5	21	23	2	5	2	15	300
V ppm :	59	72	100	120	130	80	320	130
YB ppm :	0.5	0.5	1.0	1.5	1.5	1.4	0.9	3.9
ZN ppm :	45	35	77	96	95	74	94	150

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION  
ICP-ES LABORATORY

DATE: 2 MARCH 88

LAB. NO.	129	130	131
SAMPLE NO:	153-87-1	153-87-1	153-87-1
	29 #81	30 #101	31 #108
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BE	ppm :	1.5	6.6	0.7
CO	ppm :	14	38	15
CR	ppm :	11	390	26
CU	ppm :	18	68	260
LA	ppm :	16	32	7
NI	ppm :	0	300	0
V	ppm :	160	130	83
YB	ppm :	1.9	3.9	1.4
ZN	ppm :	85	150	57

COMMENTS:

\* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE ( ACID + FUSION OF RESIDUE )  
DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.