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Geochemical analyses of copper-silver-bearing rocks in
the Spokane Formation (Belt Supergroup),
Lewis and Clark County, Montana

By

J. J. Connor, J. M. McNeal, and J. G. Crock

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The Spokane Formation (Belt Supergroup) in the Rogers Pass area of western Montana (fig. 1) contains widely scattered deposits of quartzitic copper-silver-bearing rocks, one of which (in Alice Creek) has been mined for its silver content. In 1977-78, 30 samples were collected from seven of these deposits in outcrop (table 1), and 37 more were collected from the Alice Creek mine (table 2). All were analyzed for a large number of elements as part of a general survey of the mineral potential of the Rogers Pass area. In addition to the quartzitic occurrences, three samples of copper-silver-bearing siltite from the transition zone between the Spokane and overlying Empire Formation and four samples of a Proterozoic Z diabasic sill were also collected and analyzed. A geologic map of the Alice Creek mine is given in figure 2, and sampling localities in the mine are shown in figure 3. We thank the operator of the mine, Mr. Leonard Orr, Lincoln, Montana, for permission to publish the map and the mine data.

Many of the samples were split into two parts prior to chemical analysis. In table 1, duplicate analyses are noted by an R instead of a Q in the fourth character of the sample identifier; in table 2, the duplicate analyses are noted by an X added to the sample identifier or, for the last nine samples, an R instead of a Q in the fourth character. In table 1, the fifth character (first number) in the sample identifier is the locality number which appears in figure 1. Most of the tabulated data contain no more than two significant figures.

The analytical methods used in the analysis of these materials are listed in table 3. The analysis for "soluble" copper was adapted from an unpublished procedure developed by G. M. Chaplin, a student metallurgist at Duva Corporation, Tucson, Arizona, in 1967; Sloan (1934) discussed in detail various methods used in such determinations. The procedure adapted here follows:

- 1) Solution (1): Add 100 ml concentrated HCl to 700 ml distilled water. Add 25 g hydroxylamine hydrochloride and mix. Bring to a volume of 1000 ml with distilled water.
- 2) Prewarm shaking water bath to 96 degrees C.
- 3) Weigh 1.000 g of 100-mesh ground sample and 10.0 g of 100-mesh ground, copper-free sand in 125-ml plastic Erlenmeyer flask. Mix by swirling.
- 4) Add 40 ml of solution (1); cap tightly with a plastic thimble.
- 5) Place in shaking water bath. Heat and mix for 40 minutes at 96 degrees C.
- 6) Transfer with water to a 25 X 200-mm culture tube; centrifuge at 2500 rpm for 5 minutes.

- 7) Filter through 40 Whatman filter paper into a 100-ml volumetric flask and bring to volume with water.
- 8) Determine percent acid-soluble copper by atomic absorption. Turn 10-cm burner 30 degrees away from straight alignment; use 30 and 50 parts per million set to 0.300 and 0.500 percent copper, respectively. (1 ppm in solution equals 0.01 percent acid-soluble copper).

The geochemical data in tables 1 and 2 are listed under the standard symbols for the chemical element or compound in percent (%) or parts per million (ppm). Column headings not readily interpretable are:

LONGITUD	=	Longitude
Cu-Sol	=	Acid-soluble copper
T-C	=	Total carbon
Org-C	=	Organic carbon
CO3-C	=	Carbonate carbon
T-Fe2O3	=	Total iron as ferric oxide

A geochemical label ending in "-S" means the element concentration was measured by emission spectrography; a geochemical label ending in "-A" means the element concentration was measured by atomic absorption. Special letters affixed to the concentration data in these tables mean:

N	=	Constituent not detected at lower limit of determination
L	=	Constituent less than given value
G	=	Constituent greater than given value
B	=	Blank, no data.

The sample locality is given by north latitude and west longitude in degrees, minutes, and seconds.

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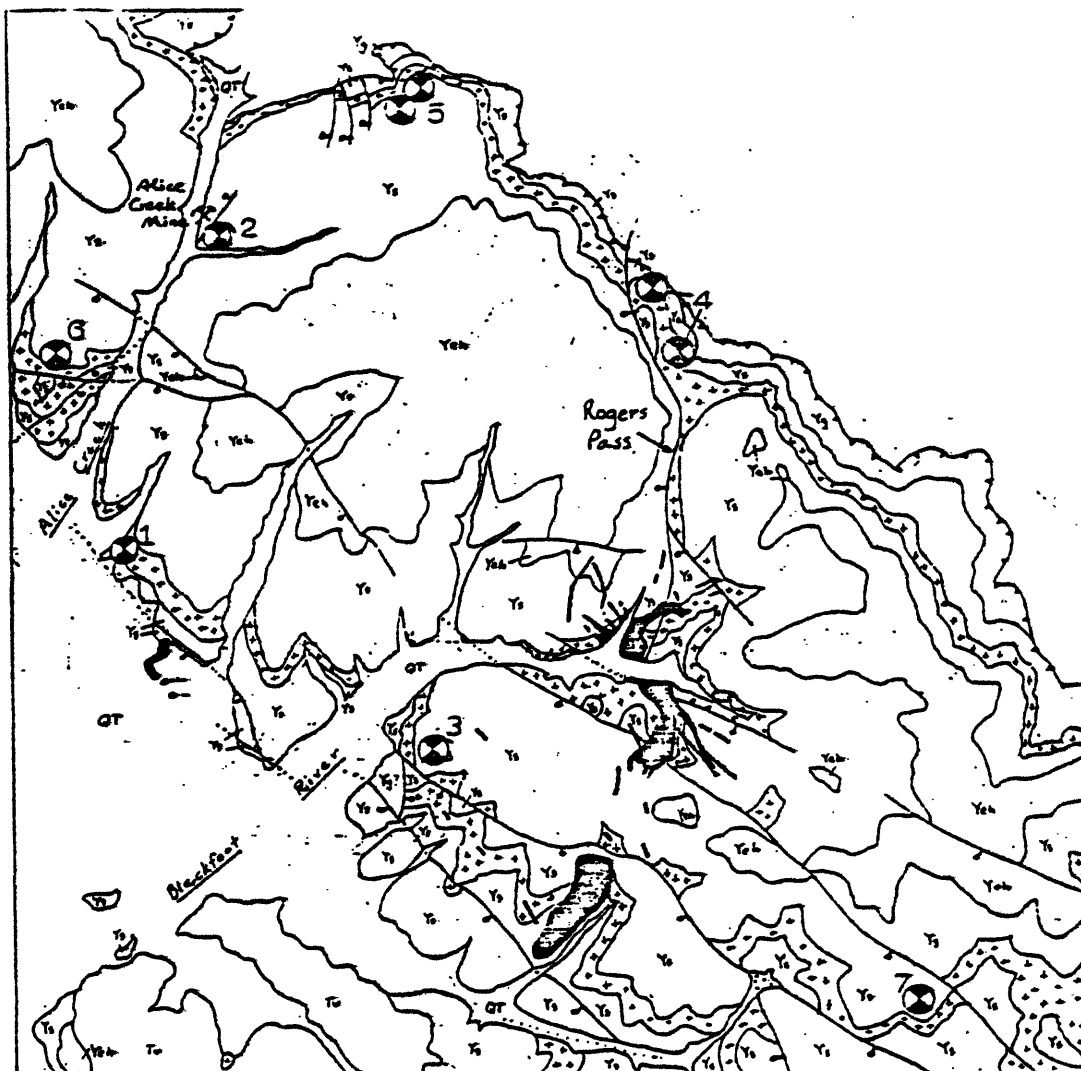
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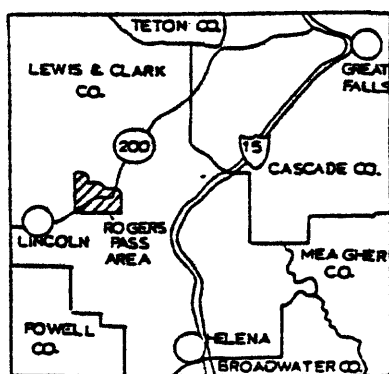
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0 5 10 KM
SCALE



EXPLANATION

Quaternary-Tertiary

QT UNCONSOLIDATED SEDIMENTS

Tertiary

Tv VOLCANICS

M MONZONITE

Proterozoic Y

Yeh EMPIRE, HELENA FMS

Ys SPOKANE FM
(PATTERN: DIABASIC SILL OF
PROTEROZOIC Z AGE)

Yg GREYSON FM

Geologic contact

Fault
(DOTTED WHERE CONCEALED;
BAR & BALL ON DOWNTOWN
SIDE)

Thrust fault
(TEETH ON UPTHROWN SIDE)

Sampling locality

Figure 1.--Index map showing location of Rogers Pass area (patterned), western Montana, and geologic map showing distribution of the Spokane Formation (Belt Supergroup) and sampling localities in the Rogers Pass area, western Montana. (Geologic base from Whipple, 1979.)

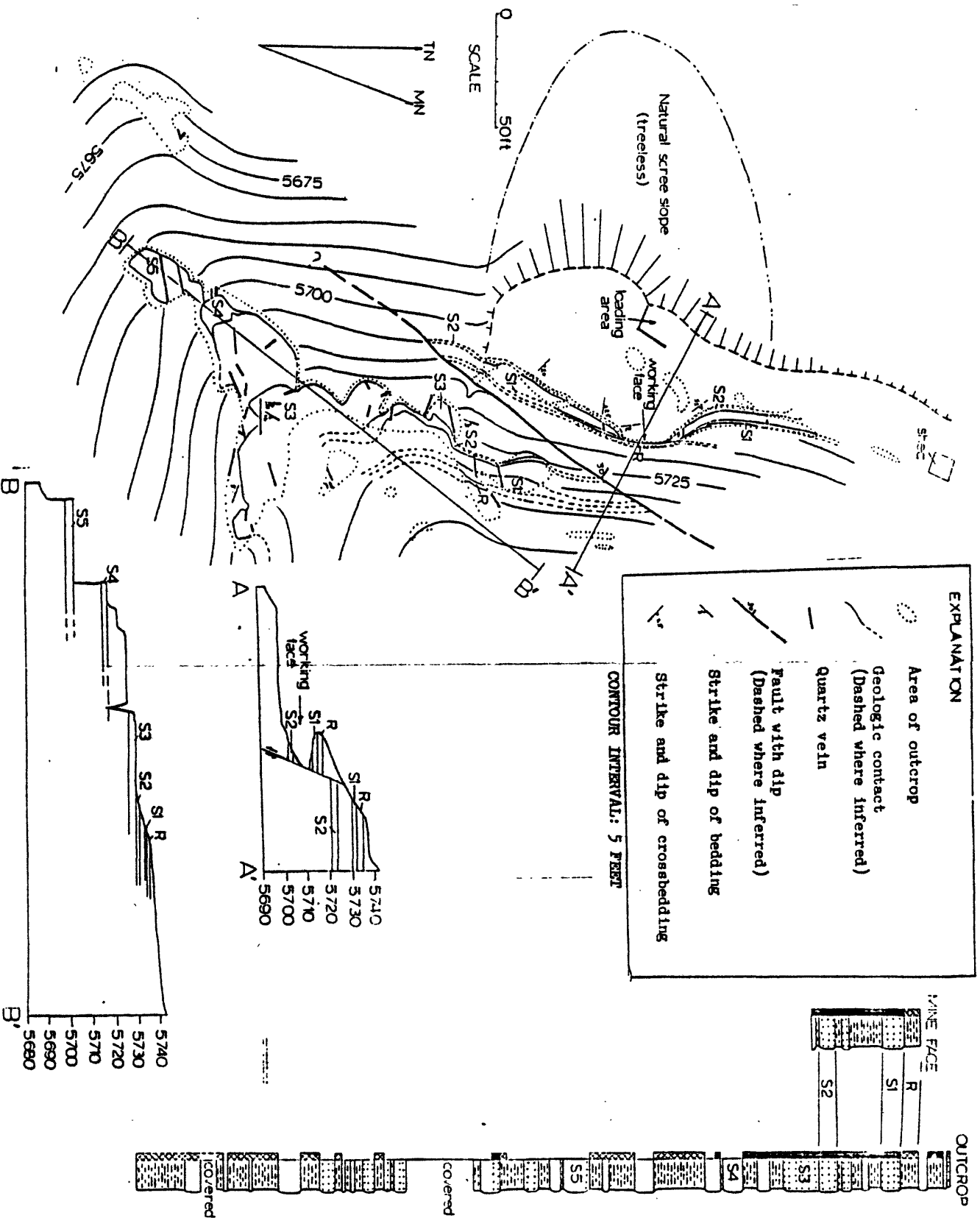


Figure 2.--Geologic map and section of the Alice Creek mine.

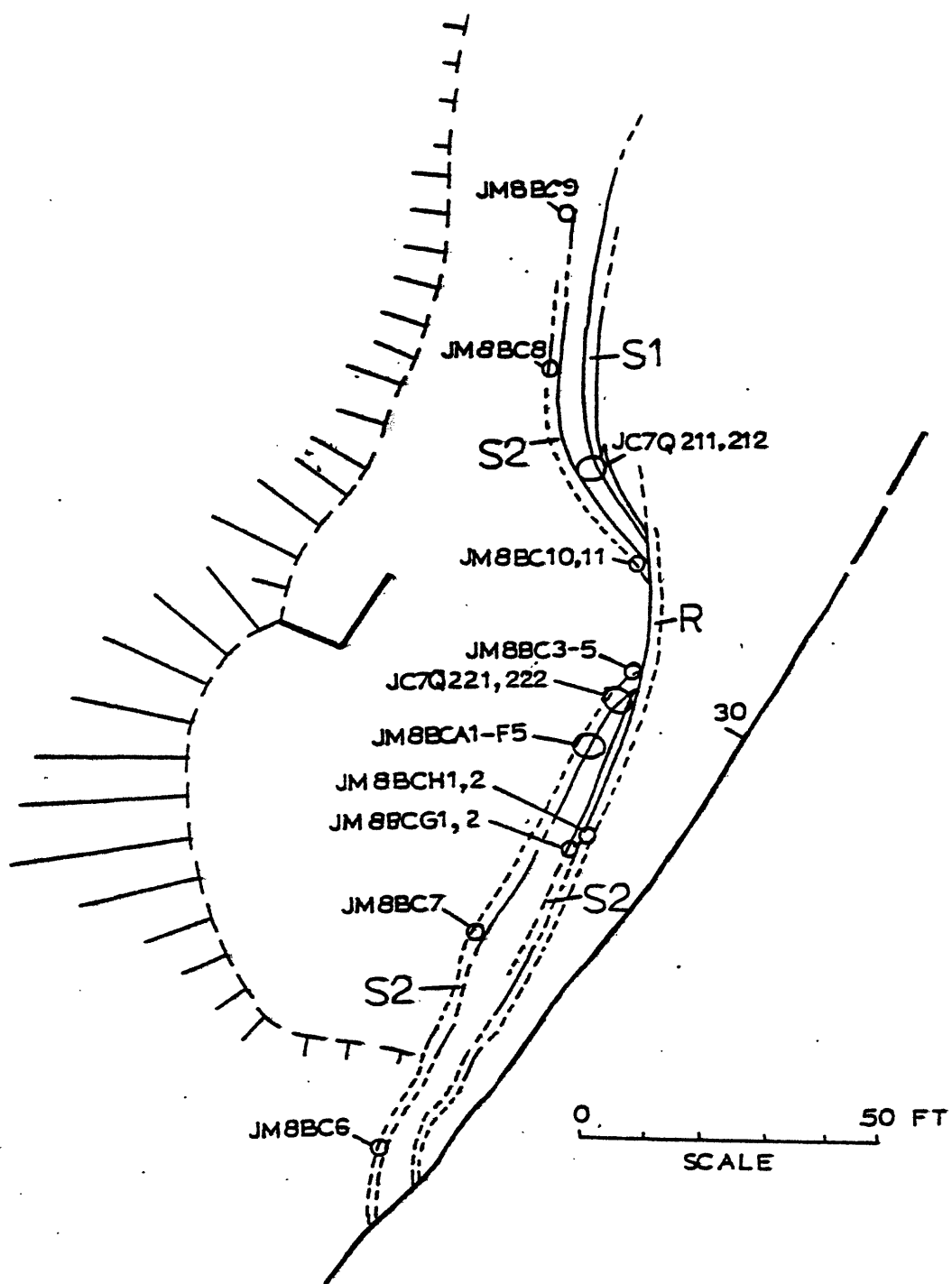


Figure 3.--Sampling localities in the Alice Creek Mine.
(Geology from fig. 2).

Table 1.--Samples from outcrop CR in fourth character of sample number indicates duplicate analysis--continued

LAB. NO.	SAMPLE	LATITUDE	LONGITUD	SiO ₂ %	Si% _S	Al ₂ O ₃ %	Al% _S	Na% _S	K ₂ O%	K% _S
Samples from Proterozoic 2 sill										
193991	JC7a1S	47 02 00N	112 25 30W	48.0000	18.0000	12.0000	7.1000	1.5000	0.6000	0.5600
193967	JC7a4S	47 06 00N	112 22 30W	50.0000	18.0000	12.0000	6.8000	0.9900	0.5000	0.3600
194003	JC7a6S	47 05 00N	112 22 30W	46.3500	16.0000	9.8820	5.7000	1.6000	0.2451	0.3000
193984	JC7a7S	47 05 00N	112 22 30W	49.0000	18.0000	12.0000	5.3000	1.3000	0.5000	0.4200
Samples from Proterozoic 2 sill--continued										
LAB. NO.	SAMPLE	Cu ppm-S	Cu% _A	Cu% _{Sol}	Ag ppm-S	Ag ppm-A	Sulfur%	Sulfidex	Pb ppm-S	Zn ppm-S
193991	JC7a1S	370.0000	0.00008	0.00008	0.4600L	0.00008	0.3000	0.00008	8.1000	160.0000
193967	JC7a4S	240.0000	0.00008	0.00008	0.4600L	0.00008	0.2000	0.00003	5.4000	140.0000
194003	JC7a6S	290.0000	0.00008	0.00008	1.6000	0.00008	0.1506	0.00008	8.1000	110.0000
193984	JC7a7S	360.0000	0.00008	0.00008	0.4600L	0.00008	0.2000	0.00003	19.0000	130.0000
Samples from Proterozoic 2 sill--continued										
LAB. NO.	SAMPLE	Hg ppm	As ppm	Ge ppm	Ge ppm-S	Sb ppm	Sb ppm-S	Se ppm	Cd ppm-S	Mo ppm-S
193991	JC7a1S	0.00008	0.00008	0.00008	0.4600L	0.00008	22.0000L	0.00008	10.0000L	9.9000
193967	JC7a4S	0.00008	0.00008	0.00008	0.4600L	0.00008	22.0000L	0.00003	10.0000L	8.5000
194003	JC7a6S	0.00008	0.00008	0.00008	0.5400	0.00008	22.0000L	0.00008	10.0000L	11.0000
193984	JC7a7S	0.00008	0.00008	0.00008	0.4600L	0.00008 ,	22.0000L	0.00008	10.0000L	12.0000
Samples from Proterozoic 2 sill--continued										
LAB. NO.	SAMPLE	T-C %	Org-C %	CO ₃ -C %	CaO%	Ca% _S	Mg% _S	Str ppm-S	Ba ppm-S	P ₂ O ₅ %
193991	JC7a1S	0.00008	0.00008	0.00008	6.8000	5.9000	3.0000	120.0000	120.0000	0.00008
193967	JC7a4S	0.00008	0.00008	0.00008	7.2000	5.5000	2.8000	120.0000	92.0000	0.00008
194003	JC7a6S	0.00008	0.00008	0.00008	6.6140	5.4000	3.2000	110.0000	2.2000L	0.00008
193984	JC7a7S	0.00008	0.00008	0.00008	6.2000	4.0000	2.9000	130.0000	65.0000	0.00008

Table 1.--Samples from outcrop in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	Ti-Fe2O3%	Fe2-S	FeO%	Mn ppm-S	TiO2%	Ti%-S	Zr ppm-S	Ni ppm-S	Cr ppm-S
Samples from Proterozoic 2 sill-continued										
193991	JC701S	13.0000	9.5000	0.00008	1700.0000	2.4000	2.20006	190.0000	55.0000	49.0000
193967	JC704S	13.0000	9.5000	0.00008	1400.0000	2.2000	1.1000	110.0000	54.0000	84.0000
194003	JC706S	13.2700	6.1000	13.9000	1900.0000	2.1890	2.20006	170.0000	56.0000	71.0000
193984	JC707S	13.0000	11.0000	0.00008	1700.0000	2.3000	2.20006	190.0000	54.0000	83.0000
LAB. NO. SAMPLE B ppm-S Be ppm-S Ce ppm-S Co ppm-S Ga ppm-S Er ppm-S Eu ppm-S Dy ppm-S Gd ppm-S										
Samples from Proterozoic 2 sill-continued										
193991	JC701S	24.0000	1.0000L	46.0000L	49.0000	11.0000	5.3000	2.8000	10.0000L	14.0000
193967	JC704S	18.0000	1.0000L	46.0000L	37.0000	8.4000	4.6000L	3.0000	10.0000L	2.2000L
194003	JC706S	16.0000	1.0000L	46.0000L	44.0000	11.0000	9.3000	1.0000L	10.0000L	4.1000
193984	JC707S	32.0000	1.0000L	46.0000L	37.0000	8.6000	4.6000L	2.9000	10.0000L	2.2000L
LAB. NO. SAMPLE La ppm-S Li-S Nb ppm-S Nd ppm-S Pr ppm-S Sc ppm-S Sm-S Sn ppm-S Sn ppm										
Samples from Proterozoic 2 sill-continued										
193991	JC701S	16.0000	103.0000L	5.2000	46.0000L	46.0000L	4.6000L	46.0000L	4.6000L	0.00008
193967	JC704S	10.0000L	103.0000L	4.6000L	46.0000L	46.0000L	4.6000L	46.0000L	4.6000L	0.00008
194003	JC706S	10.0000L	103.0000L	5.5000	46.0000L	46.0000L	39.0000	46.0000L	4.6000L	0.00008
193984	JC707S	10.0000L	103.0000L	4.6000L	46.0000L	46.0000L	4.6000L	46.0000L	4.6000L	0.00008
LAB. NO. SAMPLE Tb ppm-S Th ppm Tm-S U ppm V ppm-S Y ppm-S Yb ppm-S										
Samples from Proterozoic 2 sill-continued										
193991	JC701S	22.0000L	3.00008	2.2000L	0.00008	390.0000	40.0000	2.9000		
193967	JC704S	22.0000L	0.00008	2.2000L	0.00008	310.0000	33.0000	2.2000		
194003	JC706S	22.0000L	3.00008	2.2000L	0.00008	280.0000	43.0000	2.7000		
193984	JC707S	22.0000L	0.00008	2.2000L	0.00008	370.0000	29.0000	2.0000		

Table 1.--Samples from Quartzite CR in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	La ppm-S	Li-S	Nb ppm-S	Nd ppm-S	Pr ppm-S	Sc ppm-S	Sm-S	Sn ppm-S	Sn ppm
Samples of quartzitic rocks in Spokane formation-continued										
193986	JC7a111	43.0000	103.0000L	17.0000	46.0000L	46.0000L	4.6000	46.0000L	4.6000L	0.30008
193971	JC7a112	26.0000	103.0000L	16.0000	47.0000	46.0000L	3.3000	46.0000L	4.6000L	0.00008
193999	JC7a112	38.0000	103.0000L	22.0000	46.0000L	46.0000L	5.3000	46.0000L	4.6000L	0.30008
193960	JC7a121	20.0000	103.0000L	15.0000	56.0000	46.0000L	3.8000	46.0000L	4.6000L	0.3000
193963	JC7a121	19.0000	103.0000L	11.0000	46.0000L	46.0000L	3.4000	46.0000L	4.6000L	0.5000
193995	JC7a122	13.0000	103.0000L	13.0000	46.0000L	46.0000L	2.6000	46.0000L	4.6000L	0.7000
193994	JC7a211	20.0000	103.0000L	14.0000	67.0000	46.0000L	2.9000	46.0000L	4.6000L	0.4000
193998	JC7a211	33.0000	103.0000L	11.0000	63.0000	46.0000L	3.3000	46.0000L	4.6000L	0.4000
193961	JC7a212	25.0000	103.0000L	12.0000	73.0000	46.0000L	3.8000	46.0000L	4.6000L	0.6000
193985	JC7a221	12.0000	103.0000L	5.7000	46.0000L	46.0000L	2.0000	46.0000L	4.6000L	0.2000L
193966	JC7a221	18.0000	103.0000L	9.6000	46.0000L	46.0000L	2.2000	46.0000L	4.6000L	0.2000L
193968	JC7a222	27.0000	103.0000L	12.0000	46.0000L	46.0000L	4.2000	46.0000L	4.6000L	0.8000
193993	JC7a311	19.0000	103.0000L	18.0000	50.0000	51.0000	2.7000	46.0000L	4.6000L	0.2000
193970	JC7a312	10.0000	103.0000L	5.5000	46.0000L	46.0000L	1.6000	46.0000L	4.6000L	0.2000L
193992	JC7a321	12.0000	103.0000L	9.9000	46.0000L	46.0000L	2.6000	46.0000L	4.6000L	4.9000
193990	JC7a322	12.0000	103.0000L	7.1000	46.0000L	46.0000L	1.6000	46.0000L	4.6000L	0.2000
194001	JC7a322	14.0000	103.0000L	6.6000	46.0000L	46.0000L	2.5000	46.0000L	4.6000L	0.7000
193975	JC7a411	30.0000	103.0000L	13.0000	46.0000L	68.0000L	5.1000	46.0000L	4.6000L	0.8000
193990	JC7a412	12.0000	103.0000L	11.0000	46.0000L	46.0000L	1.9000	46.0000L	4.6000L	0.3000
193988	JC7a412	23.0000	103.0000L	12.0000	46.0000L	46.0000L	1.9000	46.0000L	4.6000L	0.5000
193989	JC7a421	20.0000	103.0000L	5.5000	46.0000L	46.0000L	3.6000	46.0000L	4.6000L	1.3000
193965	JC7a422	21.0000	103.0000L	9.2000	46.0000L	46.0000L	2.2000	46.0000L	4.6000L	0.7000
193962	JC7a422	23.0000	103.0000L	7.5000	46.0000L	46.0000L	2.0000	46.0000L	4.6000L	1.3000
193976	JC7a511	11.0000	103.0000L	7.1000	87.0000	53.0000	3.4000	46.0000L	4.6000L	0.6000
193972	JC7a512	4.6000L	103.0000L	7.2000	46.0000L	46.0000L	1.8000	46.0000L	4.6000L	0.5000
193996	JC7a512	5.5000	103.0000L	6.6000	46.0000L	46.0000L	1.8000	46.0000L	4.6000L	0.6000
193981	JC7a521	17.0000	103.0000L	6.7000	46.0000L	46.0000L	3.0000	46.0000L	4.6000L	0.5000
194000	JC7a522	6.9000	103.0000L	7.5000	46.0000L	46.0000L	1.6000	46.0000L	4.6000L	0.2000L
205862	JC8a611	35.0000	103.0000	18.0000	77.0000	60.0000L	8.7000	46.0000L	4.6000L	1.9000
205885	JC8a612	37.0000	103.0000L	12.0000	67.0000	60.0000L	8.7000	46.0000L	4.6000L	1.1000
205851	JC8a621	17.0000	103.0000L	14.0000	61.0000	60.0000L	3.8000	46.0000L	4.6000L	0.2000L
205850	JC8a621	21.0000	103.0000L	12.0000	63.0000	60.0000L	4.0000	46.0000L	4.6000L	0.4000
205878	JC8a622	35.0000	103.0000L	19.0000	46.0000L	60.0000L	9.4000	46.0000L	4.6000L	1.1000
205846	JC8a711	22.0000	103.0000L	12.0000	46.0000L	60.0000L	5.5000	46.0000L	4.6000L	0.2000L
205871	JC8a711	29.0000	103.0000L	17.0000	46.0000L	60.0000L	8.2000	46.0000L	4.6000L	15.0000
205835	JC8a712	39.0000	103.0000L	20.0000	46.0000L	60.0000L	5.7000	46.0000L	4.6000L	1.4000
205882	JC8a721	38.0000	103.0000L	22.0000	48.0000	60.0000L	8.6000	46.0000L	4.6000L	2.5000
205868	JC8a722	21.0000	103.0000L	16.0000	46.0000L	60.0000L	5.7000	46.0000L	4.6000L	1.0000
193987	JC7a521X	65.0000	103.0000L	7.4000	46.0000L	46.0000L	10.0000	46.0000L	4.6000L	0.30008
193959	JC7a521X	13.0000	103.0000L	6.4000	79.0000	46.0000L	2.4000	46.0000L	4.6000L	0.30008
193983	JC7a521X	31.0000	103.0000L	15.0000	46.0000L	59.0000	5.5000	46.0000L	4.6000L	0.30008
Samples from Spokane-Empire transition-continued										
193977	JC7a611	13.0000	103.0000L	5.7000	46.0000L	46.0000L	3.2000	46.0000L	2.2000L	0.30008
193997	JC7a612	33.0000	103.0000L	9.8000	46.0000L	46.0000L	7.9000	46.0000L	4.6000L	0.30008
193978	JC7a611X	4.6000L	103.0000L	4.6000L	46.0000L	46.0000L	1.3000	46.0000L	4.7000	0.30008

Table 1.--Samples from quartzite in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	Tb ppm-S	Th ppm	Tm-S	U ppm	V ppm-S	Y ppm-S	Yb ppm-S
Samples of quartzitic rocks in Spokane formation-continued								
193986	JC7Q111	26.0000	3.0000B	2.2000L	0.0000B	25.0000	46.0000	2.6000
193971	JC7Q112	22.0000L	3.0000B	2.2000L	0.0000B	24.0000	28.0000	2.5000
193999	JC7R112	22.0000L	3.0000B	2.2000L	0.0000B	32.0000	48.0000	3.3000
193960	JC7Q121	22.0000L	8.6500	2.2000L	2.7500	40.0000	21.0000	1.3000
193963	JC7R121	22.0000L	13.4000	2.2000L	2.6900	37.0000	24.0000	1.3000
193995	JC7Q122	22.0000L	7.9200	2.2000L	2.1500	23.0000	22.0000	1.4000
193994	JC7Q211	22.0000L	7.0400	2.2000L	1.8600	18.0000	30.0000	1.8000
193998	JC7R211	22.0000L	8.9300	2.2000L	1.8000	20.0000	37.0000	2.0000
193961	JC7Q212	22.0000L	8.4900	2.2000L	2.2500	22.0000	33.0000	1.9000
193985	JC7Q221	22.0000L	5.3700	2.2000L	1.5400	12.0000	21.0000	1.3000
193966	JC7R221	22.0000L	6.4600	2.2000L	1.6100	12.0000	30.0000	1.5000
193968	JC7Q222	22.0000L	8.4900	2.2000L	2.0000	20.0000	35.0000	1.8000
193993	JC7Q311	22.0000L	8.0200	2.2000L	1.9000	11.0000	29.0000	1.7000
193970	JC7Q312	22.0000L	4.3700	2.2000L	1.3600	4.9000	14.0000	0.9400
193992	JC7Q321	22.0000L	6.4100	2.2000L	1.7500	18.0000	24.0000	1.4000
193980	JC7Q322	22.0000L	5.8900	2.2000L	1.5900	8.1000	21.0000	1.2000
194001	JC7R322	25.0000	7.0400	2.2000L	1.6200	13.0000	27.0000	1.6000
193975	JC7Q411	23.0000	8.9300	2.2000L	1.7000	17.0000	23.0000	1.6000
193990	JC7Q412	27.0000	9.2100	2.2000L	4.0400	8.0000	85.0000	4.2000
193988	JC7R412	22.0000L	8.6800	2.2000L	3.0500	8.4000	50.0000	2.1000
193989	JC7Q421	22.0000L	7.8300	2.2000L	1.6900	15.0000	23.0000	1.7000
193965	JC7R422	22.0000L	7.6500	2.2000L	1.5900	6.1000	20.0000	1.4000
193982	JC7Q511	22.0000L	5.3300	2.2000L	1.6300	5.9000	23.0000	1.2000
193976	JC7Q512	22.0000L	8.7000	2.2000L	1.6300	8.2000	17.0000	1.4000
193972	JC7R512	22.0000L	7.8800	2.2000L	1.4800	8.9000	17.0000	1.2000
193996	JC7Q521	22.0000L	5.0700	2.2000L	1.6700	20.0000	25.0000	1.5000
193981	JC7Q522	22.0000L	5.0500	2.2000L	1.9700	11.0000	17.0000	1.0000
194000	JC8Q611	22.0000L	9.2300	2.7000	2.3200	22.0000	17.0000	1.7000
205862	JC8Q612	22.0000L	9.6100	2.2000L	2.0300	20.0000	22.0000	1.9000
205885	JC8Q621	22.0000L	7.5200	3.7000	1.8400	11.0000	17.0000	1.2000
205850	JC8R621	22.0000L	7.3300	2.8000	2.1900	13.0000	14.0000	1.4000
205878	JC8Q622	22.0000L	10.3000	2.2000L	3.2100	27.0000	23.0000	1.8000
205846	JC8Q711	22.0000L	12.4000	2.2000L	2.5900	20.0000	15.0000	1.5000
205871	JC8R711	22.0000L	9.0500	2.2000L	2.7400	27.0000	22.0000	1.9000
205835	JC8Q712	22.0000L	5.1000L	3.6000	14.9000	19.0000	25.0000	1.6000
205882	JC8Q721	22.0000L	11.1000	2.2000L	2.7400	24.0000	21.0000	2.0000
205868	JC8Q722	22.0000L	7.5500	3.8000	1.9500	17.0000	17.0000	1.4000
193987	JC7Q421X	22.0000L	3.0000B	2.2000L	0.0000B	93.0000	51.0000	3.2000
193959	JC7Q521X	53.0000	3.0000B	2.2000L	0.0000B	18.0000	29.0000	1.6000
193983	JC7R521X	22.0000L	3.0000B	2.2000L	0.0000B	32.0000	30.0000	2.0000
Samples from Spokane-Empire transition-continued								
193977	JC7Q611	22.0000L	3.0000B	2.2000L	0.0000B	16.0000	16.0000	0.6700
193997	JC7Q612	22.0000L	3.0000B	2.2000L	0.0000B	52.0000	41.0000	2.5000
193978	JC7Q611X	22.0000L	3.0000B	2.2000L	0.0000B	3.1000	8.4000	0.4600L

Table 1.--Samples from OUTCROP CR in fourth character of sample number indicates duplicate analysis--continued

LAB. NO.	SAMPLE	T-Fe2O3%	FeO-S	FeO%	Mn ppm-S	tiO2%	ti2-S	Zr ppm-S	NI ppm-S	Cr ppm-S
Samples of quartzitic rocks in Spokane formation--continued										
193986	JC70111	0.7000	3.7400	0.00008	41.0000	0.5000	0.3100	920.0000	4.3000	25.3000
193971	JC70112	0.9000	3.9500	0.00008	69.0000	0.5000	0.2500	410.0000	5.6000	25.0000
193999	JC70112	1.1620	3.9300	0.00008	89.0000	0.5760	0.6800	1000.00006	6.1300	15.3000
193960	JC70121	1.7000	1.6000	0.00008	97.0000	0.3000	0.2200	360.0000	7.1000	22.3000
193963	JC70121	2.1000	1.9000	0.00008	110.0000	0.3000	0.2200	430.0000	11.0300	21.3000
193995	JC70122	0.7000	3.8600	0.00008	61.0000	0.3000	0.1800	340.0000	3.3000	13.0000
193994	JC70211	1.0000	3.7900	0.00008	79.0000	0.3000	0.1600	280.0000	5.4000	13.3000
193998	JC70211	0.9000	3.9900	0.00008	70.0000	0.3000	0.2100	320.0000	5.2000	27.0000
193961	JC70212	1.5000	1.3000	0.00008	120.0000	0.4000	0.1800	320.0000	11.0300	10.3000
193985	JC70221	0.7000	3.6000	0.00008	83.0000	0.3000	0.1300	200.0000	1.5000	18.0000
193966	JC70221	0.8000	0.7000	0.00008	47.0000	0.3000	0.1300	210.0000	1.9300	16.3000
193968	JC70222	1.2000	3.9100	0.00008	70.0000	0.4000	0.2200	380.0000	5.6000	35.0000
193993	JC70311	0.6000	3.6300	0.00008	28.0000	0.5000	0.1800	410.0000	2.8300	19.3000
193970	JC70312	0.3000	3.2800	0.00008	19.0000	0.3000	0.0640	160.0000	3.9000	8.1000
193992	JC70321	0.9000	3.8900	0.00008	68.0000	0.4000	0.1700	220.0000	7.2000	22.3000
193980	JC70322	0.5000	3.4400	0.00008	52.0000	0.4000	0.0910	260.0000	2.3000	10.3000
194001	JC70322	0.5082	3.6100	0.00008	82.0000	0.3552	0.1500	400.0000	3.7000	16.3000
193975	JC70411	1.2000	1.2000	0.00008	110.0000	0.3000	0.2400	300.0000	6.6000	17.0000
193990	JC70412	0.3000	3.2600	0.00008	36.0000	0.3000	0.0950	370.0000	1.5300	13.3000
193988	JC70412	0.3000	3.3700	0.00008	53.0000	0.3000	0.1200	440.0000	1.6000	16.0000
193989	JC70421	0.9000	3.9400	0.00008	85.0000	0.3000	0.1600	250.0000	8.9300	11.3000
193965	JC70422	0.4000	3.3600	0.00008	61.0000	0.2000	0.1200	280.0000	4.3000	23.3000
193982	JC70422	0.4000	3.3400	0.00008	72.0000	0.2000	0.1200	300.0000	2.4300	14.3000
193976	JC70511	1.1000	1.0000	0.00008	120.0000	0.3000	0.1900	200.0000	7.2000	14.3000
193972	JC70512	0.5000	3.4600	0.00008	20.0000	0.2000	0.1100	380.0000	1.5300	14.3000
193996	JC70512	0.5000	3.4800	0.00008	26.0000	0.2000	0.1300	260.0000	2.2000	13.3000
193981	JC70521	1.0000	3.9900	0.00008	71.0000	0.3000	0.1500	150.0000	4.7000	27.3000
194000	JC70522	0.4321	3.4600	0.00008	57.0000	0.2283	0.0980	89.0000	3.0000	16.0000
205862	JC80611	1.3100	3.9300	0.5100	170.0000	0.4000	0.2200	220.0000	8.0000	23.3000
205865	JC80612	2.0900	1.1000	1.2700	660.0000	0.3200	0.2000	240.0000	14.0000	20.3000
205851	JC80621	0.4100	3.4000	0.2800	80.0000	0.2500	0.1300	180.0000	3.5300	6.9000
205850	JC80621	0.7600	3.5500	0.5300	120.0000	0.2800	0.1300	140.0000	4.6000	9.9000
205878	JC80622	2.2500	1.2000	1.5300	140.0000	0.4400	0.2300	280.0000	15.0000	26.3000
205846	JC80711	2.5500	1.2000	1.5300	260.0000	0.4200	0.1300	180.0000	12.0000	20.3000
205871	JC80711	2.5200	1.4000	1.3400	320.0000	0.4200	0.2200	250.0000	16.0300	28.3000
205835	JC80712	1.0700	3.8300	0.5300	360.0000	0.3100	0.1900	240.0000	10.0000	19.3000
205882	JC80721	2.9100	1.5000	1.8400	230.0000	0.4400	0.2800	230.0000	17.0300	28.3000
205868	JC80722	1.7600	3.9200	1.3100	310.0000	0.3100	0.1600	170.0000	15.0000	24.0000
193987	JC70421X	3.5000	2.7000	0.00008	170.0000	0.7000	0.4500	320.0000	21.0000	43.3000
193959	JC70521X	1.3000	1.1000	0.00008	130.0000	0.2000	0.1200	290.0000	14.0000	16.3000
193983	JC70521X	2.1000	1.5000	0.00008	210.0000	0.4000	0.2300	370.0000	19.0000	19.3000
Samples from Spokane-Empire transition--continued										
193977	JC70611	3.2000	2.6000	0.00008	3600.0000	0.1000	0.0220L	110.0000	7.3000	7.1000
193977	JC70612	2.2000	1.6000	0.00008	1800.0000	0.4000	0.2500	320.0000	15.0000	25.0000
193978	JC70611X	0.3000	3.3000	0.00008	1000.0000	0.2000	0.0063	54.0000	2.5300	1.5000

Table 1.--Samples from outcrop in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	B ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Ga ppm-S	Er ppm-S	Eu ppm-S	Dy ppm-S	Gd ppm-S
Samples of quartzitic rocks in Spokane formation-continued										
193986	JC7a111	48.0000	1.2000	61.0000	2.0000	2.2000L	6.2000	2.2000	10.0300L	17.3000
193971	JC7a112	46.0000	1.3000	46.0000L	1.9000	2.2000L	4.6000L	1.5000	10.0000L	2.2000L
193999	JC7R112	50.0000	1.4000	58.0000	2.9000	2.2000L	6.7000	1.0000L	11.0000	10.3000
193960	JC7a121	34.0000	1.3000	46.0000L	4.2000	2.2000L	5.1000	1.2000	10.0000L	11.0000
193963	JC7R121	32.0000	1.6000	46.0000L	4.6000	2.2000L	5.6000	1.0000L	10.0300L	2.2000L
193995	JC7a122	18.0000	1.2000	46.0000L	2.9000	2.2000L	4.8000	1.5000	10.0000L	10.0000
193994	JC7a211	11.0000	1.6000	46.0000L	3.2000	2.2000L	6.2000	1.5000	10.0300	2.2000L
193998	JC7R211	15.0000	1.4000	46.0000L	2.8000	2.2000L	6.0000	2.1000	11.0000	3.6000
193961	JC7a212	18.0000	1.2000	46.0000L	7.0000	2.2000L	6.4000	2.2000	10.0300L	5.7000
193965	JC7a221	5.0000L	1.0000L	46.0000L	1.4000	2.2000L	5.9000	2.1000	10.0000L	5.7000
193966	JC7R221	5.0000L	1.2000	46.0000L	1.2000	2.2000L	4.6000L	2.2000	10.0300L	2.8000
193968	JC7a222	13.0000	1.1000	46.0000L	3.5000	2.2000L	5.8000	1.0000L	11.0300	13.0000
193970	JC7a311	5.0000L	1.2000	46.0000L	0.8100	2.2000L	6.5000	2.0000	10.0300L	14.3000
193973	JC7a312	5.0000L	1.0000L	46.0000L	0.4600L	2.2000L	4.6000L	2.4000	10.0000L	3.9000
193992	JC7a321	12.0000	1.9000	46.0000L	3.1000	2.2000L	5.4000	1.9000	10.0000L	11.3000
193980	JC7a322	5.0000L	1.2000	46.0000L	1.5000	2.2000L	5.5000	2.1000	10.0000L	2.2000L
194001	JC7R322	5.0000L	1.5000	46.0000L	2.5000	2.2000L	5.0000	1.0000L	10.0300L	4.4000
193975	JC7a411	8.6000	1.7000	63.0000	3.4000	2.2000L	4.6000L	1.0000L	10.0000L	7.4000
193990	JC7R412	5.0000L	1.0000L	46.0000L	0.6900	2.2000L	7.0000	2.3000	10.0300	2.2000L
193988	JC7R412	5.0000L	1.0000L	46.0000L	0.8700	2.2000L	6.1000	1.0000L	10.0000L	2.2000L
193989	JC7a421	12.0000	1.2000	46.0000L	5.6000	2.2000L	6.4000	1.9000	10.0000L	2.2000L
193965	JC7a422	5.0000L	1.0000L	46.0000L	1.4000	2.2000L	4.7000	1.8000	10.0000L	2.2000L
193976	JC7R511	13.0000	1.1000	46.0000L	3.4000	2.2000L	6.2000	1.6000	10.0000L	6.4000
193972	JC7a512	6.8000	1.0000L	46.0000L	0.7100	2.2000L	4.6000L	2.3000	10.0300L	2.2000L
193996	JC7R512	5.0000L	1.0000L	46.0000L	0.8500	2.2000L	6.1000	1.3000	10.0000L	2.2000L
193981	JC7a521	11.0000	1.4000	46.0000L	2.8000	2.2000L	4.9000	1.3000	10.0000L	4.6000
194000	JC7R522	5.0000L	1.0000L	46.0000L	2.2000	2.2000L	5.3000	1.0000L	10.0000L	2.2000L
205862	JC8a611	29.0000	1.0000L	96.0000	4.7000	4.2000	4.6000L	1.0000L	10.0000L	11.3000
205885	JC8a612	5.0000L	1.2000	100.0000	12.0000	4.4000	4.6000L	1.8000	10.0300L	5.7000
205851	JC8a621	5.0000L	1.0000L	58.0000	1.9000	2.2000L	4.6000L	2.4000	10.0300L	21.3000
205850	JC8R621	5.0000L	1.0000L	68.0000	2.7000	2.2000L	4.6000L	2.9000	10.0000L	13.0000
205878	JC8a622	21.0000	1.0000	99.0000	8.6000	5.0000	4.6000L	1.8000	10.0300L	11.3000
205846	JC8R711	15.0000	1.0000L	52.0000	6.1000	2.4000	4.6000L	2.7000	10.0000L	15.0000
205871	JC8R711	32.0000	1.1000	110.0000	8.4000	4.9000	4.6000L	1.8000	10.0300L	8.3000
205835	JC8a712	16.0000	2.3000	120.0000	6.7000	3.4000	4.6000L	4.4000	12.0000	8.0000
205882	JC8a721	24.0000	1.0000L	100.0000	13.0000	5.0000	4.6000L	1.0000L	10.0300L	10.3000
205868	JC8a722	9.0000	1.0000L	60.0000	6.3000	2.6000	4.6000L	1.0000L	10.0000L	13.0000
193987	JC7a421x	30.0000	2.0000	74.0000	9.9000	10.0000	7.8000	2.8000	10.0300L	15.3000
193959	JC7a521x	5.0000L	1.6000	46.0000L	8.1000	2.2000L	5.1000	1.4000	10.0000L	2.2000L
193983	JC7R521x	36.0000	1.6000	46.0000L	11.0000	4.4000	6.3000	1.7000	10.0300L	2.2000L
Samples from Spokane-Empire transition-continued										
193977	JC7a611	18.0000	1.1000	46.0000L	11.0000	2.2000L	8.8000	1.4000	10.0300L	2.2000L
193997	JC7a612	83.0000	1.3000	59.0000	11.0000	4.5000	6.7000	2.4000	10.0000L	2.2000L
193978	JC7a611x	5.0000L	1.0000L	46.0000L	1.5000	2.2000L	4.7000	2.1000	10.0300L	2.2000L

Table 1.--Samples from outcrop in fourth character of sample number indicates duplicate analysis--continued

LAB. NO.	SAMPLE	T-C %	Org-C %	CO ₃ -C %	CaOx	Ca ²⁺ -S	Mg ²⁺ -S	Sr ppm-S	Ba ppm-S	P2O ₅ %
Samples of quartzeitic rocks in Spokane formation--continued										
193986	JC7a111	0.0008	3.00008	0.00008	0.1000L	0.1000L	0.1800	310.0000	310.0000	0.30008
193971	JC7a112	0.00008	3.00008	0.00008	0.1000L	0.1000L	0.2200	310.0000	220.0000	0.30008
193999	JC7a112	0.00008	3.00008	0.00008	0.1000L	0.1000L	0.2600	420.0000	310.0300	0.30008
193960	JC7a121	0.0500	3.0500	0.0100L	0.1000L	0.2300	0.3700	97.0000	200.0000	0.3300
193963	JC7a121	0.0500	3.0500	0.0100L	0.1000L	1.7000	0.3300	190.0000	160.0300	0.1000L
193995	JC7a122	0.0300	3.0300	0.0100L	0.1000L	0.2400	0.2300	17.0000	120.0300	0.1000L
193994	JC7a211	0.0200	3.0200	0.0100L	0.1000L	0.1000L	0.2500	120.0000	620.0300	0.1000L
193998	JC7a211	0.0300	3.0300	0.0100L	0.1000L	0.1000L	0.3400	200.0000	790.0000	0.1000L
193961	JC7a212	0.0200	3.0200	0.0100L	0.1000	0.1100	0.7100	94.0000	740.0300	0.2300
193985	JC7a221	0.0200	3.0200	0.0100L	0.1000L	0.1000L	0.0910	160.0000	160.0300	0.1000L
193966	JC7a221	0.0300	3.0300	0.0100L	0.1000L	0.1000L	0.1100	190.0000	710.0300	0.1300
193968	JC7a222	0.0200	3.0200	0.0100L	0.1000L	0.2400	0.3400	95.0000	970.0000	0.2700
193993	JC7a311	0.0100L	3.0100L	0.0100L	0.1000L	0.1000L	0.0980	150.0000	4000.0000	0.1000L
193970	JC7a312	0.0500	3.0500	0.0100L	0.1000L	0.1000L	0.0880	110.0000	3100.0000	0.1000L
193992	JC7a321	0.0200	3.0200	0.0100L	0.1000L	0.2000	0.4500	110.0000	370.0000	0.1000
193980	JC7a322	0.0200	3.0200	0.0100L	0.1000L	0.1000L	0.1900	160.0000	2900.0300	0.1000L
194001	JC7a322	0.0200	3.0200	0.0100L	0.1000L	0.1000L	0.2700	190.0000	3400.0000	0.1000L
193975	JC7a411	0.0300	3.0300	0.0100L	0.1000	0.1600	0.3500	130.0000	310.0000	0.2500
193990	JC7a412	0.0200	3.0200	0.0100L	0.1000L	0.1000L	0.0670	110.0000	620.0000	0.1000L
193988	JC7a412	0.0300	3.0300	0.0100L	0.1000L	0.1000L	0.0860	120.0000	660.0000	0.1000L
193989	JC7a422	0.0200	3.0200	0.0100L	0.1000L	0.1200	0.1300	120.0000	120.0300	0.2200
193965	JC7a422	0.1600	3.0100L	0.1200	0.5000	0.6600	0.1400	120.0000	83.0300	0.1000L
193976	JC7a511	0.0100	3.0100	0.0100L	0.1000	0.1200	0.3700	110.0000	150.0000	0.1200
193972	JC7a512	0.2000	3.0200	0.0100L	0.1000L	0.1900	0.0590	93.0000	410.0000	0.1700
193996	JC7a512	0.0200	3.0200	0.0100L	0.1000L	0.0860L	0.0750	110.0000	300.0300	0.1000L
193981	JC7a521	0.0200	3.0200	0.0100L	0.1000L	0.0890	0.2600	160.0000	180.0300	0.1000L
194000	JC7a522	0.0300	3.0300	0.0100L	0.2141	0.1500	0.1000	140.0000	490.0000	0.6400
205862	JC8a611	0.1000	3.0600	0.0400	0.2300	0.1000L	0.5400	140.0000	220.0300	0.1000L
205885	JC8a612	0.2100	3.0600	0.1500	1.4000	1.0000	1.3000	240.0000	1400.0300	0.1000L
205851	JC8a621	0.0500	3.0500	0.0100L	0.1800	0.1000L	0.3800	120.0000	1500.0300	0.1000L
205850	JC8a621	0.0500	3.0500	0.0100L	0.1900	0.3000	0.3800	120.0000	1500.0300	0.1000L
205878	JC8a622	0.0200	3.0200	0.0100L	0.2800	0.2200	0.8300	120.0000	450.0000	0.1000
205846	JC8a711	0.0500	3.0500	0.0100L	0.3200	0.3000	0.6300	74.0000	390.0000	0.1000L
205871	JC8a712	0.1700	3.0300	0.1400	0.9600	0.4800	0.5900	150.0000	980.0000	0.1000L
205835	JC8a722	0.0300	3.0300	0.0100L	0.3700	0.2400	1.1000	120.0000	230.0300	0.1000L
205882	JC8a722	0.1900	3.0400	0.1500	0.8600	0.7500	0.6300	130.0000	340.0000	0.1000L
193887	JC7a421x	0.00008	3.00008	0.00008	0.2000	0.1500	1.4000	190.0000	520.0300	0.30008
193959	JC7a521x	0.00008	3.00008	0.00008	0.1000	0.1200	1.4000	99.0000	320.0300	0.30008
193983	JC7a521x	0.00008	3.00008	0.00008	0.1000	0.1000	1.5000	120.0000	220.0300	0.30008
Samples from Spokane-Empire transition--continued										
193977	JC7a611	0.00008	3.00008	0.00008	9.9000	3.3000	1.8000	150.0000	290.0000	0.30008
193997	JC7a612	0.00008	3.00008	0.00008	4.8000	4.2000	1.6000	130.0000	200.0000	0.30008
193978	JC7a611x	0.00008	3.00008	0.00008	2.1000	0.9700	0.5000	120.0000	1300.0300	0.30008

Table 1.--Samples from QUICCOG CR in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	Hg ppm	As ppm	Ge ppm	Ge ppm-S	Sb ppm	Sb ppm-S	Se ppm	Cd ppm-S	Mo ppm-S
Samples of quartztitic rocks in Spokane formation-continued										
193986	JC7a111	0.00008	3.00008	0.00008	1.5000	0.00008	22.0000L	0.00008	10.0000L	1.3000L
193971	JC7a112	0.00008	3.00008	0.00008	1.3000	0.00008	22.0000L	0.00008	10.0000L	1.2000
193999	JC7R112	0.00008	3.00008	0.00008	1.2000	0.00008	22.0000L	0.00003	10.0000L	1.1000
193960	JC7a121	2.6000	13.0000	4.0000	5.2000	24.0000	54.0000	0.2000	10.0000L	1.6000
193963	JC7R121	3.2000	21.0000	4.5000	4.9000	29.0000	58.0000	0.5000	10.0000L	2.2000
193995	JC7a122	0.9100	4.5000	2.5000	2.1000	6.9000	51.0000	0.2000L	10.0000L	1.3000L
193994	JC7a211	0.1900	3.7000	0.8000	0.4600L	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193998	JC7R211	0.1700	3.9000	0.9000	0.6100	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193961	JC7a212	0.1100	1.1000	1.2000	0.6800	0.3000	22.0000L	0.2000L	10.0000L	1.3000L
193985	JC7a221	0.1300	3.7000	0.9000	1.1000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193966	JC7R221	0.2100	3.9000	0.9000	0.9200	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193968	JC7a311	0.1500	1.1000	0.9000	0.6000	0.4000	22.0000L	0.2000L	10.0000L	1.3000L
193993	JC7a312	0.6800	1.0000	0.6000	0.9000	0.4000	22.0000L	0.2000L	10.0000L	1.3000L
193970	JC7a321	0.4100	3.4000	0.3000	1.1000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193992	JC7a322	1.3500	3.0000	1.5000	1.1000	1.4000	22.0000L	0.2000L	10.0000L	1.9000
193980	JC7a332	0.1500	2.2000	0.9000	0.9000	0.4000	24.0000	0.2000L	10.0000L	8.4000
194001	JC7R322	0.1000	3.7000	0.9000	0.7100	0.2000L	22.0000L	0.3000	10.0000L	9.5000
193975	JC7a411	0.3900	3.4000	0.7000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
193990	JC7a412	0.0800	3.4000	0.7000	1.4000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193988	JC7R412	0.0700	3.9000	0.9000	0.9000	0.2000	22.0000L	0.2000L	10.0000L	1.3000L
193989	JC7a421	0.0500	3.6000	0.9000	1.1000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193965	JC7a422	0.0400	3.4000	1.2000	0.4600L	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193982	JC7R422	0.0600	3.3000	1.0000	1.2000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193976	JC7a511	0.2200	3.9000	1.1000	1.3000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193972	JC7a512	0.2400	1.5000	1.3000	0.9200	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193996	JC7R512	0.1600	1.5000	1.2000	1.0000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
193981	JC7a521	0.1000	3.8000	0.7000	1.1000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
194000	JC7a522	0.1600	3.9000	0.7000	1.2000	0.2000L	22.0000L	0.2000L	10.0000L	1.3000L
205862	JC8a611	0.1300	3.8000	1.7000	1.7000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000L
205885	JC8a612	0.0200	1.2000	1.0000	1.5000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000L
205851	JC8a621	0.1300	3.2000L	0.8000	1.2000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000L
205850	JC8R621	0.0200L	1.9000	1.1000	1.2000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000L
205878	JC8a622	0.0200	3.7000	1.1000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.3000L
205846	JC8R711	0.0700	3.4000	0.6000	0.8600	0.2000L	46.0000L	0.2000L	10.0000L	1.2000
205871	JC8R711	0.0400	3.4000	2.5000	0.4600L	4.1000	46.0000L	0.2000L	10.0000L	1.2000
205835	JC8a712	0.0300	2.5000	1.8000	2.3000	0.3000	46.0000L	0.2000L	10.0000L	1.0000L
205882	JC8a721	0.0200	3.9000	1.5000	1.9000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000
205868	JC8a722	0.0700	1.1000	1.4000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.2000
193987	JC7a421x	0.00008	3.00008	0.00008	0.5500	0.00008	22.0000L	0.00008	10.0000L	1.3000
193959	JC7a521x	0.00008	3.00008	0.00008	0.8100	0.00008	22.0000L	0.00008	10.0000L	1.4000
193983	JC7R521x	0.00008	3.00008	0.00008	0.6500	0.00008	22.0000L	0.00008	10.0000L	1.3000L
Samples from Spokane-Empire transition-continued										
193977	JC7a611	0.00008	3.00008	0.00008	0.4600L	0.00008	22.0000L	0.00008	24.0000	1.9000
193997	JC7a612	0.00008	3.00008	0.00008	0.5500	0.00008	22.0000L	0.00008	10.0000L	3.8000
193978	JC7a611x	0.00008	3.00008	0.00008	1.7000	0.00008	22.0000L	0.00008	10.0000L	1.3000L

Table 1.--Samples from quartzite in fourth character of sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	Cu ppm-S	Cu ²⁺ -A	Cu ²⁺ -Sol	Ag ppm-S	Ag ppm-A	Sulfur%	Sulfide%	Pb ppm-S	Zn ppm-S
Samples of quartzitic rocks in Spokane formation-continued										
193986	JC70111	11.0000	0.00008	0.00008	0.4600L	0.00008	0.2000	0.00008	8.2300	11.2000
193971	JC70112	26.0000	0.00008	0.00008	0.4600L	0.00008	0.1000	0.00008	6.2000	10.3000
193999	JC70112	20.0000	0.00008	0.00008	0.4600L	0.00008	0.0652	0.00003	9.7300	13.3000
193960	JC70121	2200.0000	0.2670	0.2260	14.0000	8.0000	0.0600	0.0100L	26.0000	42.3000
193963	JC70121	2000.0000	0.2460	0.2030	17.0000	9.0000	0.1000	0.0100L	24.0000	61.3000
193995	JC70122	490.0000	0.0520	0.0430	2.9000	3.0000	0.2000	0.0100L	5.4300	20.3000
193994	JC70211	1480.0000	0.1680	0.1330	0.4600	12.0000	0.1000	0.0100L	5.5000	28.0000
193998	JC70211	1300.0000	0.1420	0.1190	21.0000	6.0000	0.2000	0.0100L	7.5000	26.0000
193961	JC70212	1200.0000	0.1430	0.1200	17.0000	8.0000	0.1000	0.0100L	4.7300	96.3000
193985	JC70221	1400.0000	0.1570	0.1320	9.7000	4.0000	0.2000	0.0100L	4.7000	11.3000
193966	JC70221	1600.0000	0.1930	0.1600	18.0000	9.0000	0.1000	0.0100L	3.8000	37.3000
193968	JC70222	1500.0000	0.1790	0.1510	8.3000	7.0000	0.2000	0.0100L	4.7000	37.3000
193993	JC70311	4600.00006	0.7860	0.7000	20.0000	11.0000	0.3000	0.0100L	4.9300	18.3000
193970	JC70312	4600.00006	0.5840	0.5100	9.8000	6.0000	0.2000	0.0100L	4.5000	7.2000
193992	JC70321	4600.00006	1.0700	0.7130	22.00006	16.0000	0.3000	0.0800	4.5300	90.3000
193980	JC70322	870.0000	0.1150	0.0900	2.0000	3.0000L	0.3000	0.0100L	81.0000	23.0000
194001	JC70411	1300.0000	0.1390	0.1170	1.7000	3.0000L	0.1620	0.0100L	89.0000	39.3000
193975	JC70412	5.1000	0.0020	0.0050L	8.4000	10.0000	0.1000	0.0100L	4.7300	19.3000
193990	JC70412	2300.0000	0.2540	0.2140	22.0000	21.0000	0.2000	0.0100L	2.9300	8.5000
193988	JC70421	2300.0000	0.2690	0.2270	12.0000	7.0000	0.2000	0.0100L	3.5000	28.3000
193989	JC70422	750.0000	0.0780	0.0590	1.2000	3.0000L	0.1000	0.0100L	4.4300	12.3000
193965	JC70422	540.0000	0.0710	0.0660	1.1000	3.0000L	0.0800	0.0100L	3.0000	30.3000
193982	JC70422	630.0000	0.0780	0.0660	0.8600	3.0000L	0.2000	0.1000L	3.1000	12.3000
193976	JC70511	1100.0000	0.0160	0.1050	17.0000	9.0000	0.1000	0.0100L	17.0000	36.3000
193972	JC70512	95.0000	0.0150	0.0100	1.4000	3.0000L	0.0800	0.0100L	3.9000	7.9000
193996	JC70512	120.0000	0.0150	0.0090	1.3000	3.0000L	0.1000	0.0100L	4.8000	8.3000
193981	JC70521	930.0000	0.1090	0.0900	3.3000	3.0000	0.1000	0.0100L	4.7300	32.3000
194000	JC70522	2700.0000	0.2740	0.2430	7.3000	4.0000	0.0996	0.0100L	7.1000	17.3000
205862	JC80611	80.0000	0.0090	0.0080	0.6800	3.0000L	0.1000L	0.0100L	7.1000	36.3000
205885	JC80612	1400.0000	0.1470	0.1150	5.9000	5.0000	0.1000L	0.0200	13.0300	130.3000
205851	JC80621	1200.0000	0.1200	0.1050	7.2000	5.0000	0.1000L	0.0100L	4.4300	30.3000
205850	JC80621	3200.0000	0.3380	0.2350	15.0000	8.0000	0.1000L	0.0100	5.6000	33.3000
205878	JC80622	2400.0000	0.2630	0.2100	11.0000	8.0000	0.1000L	0.0100	12.0300	120.3000
205846	JC80711	4600.00006	0.7250	0.5460	15.0000	12.0000	0.1000L	0.0400	5.9000	45.3000
205871	JC80712	4600.00006	0.6100	0.5730	14.0000	7.0000	0.1000L	0.0300	7.6300	54.3000
205835	JC80712	100.0000	0.0080	0.0060	28.0000	12.0000	0.1000L	0.0600	9.2000	42.3000
205882	JC80721	130.0000	0.0150	0.0130	0.6300	3.0000L	0.1000L	0.0100L	7.4000	32.3000
205868	JC80722	4600.00006	0.7500	0.5590	20.0000	10.0000	0.1000L	0.0400	7.4000	52.3000
193987	JC70421X	4600.00006	0.00008	0.00008	15.0000	0.00008	0.2000	0.00008	4.2300	98.3000
193959	JC70521X	3100.0000	0.00008	0.00008	22.00006	0.00008	0.1000	0.00008	10.0000	130.3000
193983	JC70521X	2500.0000	0.00008	0.00008	19.0000	0.00008	0.1000	0.00003	13.0300	130.3000
Samples from Spokane-Empire transition-continued										
193977	JC70611	8.1000	0.00008	0.00008	0.4600L	0.00008	0.1000	0.00008	4.9000	110.3000
193997	JC70612	1500.0000	0.00008	0.00008	5.8000	0.00008	0.2000	0.00008	46.0000	67.3000
193978	JC70611X	1.7000	0.00008	0.00008	0.4600L	0.00008	0.2000	0.00008	2.3000	13.3000

Table 1.--Samples from OUTLEGG CR in fourth character of sample number indicates duplicate analysis]

LAB. NO.	SAMPLE	LATITUDE	LONGITUDE	SiO ₂ %	SiX-S	Al ₂ O ₃ %	AlX-S	NaX-S	K ₂ O%	KX-S
Samples of quartzitic rocks in Spokane formation										
193986	JC7Q111	47 03 30N	112 29 30W	84.0000	37.00006	9.5000	4.6000	0.1000	1.6000	1.3000
193971	JC7Q112	47 03 30N	112 29 30W	84.0000	37.00006	8.0000	4.9000	0.0740	1.7000	1.3000
193999	JC7R112	47 03 30N	112 29 30W	85.0900	37.00006	8.6940	5.1000	0.0860	1.8670	1.4000
193960	JC7Q121	47 03 30N	112 29 30W	70.0000	36.0000	8.5000	5.2000	0.1400	2.1000	1.9000
193963	JC7R121	47 03 30N	112 29 30W	75.0000	36.0000	8.9000	5.0000	0.0820	2.2000	1.5000
193995	JC7Q122	47 03 30N	112 29 30W	84.0000	37.00006	7.0000	4.9000	0.0540	1.8000	1.3000
193994	JC7Q211	47 06 30N	112 28 00W	80.0000	34.0000	9.8000	5.7000	1.5000	1.1000	1.4000
193998	JC7R211	47 06 30N	112 28 00W	81.0000	36.0000	9.9000	6.3000	1.4000	1.1000	0.9900
193961	JC7Q212	47 06 30N	112 28 00W	79.0000	34.0000	10.0000	6.3000	1.3000	1.4000	1.2000
193985	JC7Q221	47 06 30N	112 28 00W	83.0000	36.0000	7.1000	4.1000	1.2000	0.6000	0.4600
193966	JC7R221	47 06 30N	112 28 00W	82.0000	34.0000	7.0000	4.2000	1.2000	0.8000	0.5100
193968	JC7Q222	47 06 30N	112 28 00W	81.0000	31.0000	9.0000	5.8000	1.4000	1.2000	0.5100
193993	JC7Q311	47 02 00N	112 25 30W	81.0000	37.00006	7.5000	4.5000	1.2000	0.3000	0.1600
193970	JC7Q312	47 02 00N	112 25 30W	87.0000	37.00006	5.9000	4.0000	1.2000	0.2000	0.1200L
193992	JC7Q321	47 02 00N	112 25 30W	80.0000	37.00006	8.7000	4.4000	1.1000	0.5000	0.2900
193980	JC7Q322	47 02 00N	112 25 30W	84.0000	37.0000	6.5000	4.0000	1.1000	0.2000	0.1200L
194001	JC7R322	47 02 00N	112 25 30W	79.1100	37.00006	5.8800	4.9000	1.2000	0.2454	0.1800
193975	JC7Q411	47 06 00N	112 22 30W	83.0000	37.00006	7.4000	5.0000	2.6000	0.5000	0.5500
193990	JC7Q412	47 06 00N	112 22 30W	86.0000	37.00006	7.1000	3.8000	1.1000	0.4000	0.2700
193988	JC7R412	47 06 00N	112 22 30W	85.0000	37.00006	7.2000	4.3000	1.1000	0.5000	0.3700
193989	JC7Q421	47 05 30N	112 22 00W	79.0000	37.00006	9.5000	6.1000	1.5000	0.6000	0.4600
193965	JC7Q422	47 05 30N	112 22 00W	83.0000	37.00006	6.4000	4.2000	1.0000	0.1000	0.1200L
193982	JC7R422	47 05 30N	112 22 00W	86.0000	36.0000	6.8000	3.6000	0.9500	0.1300	0.1200L
193976	JC7Q511	47 07 30N	112 25 30W	82.0000	37.00006	8.6000	5.6000	1.3000	1.0000	0.7600
193972	JC7Q512	47 07 30N	112 25 30W	85.0000	37.00006	6.9000	3.9000	1.1000	0.8000	0.5300
193996	JC7R512	47 07 30N	112 25 30W	79.0000	37.00006	6.5000	4.2000	1.1000	0.8000	0.5400
193981	JC7Q521	47 07 28N	112 26 00W	81.0000	37.00006	8.7000	5.4000	1.3000	1.1000	1.3000
194000	JC7Q522	47 07 28N	112 26 00W	85.9500	37.00006	6.2740	4.2000	1.4000	0.7738	0.7900
205862	JC8Q611	47 04 57N	112 30 24W	80.4500	29.0000	10.4300	4.9000	2.5000	2.2100	2.1000
205885	JC8Q612	47 04 57N	112 30 24W	75.7300	32.0000	9.6300	5.6000	3.1000	0.7200	0.6200
205851	JC8Q621	47 05 10N	112 30 15W	84.8800	35.0000	7.4200	4.4000	2.3000	0.8200	0.6200
205850	JC8R621	47 05 10N	112 30 15W	85.1500	32.0000	8.3000	3.9000	2.5000	0.9800	0.8900
205878	JC8Q622	47 05 10N	112 30 15W	78.6100	31.0000	11.1000	5.3000	2.5000	2.2500	1.8000
205846	JC8Q711	46 59 29N	112 19 12W	78.4600	25.0000	10.4600	4.8000	2.0000	1.6700	0.9400
205871	JC8R711	46 59 29N	112 19 12W	76.0800	33.0000	10.2900	5.4000	2.5000	1.6400	1.4000
205835	JC8Q712	46 59 29N	112 19 12W	79.3600	37.00006	8.3900	5.5000	2.9000	1.0300	1.1000
205882	JC8Q721	46 59 26N	112 19 15W	76.2800	30.0000	10.8100	5.9000	3.0000	0.9700	0.9500
205868	JC8Q722	46 59 29N	112 19 15W	80.8500	32.0000	8.6400	4.6000	2.5000	1.0700	0.7600
193987	JC7Q421X	47 05 30N	112 22 00W	60.0000	26.0000	18.0000	7.7000	0.9400	3.5000	2.9000
193959	JC7Q521X	47 07 28N	112 26 00W	75.0000	34.0000	8.4000	4.9000	1.1000	0.8000	0.6500
193983	JC7R521X	47 07 28N	112 26 00W	69.0000	28.0000	13.0000	7.6000	1.4000	2.4000	2.3000
Samples from Spokane-Empire transition										
193977	JC7Q611	47 10 00N	112 29 00W	53.0000	20.0000	3.1000	2.6000	0.5600	0.8000	0.6200
193997	JC7Q612	47 10 00N	112 29 00W	58.0000	24.0000	12.0000	7.1000	1.3000	2.5000	2.3000
193978	JC7Q611X	47 10 00N	112 29 00W	86.0000	37.00006	1.3000	1.2000	0.2600	0.0300L	0.1200L

Table 2.--Samples from mine (terminal x in sample number indicates duplicate analysis)-continued

LAB. NO.	SAMPLE	th ppm-S	th ppm	th-S	U ppm	V ppm-S	Y ppm-S	Yb ppm-S
205884	JM8BC9	22.0000L	5.1700	2.2000L	1.3500	5.8000	19.0000	1.2000
205852	JM8BC9X	22.0000L	4.8800	2.3000	1.3900	4.4000	15.0000	1.2000
205880	JM8BC8	22.0000L	4.3000	2.5000	2.5200	5.9000	13.0000	1.1000
205875	JM8BC10	22.0000L	7.5900	2.6000	2.0400	5.9000	15.0000	1.1000
205859	JM8BC10X	22.0000L	9.0600	2.3000	2.2900	5.2000	15.0000	1.2000
205840	JM8BC11	22.0000L	5.9000	3.7000	3.0000	8.5000	19.0000	1.3000
205854	JM8BC3	22.0000L	4.7000	2.2000	2.2700	9.2000	13.0000	1.0000
205847	JM8BC4	22.0000L	4.7000	3.3000	2.2000	4.5000	12.0000	0.8700
205839	JM8BC4X	22.0000L	4.9100	3.7000	1.9500	6.7000	14.0000	1.1000
205834	JM8BC5	22.0000L	9.0600	3.3000	1.9500	7.5000	22.0000	1.4000
205860	JM8BC7	22.0000L	5.7500	2.2000L	1.2800	5.3000	10.0000	0.9800
205841	JM8BC6	22.0000L	5.6600	4.2000	1.5300	6.2000	16.0000	1.1000
205861	JM8BC6X	22.0000L	5.1200	3.3000	1.6200	5.5000	18.0000	1.4000
205848	JM8BC12	22.0000L	18.3000	2.2000L	4.5100	54.0000	39.0000	2.8000
205858	JM8BC11X	22.0000L	21.6000	2.2000L	4.0400	59.0000	34.0000	2.8000
205876	JM8BC11	22.0000L	19.9000	2.2000L	4.2400	52.0000	36.0000	3.1000
205857	JM8BC12	22.0000L	3.9000	2.6000	1.3700	8.0000	15.0000	1.2000
205842	JM8BC61X	22.0000L	8.4100	5.0000	1.8300	13.0000	30.0000	2.0000
205864	JM8BC1	22.0000L	8.6300	3.4000	1.8200	12.0000	25.0000	1.6000
205865	JM8BC15	22.0000L	9.9400	2.2000L	2.7900	33.0000	29.0000	2.2000
205870	JM8BC14	22.0000L	8.6900	3.9000	2.7900	30.0000	34.0000	2.3000
205863	JM8BC13	22.0000L	13.5000	2.2000L	3.2900	38.0000	24.0000	1.9000
205843	JM8BC12	22.0000L	7.3600	2.2000L	2.3200	30.0000	40.0000	2.5000
205844	JM8BC12X	22.0000L	9.5900	2.2000L	2.0700	32.0000	37.0000	2.2000
205877	JM8BC11	22.0000L	17.0000	2.2000L	4.5300	52.0000	39.0000	3.2000
205856	JM8BC12	22.0000L	9.9500	1.9000	2.2300	19.0000	29.0000	1.9000
205883	JM8BC1	22.0000L	9.9400	3.7000	2.1900	18.0000	20.0000	1.5000
205873	JM8BC1	22.0000L	7.7300	2.2000L	2.1500	29.0000	26.0000	1.8000
205853	JM8BC11X	22.0000L	3.5000	2.2000L	2.1000	27.0000	31.0000	2.1000
205869	JM8BC1	22.0000L	14.6000	2.2000L	5.0800	73.0000	33.0000	2.6000
205837	JM8BC1	22.0000L	4.1000	3.6000	2.7200	14.0000	13.0000	1.1000
205855	JM8BC1	22.0000L	5.4800	3.9000	2.2200	5.3000	11.0000	1.0000
205836	JM8BC1X	22.0000L	12.5000	4.8000	4.4700	9.7000	37.0000	2.8000
205872	JM8BC1X	22.0000L	11.4000	2.9000	3.8300	18.2000	28.0000	1.9000
205838	JM8BC1X	22.0000L	13.3000	2.2000L	3.4200	49.0000	40.0000	2.9000
205881	JM8BC1	22.0000L	8.8400	2.2000L	2.1600	21.0000	26.0000	2.0000
205867	JM8BC1X	22.0000L	9.6100	3.2000	2.0400	23.0000	26.0000	1.9000
205874	JM8BC1	22.0000L	13.2000	2.2000L	3.5900	49.0000	36.0000	2.4000
205879	JM8BC1	22.0000L	5.6300	2.8000	2.6300	6.1000	19.0000	1.2000
194002	JC70211P	22.0000L	9.7500	2.2000L	2.9200	45.0000	42.0000	2.6000
193969	JC70212P	22.0000L	11.4000	2.2000L	2.5800	29.0000	43.0000	2.4000
193979	JC70221P	22.0000L	13.2000	2.2000L	3.3900	61.0000	46.0000	2.5000
193962	JC70222P	22.0000L	7.7000	2.2000L	1.9400	21.0000	32.0000	1.8000
193973	JC70231P	56.0000	4.5000	2.2000L	1.8900	5.3000	9.6000	0.6100
193974	JC70231P	22.0000L	5.4200	2.2000L	1.6000	5.1000	14.0000	0.8600
193964	JC70232P	22.0000L	13.2000	2.2000L	2.7900	36.0000	35.0000	2.2000
196921	JC70241P	0.0000B	3.0000B	2.2000L	0.0000B	0.0000B	0.0000B	0.0000B
196922	JC70242P	0.0000B	3.0000B	2.2000L	0.0000B	0.0000B	0.0000B	0.0000B

Table 2.--Samples from the Terminal X in sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	La ppm-S	Li-S	Nb ppm-S	Nd ppm-S	Pr ppm-S	Sc ppm-S	Sm-S	Sn ppm-S	Sr ppm
205884	JM8BC9	26.0000	103.0000L	6.2000	46.0000L	60.0000L	2.8000	46.0000L	5.5000	0.2000L
205852	JM8BC9X	14.0000	103.0000L	6.5000	46.0000L	60.0000L	2.7000	46.0000L	4.6000L	0.2000L
205880	JM8BC8	17.0000	103.0000L	9.4000	46.0000L	60.0000L	2.1000	46.0000L	4.8000	2.5000
205875	JM8BC10	16.0000	103.0000L	8.5000	82.0000	60.0000L	2.5000	46.0000L	4.8000	0.2000L
205859	JM8BC10X	22.0000	103.0000L	6.0000	46.0000L	60.0000L	2.4000	52.0000	4.6000L	0.5000
205840	JM8BC11	24.0000	103.0000L	6.8000	73.0000	60.0000L	3.2000	46.0000L	7.3000	2.8000
205854	JM8BC3	17.0000	103.0000L	2.2000L	46.0000L	60.0000L	2.7000	46.0000L	4.6000L	0.2000L
205847	JM8BC4	11.0000	103.0000L	13.0000	46.0000L	60.0000L	2.3000	46.0000L	4.6000L	0.2000L
205839	JM8BC4X	23.0000	103.0000L	8.4000	48.0000	60.0000L	3.0000	46.0000L	7.3000	0.6000
205834	JM8BC5	24.0000	103.0000L	12.0000	43.0000	60.0000L	2.8000	47.0000	5.7000	8.4000
205860	JM8BC7	17.0000	103.0000L	8.5000	46.0000L	60.0000L	2.5000	46.0000L	4.6000L	0.2000L
205841	JM8BC6	20.0000	103.0000L	15.0000	68.0000	60.0000L	3.1000	46.0000L	6.7000	3.3000
205861	JM8BC6X	20.0000	103.0000L	11.0000	46.0000L	60.0000L	2.4000	46.0000L	4.9000	0.4000
205848	JM8BC12	52.0000	103.0000L	22.0000	78.0000	60.0000L	12.0000	46.0000L	4.6000L	1.0000
205858	JM8BC11X	43.0000	193.0000	17.0000	46.0000L	60.0000L	14.0000	46.0000L	4.6000L	3.8000
205876	JM8BC11	52.0000	103.0000L	20.0000	92.0000	60.0000L	12.0000	46.0000L	4.6000L	2.8000
205857	JM8BC62	17.0000	103.0000L	12.0000	46.0000L	60.0000L	3.6000	46.0000L	4.6000L	0.2000L
205842	JM8BC61X	29.0000	103.0000L	16.0000	46.0000L	60.0000L	5.8000	46.0000L	7.1000	2.4000
205864	JM8BC61	20.0000	103.0000L	17.0000	46.0000L	60.0000L	4.4000	46.0000L	4.6000L	7.4000
205865	JM8BCF5	45.0000	103.0000L	9.8000	63.0000	60.0000L	11.0000	46.0000L	4.6000L	15.3000
205870	JM8BCF4	45.0000	103.0000L	19.0000	63.0000	60.0000L	7.6000	46.0000L	4.6000L	14.0000
205863	JM8BCF3	35.0000	143.0000	11.0000	61.0000	60.0000L	9.6000	46.0000L	6.0000	0.7000
205843	JM8BCF2	45.0000	103.0000L	21.0000	75.0000	60.0000L	8.6000	46.0000L	4.3000	1.3000
205844	JM8BCF2X	41.0000	103.0000L	18.0000	49.0000	60.0000L	17.0000	46.0000L	4.6000L	1.7000
205877	JM8BCF1	63.0000	103.0000L	22.0000	53.0000	60.0000L	6.5000	46.0000L	4.6000L	0.5000
205856	JM8BCF1	36.0000	103.0000L	19.0000	46.0000L	60.0000L	4.9000	46.0000L	4.6000L	0.8000
205883	JM8BCF1	25.0000	103.0000L	8.4000	88.0000	60.0000L	6.4000	46.0000L	4.6000L	0.7000
205873	JM8BCD1	35.0000	113.0000	17.0000	46.0000L	60.0000L	7.3000	46.0000L	4.6000L	0.2000
205853	JM8BCD1X	48.0000	120.0000	12.0000	46.0000L	60.0000L	3.4000	46.0000L	4.6000L	3.8000
205837	JM8BCB3	23.0000	103.0000L	7.9000	46.0000L	60.0000L	1.8000	52.0000	4.6000L	0.3000
205872	JM8BCB1	36.0000	103.0000L	20.0000	64.0000	60.0000L	4.2000	46.0000L	6.8000	0.7000
205836	JM8BCA2	29.0000	103.0000L	8.8000	59.0000	60.0000L	3.4000	46.0000L	5.4000	0.2000L
205872	JM8BCA1X	68.0000	223.0000	15.0000	79.0000	60.0000L	16.0000	46.0000L	4.6000L	0.7000
205881	JM8BCA1	39.0000	103.0000L	2.2000L	48.0000	60.0000L	8.1000	46.0000L	4.6000L	0.5000
205867	JM8BCA1X	40.0000	103.0000L	19.0000	66.0000	60.0000L	14.0000	46.0000L	4.6000L	3.3000
205874	JM8BC1	48.0000	103.0000L	7.4000	46.0000L	60.0000L	2.5000	46.0000L	4.6000L	0.5000
205879	JM8BCX1	21.0000	103.0000L	13.0000	46.0000L	60.0000L	5.4000	46.0000L	4.6000L	0.2000L
194002	JC7Q211P	28.0000	103.0000L	7.2000	46.0000L	60.0000L	5.9000	46.0000L	4.6000L	0.2000L
193969	JC7Q212P	37.0000	103.0000L	7.7000	46.0000L	60.0000L	5.4000	46.0000L	4.6000L	0.2000L
193979	JC7Q221P	27.0000	103.0000L	13.0000	46.0000L	60.0000L	3.4000	46.0000L	4.6000L	0.2000L
193973	JC7Q222P	24.0000	103.0000L	6.1000	46.0000L	60.0000L	1.4000	46.0000L	4.6000L	0.2000L
193973	JC7Q231P	4.6000L	103.0000L	4.6000L	46.0000L	60.0000L	1.4000	46.0000L	4.6000L	0.2000L
193974	JC7R231P	7.7000	103.0000L	4.6000L	46.0000L	60.0000L	4.6000	46.0000L	4.6000L	0.4000
193964	JC7Q232P	31.0000	103.0000L	6.5000	63.0000	60.0000L	4.6000	46.0000L	4.6000L	1.8000
196921	JC7Q241P	0.00008	103.0000L	0.00008	0.00008	0.00008	0.00008	46.0000L	0.00008	0.8000
196922	JC7Q242P	0.00008	103.0000L	0.00008	0.00008	0.00008	0.00008	46.0000L	0.00008	0.8000

Table 2.--SANDPES FROM WIDE CTERMINAL X IN SAMPLE NUMBER INDICATES DUPLICATE ANALYSIS--continued

LAB. NO.	SAMPLE	B ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Ga ppm-S	Er ppm-S	Eu ppm-S	Dy ppm-S	Gd ppm-S
205884	JM8BC9	5.0000L	1.2000	74.0000	0.4600L	2.2000L	4.6000L	1.0000L	10.0000L	20.3000
205852	JM8BC9X	5.0000L	1.0000L	53.0000	1.3000	2.2000L	4.6000L	3.1000	10.0300L	4.4000
205880	JM8BC8	5.0000L	1.1000	74.0000	0.4600L	2.2000L	4.6000L	1.0000L	10.0000L	2.2000L
205875	JM8BC10	5.0000L	1.0000L	65.0000	0.4600L	2.2000L	4.6000L	3.3000	10.0000L	9.4000
205859	JM8BC10X	5.0000L	1.0000L	70.0000	1.8000	2.2000L	4.6000L	2.5000	10.0000L	2.2000L
205840	JM8BC11	5.0000L	1.2000	88.0000	1.9000	2.2000L	4.6000L	1.0000L	10.0000L	9.4000
205854	JM8BC3	5.0000L	1.0000L	87.0000	1.7000	2.2000L	4.6000L	1.0000L	10.0000L	7.1000
205847	JM8BC4	5.0000L	1.0000L	46.0000L	1.3000	2.2000L	4.6000L	2.5000	10.0000L	2.2000L
205839	JM8BC4X	5.0000L	1.9000	79.0000	1.5000	2.2000L	4.6000L	1.0000L	10.0000L	2.2000L
205834	JM8BC5	5.0000L	1.0000L	48.0000	1.6000	2.2000L	4.6000L	1.9000	10.0000L	4.1000
205860	JM8BC7	5.0000L	2.0000	81.0000	1.5000	2.2000L	4.6000L	3.0000	10.0300L	9.3000
205841	JM8BC6	5.0000L	1.0000L	54.0000	0.4600L	2.2000L	4.6000L	2.6000	10.0000L	12.3000
205848	JM8BC6X	5.0000L	1.6000	130.0000	11.0000	13.0000	4.6000L	1.0000L	10.0000L	9.3000
205858	JM8BC12	73.0000	1.7000	120.0000	12.0000	14.0000	4.6000L	2.1000	10.0000L	14.3000
205876	JM8BC11X	65.0000	1.8000	130.0000	13.0000	14.0000	4.6000L	2.8000	10.0300L	5.9000
205857	JM8BC12	5.0000L	1.0000L	59.0000	1.5000	2.2000L	4.6000L	3.9000	10.0000L	2.2000L
205842	JM8BC11X	9.5000	1.7000	96.0000	2.2000	2.2000L	4.6000L	3.7000	11.0300	8.7000
205864	JM8BC61	5.7000	1.0000L	70.0000	2.0000	2.2000L	4.6000L	2.6000	10.0000L	13.3000
205865	JM8BC5	39.0000	1.1000	120.0000	11.0000	7.5000	4.6000L	1.0000L	10.0000L	9.7000
205870	JM8BC4	33.0000	1.0000L	130.0000	13.0000	6.6000	4.6000L	1.8000	10.0300L	2.2000L
205863	JM8BC3	41.0000	1.1000	87.0000	10.0000	6.1000	4.6000L	1.0000L	10.0000L	8.3000
205843	JM8BCF2	26.0000	1.8000	120.0000	7.9000	4.5000	4.6000L	1.0000L	10.0300L	13.3000
205844	JM8BCF2X	19.0000	1.7000	170.0000	10.0000	15.0000	4.6000L	3.2000	10.0000L	2.2000L
205877	JM8BCF1	59.0000	1.0000L	140.0000	7.0000	3.7000	4.6000L	1.0000L	10.0000L	19.3000
205856	JM8BCF2	21.0000	1.0000L	62.0000	13.0000	4.9000	4.6000L	1.0000L	10.0000L	5.1000
205883	JM8BCF1	18.0000	1.0000L	110.0000	14.0000	5.5000	4.6000L	1.0000L	10.0000L	22.0000
205873	JM8BCD1	21.0000	1.0000L	150.0000	8.2000	12.0000	4.6000L	4.1000	10.0300L	15.3000
205853	JM8BCD1X	47.0000	1.0000L	90.0000	2.0000	2.2000L	4.6000L	3.4000	10.0000L	8.1000
205837	JM8BCB3	5.0000L	1.0000L	46.0000L	1.2000	2.2000L	4.6000L	1.0000L	10.0300L	5.6000
205855	JM8BCB2	5.9000	1.6000	130.0000	1.9000	2.2000L	4.6000L	5.4000	10.0000L	15.0000
205836	JM8BCB1	5.0000L	1.0000L	84.0000	1.8000	2.2000L	4.6000L	3.2000	10.0000L	2.2000L
205872	JM8BCA2	47.0000	1.4000	160.0000	21.0000	16.0000	4.6000L	3.4000	10.0300L	7.7000
205838	JM8BCA1	14.0000	1.0000L	110.0000	11.0000	5.2000	4.6000L	3.5000	10.0000L	6.5000
205881	JM8BCA1X	19.0000	1.0000	120.0000	11.0000	5.2000	4.6000L	3.0000	10.0000L	7.4000
205867	JM8BC1	5.0000L	1.4000	130.0000	13.0000	9.9000	4.6000L	1.0000L	10.0000L	2.2000L
205874	JM8BC1	5.0000L	1.1000	87.0000	0.4600L	2.2000L	4.6000L	2.4000	10.0300L	2.2000L
205879	JM8BCX1	36.0000	1.7000	46.0000L	9.8000	4.0000	7.5000	1.8000	10.0000L	8.0000
194002	JC7Q211P	25.0000	1.2000	46.0000L	6.1000	2.9000	6.4000	1.8000	10.0000L	8.0000
193969	JC7Q212P	53.0000	1.9000	46.0000L	4.5000	4.7000	6.6000	1.0000L	10.0000L	5.6000
193979	JC7Q221P	17.0000	1.1000	46.0000L	0.4600L	2.2000L	4.6000L	2.5000	10.0300L	2.2000L
193962	JC7Q222P	5.0000L	1.0000L	46.0000L	0.4600L	2.2000L	4.6000L	2.5000	10.0000L	2.2000L
193973	JC7Q231P	5.0000L	1.0000L	46.0000L	0.4600L	2.2000L	4.6000L	2.5000	10.0000L	2.2000L
193974	JC7R231P	31.0000	1.7000	46.0000L	10.0000	4.5000	6.8000	2.1000	10.0000L	2.2000L
193964	JC7Q232P	0.0000B	2.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B
196921	JC7Q241P	0.0000B	2.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B
196922	JC7Q242P	0.0000B	2.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B

Table 2.--Samples from Mine Terminal x in sample number indicates duplicate analysis]-continued

LAB. NO.	SAMPLE	T-fe203x	Fe2-S	FeOx	Mn ppm-S	T102x	T1x-S	Zr ppm-S	Ni ppm-S	Cr ppm-S
205884	JM8BC9	0.4700	3.2800	0.1400	130.0000	0.1700	0.0760	120.0000	2.1300	8.3000
205852	JM8BC9X	0.3400	3.2800	0.1500	130.0000	0.1700	0.0580	270.0000	1.6000	9.5000
205880	JM8BC8	0.1800	3.1900	0.1900	46.0000L	0.1700	0.0610	180.0000	2.1000	5.0000
205875	JM8BC10	0.1300	3.1700	0.0800	120.0000	0.2200	0.0730	130.0000	2.1000	5.2000L
205859	JM8BC10X	0.1000L	3.1900	0.1200	160.0000	0.2300	0.0990	220.0000	2.4000	5.1000
205840	JM8BC11	0.1100	3.1800	0.1900	58.0000	0.2200	0.0990	220.0000	2.4000	6.2000
205854	JM8BC3	0.1200	3.2200	0.2700	63.0000	0.1400	0.0620	110.0000	2.4000	10.0000
205847	JM8BC4	0.1500	3.1300	0.1400	97.0000	0.1600	0.0510	95.0000	1.4000	6.5000
205839	JM8BC4X	0.1000L	3.1600	0.1400	130.0000	0.1500	0.0630	160.0000	2.0000	5.3000
205834	JM8BC5	0.1200	3.1900	0.1600	200.0000	0.2000	0.1000	270.0000	2.3000	14.2000
205860	JM8BC7	0.7600	3.3700	0.1100	140.0000	0.1800	0.0660	98.0000	2.7000	9.3000
205841	JM8BC6	0.5000	3.4000	0.1200	130.0000	0.2100	0.0980	190.0000	5.5000	5.4000
205848	JM8BC6X	0.5200	3.4200	0.1100	130.0000	0.2000	0.1000	190.0000	3.9000	10.0000
205858	JM8BC1X	6.0900	2.7000	1.2600	240.0000	0.5900	0.3100	210.0000	22.0000	40.0000
205842	JM8BC2	6.0600	2.4000	1.2400	260.0000	0.6000	0.2700	230.0000	25.0000	43.0000
205876	JM8BC1	0.8700	3.5200	0.3100	120.0000	0.1900	0.1200	170.0000	3.7000	44.0000
205842	JM8BC61X	1.1600	3.9000	0.5000	69.0000	0.3100	0.1800	230.0000	5.5000	15.0000
205864	JM8BC61	1.1600	3.6400	0.5700	77.0000	0.3200	0.1300	200.0000	4.2000	13.0000
205865	JM8BCF5	3.1800	1.4000	0.8300	150.0000	0.4900	0.3100	290.0000	23.0000	30.0000
205870	JM8BCF4	2.8600	1.3000	1.0000	200.0000	0.4500	0.3200	310.0000	25.0000	28.0000
205863	JM8BCF3	1.0300	1.6000	1.1100	160.0000	0.3100	0.1900	210.0000	20.0000	26.0000
205843	JM8BCF2	2.3100	1.2000	0.6300	170.0000	0.3700	0.2500	250.0000	15.0000	27.0000
205844	JM8BCF2X	1.9200	1.0000	0.5600	180.0000	0.3300	0.2200	230.0000	17.0000	21.0000
205877	JM8BCF1	4.1500	1.6000	0.8400	130.0000	0.6400	0.4800	290.0000	13.0000	33.0000
205856	JM8BCF2	2.0400	3.9900	0.5600	310.0000	0.3900	0.2100	250.0000	17.0000	22.0000
205883	JM8BCF1	1.4300	3.9100	0.4700	160.0000	0.3600	0.2100	240.0000	7.4000	18.0000
205873	JM8BCD1	2.4000	1.2000	1.2000	230.0000	0.3200	0.1600	270.0000	19.0000	15.0000
205853	JM8BCD1X	2.3900	1.0000	1.2900	250.0000	0.3200	0.1800	350.0000	21.0000	16.0000
205869	JM8BCB3	2.6400	1.1000	0.7100	130.0000	0.6200	0.2500	240.0000	16.0000	36.0000
205837	JM8BCB3	0.3500	3.3500	0.3700	130.0000	0.1500	0.0770	95.0000	3.3000	12.0000
205855	JM8BCB2	0.1000L	3.1700	0.1300	150.0000	0.2300	0.0730	130.0000	1.5000	12.0000
205836	JM8BCB1	0.2300	3.3000	0.2200	140.0000	0.3800	0.2200	660.0000	3.7000	9.4000
205872	JM8BCB1X	0.2500	3.2400	0.1900	35.0000	0.4000	0.1800	550.0000	2.3000	33.0000
205838	JM8BCA2	3.1400	1.7000	1.4500	220.0000	0.5400	0.4400	490.0000	31.0000	33.0000
205881	JM8BCA1	2.3500	1.0000	1.0600	150.0000	0.3500	0.1700	210.0000	16.0000	18.0000
205874	JM8BCA1X	2.2500	1.0000	1.0600	140.0000	0.3600	0.2100	310.0000	17.0000	19.0000
205879	JM8BC1	3.9900	1.8000	1.1700	170.0000	0.5800	0.3700	320.0000	23.0000	36.0000
194002	JM8BCX1	0.1200	3.2000	0.2500	150.0000	0.1600	0.1100	150.0000	2.6000	11.0000
193969	JC7Q21P	2.1030	1.6000	1.5600	110.0000	0.5860	0.3000	300.0000	22.0000	20.0000
193979	JC7Q21P	1.0000	3.7600	0.6100	98.0000	0.3000	0.1900	370.0000	13.0000	31.0000
193962	JC7Q22P	2.6000	2.0000	0.9800	95.0000	0.6000	0.2700	180.0000	16.0000	22.0000
193973	JC7Q23P	1.2000	3.9700	0.5200	100.0000	0.3000	0.1700	210.0000	7.1000	29.0000
193974	JC7R23P	0.2000	3.1600	0.1100	67.0000	0.4000	0.0560	160.0000	1.0000L	5.9000
193964	JC7R23P	0.1000	3.1100	0.0700	66.0000	0.3000	0.0520	110.0000	1.6000	6.3000
196921	JC7Q24P	2.6000	2.0000	1.4400	100.0000	0.5000	0.2600	370.0000	20.0000	15.0000
196922	JC7Q24P	0.0000B	3.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B
	JC7Q24P	0.0000B	3.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B

Table 2.--Samples from mine (terminal x in sample number indicates duplicate analysis)-continued

LAB. NO.	SAMPLE	T-C %	Org-C %	CO ₃ -C %	CaO%	Ca ⁺⁺ -S	Mg ⁺⁺ -S	Sr ppm-S	Ba ppm-S	P ₂ O ₅ %
205884	JM8BC9	0.0300	0.0300	0.0100L	0.1000	0.2200	0.1500	200.0000	3900.0000	0.1000L
205852	JM8BC9X	0.0300	0.0300	0.0100L	0.1000L	0.1700	0.1500	180.0000	2800.0000	0.1000L
205880	JM8BC8	0.0200	0.0200	0.0100L	0.1000L	0.3000	0.1500	130.0000	3000.0000	0.1000L
205875	JM8BC10	0.0200	0.0200	0.0100L	0.1000L	0.2700	0.1700	170.0000	2100.0000	0.1000L
205859	JM8BC10X	0.0200	0.0200	0.0100L	0.1000L	0.3700	0.1300	150.0000	1900.0000	0.1000L
205840	JM8BC11	0.0200	0.0200	0.0100L	0.1000L	0.2800	0.1800	140.0000	1300.0000	0.1000L
205854	JM8BC3	0.0200	0.0200	0.0100L	0.1100	0.3900	0.1500	130.0000	1900.0000	0.1000L
205847	JM8BC4	0.0400	0.0400	0.0100L	0.1000L	0.1900	0.1500	110.0000	2300.0000	0.1000L
205839	JM8BC4X	0.0300	0.0300	0.0100L	0.1000L	0.2800	0.1400	180.0000	4500.0000	0.1000L
205834	JM8BC5	0.0600	0.0300	0.0300	0.1000	0.3300	0.1900	210.0000	4400.0000	0.1000L
205860	JM8BC7	0.0200	0.0200	0.0100L	0.1000L	0.1000L	0.1700	120.0000	110.0000	0.1000L
205841	JM8BC6	0.0300	0.0300	0.0100L	0.1000L	0.1000L	0.1800	170.0000	1500.0000	0.1000L
205861	JM8BC6X	0.0200	0.0200	0.0100L	0.1000L	0.1000L	0.1800	180.0000	2100.0000	0.1000L
205848	JM8BC12	0.0200	0.0200	0.0100L	0.2300	0.2500	0.7400	94.0000	1200.0000	0.1400
205858	JM8BC11X	0.0200	0.0200	0.0100L	0.2100	0.1000L	1.0000	120.0000	390.0000	0.1400
205876	JM8BC11	0.0200	0.0200	0.0100L	0.2100	0.1000L	1.0000	120.0000	430.0000	0.1600
205857	JM8BC62	0.0200	0.0200	0.0100L	0.1000L	0.3600	0.2000	120.0000	4700.0000	0.1000L
205842	JM8BC61X	0.0200	0.0200	0.0100L	0.1000	0.3800	0.2300	170.0000	3000.0000	0.1000L
205864	JM8BC61	0.0300	0.0300	0.0100L	0.1100	0.4000	0.2400	130.0000	3700.0000	0.1000L
205865	JM8BCF5	0.0300	0.0300	0.0100L	0.1600	0.6000	0.8100	120.0000	2100.0000	0.1000L
205863	JM8BCF4	0.0300	0.0300	0.0100L	0.1500	0.3000	0.7000	130.0000	1130.0000	0.1000L
205843	JM8BCF2	0.0300	0.0300	0.0100L	0.1100	0.4100	0.8500	97.0000	420.0000	0.1000L
205844	JM8BCF2X	0.0300	0.0300	0.0100L	0.1600	0.3200	0.7600	140.0000	1900.0000	0.1000L
205877	JM8BCF1	0.0200	0.0200	0.0100L	0.2400	0.4200	0.6800	130.0000	1000.0000	0.1000L
205856	JM8BCF2	0.0300	0.0300	0.0100L	0.1400	0.2400	0.6200	120.0000	3500.0000	0.1300
205873	JM8BCF1	0.0300	0.0300	0.0100L	0.1600	0.3000	0.5900	120.0000	770.0000	0.1000L
205883	JM8BCF1	0.0200	0.0200	0.0100L	0.1400	0.1900	0.4500	120.0000	1400.0000	0.1000L
205873	JM8BCD1	0.0200	0.0200	0.0100L	0.1700	0.3200	0.8400	110.0000	670.0000	0.1000L
205853	JM8BCD1X	0.0200	0.0200	0.0100L	0.1600	0.3400	0.9200	120.0000	960.0000	0.1000L
205869	JM8BC1	0.1000	0.0400	0.0600	0.2900	1.1000	0.7600	120.0000	2800.0000	0.1600
205837	JM8BCB3	0.0400	0.0300	0.0100L	0.1400	0.4500	0.2200	170.0000	1400.0000	0.1000L
205855	JM8BCB2	0.0300	0.0300	0.0100L	0.1100	0.2900	0.1500	160.0000	3100.0000	0.1000L
205836	JM8BCB1	0.0300	0.0300	0.0100L	0.1000L	0.3200	0.2200	150.0000	2300.0000	0.1000L
205872	JM8BCB1X	0.0200	0.0200	0.0100L	0.1100	0.2100	0.2100	120.0000	1300.0000	0.1000L
205838	JM8BCA2	0.0300	0.0300	0.0100L	0.1900	0.3100	1.1000	160.0000	2100.0000	0.1000L
205881	JM8BCA1	0.0200	0.0200	0.0100L	0.1500	0.2700	0.8300	120.0000	2500.0000	0.1000L
205867	JM8BCA1X	0.0100	0.0100L	0.0100L	0.1500	0.2600	0.7300	130.0000	2300.0000	0.1000L
205874	JM8BC1	0.0200	0.0200	0.0100L	0.1900	0.3400	0.8000	120.0000	830.0000	0.1100
205879	JM8BCX1	0.0500	0.0500	0.0100L	0.1400	0.2800	0.1900	150.0000	3300.0000	0.4200
194002	JC7Q211P	0.0300	0.0300	0.0100L	0.1327	0.1400	1.5000	140.0000	2000.0000	0.1700
193969	JC7Q212P	0.0200	0.0200	0.0100L	0.1000	0.1400	0.5900	130.0000	520.0000	0.1700
193979	JC7Q221P	0.0200	0.0200	0.0100L	0.2000	0.1000L	1.3000	110.0000	1500.0000	0.4800
193962	JC7Q222P	0.0400	0.0400	0.0100L	0.1000L	0.1700	0.3800	120.0000	520.0000	0.4400
193973	JC7Q231P	0.0400	0.0400	0.0100L	0.1000L	0.1000L	0.0320	150.0000	1600.0000	0.1700
193974	JC7R231P	0.0300	0.0300	0.0100L	0.1000L	0.1000L	0.0770	140.0000	3200.0000	0.4100
193964	JC7Q232P	0.0300	0.0300	0.0100L	0.1000	0.2200	1.0000	90.0000	1100.0000	0.1700
196921	JC7Q241P	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B
196922	JC7Q242P	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B	0.0000B

Table 2.--Samples from mine [terminal x in sample number indicates duplicate analysis]--continued

LAB. NO.	SAMPLE	Hg ppm	As ppm	Ge ppm	Ge ppm-S	Sb ppm	Sh ppm-S	Se ppm	Cd ppm-S	Mo ppm-S
205884	JM8BC9	0.1600	3.4000	0.6000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205852	JM8BC9X	0.1300	3.3000	0.5000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205880	JM8BC8	0.2100	1.1000	1.3000	2.4000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205875	JM8BC10	0.3200	3.0000	0.4000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205859	JM8BC10X	0.3300	3.2000	0.5000	2.3000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205840	JM8BC11	0.3000	2.7000	1.6000	2.9000	1.4000	46.0000L	0.2000L	10.0000L	1.0000L
205854	JM8BC3	3.2000	3.4000	0.3000	1.8000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205847	JM8BC4	397.0000	3.2000L	1.8000	0.8400	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205839	JM8BC4X	155.0000	3.2000L	4.4000	2.5000	0.7000	46.0000L	0.2000L	10.0000L	1.3000
205834	JM8BC5	427.0000	3.2000L	\$5.0000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.2000
205860	JM8BC7	0.1400	0.7000	0.4000	2.4000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205841	JM8BC6	0.1800	3.7000	0.8000	2.8000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205861	JM8BC6X	0.1400	3.9000	0.6000	2.1000	0.3000	46.0000L	0.2000L	10.0000L	1.0000L
205848	JM8BC12	0.0800	2.2000	1.3000	1.5000	0.3000	46.0000L	0.2000L	10.0000L	1.9000
205858	JM8BC11X	0.0300	2.1000	1.9000	2.1000	0.7000	46.0000L	0.2000L	10.0000L	2.0000
205876	JM8BC11	0.0300	1.6000	1.7000	1.3000	0.4000	46.0000L	0.3000	10.0000L	1.9000
205857	JM8BC62	0.3340	3.3000	0.5000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205842	JM8BC61X	0.5300	3.6000	1.0000	2.7000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205864	JM8BC61	0.5200	1.6000	1.8000	1.3000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205865	JM8BCF5	0.6000	3.6000	0.2000L	1.9000	0.2000L	46.0000L	0.2000L	10.0000L	1.4000
205870	JM8BCF4	0.3700	1.4000	1.8000	1.1000	0.2000L	46.0000L	0.2000L	10.0000L	1.2000
205863	JM8BCF3	0.2900	2.6000	2.4000	1.7000	3.2000	46.0000L	0.2000L	10.0000L	1.2000
205843	JM8BCF2	0.2000	3.5000	0.9000	0.4600L	0.4000	46.0000L	0.2000L	10.0000L	1.0000L
205844	JM8BCF2X	0.1700	3.5000	0.9000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.1000
205877	JM8BCF1	0.2300	3.7000	1.0000	0.5200	0.2000L	46.0000L	0.2000L	10.0000L	1.2000
205856	JM8BCF2	0.2800	3.6000	0.9000	1.3000	0.2000L	46.0000L	0.2000L	10.0000L	1.3000
205883	JM8BCF1	0.1600	3.5000	0.9000	2.1000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205873	JM8BCD1	0.1900	3.4000	0.6000	0.4600L	0.4000	46.0000L	0.2000L	10.0000L	1.0000L
205869	JM8BCD1X	0.1900	3.2000L	0.7000	1.7000	0.2000L	46.0000L	0.2000L	10.0000L	1.4000
205853	JM8BC1	0.5700	3.9000	2.0000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205837	JM8BCB3	0.1300	3.9000	1.9000	1.8000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205855	JM8BCB2	0.2000	1.3000	0.4000	0.9200	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205836	JM8BCB1	0.3300	1.5000	0.7000	2.7000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205872	JM8BCB1X	0.2500	1.0000	0.5000	0.4600L	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205838	JM8BCA2	0.2400	3.5000	0.9000	1.9000	0.2000L	46.0000L	0.2000L	10.0000L	1.1000
205881	JM8BCA1	0.2200	3.6000	0.8000	1.7000	0.2000L	46.0000L	0.2000L	10.0000L	1.0000L
205867	JM8BCA1X	0.2100	3.4000	0.7000	1.5000	0.2000L	46.0000L	0.2000L	10.0000L	1.1000
205874	JM8BC1	0.4500	3.2000	0.6000	1.2000	0.2000L	46.0000L	0.2000L	10.0000L	1.1000
205879	JM8BCX1	1.3000	2.5000	1.7000	2.2000	4.9000	46.0000L	0.2000L	10.0000L	1.0000
194002	JC7A21P	0.7400	0.9000	0.9000	0.4700	0.3000	22.0000L	0.2000L	10.0000L	1.0000L
193969	JC7A212P	0.3200	3.7000	0.7000	0.4600L	0.2000L	22.0000L	0.2000L	10.0000L	1.0000L
193972	JC7A221P	0.2400	1.2000	1.1000	0.7600	0.2000L	22.0000L	0.2000L	10.0000L	1.1000
193962	JC7A222P	0.1800	1.0000	0.9000	0.8600	0.2000L	22.0000L	0.2000L	10.0000L	1.0000L
193973	JC7A231P	440.0000	3.7000	0.8000	0.9800	0.2000L	22.0000L	0.2000L	10.0000L	1.0000L
193974	JC7A231P	316.0000	3.7000	1.0000	1.4000	0.2000L	22.0000L	0.2000L	10.0000L	1.0000L
193964	JC7A232P	0.1800	1.7000	1.2000	0.4600L	0.3000	22.0000L	0.2000	10.0000L	1.6000
196921	JC7A241P	1.0000	1.5000	1.1000	0.0000B	1.6000	0.0000B	0.2000L	0.0000B	0.0000B
196922	JC7A242P	0.5000	3.8000	0.9000	0.0000B	1.7000	0.0000B	0.2000L	0.0000B	0.0000B

Table 2.--Samples from nine terminal x in sample number indicates duplicate analysis

LAB. NO.	SAMPLE	LATITUDE	LONGITUDE	S102X	S14-S	AL203X	AL4-S	MA4-S	K20X	K4-S
205884	JM8BC9	47 06 30N	112 28 01W	81.7700	36.0000	5.6000	2.1000	2.5000	0.6600	0.6200
205852	JM8BC9X	47 06 30N	112 28 01W	87.6000	30.0000	5.8500	3.7000	2.3000	0.6900	0.5200
205880	JM8BC8	47 06 30N	112 28 01W	90.0700	34.0000	5.8600	4.1000	2.0000	0.6300	0.4100
205875	JM8BC10	47 06 30N	112 28 01W	89.6100	33.0000	5.3200	1.6000	2.0000	0.6100	0.4700
205859	JM8BC10X	47 06 30N	112 28 01W	90.8300	32.0000	5.6300	4.0000	2.3000	0.6200	0.5400
205840	JM8BC11	47 06 30N	112 28 01W	88.9500	37.00006	5.8300	4.3000	2.2000	0.7400	0.7000
205854	JM8BC3	47 06 30N	112 28 01W	87.7300	31.0000	7.0700	3.8000	2.8000	0.7600	0.6900
205847	JM8BC4	47 06 30N	112 28 01W	90.0300	29.0000	5.4200	1.5000	2.1000	0.4800	0.3700
205839	JM8BC4X	47 06 30N	112 28 01W	89.1600	37.00006	5.4100	1.6000	2.5000	0.4800	0.5200
205834	JM8BC5	47 06 30N	112 28 01W	85.2700	35.0000	5.1500	4.4000	2.2000	0.4500	0.4300
205860	JM8BC7	47 06 30N	112 28 01W	85.2700	35.0000	5.6100	4.3000	2.0000	0.6600	0.5200
205841	JM8BC6	47 06 30N	112 28 01W	87.1700	37.00006	5.8000	4.3000	2.5000	0.6800	0.5900
205848	JM8BC6X	47 06 30N	112 28 01W	88.2500	32.0000	5.8200	4.3000	2.3000	0.6800	0.5800
205858	JM8BC11X	47 06 30N	112 28 01W	54.6000	23.0000	17.5800	6.5000	2.3000	5.0700	4.9000
205876	JM8BC11	47 06 30N	112 28 01W	60.4700	23.0000	16.1300	7.3000	2.5000	5.1900	5.8000
205842	JM8BC62	47 06 30N	112 28 01W	87.6100	34.0000	6.6200	4.5000	2.5000	0.6100	0.5200
205864	JM8BC61X	47 06 30N	112 28 01W	76.9000	37.00006	7.4000	4.8000	3.0000	0.9000	0.9200
205865	JM8BC61	47 06 30N	112 28 01W	82.8200	30.0000	8.0900	4.8000	2.8000	0.9400	0.7000
205870	JM8BCF5	47 06 30N	112 28 01W	71.4500	27.0000	12.5200	6.0000	3.3000	2.3200	2.3000
205863	JM8BCF4	47 06 30N	112 28 01W	73.8900	29.0000	11.6900	5.9000	3.9000	2.0200	2.1000
205843	JM8BCF3	47 06 30N	112 28 01W	83.7800	25.0000	8.1800	5.3000	2.8000	0.9400	2.4000
205844	JM8BCF2X	47 06 30N	112 28 01W	80.4200	34.0000	10.6900	6.1000	3.5000	1.9600	2.0000
205877	JM8BCF1	47 06 30N	112 28 01W	61.8600	22.0000	9.7400	5.3000	3.2000	1.5700	1.7000
205856	JM8BCF2	47 06 30N	112 28 01W	80.2900	32.0000	16.7200	7.5000	3.0000	4.9600	5.6000
205863	JM8BCF1	47 06 30N	112 28 01W	80.6400	33.0000	9.9000	5.0000	3.5000	1.5200	1.4000
205873	JM8BCF1	47 06 30N	112 28 01W	75.8900	27.0000	11.4400	5.0000	3.3000	1.7200	1.4000
205853	JM8BCF1X	47 06 30N	112 28 01W	75.0600	27.0000	11.4900	5.5000	3.3000	1.7200	1.5000
205869	JM8BCF1	47 06 30N	112 28 01W	63.3200	22.0000	16.2800	4.1000	3.4000	3.9100	3.3000
205837	JM8BCF3	47 06 30N	112 28 01W	86.0600	34.0000	7.1500	4.1000	3.0000	0.7900	0.2000
205835	JM8BCF2	47 06 30N	112 28 01W	91.4900	31.0000	5.2200	1.6000	2.0000	0.3500	0.2000
205836	JM8BCF1	47 06 30N	112 28 01W	87.2500	37.00006	6.3300	4.9000	3.0000	0.6600	0.7700
205872	JM8BCF1X	47 06 30N	112 28 01W	88.7900	30.0000	6.5400	4.2000	2.8000	0.6900	0.5200
205838	JM8BCA2	47 06 30N	112 28 01W	60.4000	29.0000	12.5500	7.4000	3.7000	2.8200	3.1000
205881	JM8BCA1	47 06 30N	112 28 01W	76.2900	27.0000	11.0100	5.4000	3.3000	1.6700	1.6000
205867	JM8BCA1X	47 06 30N	112 28 01W	76.3100	29.0000	10.9600	5.7000	3.6000	1.6700	1.6000
205879	JM8BC1	47 06 30N	112 28 01W	87.8700	34.0000	14.1800	6.4000	3.0000	3.4200	3.3300
205879	JM8BCX1	47 06 30N	112 28 01W	87.8700	34.0000	5.5200	4.1000	2.5000	0.5300	0.4700
194002	JC7Q211P	47 06 30N	112 28 00W	71.9300	32.0000	10.3300	7.3000	1.5000	1.8720	1.5000
193969	JC7Q212P	47 06 30N	112 28 00W	76.0000	30.0000	11.0000	6.8000	1.6000	1.3000	1.2000
193979	JC7Q221P	47 06 30N	112 28 00W	69.0000	28.0000	14.0000	7.1000	1.1000	3.2000	2.3000
193962	JC7Q222P	47 06 30N	112 28 00W	80.0000	34.0000	9.0000	5.6000	1.2000	1.3000	1.1000
193973	JC7Q231P	47 06 30N	112 28 00W	86.0000	37.00006	5.9000	4.0000	0.9500	0.4000	0.1400
193974	JC7R231P	47 06 30N	112 28 00W	88.0000	37.00006	6.0000	4.0000	1.1000	0.4000	0.1800
193964	JC7Q232P	47 06 30N	112 28 00W	71.0000	28.0000	12.0000	6.9000	1.4000	2.2000	1.9000
196921	JC7Q241P	47 06 30N	112 28 00W	0.00008	0.00008	0.00008	0.00008	0.00003	0.00008	0.00008
196922	JC7Q242P	47 06 30N	112 28 00W	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008

Table 2.--Samples from Mine Terminal X in sample number indicates duplicate analysis--continued

LAB. NO.	SAMPLE	Cu ppm-S	Cu-A	Cu-Sol	Ag ppm-S	Ag ppm-A	Sulfur	Sulfide	Pb ppm-S	Zn ppm-S
205884	JM8BC9	3500.0000	3.3750	0.3150	55.0000	26.0000	0.1000L	0.0200	6.1000	19.0000
205852	JM8BC9X	2900.0000	3.3530	0.2930	37.0000	25.0000	0.1000L	0.0100L	4.8000	17.0000
205880	JM8BC8	4600.00006	0.5150	0.3930	82.0000	49.0000	0.1000L	0.0400	8.8000	14.3000
205875	JM8BC10	3700.0000	3.4600	0.3850	57.0000	50.0000	0.1000L	0.0100L	8.8000	14.3000
205859	JM8BC10X	4600.00006	3.5500	0.4730	110.0000	55.0000	0.1000L	0.0100L	7.9000	13.3000
205840	JM8BC11	2900.0000	3.4000	0.3070	100.0000	62.0000	0.1000L	0.0200	26.0000	16.3000
205854	JM8BC3	4600.00006	3.8000	0.4880	580.0000	146.0000	0.1000L	0.0400	14.3000	16.3000
205847	JM8BC4	4600.00006	0.6450	0.4860	4600.00006	111.0000	0.1000L	0.0100	59.0000	11.3000
205839	JM8BC4X	4600.00006	0.5750	0.4090	4600.00006	126.0000	0.1000L	0.0300	71.0000	16.3000
205834	JM8BC5	4600.00006	0.5830	0.4340	4600.00006	147.0000	0.1000L	0.0100L	83.0000	17.3000
205860	JM8BC7	1600.0000	0.1830	0.1640	19.0000	12.0000	0.1000L	0.0100L	5.2000	16.3000
205841	JM8BC6	1600.0000	3.1620	0.1330	18.0000	14.0000	0.1000L	0.0200	7.1000	19.3000
205861	JM8BC6X	1300.0000	0.1540	0.1390	16.0000	9.0000	0.1000L	0.0100L	5.3000	15.3000
205848	JM8BC12	2600.0000	3.3150	0.2550	54.0000	21.0000	0.1000L	0.0100L	21.0000	190.3000
205858	JM8BC11X	1100.0000	0.1020	0.0830	31.0000	11.0000	0.1000L	0.0200	17.0000	210.3000
205876	JM8BC1X	1100.0000	3.0960	0.0840	19.0000	16.0000	0.1000L	0.0100L	18.0300	220.3000
205857	JM8BC62	4600.00006	0.4600	0.3560	53.0000	30.0000	0.1000L	0.0100L	6.2300	19.3000
205842	JM8BC61X	4600.00006	3.6650	0.4950	75.0000	50.0000	0.1000L	0.0500	11.0000	25.3000
205864	JM8BC61	4600.00006	0.6650	0.5330	79.0000	44.0000	0.1000L	0.0500	6.7300	21.3000
205865	JM8BCF5	4600.00006	1.0800	0.8700	170.0000	104.0000	0.1000L	0.0100	14.0300	160.0000
205870	JM8BCF4	4600.00006	0.5600	0.4940	100.0000	76.0000	0.1000L	0.0100	11.0300	130.0000
205863	JM8CF3	2600.0000	3.6100	0.2760	52.0000	35.0000	0.1000L	0.0100L	15.0000	110.3000
205843	JM8CF2	2700.0000	0.3450	0.2350	72.0000	30.0000	0.1000L	0.0100	11.0000	73.3000
205844	JM8CF2X	3200.0000	3.2690	0.2350	52.0000	30.0000	0.1000L	0.0100	12.0300	110.0000
205877	JM8CF1	3200.0000	0.3950	0.3340	54.0000	28.0000	0.1000L	0.0100L	9.0000	83.0000
205856	JM8CE2	3200.0000	3.3550	0.3300	54.0000	29.0000	0.1000L	0.0100	7.9000	71.3000
205883	JM8CE1	2500.0000	0.3050	0.2550	56.0000	40.0000	0.1000L	0.0200	11.0000	230.3000
205873	JM8CB1	3500.0000	3.4430	0.3890	56.0000	40.0000	0.1000L	0.0100L	9.8000	140.0000
205853	JM8CB1X	4100.0000	0.4330	0.3710	55.0000	42.0000	0.1000L	0.0200	6.7000	190.3000
205869	JM8CB1	4600.00006	1.9700	1.6000	210.0000	117.0000	0.1000L	0.0100	12.0000	140.0000
205837	JM8CB3	4600.00006	0.7900	0.4730	130.0000	72.0000	0.1000L	0.0900	16.0300	23.3000
205855	JM8CB2	4600.00006	3.5300	0.4010	57.0000	40.0000	0.1000L	0.0100	7.3000	15.3000
205836	JM8CB1X	2700.0000	0.3950	0.3090	79.0000	51.0000	0.1000L	0.0200	11.0000	24.0000
205872	JM8CB1X	3000.0000	3.3850	0.3300	79.0000	50.0000	0.1000L	0.0200	8.9000	21.0000
205838	JM8CA2	3300.0000	0.4450	0.3780	97.0000	48.0000	0.1000L	0.0100L	12.0000	290.3000
205881	JM8CA1	2900.0000	3.3753	0.3040	54.0000	37.0000	0.1000L	0.0100	7.8000	130.3000
205867	JM8CA1X	3000.0000	3.3580	0.3010	53.0000	36.0000	0.1000L	0.0300	15.0000	140.3000
205874	JM8C1	4600.00006	3.6600	0.3350	170.0000	105.0000	0.1000L	0.0400	15.0000	210.3000
205879	JM8CX1	4600.00006	3.6600	0.3670	270.0000	145.0000	0.1000L	0.0300	9.5300	18.3000
194002	JC7Q211P	4600.00006	3.9360	0.4500	22.00006	19.0000	0.3061	0.0500	11.0000	160.3000
193969	JC7Q212P	4600.00006	3.4600	0.4190	22.00006	15.0000	0.2000	0.0100L	8.9000	85.3000
193979	JC7Q221P	4600.0000	3.4230	0.3700	22.00006	20.0000	0.2000	0.0100L	10.0000	110.0000
193962	JC7Q222P	2200.0000	3.2500	0.2070	22.00006	18.0000	0.1000	0.0100L	11.0000	63.3000
193973	JC7Q231P	4600.00006	3.4600	0.3540	22.00006	49.0000	0.3000	0.0100L	51.0000	6.7000
193974	JC7R231P	3800.0000	0.4320	0.3330	22.00006	36.0000	0.3000	0.0100L	51.0000	5.1000
193964	JC7Q232P	3600.0000	3.3370	0.2860	22.00006	18.0000	0.2000	0.0100L	11.0000	190.0000
196921	JC7Q241P	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.30008
196922	JC7Q242P	0.00008	3.30008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.30008

1/ Ag by fire assay for these samples yielded: JM8BC3 = 420 ppm; JM8BC4 = 840 ppm; JM8BC5 = 8100 ppm.

Table 3.--List of analytical methods used in study of the Rogers Pass area 1/

Constituent	Method	Reference
Aluminum (Al)		
As Al ₂ O ₃	X-ray fluorescence	Wahlberg, 1975
As Al	Emission spectrography	Sutton, 1976
Antimony (Sb)	X-ray fluorescence	Wahlberg, 1975
Arsenic (As)	do	do
Barium (Ba)	Emission spectrography	Sutton, 1976
Beryllium (Be)	do	do
Boron (B)	do	do
Cadmium (Cd)	do	do
Calcium (Ca)		
As CaO	X-ray fluorescence	Wahlberg, 1975
As Ca	Emission spectrography	Sutton, 1976
Carbon (C)		
Total	Leco gasometric	Huffman and Dinnen, 1976
As carbonate	Gasometric	do
As organic	Difference	do
Cerium (Ce)	Emission spectrography	Sutton, 1976
Chromium (Cr)	do	do
Cobalt (Co)	do	do
Copper (Cu)		
Soluble	Atomic absorption	See text
Total	Atomic absorption	Unpublished
	Emission spectrography	Sutton, 1976
Dysprosium (Dy)	Emission spectrography	Sutton, 1976
Erbium (Er)	do	do
Europium (Eu)	do	do
Gadolinium (Gd)	do	do
Gallium (Ga)	do	do
Germanium (Ge)	X-ray fluorescence	Wahlberg, 1975
	Emission spectrographic	Sutton, 1976
Iron (Fe)		
As Fe ₂ O ₃	X-ray fluorescence	Wahlberg, 1975
As FeO	Titration	
As Fe	Emission spectrographic	Sutton, 1976
Lanthanum (La)	do	do
Lead (Pb)	do	do
Lithium (Li)	do	do
Magnesium (Mg)	do	do
Manganese (Mn)	do	do
Mercury (Hg)	Atomic absorption (flameless)	Huffman, 1975
Molybdenum (Mo)	Emission spectrography	Sutton, 1976
Neodymium (Nd)	do	do
Nickel (Ni)	do	do
Niobium (Nb)	do	do

Table 3.--Cont.

Constituent	Method	Reference
Phosphorus (P)		
As P205	X-ray fluorescence	Wahlberg, 1975
Potassium (K)		
As K20	do	do
As K	Emission spectrography	Sutton, 1976
Praesodymium (Pr)	do	do
Samarium (Sm)	do	do
Scandium (Sc)	do	do
Selenium (Se)	X-ray fluorescence	Wahlberg, 1975
Silicon (Si)		
As SiO2	do	do
As Si	Emission spectrography	Sutton, 1976
Silver (Ag)	Atomic absorption	Unpublished
	Emission spectrography	Sutton, 1976
Sodium (Na)	do	do
Strontium (Sr)	do	do
Sulfur (S)		
Total	X-ray fluorescence	Wahlberg, 1975
As sulfide		
Terbium (Tb)	Emission spectrography	Sutton, 1976
Thorium (Th)	Neutron activation	Millard, 1975
Thulium (Tm)	Emission spectrography	Sutton, 1976
Tin (Sn)	X-ray fluorescence	Wahlberg, 1975
Titanium (Ti)		
As TiO2	do	do
As Ti	Emission spectrography	Sutton, 1976
Uranium (U)	Neutron activation	Millard, 1975
Vanadium (V)	Emission spectrography	Sutton, 1976
Ytterbium (Yb)	do	do
Yttrium (Y)	do	do
Zinc (Zn)	do	do
Zirconium (Zr)	do	do

1/ Elements looked for by emission spectrography but not found are listed here along with their approximate limits of determination (in ppm):

Arsenic (As)	220	Palladium (Pd)	1
Bismuth (Bi)	10	Platinum (Pt)	10
Gold (Au)	4.6	Rhenium (Re)	20
Hafnium (Hf)	100	Rhodium (Rh)	2.2
Holmium (Ho)	10	Ruthenium (Ru)	10
Indium (In)	50	Tantalum (Ta)	500
Iridium (Ir)	46	Thallium (Tl)	4.6
Lutetium (Lu)	10	Tungsten (W)	46
Osmium (Os)	22		