Geochemistry of Auriferous Pyrite Mineralization at the Bonanza Ledge, Mosquito Creek Mine and Other Properties in the Wells-Barkerville Area, British Columbia

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KEYWORDS: Gold, Wells, Barkerville, Mosquito Creek Mine, Island Mountain Mine, Cariboo Gold Quartz Mine, Bonanza Ledge, Pyrite, Quartz veins, Geochemistry, Exploration, Economic Geology.

INTRODUCTION AND LOCATION

The 30 km-long, northwest trending Wells-Barkerville Gold Belt lies approximately 65 km east of Quesnel in east-central British Columbia. It has had a 140 year-long mining history, having produced over 75 tonnes of gold from placer sources and a further 38.3 tonnes by underground mining. The belt contains numerous small pits and adits that were commonly driven on auriferous quartz veins; examples of these are at the Warspite, Proserpine, Canusa, Blackbull, Hardscrabble and BC veins, as well as at the Perkins and Standard Location properties situated southwest of the main belt and east of Stanley townsite (Figure 1). Most of the belts' production, however, came from four larger underground properties, the Mosquito Creek, Island Mountain (Aurum), and Cariboo Gold Quartz mines at the northwest end of the belt (Figures 1 and 2) and the Cariboo-Hudson further southeast. Apart from minor amounts of coarse visible free gold in quartz (Skerl, 1948), most gold occurs as micron-sized particles intimately associated with crystalline pyrite (Rhys and Ross, 2000).

There are two main styles of pyritic gold mineralization: (1) auriferous pyrite that lies in or adjacent to generally barren quartz ± carbonate ± sericite veins, and (2) massive to semi-massive banded and stringer pyrite that form small tabular and lenticular "replacement" bodies (Photos 1 and 2). Both types of mineralization are present at the Mosquito Creek, Island Mountain and Cariboo Gold Quartz mines. However, quartz-vein-related pyrite was the main ore mined at Cariboo Gold Quartz and it was also significant at the Island Mountain Mine (Skerl, 1948). Massive to semi-massive replacement and pyrite stringer ore bodies were the main economic focus at the Mosquito Creek Mine (Alldrick, 1983), and were also important at the Island Mountain Mine (Hanson, 1935; Benedict, 1945; Sutherland Brown, 1957).

The replacement bodies are mineralogically and chemically zoned (Alldrick, 1983). Their central portions are marked by fine grained, highly auriferous pyrite with a dolomite and quartz gangue; laterally, they grade out to coarser grained barren pyrite with arsenopyrite and minor galena, sphalerite and rare pyrrhotite. Outboard, the pyrite bodies are enveloped by silicified or sericitized limestone or sericite schist (Alldrick, 1983).

Exploration in the belt was recently revitalized by the discovery of the Bonanza Ledge Gold Zone by International Wayside Gold Mines Ltd. This property is located approximately 3 km southeast of the Wells townsite and the former Cariboo Gold Quartz mine (Figures 1 and 2). A staking rush took place after the announcement of several spectacular drill intersections, including 24.65 g/t Au over 25.8 m in hole BC-2K-10. As a result of this discovery, the B.C. Geological Survey, in co-operation with International Wayside and its contractors, began a program to examine the Bonanza Ledge and other pyritic gold properties in the belt.

This paper presents major and trace element geochemical data concerning the different styles of gold mineralization and their associated alteration. In addition, samples of quartz in the veins and massive pyritic replacements were subjected to fluid inclusion analysis, the results of which are summarized by Dunne and Ray (2001, this volume). Preliminary data suggests significant variations in the mineralogy and chemistry of the auriferous pyrite, as well as some chemical differences of fluids in the quartz veins throughout the belt. It is not yet known whether these variations reflect district-scale chemical zoning and temperature differences, but the distinctive chemical signatures noted in the Bonanza Ledge mineralization could be used to locate other pyritic gold zones of this type.

PREVIOUS WORK

Some of the earliest published work in the district includes the superb geology and placer maps of Bowman (1889, 1895). Since that time there have been numerous government and company geologists working in the district; these have produced a wealth of data concerning the

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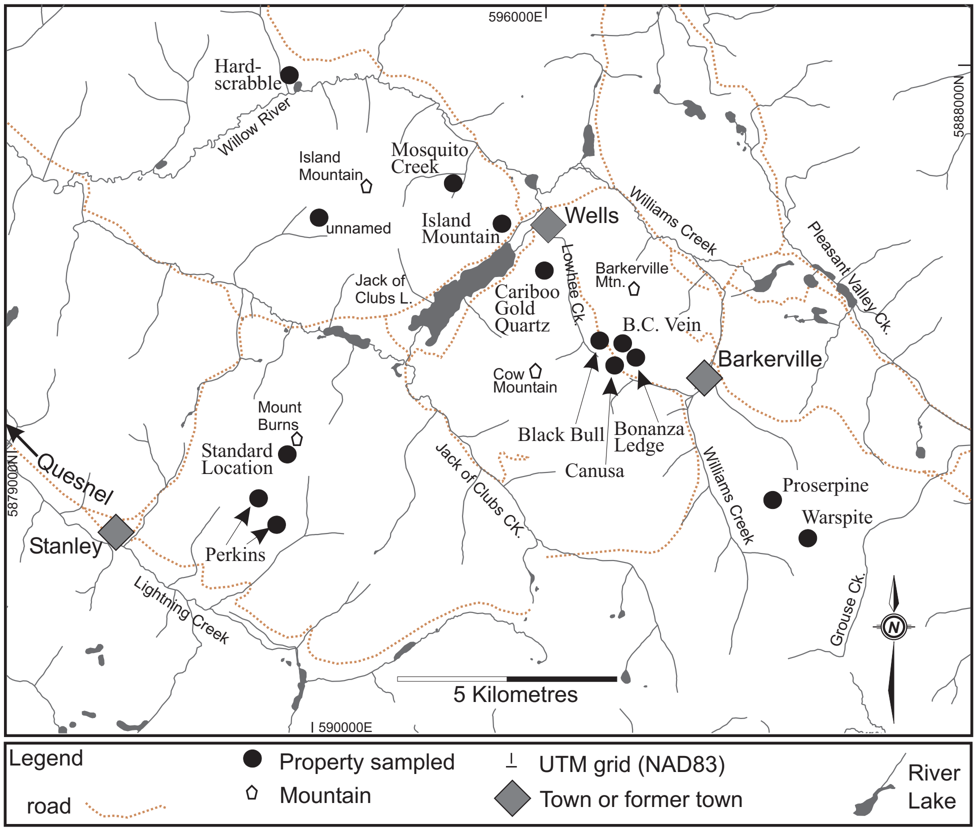


Figure 1. The NW part of the Wells-Barkerville Gold Belt showing the location of the gold mines and occurrences mentioned in this paper.

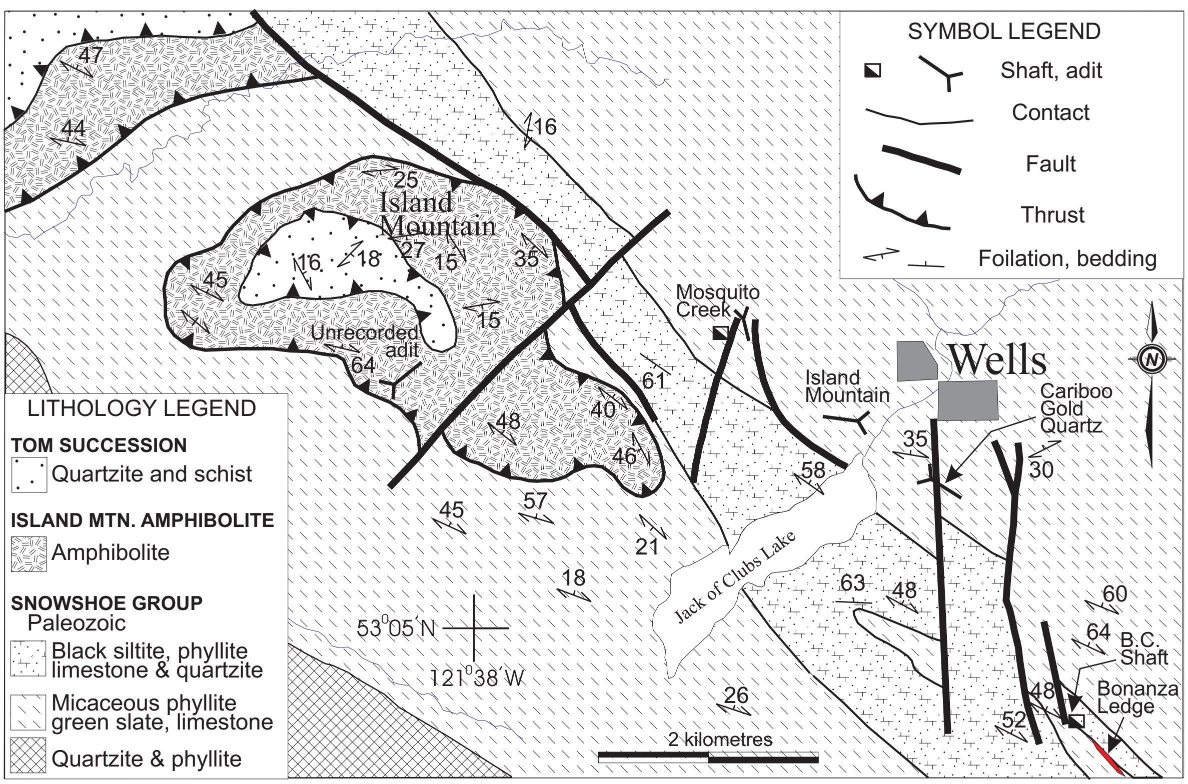


Figure 2. Simplified geology of the Wells area (adapted after Alldrick, 1983 and Struik, 1988b).

Photo 1. NNE-trending white quartz vein with dolomite and pyrite-rich margins and sigmoidal satellite quartz veinlets. Exposure in the Number 1 underground level (4400 feet), Mosquito Creek Gold Mine.

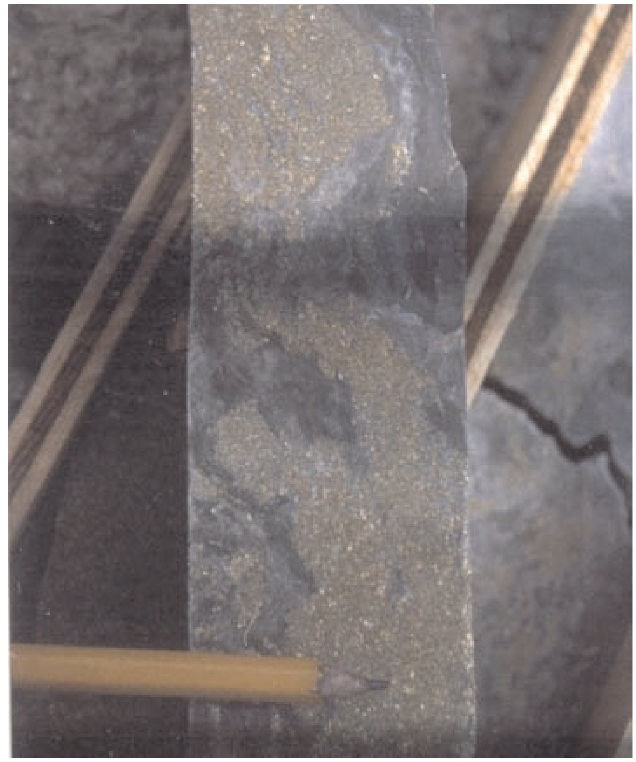


Photo 2. Gold-bearing semi-massive pyrite mineralization in drill core at the Bonanza Ledge Gold Zone. Drill hole BC-2K-19 at 310 feet.

placer and lode gold in the area, although some is unfortunately unpublished. Information on the placers is given by Uglow and Johnson (1923), Johnson and Uglow (1926), Clague (1989), McTaggart and Knight (1993), and Levson and Giles (1993).

Bedrock mapping includes work by Hanson (1934, 1935), Holland (1948, 1950, 1954), Sutherland Brown (1957, 1963) and more recently by Struik (1988a and 1988b). More detailed work on the deposits has been completed by Bacon (1939), Benedict (1945), Skerl (1948), Runkle (1950), Alldrick (1983), and Robert and Taylor (1989). Recent summaries of the camp have been completed by Hall (1999) and of the Bonanza Ledge Gold Zone by Rhys and Ross (2000) and Rhys (2000). The preliminary results concerning the fluid inclusion characteristics of some mineralized veins and replacements in the district are presented by Dunne and Ray (2001, this volume). Observations on the possible regional controls between the Wells-Barkerville Au mineralization and listwanite-altered ophiolitic rocks in the district are presented by Ash (in press).

GEOLOGY AND STRUCTURE

The Wells-Barkerville Gold Belt lies in the Proterozoic to Paleozoic Barkerville subterrane. The subterrane in this area comprises metamorphosed grits, quartzites, phyllitic argillites and schists with lesser carbonates, tuffs and mafic volcanic rocks. Many of the argillites are dark and organic-rich except where they have been bleached during metamorphism (Sutherland Brown, 1957).

In the immediate Wells-Barkerville vicinity, the succession belongs to the Paleozoic Snowshoe Group (Struik, 1988a, 1988b). However, Paleozoic or older rocks represented by the Island Mountain Amphibolite and the structurally overlying Tom succession occupy the summit of Island Mountain (Figure 2). The structural relationship between these two latter packages is uncertain, and Alldrick (1983) and Struik (1988a, 1988b) suggest they occupy klippes that structurally overlie the Snowshoe Group rocks. The stratigraphic relationship of the foliated and banded mafic rocks in the Island Mountain Amphibolite is also controversial; the unit may represent an unusual facies of the Snowshoe Group or thrust slices derived either from the Slide Mountain Terrane to the northeast or the Crooked Amphibolite unit further southwest (Struik, 1988a, 1988b) .

Both the pyritic quartz-vein and replacement mineralization in the belt are mainly hosted by lower greenschist facies phyllitic Snowshoe Group rocks and are generally confined to a stratigraphic interval in the upper part of the succession (Sutherland Brown, 1957, 1963; Alldrick, 1983; Robert and Taylor, 1989). These rocks display moderate to high strain; bedding is locally preserved (Alldrick, 1983; Robert and Taylor, 1989), but in many parts it is undetectable or has been intensely transposed. The positive identification of mappable stratigraphic units throughout the district is difficult for a number of reasons: the lack of widespread marker horizons and fossils (Struik, 1988a), the rarity of reliable bedding-cleavage intersections and the bleaching effects caused by hydrothermal or metamorphic overprinting (Photo 3; Sutherland Brown, 1957).

At least three major deformational events are recognized (Struik, 1988a, 1988b; Robert and Taylor, 1989) resulting in various fold styles and the formation of three sets of foliations and cleavages. The earliest foliation corresponds to layering of possible tectonic origin in the metasedimentary rocks, together with boudinage, ductile shearing and the formation of small scale isoclinal rootless folds (Struik, 1988a, 1988b; Robert and Taylor 1989).

The second period of ductile folding (F2) appears to have been the dominant structural event in the Wells-Barkerville area. It resulted in isoclinal to tight asymmetric folds (Photo 4), together with axial planar S2 fabrics that vary from a penetrative, intense sericite-muscovite cleavage and schistosity to a more widely spaced, less strong fracture cleavage.

The S2 foliations strike northwest to west and mostly have a moderate to gentle northeast dip. The F2 event was associated with the development of a strong mineral lineation and elongate rodding or mullion structures; these plunge gently to moderately northwest, parallel to the F2 fold axes (Alldrick, 1983; Struik, 1988a, 1988b; Robert and Taylor, 1989). The massive pyritic ore bodies at the Mosquito Creek mine also plunge sub-parallel to the F2 linear structures (Alldrick, 1983) and the margins of some quartz veins (*e.g.* the BC Vein) exhibit similar northwest plunging rodding structures. Likewise, recent work demonstrates that the Bonanza Ledge mineralization is folded by F2 structures (Rhys, personal communication, 2000). This is evidence that introduction of the older replacement pyritic bodies and many of the slightly younger quartz veins occurred before the F2 deformation had ceased. Thus, the mineralization may well have accompanied, and been controlled by, this regional structural-metamorphic event.

The third deformation (F3) was possibly related to a broad anticlinorium that developed west of the Wells area (Struik, 1988a; Robert and Taylor, 1989). This resulted in open folds, formation of both miceaceous planar and crenulation strain-slip cleavages, and brittle faulting.

SAMPLING

Sampling was mainly confined to the northwest part of the Wells-Barkerville Belt (Figure 1). This area includes three of the major underground mines (Mosquito Creek, Island Mountain and Cariboo Gold Quartz) as well as the Bonanza Ledge mineralization. In addition, samples were taken from the Perkins-Standard Location veins in the southwest, and from mineralization in the Warspite-Grouse Creek area to the southeast (Figure 1).

Photo 3: Blue-grey phyllite that is partially bleached by fluids of presumed metamorphic or igneous hydrothermal origin. Snowshoe Group metasediments, 2.5 km NW of the Hardscrabble occurrence, UTM 588465E; 5890076N.

Photo 4. Tight to isoclinal F2 folding in an interbedded carbonate-phyllite unit. Underground exposure, Island Mountain Mine.

The following rock types were sampled and assayed:

1. Massive to semi-massive pyritic and stringer "replacement" mineralization from the Bonanza Ledge Zone (Photo 2) and the Mosquito Creek and Island Mountain mines. The mine samples were taken mostly from underground workings although some mineralized float specimens on the mine dumps were also included. The pyritic Bonanza Ledge samples were selected from two drill holes (BC-2K-19 and BC-2K-29) and were analysed for major and trace elements (Tables 1A and 2B).
2. Barren footwall and hanging-wall alteration adjacent to the auriferous pyrite in the above two drill-holes at the Bonanza Ledge Zone. These samples were analysed for major and trace elements (Table 1A).
3. Massive to semi-massive pyrite within or adjacent to quartz veins at the Mosquito Creek and Cariboo Gold Quartz mines (Photo 1). These samples were taken from underground exposures and mineralized float on the mine dumps; they were assayed for their trace element content (Table 2A).
4. Pyrite-poor quartz veins, some of which contain minor quantities of galena and sphalerite. These includes samples from the BC, Proserpine, Warspite, Canusa, Black Bull, Standard Location and Perkins veins, as well as from some other unnamed vein occurrences. This outcrop and mine dump material was sampled and assayed for trace elements (Table 3A).
5. Igneous rocks: these are rare in the district. However, samples were taken from presumed metavolcanics of the Island Mountain Amphibolites southwest of Island Mountain (Figure 1) as well as from some altered intrusions recently intersected by drilling in the Mosquito Creek mine area. These samples were analysed for major and some trace elements to determine their composition and possible origin. The data will be published in full at a later date, but discrimination plots suggest that the Island Mountain Amphibolite rocks compositionally resemble tholeiitic ocean floor basalts while the intrusive rocks intersected in the drilling at Mosquito Creek are alkalic diorites.
6. Miscellaneous samples collected due to either their distinctive alteration (*e.g.* the presence of possible fuchsite-mariposite) or unusual sulphide content (*e.g.* massive galena from the Mosquito Creek mine dump). This data is presented in Table 3A.

In addition to the above, a heavy mineral pan concentrate sample collected by placer miner Mr. Wilfred Frederick from Lowhee Creek, southeast of Wells (Figure 1), was assayed. The results are presented in Table 4.

BONANZA LEDGE ZONE

Geology and Mineralogy

This newly discovered pyritic gold zone has been traced for over 130 m along strike and reaches widths up to 30 m. It is hosted by an overturned, northeast-dipping, predominantly clastic meta-turbidite sequence that possibly includes some highly altered carbonates and tuffaceous rocks. The sequence has been overprinted by muscovite-sericite, greenschist facies metamorphic assemblages and was affected by several episodes of ductile-brittle folding and later brittle fracturing (Rhys and Ross, 2000). The mineralization lies in structurally deformed and transposed footwall rocks below the northwest-trending BC quartz vein. This vein exceeds 700 m in length and reaches more than 15 m in width (Sutherland Brown, 1957). Most of the vein quartz is barren, but pyrite-rich pockets in the vein and sporadic pods and lenses along its margins have been historically mined for gold. The Bonanza Ledge Zone was discovered during a drilling program to test the BC Vein, and the generalized sequence as logged by the staff of International Wayside and Panterra Geoservices Inc. is as follows (Figures 3A and 3B; Rhys and Ross, 2000; Rhys, 2000):

1. Pale muscovite phyllite in the structural hangingwall with porphyroblasts of magnetite and lesser carbonate. This unit may form part of the Rainbow Member of Hanson (1935) and Hardscrabble Mountain Succession of Struik (1988a, 1988b).
2. White B.C. quartz vein. The vein margins are often marked by graphitic shears and the vein is locally cut out by brittle faulting.
3. Black carbonaceous phyllite with silty interbeds. This sequence is believed to belong to the BC Member of Hanson (1935).
4. Pale, well-laminated muscovitic pelites and phyllites with areas containing Fe-Mg carbonate (?dolomite) that occurs as laminae and pervasive, tan-colored zones. These rocks and the remaining footwall section are thought to belong to the Lowhee Member of Hanson (1935) (D. Rhys, personal communication, 2000). These unit 4 rocks in part host the auriferous Bonanza Ledge pyrite zones (Photos 5 to 9). Much of the dolomitic alteration is probably related to the mineralizing event, although some may be derived from original carbonate sediments.
5. The drilled footwall of the sequence comprises altered and sheared sedimentary phyllites and meta-turbidites that are locally well laminated with transposed bedding. The upper parts may host auriferous Bonanza Ledge pyrite mineralization. Locally, this unit and unit 4 above are altered and quartz-rich ("watery quartzite") with abundant parallel thin slivers of white and blue-grey quartz, some cross-cutting quartz and dolomitic veinlets, muscovite and trace rutile. Lower in the section there are sporadic disseminations and bands of pyrite and pyrrhotite, both of which tend to be barren.

The auriferous zones at Bonanza Ledge comprise between 5 and 75 percent fine to medium-grained pyrite that forms euhedral to subhedral crystals (Photos 5 to 9). These pyrite crystals reach up to 8 mm in diameter, but are mostly < 1.5 mm. Pyrite forms semi-massive layers up to 0.75 m thick, as well as thinner pods, stringers and folded veins. It can be fine grained and disseminated (Photo 5) or be concentrated in bands that follow either transposed

TABLE 1A
GEOCHEMICAL DATA OF SAMPLES FROM DRILLHOLES BC-2K-19&29
BONANZA LEDGE GOLD ZONE, WELLS-BARKERVILLE, B.C.
(FOR SAMPLE DESCRIPTION *SEE* TABLE 1B)

	Depth in feet	Au ppb	Au g/tonne	As ppm	Hg ppb	Sb ppm	Ba ppm	Be ppm	Bi ppm	Cd ppm	Ca %	Ce ppm	Cs ppm	Cr ppm	Co ppm	Cu ppm	Ga ppm	Ge ppm	La ppm	Pb ppm	Li ppm	Mo ppm	Ni ppm	Nb ppm	P ppm	Rb ppm
Hole BC-2K-19																										
2K-19-1	58	<5	-----	7	<10	0.9	1210	2.7	1.4	0.12	0.36	102.5	11.25	86	22.8	<1	26.6	2.1	49	414	125.5	<0.2	37.4	3.8	680	182
2K-19-2	87	120	-----	228	<10	7	500	3.4	0.4	0.24	0.93	41.9	7.05	98	20.8	45	24.1	2.1	19.5	84.5	12.6	<0.2	39.8	2.8	510	210
2K-19-3	115	<5	-----	1	<10	0.3	1090	2.05	0.13	0.06	0.8	86.2	14.7	79	24.2	104	21.9	1.9	38.5	26.5	90.2	1	38.6	5	590	120
2K-19-4	135	255	-----	459	<10	1.2	190	2.3	0.85	0.18	7.57	36.6	9.75	107	19.4	1	21.9	1.3	17	19	13.2	9	76.8	2	2980	187.5
2K-19-5	141	20	-----	236	<10	0.6	960	2.35	0.11	0.26	11.75	73.6	5.75	300	35.6	<1	17.7	1	32.5	14.5	11.8	1.8	79.8	9.2	3350	149
2K-19-6	177	<5	-----	324	<10	0.7	1180	1.3	0.19	0.24	13.3	22	2.9	458	31.6	<1	12.9	0.6	10.5	12	5.8	0.2	139	2.6	790	96.2
2K-19-7	208	15	-----	303	<10	2	370	1.4	0.89	0.06	9.32	16.55	3.9	285	34.8	15	12	1	7.5	28	6.8	0.8	165.5	2.4	580	114.5
2K-19-8	230	20	-----	120	110	1.6	130	1.5	0.25	0.18	4.27	29.8	4.15	180	36.6	89	20.2	1.3	12.5	21.5	6.8	0.4	92.1	9.2	1500	146
2K-19-9	246	80	-----	598	<10	1.6	960	2.3	0.33	0.24	5.94	67.2	4.9	478	55.6	26	22.2	1.4	29	14	6.4	2.2	272	10	2350	189
2K-19-10	249	20	-----	96	<10	0.4	1210	1.9	0.14	0.08	0.32	73.5	4.1	62	11	14	18.1	1.9	33	14	6	0.4	29.6	2.8	400	134.5
2K-19-20	294	25000	25	876	2370	1.4	1720	3.9	5.15	0.16	2.74	32.6	7.4	44	91.7	7	29.5	1.9	14.5	39.5	8.2	0.8	152.5	12.6	1790	246
2K-19-21	323	8300	-----	953	1110	0.8	2360	3.35	7.56	<0.02	1.62	87.8	7.45	77	78.2	8	32.4	1.8	39.5	43.5	11.6	0.8	159.5	2.6	570	257
2K-19-22	318	1505	-----	729	270	0.7	2600	4.1	7.06	0.02	0.53	87.5	8	111	89.2	4	35.9	2.1	39	20.5	13	1	154	2.4	600	300
2K-19-23	309	31800	31.8	845	4350	5.2	1180	3.1	7.22	0.04	0.34	47.7	6.9	68	36.2	16	27.7	1.5	19.5	61	9.2	1	88.4	1.4	380	238
2K-19-11	333	<5	-----	26	<10	0.4	3210	3.2	0.07	0.24	6.69	55.5	6.95	46	8.2	19	30.1	1.8	23.5	13.5	13.4	0.8	15.6	17.8	1670	232
2K-19-12	350	10	-----	293	20	0.7	580	1.3	0.13	0.2	3.55	21.8	4.15	170	43	83	17.8	1.5	9.5	8.5	6.2	<0.2	80.5	5.4	970	134.5
2K-19-13	365	4740	-----	708	6610	2.8	1670	2.1	12.85	0.1	1.82	58.5	5.05	57	36.8	13	17.9	1.2	25.5	45.5	6.6	2	71	1	960	149
2K-19-14	393	545	-----	240	3670	2.2	1170	3.9	11.5	0.18	0.35	109	8.3	118	31.8	15	35.5	2.1	45.5	21.5	11.6	0.8	69.5	2	680	276
2K-19-15	398	475	-----	146	1750	1.1	1300	4.25	6.43	0.18	0.22	118.5	8.8	139	29.2	17	38.2	2.3	48.5	19.5	13.8	0.6	57.3	2.4	760	315
2K-19-16	426	10	-----	83	110	2.2	110	2.05	0.18	0.24	0.47	24.3	5.4	904	90.6	94	25.1	2	10	13	6.8	1.6	419	5.6	1940	187
2K-19-17	453	5	-----	8	<10	0.4	1280	1.7	0.2	0.12	0.15	81.5	4.6	70	12.8	28	22.6	1.9	37.5	33	8.6	1.8	24.4	4.4	420	162.5
2K-19-18	465	10	-----	24	<10	0.5	330	1.55	0.63	0.08	0.29	65.2	4.65	64	18.2	28	20.2	1.8	28.5	17.5	9.2	1	29.2	2.2	450	149
2K-19-19	498	5	-----	5	<10	0.1	670	1.3	0.25	<0.02	0.31	76.8	3.3	49	10	18	15.9	1.7	34.5	15.5	9.6	0.6	21.4	2.4	280	115
Hole BC-2K-29																										
2K-29-1	55	70	-----	57	10	6.2	1320	2.35	0.17	0.06	0.34	100.5	9.8	93	27.6	15	27.6	2.3	43.5	9	17	<0.2	43.8	5.2	670	247
2K-29-2	78	180	-----	105	<10	1.8	1460	2.2	0.38	0.5	6.66	58	6.2	96	15.4	18	16.3	1.6	28	96	72.6	1.6	41	4.4	840	123.5
2K-29-3	89	75	-----	34	<10	0.6	40	<0.05	1.15	0.02	0.22	1.92	0.35	16	1.8	5	0.5	3.4	0.5	8	11.6	0.2	6.6	<0.2	130	4
2K-29-4	116	20	-----	228	<10	1.6	1040	1.55	0.1	0.2	6.6	43.3	3.4	294	34.6	65	18.2	1.3	19.5	8	9.6	1	81.6	9.8	1200	153
2K-29-5	166	80	-----	116	450	2.5	230	1.15	0.22	0.24	2.57	33.2	3.2	40	44	70	22.6	1.2	13.5	8	5.8	3.4	47.2	13.6	1830	183
2K-29-6	215	4210	-----	847	3660	1.8	1710	3.25	11.4	0.12	1.7	34.7	5.85	71	82.6	<1	29.4	1.7	13.5	19	10.6	2.2	175	8.2	3070	184
2K-29-19	219	100	-----	139	4590	2.3	1990	2.05	0.74	0.16	0.91	31.4	4.65	60	44	33	22.1	1.9	12	9	9	5.4	59.5	11.6	2810	138.5
2K-29-18	225	405	-----	121	2510	1.8	530	2.95	3.47	0.12	1.34	34	5.6	58	43.8	8	24.8	2	13	13	12	3.4	66.5	11.4	2960	171
2K-29-17	235	14000	14	1180	3230	1.5	1280	2.6	5.36	0.1	0.89	45.4	4.6	29	110	26	27.3	1.5	18	86.5	7	0.8	309	12	2510	198
2K-29-20	243	24800	24.8	1295	2030	1.1	530	1.65	11.2	0.24	1.98	35.1	3.9	58	63.2	42	18.9	1.2	14	129.5	5	1.4	170	5.2	1010	132.5
2K-29-7	271	20	-----	44	440	0.7	1630	0.9	0.16	0.14	0.7	59.9	3.5	41	37.6	229	28.3	1.8	26.5	5.5	4.2	0.4	57.4	24.2	2320	97.2
2K-29-8	294	20	-----	182	1700	5.5	230	1	0.03	0.18	1.38	20.6	4.1	93	59.4	113	22.5	1.7	8	5.5	6.2	1	96.3	8.6	1220	172
2K-29-9	327	15	-----	75	5100	2.7	250	0.9	0.03	0.18	0.84	23.5	4.1	33	45.8	146	23.1	1.5	7.5	6.5	6.2	1.6	47.4	12.4	1960	104
2K-29-10	344	15	-----	103	1160	3	340	1.55	0.05	0.1	0.78	28.3	4.95	58	26.6	44	21.6	1.6	11.5	4	8.2	0.8	27	12.4	2970	123.5
2K-29-11	371	5	-----	119	80	0.9	1630	1.45	0.01	0.06	0.95	56.4	4.5	40	32.2	99	27.9	1.8	25	3	6.2	0.4	48	22.6	2420	130
2K-29-12	390	10	-----	131	320	0.4	2370	1.8	0.06	0.12	3.52	21.5	5.3	181	24.8	18	19.5	1.5	10	3	7.4	<0.2	60.5	7.2	600	152.5
2K-29-13	410	5	-----	80	30	0.5	2130	1.75	0.01	0.16	2.54	46.7	3.9	37	22	97	19.7	1.3	21	3	6	0.2	24.6	16	1280	104
2K-29-14	430	45	-----	170	930	0.7	260	1.75	0.42	0.1	0.89	37.5	4	48	28.2	85	20.9	1.6	14	5	6.6	0.4	41.2	12.6	1860	114.5
2K-29-15	451	<5	-----	30	<10	0.2	2630	5.25	0.02	<0.02	0.47	227	8.7	117	2.8	<1	47.1	2.2	99	8	10.8	0.2	7.2	6.2	830	357
2K-29-16	480	40	-----	75	<10	0.1	620	1.35	0.09	0.04	0.08	60	2.35	39	7.2	19	11.8	1.7	25	5.5	4.2	0.2	14.6	1.8	300	96.4

TABLE 1A CONTINUED
GEOCHEMICAL DATA OF SAMPLES FROM DRILLHOLES BC-2K-19&29
BONANZA LEDGE GOLD ZONE, WELLS-BARKERVILLE, B.C.

SAMPLE	Depth in feet	Ag ppm	Sr ppm	Ta ppm	Te ppm	Tl ppm	Th ppm	W ppm	U ppm	V ppm	Y ppm	Zn ppm	Al2O3 %	CaO %	Cr2O3 %	Fe2O3 %	K2O %	MgO %	MnO %	Na2O %	P2O5 %	SiO2 %	TiO2 %	LOI %	TOTAL %
Hole BC-2K-19																									
2K-19-1	58	1.35	128.5	0.25	<0.05	0.82	13.4	0.6	1.6	119	7	112	18.68	0.51	<0.01	9.12	4.25	2.01	0.11	1.24	0.18	54.84	1.30	6.76	99.00
2K-19-2	87	0.4	109	0.15	<0.05	0.88	9.2	1.9	1.8	143	5.9	60	17.84	1.35	<0.01	7.58	5.08	1.66	0.16	0.37	0.14	56.48	1.32	6.84	98.82
2K-19-3	115	0.4	89.5	0.3	<0.05	0.6	11.6	0.8	2	111	6.6	112	15.17	1.16	<0.01	7.97	2.90	2.09	0.20	0.82	0.17	59.02	1.29	8.27	99.06
2K-19-4	135	0.3	591	0.1	<0.05	1.14	7.4	5.6	2.6	377	19.7	36	16.27	11.15	<0.01	10.40	4.57	5.34	0.22	0.20	0.74	26.22	0.69	17.05	92.85
2K-19-5	141	0.2	628	0.45	<0.05	0.78	4.4	11.2	1.4	218	21.7	36	10.07	16.60	0.02	9.36	2.90	6.41	0.28	0.16	0.79	24.47	2.58	21.18	94.82
2K-19-6	177	0.05	450	0.1	<0.05	0.48	1.2	4.2	0.8	200	9.6	56	8.96	18.66	0.04	8.41	2.60	9.11	0.19	0.18	0.20	21.16	1.42	23.21	94.14
2K-19-7	208	0.3	300	0.05	<0.05	0.74	1.2	4.4	0.8	169	5.7	52	11.38	13.28	0.04	8.46	3.33	5.62	0.19	0.14	0.17	34.35	0.76	14.53	92.25
2K-19-8	230	0.25	270	0.5	<0.05	1.34	2.4	4.5	0.2	228	6.8	92	14.02	6.18	0.02	11.36	3.69	4.14	0.13	0.83	0.37	42.13	2.59	13.03	98.49
2K-19-9	246	0.3	403	0.6	0.05	1.48	4.2	8.8	2.4	253	14.5	82	15.16	8.84	0.06	12.17	4.68	6.39	0.25	0.24	0.60	24.89	3.51	16.01	92.80
2K-19-10	249	0.15	68.7	0.2	0.1	1.3	17.4	1.6	2.6	64	7.1	46	12.70	0.46	<0.01	4.55	3.57	1.44	0.04	0.23	0.12	70.48	0.59	5.10	99.28
2K-19-20	294	1.75	248	0.75	0.05	4.74	3.8	14.2	0.8	280	11.8	22	20.03	4.09	<0.01	19.42	6.43	1.98	0.09	0.24	0.49	25.87	4.02	15.94	98.60
2K-19-21	323	1.2	179	0.2	<0.05	5.02	15.2	4.1	3.4	128	10.1	10	22.31	2.25	<0.01	19.52	6.50	1.58	0.07	0.37	0.16	30.26	0.99	14.76	98.77
2K-19-22	318	0.65	117.5	0.15	0.15	4.66	15	5.1	4	157	9.5	10	25.77	0.71	<0.01	15.15	7.69	0.92	0.02	0.36	0.17	34.20	1.29	11.86	98.14
2K-19-23	309	8.55	77	0.05	0.05	7.54	15	3.3	3.6	128	8.4	16	20.57	0.51	<0.01	26.41	6.55	0.73	0.01	0.29	0.12	26.07	1.09	16.22	98.57
2K-19-11	333	0.35	559	0.95	<0.05	3.52	4.4	9.7	0.8	329	22.1	32	21.47	10.07	<0.01	5.41	6.36	4.66	0.26	0.45	0.41	27.33	3.30	14.13	93.85
2K-19-12	350	0.2	193	0.3	0.1	1.84	1.6	4.1	0.2	215	4.2	56	14.35	5.23	0.01	10.53	4.17	3.53	0.20	0.21	0.25	47.04	1.86	11.11	98.49
2K-19-13	365	1.15	162	0.05	0.3	6.14	8.6	2	1.8	91	8.6	12	13.74	2.60	<0.01	35.72	4.11	1.36	0.06	0.15	0.22	17.65	0.71	22.28	98.60
2K-19-14	393	0.4	84.5	0.15	0.2	13.6	19.4	4	5.2	143	8.6	50	27.44	0.48	<0.01	13.28	8.03	0.83	0.01	0.33	0.21	36.38	1.16	11.11	99.26
2K-19-15	398	0.25	90.3	0.2	0.05	9.02	20.8	3.3	4.6	143	8.8	64	27.30	0.27	0.04	13.05	8.11	0.70	<0.01	0.40	0.20	36.64	1.29	10.71	98.71
2K-19-16	426	0.2	100.5	0.3	<0.05	4.44	2	2.7	3.2	307	5.9	98	18.99	0.67	0.20	11.16	5.39	0.96	0.03	0.43	0.48	47.65	3.71	8.98	98.65
2K-19-17	453	0.2	84.1	0.3	<0.05	2.42	13.8	1.5	3.2	91	5.8	66	15.92	0.20	0.08	3.74	3.59	0.85	0.01	0.26	0.10	68.88	0.70	4.64	98.97
2K-19-18	465	0.15	96.9	0.15	0.05	1.94	12.2	2.4	3.4	75	5.5	76	15.09	0.38	0.09	5.50	3.57	1.13	0.01	0.37	0.11	66.34	0.62	5.81	99.02
2K-19-19	498	0.05	77.4	0.15	<0.05	1.24	17.4	0.7	3.8	53	6.3	62	11.12	0.42	0.04	5.08	2.79	1.51	0.04	0.32	0.08	71.80	0.50	5.25	98.95
Hole BC-2K-29																									
2K-29-1	55	0.25	91.8	0.3	<0.05	1.32	14	1.7	2	150	7.1	118	18.17	0.49	<0.01	9.25	5.21	2.29	0.11	0.38	0.17	52.54	1.39	8.38	98.38
2K-29-2	78	0.35	267	0.2	<0.05	0.7	9.6	6.1	1.6	127	9.2	72	11.37	8.85	<0.01	5.68	2.94	3.80	0.13	0.18	0.20	53.21	0.55	11.70	98.61
2K-29-3	89	0.15	12.2	<0.05	<0.05	0.02	0.2	0.7	0.2	9	0.9	2	0.88	0.25	<0.01	0.82	0.12	0.07	0.01	<0.01	0.06	96.10	0.03	0.82	99.16
2K-29-4	116	0.2	253	0.35	<0.05	0.66	3.6	6	2	218	8.7	44	12.46	9.81	<0.01	7.67	3.72	4.96	0.20	0.09	0.30	44.08	1.98	13.44	98.71
2K-29-5	166	0.3	116	0.7	<0.05	1.44	2.6	5.3	1	267	7.1	90	14.22	3.62	<0.01	13.82	4.59	2.31	0.14	0.15	0.44	43.60	3.07	12.70	98.66
2K-29-6	215	0.7	103.5	0.45	0.5	6.08	2	8.3	0.6	240	11	30	21.02	2.39	<0.01	20.32	6.78	1.19	0.09	0.30	0.77	27.72	3.38	14.40	98.36
2K-29-19	219	0.3	97.4	0.6	<0.05	4.78	2	4.9	0.2	206	6.6	50	17.21	1.22	<0.01	12.49	5.26	1.19	0.04	0.26	0.66	48.12	2.61	9.72	98.78
2K-29-18	225	0.35	110.5	0.75	0.05	4.3	3.2	7.6	1.6	189	9.2	52	18.24	1.94	<0.01	9.51	5.55	1.02	0.05	0.23	0.73	50.36	2.72	8.16	98.51
2K-29-17	235	1.8	64.6	0.65	0.05	2.38	3.4	12.4	1	340	9	22	19.39	1.32	<0.01	25.03	6.36	0.56	0.04	0.20	0.61	24.97	4.53	15.54	98.55
2K-29-20	243	3.25	92.8	0.25	<0.05	2.46	2.8	7.8	0.6	227	6.3	42	12.40	3.10	<0.01	35.92	3.92	1.33	0.12	0.04	0.27	15.87	3.09	22.46	98.52
2K-29-7	271	0.5	115	1.25	<0.05	2.26	4.4	0.7	<0.2	289	6.8	80	18.48	1.05	<0.01	9.68	3.12	1.30	0.15	4.55	0.63	48.60	4.10	7.41	99.07
2K-29-8	294	0.2	100.5	0.5	<0.05	7.2	1.6	1.5	<0.2	224	4.2	138	16.06	2.02	<0.01	14.96	3.88	2.26	0.16	1.12	0.31	43.20	2.46	12.30	98.73
2K-29-9	327	0.25	72.5	0.65	<0.05	8.66	1.8	1.3	0.2	269	5.9	84	13.97	1.18	<0.01	19.25	3.28	1.04	0.08	2.18	0.50	41.51	3.35	12.29	98.63
2K-29-10	344	0.2	102	0.7	<0.05	5.2	2	3.9	<0.2	202	7.4	60	17.80	1.08	<0.01	11.43	4.44	1.76	0.14	2.02	0.73	47.60	2.75	9.09	98.84
2K-29-11	371	0.3	121.5	1.2	<0.05	2.8	4	4.1	<0.2	336	7.3	94	17.82	1.45	<0.01	10.07	3.52	2.10	0.12	3.51	0.57	46.91	4.06	8.51	98.64
2K-29-12	390	0.1	181.5	0.35	<0.05	2.62	1.6	3.8	<0.2	155	3.9	38	14.77	5.16	<0.01	8.71	3.98	3.67	0.13	0.91	0.16	48.04	1.85	11.10	98.48
2K-29-13	410	0.2	168	0.8	<0.05	3.08	3	5.2	<0.2	238	4.9	96	15.53	3.93	<0.01	12.60	3.36	3.69	0.22	1.66	0.35	42.15	2.99	12.91	99.39
2K-29-14	430	0.25	105	0.6	<0.05	5.82	2.2	3.6	0.2	180	5.9	62	12.86	1.25	<0.01	12.49	3.65	2.26	0.16	0.26	0.47	52.18	2.79	10.23	98.60
2K-29-15	451	0.1	112.5	0.4	<0.05	3.8	36.4	4.3	6.8	131	12	14	34.33	0.65	<0.01	1.15	10.43	0.91	0.02	0.49	0.25	44.36	1.22	4.88	98.69
2K-29-16	480	0.15	36.4	0.1	<0.05	1.02	13.8	1	2	39	5.4	36	9.87	0.12	<0.01	4.14	2.76	1.15	0.05	0.10	0.08	76.17	0.44	4.13	99.01

All sample analysed by ALS Chemex, Aurora Laboratory Services Ltd., 212 Brookbank Ave, Vancouver, BC, V7J 2C1
Methods used for all data in this table: Major oxides = XRF.
Au = Fire assay and AA finish; As = AAS; Hg by cold vapour with ICP-MS rechecks. Other elements = ICP-MS

TABLE 1B
DESCRIPTION OF SAMPLES FROM HOLES BC-2K-19 & 29
BONANZA LEDGE GOLD ZONE, WELLS-BARKERVILLE
(*SEE* TABLE 1A)

Hole BC-2K-19 Sample	Depth in feet	DESCRIPTION
2K-19-1	58	Light tan hangingwall phyllite with disseminated magnetite porhyroblasts
2K-19-2	87	Light tan hangingwall phyllite with dolomite veins & minor magnetite porphyroblasts
2K-19-3	115	Light tan hangingwall phyllite without magnetite porphyroblasts
2K-19-4	135	Black graphitic sheared phyllite with disseminated pyrite & dolomitic porphyroblasts
2K-19-5	141	Tan dolomitic metasediment with dolomite veins & disseminated pyrite cubes
2K-19-6	177	Gritty dolomitic metasediment with pyrite porphyroblasts & fuchsite along shears
2K-19-7	208	Gritty dolomitic metasediment with fuchsite & disseminated pyrite cubes
2K-19-8	230	Gritty dolomitic metasediment with dolomite porphyroblasts & trace rutile
2K-19-9	246	Blue-grey "watery quartzite" unit with disseminated coarse pyrite cubes & dolomite veins
2K-19-10	249	Blue-grey "watery quartzite" unit with coarse pyrite cubes
2K-19-20	294	Semi-massive to stringer pyrite with sericite, carbonate and minor rutile
2K-19-21	323	Semi-massive to stringer pyrite with sericite
2K-19-22	318	Semi-massive to stringer pyrite with sericite
2K-19-23	309	Massive to semi-massive pyrite with sericite, dolomite and trace tourmaline & rutile
2K-19-11	333	Tan phyllite with dolomite and calcite veinlets
2K-19-12	350	Laminated tan phyllite with pyrite layers and quartz veinlets
2K-19-13	365	Tan, sericitic phyllite with blebs & veins of pyrite
2K-19-14	393	Dark muscovitic phyllite with disseminated pyrite
2K-19-15	398	Dark muscovitic phyllite with disseminated pyrite
2K-19-16	426	Brown-tan mottled metasediment with pyrite stringers and fuchsite-shears
2K-19-17	453	Dark, folded phyllite with disseminated coarse pyrite cubes
2K-19-18	465	Black, folded phyllite with pyrite cubes
2K-19-19	498	Pale layered gritty metasediment with pyrite cubes
Hole BC-2K-29		
2K-29-1	55	Bleached hangingwall sericitic phyllites with disseminated magnetite porphyroblasts
2K-29-2	78	Black graphitic phyllite close to hangingwall contact of the BC quartz vein
2K-29-3	89	White BC quartz vein with minor dolomite, pyrite & graphite
2K-29-4	116	Tan, dolomitic and fractured phyllite with fuchsite along shears
2K-29-5	166	Tan & blue-grey sericitic metasediment with disseminated pyrite cubes
2K-29-6	215	Tan sericitic metasediment with pyrite stringers and disseminated dolomite & pyrite porphyroblasts
2K-29-19	219	Sericitic phyllite with stringer and blebs of pyrite
2K-29-18	225	Semi-massive and stringer pyrite with quartz & abundant sericite
2K-29-17	235	Semi-massive pyrite with abundant muscovite-sericite & trace rutile
2K-29-20	243	Massive to semi-massive pyrite with sericite & trace rutile
2K-29-7	271	Grey to tan, thinly laminated sericitic metasediment with dolomitic and albitic veinlets
2K-29-8	294	Light grey laminated metasediment with dolomite veinlets & fuchsite on shears
2K-29-9	327	Grey, laminated and thin bedded metasediment with layers rich in pyrite, quartz and feldspar
2K-29-10	344	Light grey, weakly foliated sericitic metasediment with disseminated pyrite & mottled brown carbonate
2K-29-11	371	Light grey, weakly foliated metasediment with disseminated pyrite & carbonate, albite & trace rutile
2K-29-12	390	Light grey to purple, weakly foliated metasediment with mottled yellow-brown dolomite
2K-29-13	410	Light grey to purple, weakly foliated metasediment with mottled yellow-brown dolomite
2K-29-14	430	Grey-purple metasediment with thin pyrite & dolomite layers
2K-29-15	451	Light grey, talcose & micaceous phyllite
2K-29-16	480	Light grey quartz-muscovitic phyllite

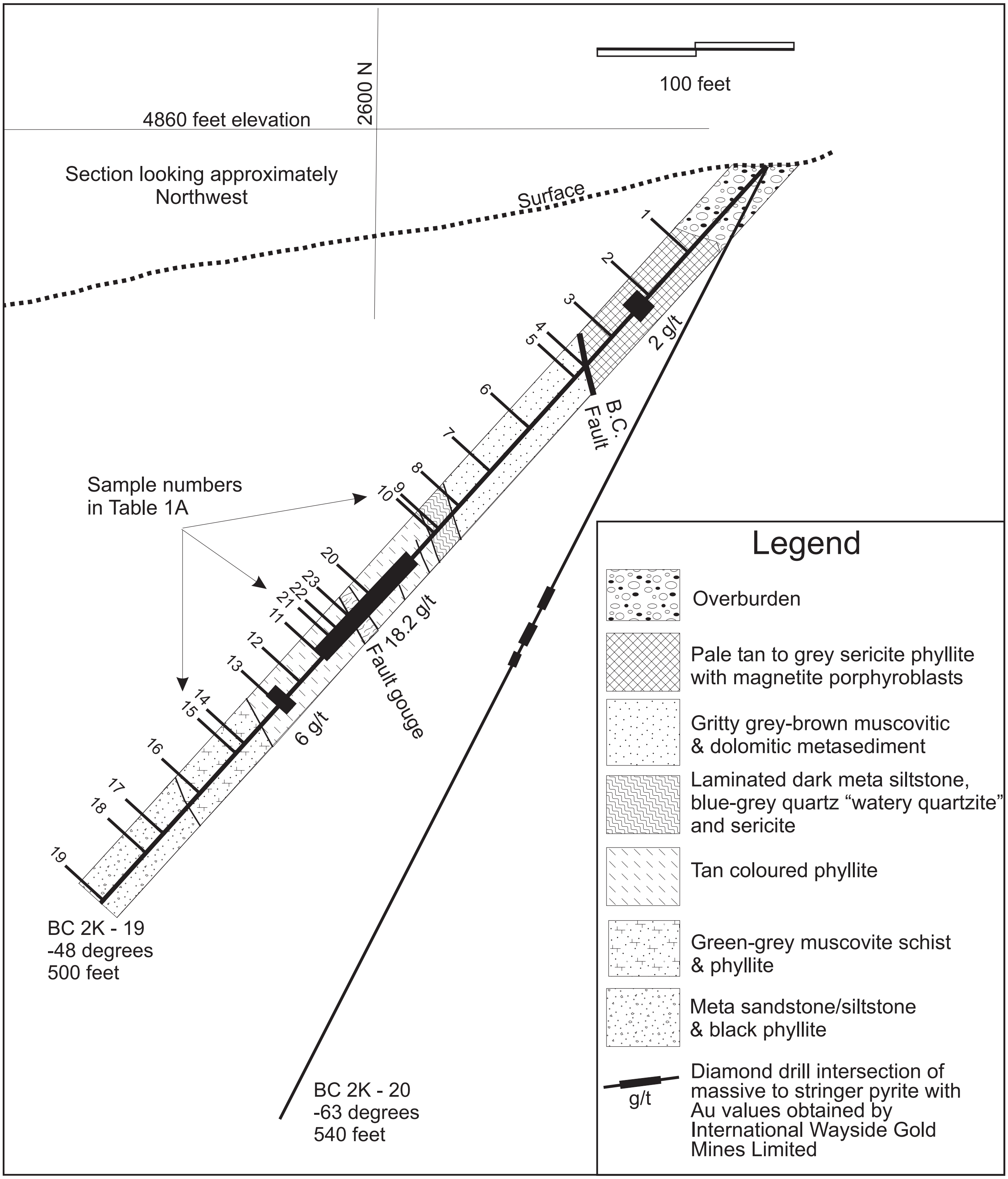


Figure 3A. Simplified drill logs of hole BC-2K-19, Bonanza Ledge Gold Zone, showing location of the sample data presented in Tables 1A and 1B. Logging by K. Ross, Panterra Geoservices Inc.

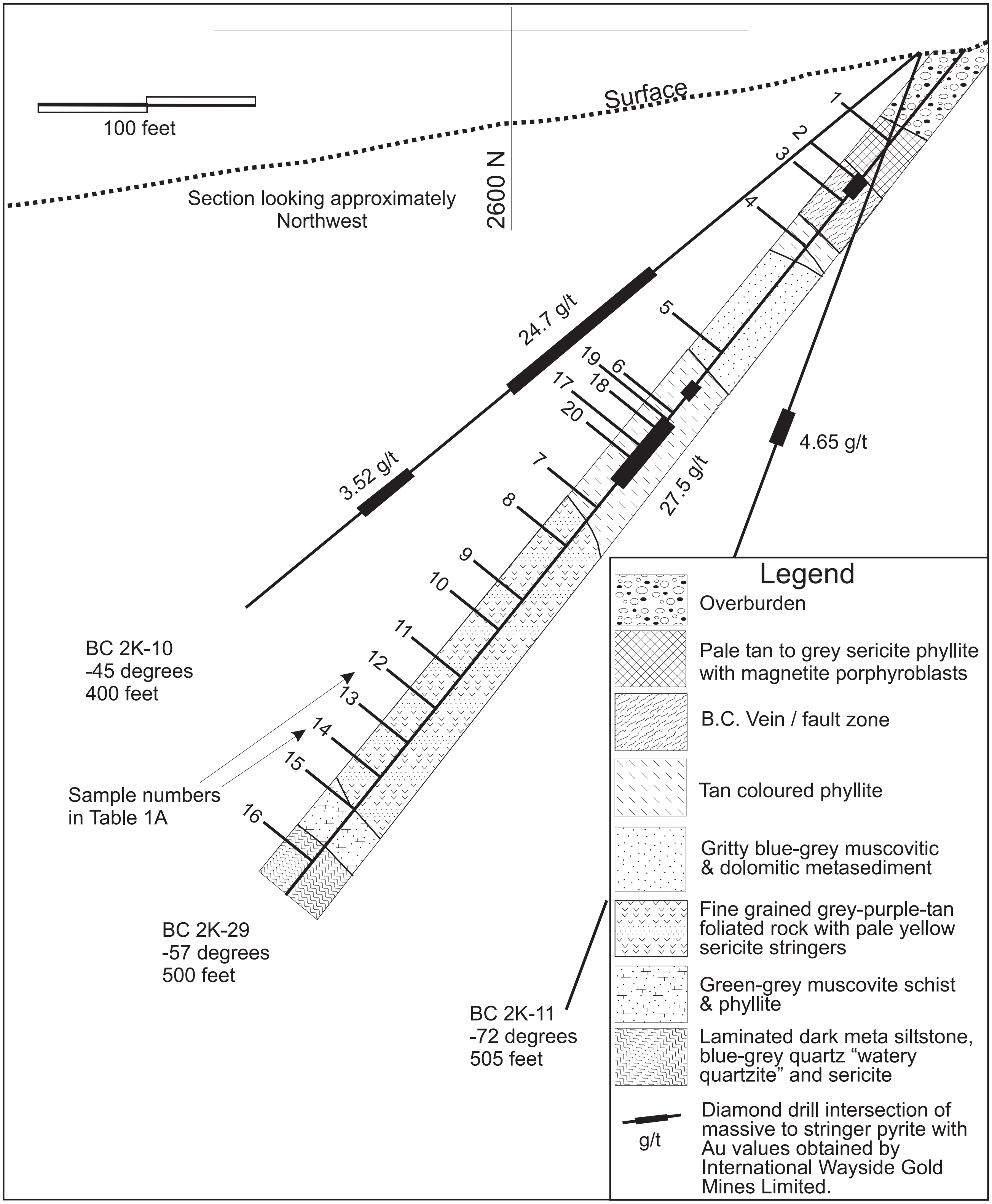


Figure 3B. Simplified drill logs of hole BC-2K-29, Bonanza Ledge Gold Zone, showing location of the sample data presented in Tables 1A and 1B. Logging by K. Ross, Panterra Geoservices Inc.

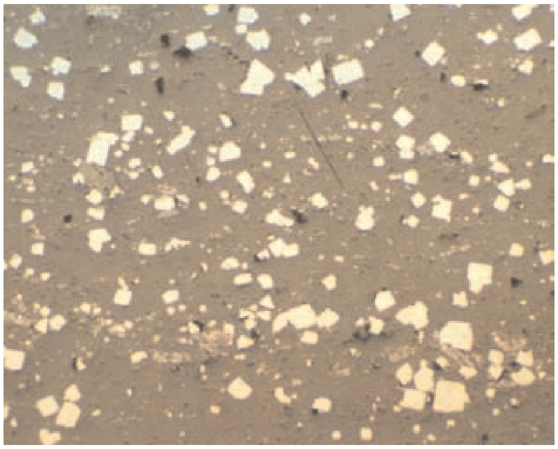


Photo 5. Small euhedral crystals of disseminated pyrite in a schistose gangue dominated by sericite, carbonate and accessory rutile, Bonanza Ledge Zone. Sample BC-2K-19-20 assaying 25 g/t Au, from drill hole BC-2K-19 at 294 feet. Photomicrograph, reflected light, uncrossed polars, and long field of view is 2 mm.

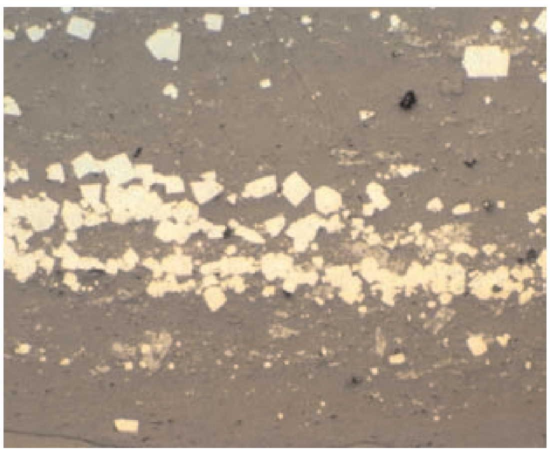


Photo 6. Trails of small euhedral pyrite crystals growing along phyllitic cleavages, Bonanza Ledge Zone. Sample BC-2K-19-20, drill hole BC-2K-19 at 294 feet. Photomicrograph, reflected light, uncrossed polars, and long field of view is 2 mm.

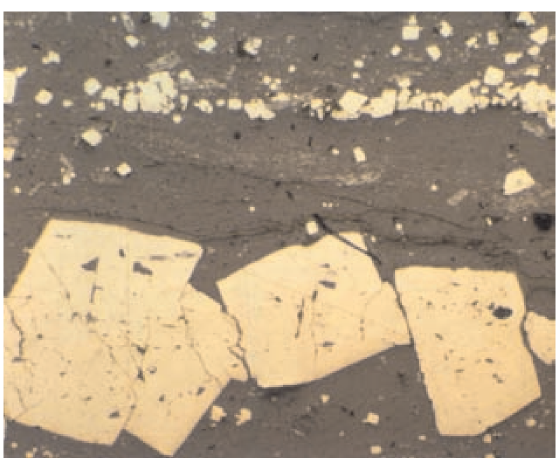


Photo 7. Trails of coarse and fine grained euhedral pyrite crystals growing along phyllitic cleavages, Bonanza Ledge Zone. Sample BC-2K-19-20, drill hole BC-2K-19 at 294 feet. Photomicrograph, reflected light, uncrossed polars, and long field of view is 2 mm.

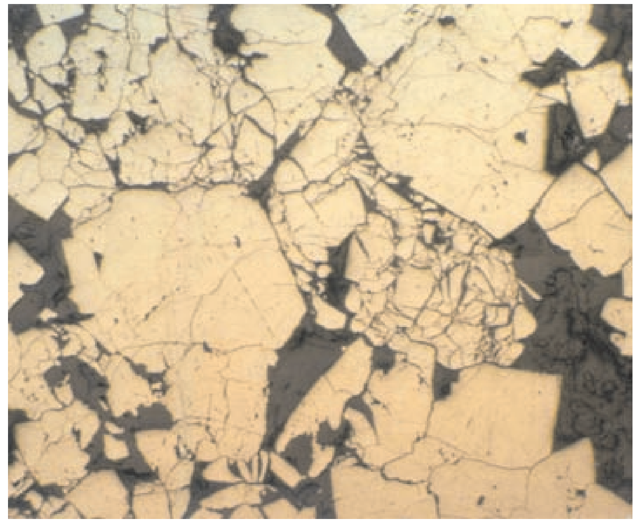


Photo 8. Coarse grained and weakly brecciated subhedral pyrite crystals, Bonanza Ledge Zone. Sample BC-2K-19-23 assaying 31.8 g/t Au, drill hole BC-2K-19 at 309 feet. Photomicrograph, reflected light, crossed polars, and long field of view is 1.5 mm.

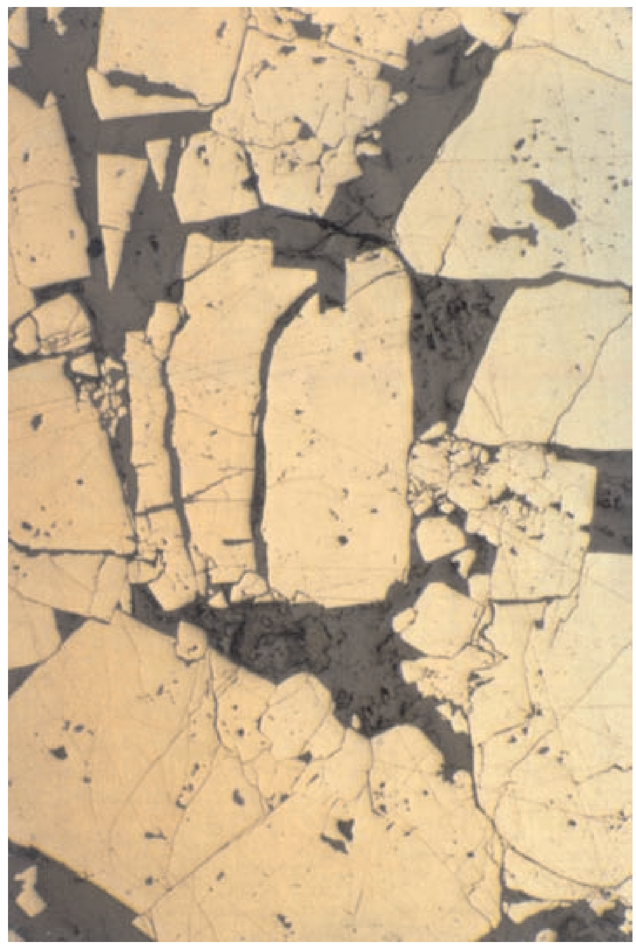


Photo 9. Coarse grained, shattered and subhedral pyrite crystals in a carbonate-sericite gangue, Bonanza Ledge Zone. Sample BC-2K-19-23, drill hole BC-2K-19 at 309 feet. Photomicrograph, reflected light, crossed polars, and long field of view is 2.5 mm.

bedding or the S2 phyllitic foliation (Photos 6 and 7). Some of the larger pyrite crystals have undergone moderate brecciation (Photos 8 and 9). On the small scale, much of the pyrite appears to be concordant to the transposed bedding, although cross-cutting veins and stringers are common. On a larger scale, however, the auriferous pyrite zones and the BC Vein are discordant to the stratigraphy (D. Rhys, personal communication, 2000). Locally, the pyritic rock may be schistose and comprise thin (0.5 cm) layers of disseminated pyrite that alternate with layers containing over 70 percent white mica and carbonate. Grades commonly range up to 40 g/t Au although some pyritic intersections contain up to 80 g/t Au. Gold forms 2.5 to 60 µm native grains that occur either: (1) along pyrite crystal boundaries (2) along microfractures in the pyrite, or (3) as micron-sized particles encapsulated in the Fe sulphides (Rhys and Ross, 2000; Rhys, 2000). These authors also report that the Au may be associated with chalcopyrite and galena, although the mineralization only averages 14.6 ppm Cu and 55 ppm Pb (Tables 1A and 2B) .

The gangue includes abundant muscovite-sericite, Fe-Mg carbonate and quartz, together with rutile and sporadic trace tourmaline. In some samples, rutile makes up to 2 percent by volume, forming dark brown, subhedral crystals up to 0.15 mm long or brown euhedra less than 25 microns in length. In some microshears, it may be intergrown with abundant, fine sericite and tourmaline. The latter mineral forms small euhedral prisms up to 0.1 mm in length. The cores of some crystals have a dark colour zoning, with a khaki-green pleochroism suggesting an intermediate dravite-schorl composition (C. Leitch, personal communication, 2000). The auriferous pyritic zones are enveloped by pale and barren alteration that has bleached and overprinted some of the originally dark, organic-rich phyllitic units. This includes some pervasive sericite-carbonate assemblages and zones of blue-grey “watery quartz” veinlet alteration that marks silicificification (Figures 3A and 3B, Rhys and Ross, 2000). Micaeous shear zones both in and outside the pyritic zones are locally marked by green fuchsite-mariposite alteration that contains weakly elevated values of Cr (up to 904 ppm Cr; Tables 1A and 1B).

Chemistry of the Bonanza Ledge Mineralization and its Alteration Envelope

To test the chemistry of the auriferous pyrite horizons and the adjacent altered wallrocks, 43 samples were collected from drillholes BC-2K-19 and BC-2K-29 that intersect well-mineralized portions of the Bonanza Ledge Zone (Figures 3A and 3B). Samples were taken not only from the pyrite, but also from the other altered and barren units in the hanging and footwall parts of the holes (Figures 3A and 3B).

The samples were analysed for their major oxide and trace element contents and the data, together with the downhole depth of each sample are presented in Tables 1A and 1B and in Figures 4 and 5. Both holes intersected two gold-bearing pyrite zones that are separated by barren interlayers (Figures 4A and 4C). The auriferous pyritic zones are characterized by higher quantities of Fe (between 13 and 36 percent Fe_2O_3 as total iron), K_2O and Al_2O_3 reflecting the abundance of pyrite and sericite-muscovite. They also coincide with increased amounts of Hg, Bi, As, and Pb, and lower quantities of Zn, Cu, CaO, MgO and SiO_2 (Figure 4). Elevated Hg values (up to 6610 ppb) occur not only in the aurifeous pyrite, but may extend well down into the barren footwall rocks (Table 1A; Figures 4C and 5B). Higher Hg values coincide with core intersections containing > 13 percent Fe_2O_3 as total iron. This suggests that the Hg is hosted by pyrite, whether or not the sulphide is auriferous or barren.

Some parts of both holes contain > 4 percent TiO_2 which represent intersections particularly rich in rutile (Figure 4A). However, TiO_2 enrichment is generally absent in the auriferous horizons but occurs sporadically in the footwall and hanging wall rocks. Dolomitic alteration, marking either original sedimentary carbonate or the results of overprinting is best developed in the hanging wall where it is associated with increased MgO and CaO values (Figure 4B).

Comparative binary plots of the geochemistry in the two Bonanza Ledge drill holes are presented in Figures 5A and 5B. These, together with Figures 4A to 4C, further demonstrate the moderate to strong positive correlations that exist between Au and some other elements such as Fe, As, Bi, Pb, Ag, K_2O and Al_2O_3, and the negative relationship between Au and Zn and Au and Cu. The negative association between Cu and Ag and positive correlation between Au and Ag (Figure 5A) suggests that Ag is hosted in the Au.

To summarize, data in Tables 1A, 2B and 2D indicate that, compared to the Mosquito Creek replacement ore, the Bonanza Ledge mineralization contains higher quantities of Cu and Hg and lower amounts of Ag, As, Sb, Bi, Pb and W. At Bonanza Ledge, strong correlations between Au:Bi, Au:As, Au:Ag and Au:K_2O are noted, and poor correlations exist between Au:Zn and Au:Cu. The Au/Ag ratios of our mineralized Bonanza Ledge samples average 6.6; by contrast, Au/Ag ratios in the Mosquito Creek replacement ore averages 3.1 (Table 2D).

COMPARATIVE CHEMISTRY AND MINERALOGY OF THE BONANZA LEDGE, MOSQUITO CREEK AND CARIBOO GOLD QUARTZ MINERALIZATION

The Mosquito Creek, Island Mountain and Cariboo Gold Quartz deposits all contain two types of auriferous pyrite: massive pyrite in replacement ore and pyrite associated with quartz veins (Hanson, 1935; Skerl, 1948; Runkle, 1950; Sutherland Brown, 1957, 1963; Alldrick, 1983; Robert and Taylor, 1989).

For this study, material representing both pyritic quartz veins and massive replacements were collected from the Mosquito Creek and Cariboo Gold Quartz underground mine workings and the mine dumps. The analytical data of these samples together with data for the pyritic mineralization from the Bonanza Ledge drill holes (Figures 3A and 3B) are presented in Tables 1 and 2.

Superficially, the pyrite in and along the margins of the quartz veins appears to be similar in all the mines and occurrences. However, the analytical data for the quartz vein pyrite reveal some geochemical differences between samples from veins at the Mosquito Creek and Cariboo Gold Quartz mines (Table 2A and 2D). Although the quartz vein pyrite in both mines has a similar Fe content (avg. 20-24 percent Fe) and Au grade (avg. 27-28 g/t Au, Tables 2A and 2D), the pyrite in the Mosquito Creek quartz veins has higher quantities of Ag, As, Sb, Pb, Zn, Al and W. It also contains higher averages of elements such as Ce, La, Li, Mn, Te and Ga, as well as having higher As/Au ratios than pyrite in veins at the Cariboo Gold Quartz mine. Although Skerl (1948) reports chalcopyrite in the Cariboo Gold Quartz Mine, all our pyritic vein samples from this deposit and from Mosquito Creek have a very low Cu content, averaging 1.3 and 3.6 ppm Cu at Mosquito Creek and Cariboo Gold Quartz respectively (Tables 2A and 2D). The Cariboo Gold Quartz vein pyrite is also distinguished from the Mosquito Creek ore in having higher Au/Ag ratios (avg. 9.7 versus 2.4).

To the naked eye, the massive replacement pyrite bodies at Mosquito Creek, Island Mountain and Bonanza Ledge appear similar in many of their features. However, there are a number of notable differences between the mineralization at Bonanza Ledge on the one hand and the Mosquito Creek and the Island Mountain mineralization on the other. These differences include:

1. Size: the replacement pyritic ore bodies at Mosquito Creek and Island Mountain tend to be smaller, reaching up to 3 m in thickness, 6 m in width and 30 to several hundred metres in down-plunge length (Alldrick, 1983). By contrast the Bonanza Ledge mineralized zone reaches 30 m in width and 130 m in strike length.
2. Pyrite textures: from the limited polished thin sections examined, pyrite at Bonanza Ledge appears to have been more brecciated (Photos 8 and 9). At Mosquito Creek and Island Mountain, the pyrite includes crystals that are highly euhedral (Photo 10), as well as others with textures suggesting recrystallization and replacement. In some cases, large euhedral crystals appear to have partially overgrown and replaced an earlier generation of smaller, possibly brecciated pyrite crystals (Photos 11 and 12). The outer parts of some coarse pyrite crystals at Mosquito Creek contain growth zones marked by or trails of fine grained silicate inclusions (Photo 13; C. Leitch, personal communication, 2000).
3. Structural and stratigraphic position: the Mosquito Creek, Island Mountain and Bonanza Ledge mineralization all lie on the western, overturned limb of an F2 fold (Sutherland Brown, 1957; Alldrick, 1983; Struik, 1988a, 1988b; D. Rhys, personal communication, 2000). However, the Mosquito Creek orebodies are hosted by carbonate-bearing rocks of the Baker Member but tend to occur within 25 m of the contact between this member and the structurally underlying Rainbow Member (Alldrick, 1983). By contrast, the Bonanza Ledge mineralization and its alteration envelope appear to be spatially related to, but cut by, the BC Vein structure. Recent work (Rhys and Ross, 2000; Rhys, 2000) indicates the mineralization is folded and hosted by organic-rich argillites of the Lowhee Member of Hanson (1935). These hostrocks lie approximately 200 to 300 m below the Rainbow-Baker stratigraphic contact (Hanson, 1935; Sutherland Brown, 1957).
4. Host lithologies: the replacement-style mineralization at both the Mosquito Creek and Cariboo Gold Quartz mines tends to be hosted by limestones and thin bedded clastic sediments (Skerl, 1948; Sutherland Brown, 1957; Alldrick, 1983) while carbonaceous phyllites, with possible altered carbonates, are important host for the Bonanza Ledge pyritic mineralization (Rhys and Ross, 2000; Rhys, 2000).
5. Gangue mineralogies: different hostrock lithologies result in different gangue mineralogies at the various properties. Replacement pyritic mineralization at the Bonanza Ledge, Mosquito Creek and Island Mountain is marked by a gangue containing variable proportions of Fe-Mg carbonate, quartz and sericite, with trace rutile and some fracture-controlled trace fuchsite-mariposite. However, rutile is far more abundant at Bonanza Ledge, which also contains more sericite-muscovite and trace quantities of tourmaline.
6. Chemistry: the analytical data presented below demonstrates there are significant chemical differences between the replacement mineralization at Mosquito Creek and Bonanza Ledge (Table 2, Figures 6A to 6C).

The data presented in Table 2B show that, on average, the Bonanza Ledge samples contain less total Fe than Mosquito Creek (avg. 24.6 percent Fe_2O_3 as total iron versus 43 percent at Mosquito Creek). This reflects the more massive pyritic nature of the Mosquito Creek samples and probably accounts for their higher average Au grade (34 g/t Au versus 14 g/t at Bonanza Ledge; Table 2B). It may also partly explain why the Bonanza Ledge mineralization averages less Ag, Bi, As, Pb, Te and W (Tables 2B and 2D).

However, despite the lower pyrite and Au content of our Bonanza Ledge samples, the mineralization contains noticeably higher quantities of Al, K, Si, P and Ti, which mark the greater abundance of sericite-quartz-rutile alteration assemblages. Also, in contrast to the Mosquito Creek pyritic ore, the Bonanza Ledge mineralization contains greater amounts of Co, Cu, Ni, and Hg, as well as more elevated quantities of elements such as Ba, Be, Ce, Cs, Ga, Ge, La, Li, Y, Th, V, Tl, Nb, Rb, Sr and Ta. Some, but not all of the chemical differences between the Mosquito Creek and Bonanza Ledge mineralization (Tables 1 and 2) probably reflect the contrasting host-rock lithologies at these two properties.

TABLE 2A
COMPARATIVE ANALYTICAL DATA OF PYRITE-RICH SAMPLES FROM QUARTZ VEINS: MOSQUITO CREEK & CARIBOO GOLD QUARTZ DEPOSITS
(FOR SAMPLE DESCRIPTION *SEE* TABLE 2C)

Mosquito Creek Deposit: pyrite in or adjacent to quartz veins

	Au	Ag	As	Hg	Al	Sb	Ba	Be	Bi	Cd	Ca	Ce	Cs	Cr	Co	Cu	Ga	Ge	Fe	La	Pb	Li	Mg
	g/tonne	ppm	ppm	ppb	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%
Sample																							
MC1	3.9	57.2	2580	10	0.24	9.7	10	0.1	182	0.48	0.39	2.9	0.1	198	80.8	1.0	0.7	0.7	25.0	1.5	2110.0	1.8	0.06
MC5	12.6	3.2	1970	<10	5.46	2.6	210	1.6	10	0.02	1.75	56.7	1.4	117	26.0	1.0	13.9	1.3	19.8	29.5	275.0	10.2	0.31
MC7	30.1	28.0	10000	<10	0.26	26.0	10	0.5	346	0.5	4.61	13.0	0.5	82	44.0	3.0	<1	2.0	25.0	5.0	856.0	2.0	1.53
MC8	46.9	8.0	2530	<10	1.32	4.5	10	0.5	17	0.02	0.06	15.0	0.7	131	28.4	1.0	3.7	1.3	21.0	7.5	157.0	13.8	0.04
MC9	95.7	17.2	7860	<10	1.14	30.0	10	0.3	26	0.02	0.06	11.3	0.7	172	90.0	1.0	3.0	0.9	25.0	6.0	1010.0	18.6	0.03
GR00-31	6.6	50.6	1060	<10	0.01	4.7	5	0.1	215	0.34	0.01	0.6	0.1	239	619.0	1.0	0.3	0.7	25.0	0.5	2110.0	0.6	0.01
GR00-32	1.4	10.5	993	<10	0.07	10.1	5	0.1	54	0.14	0.05	0.9	0.1	306	319.0	1.0	0.4	0.7	25.0	0.5	482.0	1.2	0.01
Avg (n = 7)	**28.2**	**25.0**	**3856**	**6**	**1.21**	**10.3**	**37**	**0.4**	**121**	**0.22**	**0.99**	**14.5**	**0.5**	**178**	**172.5**	**1.3**	**3.7**	**0.9**	**23.7**	**7.6**	**1000.0**	**7.7**	**0.28**
Max	95.7	57.2	10000	10	5.5	30.0	210	1.6	346	0.5	4.6	56.7	1.4	306	619.0	3.0	13.9	1.3	25.0	29.5	2110.0	18.6	1.53
Min	1.4	3.2	993	<10	0.0	2.6	5	0.1	10	0.0	0.0	0.6	0.1	82	26.0	1.0	0.3	0.7	19.8	0.5	157.0	0.6	0.01
Std. Dev	34.0	21.4	3576	2	1.9	10.1	76	0.5	129	0.2	1.7	21.5	0.5	77	221.7	0.8	5.2	0.3	2.3	11.1	815.4	7.6	0.56

Cariboo Gold Quartz Deposit: pyrite in or adjacent to quartz veins

Sample	Au	Ag	As	Hg	Al	Sb	Ba	Be	Bi	Cd	Ca	Ce	Cs	Cr	Co	Cu	Ga	Ge	Fe	La	Pb	Li	Mg
CGQ1	21.3	5.3	1480	<10	0.09	12.2	5	0.1	970	0.48	0.01	0.9	0.1	246	143.5	7.0	0.3	1.1	21.4	0.5	409.0	0.6	0.01
CGQ2	29.4	3.1	786	<10	0.02	0.7	5	0.1	23	0.06	0.01	0.1	0.1	212	40.6	8.0	0.1	1.2	14.9	0.5	173.0	0.8	0.01
CGQ3	36.4	2.7	778	10	0.05	1.0	5	0.1	20	0.02	0.01	0.3	0.1	297	63.9	1.0	0.2	0.9	25.0	0.5	60.0	1.0	0.01
CGQ4	11.6	8.9	620	<10	1.75	5.8	50	0.4	263	0.26	1.19	17.4	0.6	262	131.5	6.0	4.4	1.1	16.8	8.0	421.0	2.4	0.17
CGQ5	21.8	1.8	2910	10	0.75	0.5	30	0.2	8	0.02	0.03	8.5	0.2	175	214.0	1.0	2.2	0.7	25.0	4.5	13.0	1.2	0.02
CGQ6	16.6	4.7	1375	<10	0.83	5.8	60	0.3	149	0.22	1.72	9.5	0.3	178	47.6	4.0	2.1	1.1	19.8	5.0	231.0	1.2	0.49
CGQ7	72.0	2.7	331	40	0.27	1.0	20	0.1	34	0.06	0.05	2.8	0.1	311	199.5	1.0	0.8	0.7	25.0	1.5	76.5	0.8	0.01
CGQ8	8.4	1.3	603	<10	0.27	10.0	30	0.1	15	0.02	0.38	3.0	0.1	247	46.2	1.0	0.8	1.2	16.7	2.0	19.0	0.6	0.04
Avg (n = 8)	**27.2**	**3.8**	**1110**	**11**	**0.5**	**4.6**	**26**	**0.1**	**185**	**0.1**	**0.4**	**5.3**	**0.2**	**241**	**110.9**	**3.6**	**1.4**	**1.0**	**20.6**	**2.8**	**175.3**	**1.1**	**0.10**
Max	72.0	8.9	2910	40	1.8	12.2	60	0.4	970	0.5	1.7	17.4	0.6	311	214.0	8.0	4.4	1.2	25.0	8.0	421.0	2.4	0.49
Min	8.4	1.3	331	<10	0.0	0.5	5	0.1	8	0.0	0.0	0.1	0.1	175	40.6	1.0	0.1	0.7	14.9	0.5	13.0	0.6	0.01
Std. Dev	20.2	2.5	825	12	0.6	4.6	21	0.1	329	0.2	0.7	6.1	0.2	50	71.0	3.0	1.5	0.2	4.2	2.8	165.6	0.6	0.17

TABLE 2A CONTINUED
COMPARATIVE ANALYTICAL DATA OF PYRITE-RICH SAMPLES FROM QUARTZ VEINS: MOSQUITO CREEK & CARIBOO GOLD QUARTZ DEPOSITS
(FOR SAMPLE DESCRIPTION *SEE* TABLE 2C)

Mosquito Creek Deposit: pyrite in or adjacent to quartz veins

	Mn	Mo	Ni	Nb	P	K	Rb	Na	Sr	Ta	Te	Tl	Th	Ti	W	U	V	Y	Zn	Cu/Au	Au/Ag	As/Au	Bi/Au
	ppm	ppm	ppm	ppm	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm				
Sample																							
MC1	250	1.0	58	0.2	50	0.09	4	0.01	6	0.05	4.8	0.08	0.6	0.01	1.3	0.2	5.0	0.7	8.0	0.254	0.1	656.5	46.2
MC5	870	0.2	40	1.8	260	2.33	88	0.21	58	0.05	0.3	0.48	8.6	0.08	13.8	1.4	64.0	4.4	10.0	0.079	3.9	156.3	0.8
MC7	7310	1.0	88	1.0	150	0.11	8	0.07	132	0.05	4.5	0.1	12	0.01	<10	1.0	9.0	11.0	32.0	0.100	1.1	332.2	11.5
MC8	45	0.6	35	0.2	40	0.56	24	0.02	4	0.05	0.8	0.18	3	0.01	1.7	0.6	13.0	1.3	2.0	0.021	5.9	53.9	0.4
MC9	10	1.6	53	0.4	80	0.45	18	0.01	5	0.05	5.05	0.22	2.2	0.01	1.6	0.2	11.0	0.8	2.0	0.010	5.6	82.1	0.3
GR00-31	30	5.8	92	0.2	10	0.01	0	0.01	2	0.05	5.15	0.06	0.4	0.01	0.7	0.2	1.0	0.4	1.0	0.152	0.1	160.8	32.6
GR00-32	25	0.8	118	0.2	5	0.01	1	0.01	3	0.05	1.4	0.18	0.1	0.01	0.8	0.2	3.0	0.1	1.0	0.730	0.1	724.8	39.6
Avg (n = 7)	**1220**	**1.6**	**69**	**0.5**	**85**	**0.51**	**23**	**0.05**	**30**	**0.05**	**2.9**	**0.2**	**2.5**	**0.02**	**3.6**	**0.5**	**15.1**	**1.3**	**8**	**0.192**	**2.4**	**309.5**	**18.8**
Max	7310	5.8	118	1.8	260	2.33	88	0.21	132	0.05	5.2	0.5	8.6	0.08	13.8	1.4	64.0	4.4	32.0	0.730	5.9	724.8	46.2
Min	10	0.2	35	0.2	5	0.01	0	0.01	2	0.05	0.3	0.1	0.1	0.01	0.7	0.2	1.0	0.1	1.0	0.010	0.1	53.9	0.3
Std. Dev	2703	1.9	31	0.6	91	0.83	33	0.07	49	0.00	2.3	0.2	3.2	0.03	5.2	0.5	22.0	1.6	11.2	0.251	2.6	275.7	20.1

Cariboo Gold Quartz Deposit: pyrite in or adjacent to quartz veins

	Mn	Mo	Ni	Nb	P	K	Rb	Na	Sr	Ta	Te	Tl	Th	Ti	W	U	V	Y	Zn	Cu/Au	Au/Ag	As/Au	Bi/Au
Sample																							
CGQ1	20	2.0	36	0.2	10	0.04	2	0.01	1	0.05	2	0.02	0.2	0.01	1.1	0.2	1.0	0.1	2.0	0.329	4.0	69.5	45.5
CGQ2	25	0.2	44	0.2	50	0.01	0	0.01	2	0.05	0.25	0.02	0.2	0.01	0.3	0.2	1.0	0.1	4.0	0.272	9.6	26.7	0.8
CGQ3	15	0.6	182	0.2	50	0.01	0	0.01	1	0.05	0.45	0.02	0.2	0.01	0.3	0.2	3.0	0.1	1.0	0.027	13.7	21.4	0.5
CGQ4	235	0.4	22	0.2	170	0.76	29	0.05	31	0.05	0.85	0.18	2.8	0.02	0.9	0.2	17.0	1.7	6.0	0.517	1.3	53.4	22.7
CGQ5	5	0.8	58	0.2	50	0.33	13	0.01	3	0.05	0.65	0.06	1.8	0.01	0.9	0.2	10.0	0.8	1.0	0.046	12.1	133.5	0.4
CGQ6	960	0.2	55	0.2	300	0.36	15	0.02	53	0.05	0.9	0.1	2	0.01	0.6	0.8	7.0	2.5	16.0	0.241	3.5	82.8	8.9
CGQ7	15	1.6	90	0.2	50	0.11	5	0.01	2	0.05	0.45	0.02	0.6	0.01	0.8	0.2	4.0	0.3	1.0	0.014	27.2	4.6	0.5
CGQ8	70	0.6	86	0.2	90	0.11	5	0.01	8	0.05	0.5	0.08	1	0.01	0.4	0.6	4.0	0.4	2.0	0.119	6.5	71.7	1.8
Avg (n = 8)	**168**	**0.8**	**72**	**0.2**	**96**	**0.22**	**9**	**0.02**	**13**	**0.05**	**0.8**	**0.1**	**1.1**	**0.01**	**0.7**	**0.3**	**5.9**	**0.8**	**4.1**	**0.196**	**9.7**	**58.0**	**10.1**
Max	960	2.0	182	0.2	300	0.76	29	0.05	53	0.05	2.0	0.2	2.8	0.02	1.1	0.8	17.0	2.5	16.0	0.517	27.2	133.5	45.5
Min	5	0.2	22	0.2	10	0.01	0	0.01	1	0.05	0.3	0.0	0.2	0.01	0.3	0.2	1.0	0.1	1.0	0.014	1.3	4.6	0.4
Std. Dev	329	0.7	50	0.0	95	0.26	10	0.01	19	0.00	0.5	0.1	1.0	0.00	0.3	0.2	5.4	0.9	5.1	0.177	8.3	41.1	16.3

Note: when assay values are below detection, then half the detection limit was used to calculate the averages etc.
All sample analysed by ALS Chemex, Aurora Laboratory Services Ltd., 212 Brookbank Ave, Vancouver, BC, V7J 2C1
Methods used for all data in this table:
Au = Fire assay and AA finish; As = AAS; Hg by cold vapour with ICP-MS rechecks. Other elements = ICP-MS

TABLE 2B
COMPARATIVE ANALYTICAL DATA OF PYRITE-RICH SAMPLES FROM MASSIVE REPLACEMENT MINERALIZATION: MOSQUITO CREEK DEPOSIT & THE BONAZA LEDGE GOLD ZONE
(FOR SAMPLE DESCRIPTION *SEE* TABLE 2C)

Mosquito Creek Deposit: pyrite in replacement ore

Sample	Au	Ag	As	Hg	Al	Sb	Ba	Be	Bi	Cd	Ca	Ce	Cs	Cr	Co	Cu	Ga	Ge	Fe	La	Pb	Li	Mg	Mn	Mo	Ni	Nb	P
	g/tonne	ppm	ppm	ppb	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
GR00-34	25.27	8.0	2740	<10	0.98	1.5	40	0.3	40	0.04	0.21	9.2	0.4	243	5.0	1.0	3.5	0.9	25.0	5.5	121.0	1.0	0.04	155	5.8	9	0.6	350
GR00-39	63.42	19.5	2750	<10	0.23	620.0	10	0.1	137	0.34	3.81	1.4	0.1	124	1.4	3.0	1.0	0.4	25.0	0.5	280.0	0.6	0.48	3700	0.4	5	0.2	140
MC2	37.10	27.5	2650	<10	0.58	3.3	30	0.2	226	0.28	3.46	4.2	0.2	119	29.0	1.0	1.6	0.5	25.0	2.0	324.0	1.4	0.49	3040	0.6	30	0.2	390
MC3	39.00	8.3	3010	10	0.84	1.6	40	0.3	89	0.36	5.59	9.3	0.2	92	8.2	2.0	2.3	0.5	21.9	3.5	102.0	2.0	1.55	8640	0.2	11	0.2	470
MC4	7.48	3.2	1995	40	0.68	3.0	40	0.3	28	0.5	6.82	7.1	0.2	39	13.0	1.0	1.0	3.0	25.0	5.0	60.0	1.0	1.80	10000	1.0	13	1.0	360
MC6	16.40	5.8	10000	<10	1.37	6.0	30	0.3	20	0.5	3.18	12.8	0.5	61	20.0	1.0	2.0	3.0	25.0	5.0	170.0	1.0	1.44	7860	1.0	18	1.0	390
MC10	51.00	11.9	3520	<10	0.96	10.9	30	0.9	68	0.08	0.60	3.8	0.5	102	6.6	1.0	2.8	0.9	25.0	2.0	389.0	2.0	0.11	820	0.6	16	0.2	170
Avg (n = 7)	**34.2**	**12.0**	**3809**	**11**	**0.81**	**127.5**	**31**	**0.3**	**87**	**0.3**	**3.38**	**5.6**	**0.3**	**111**	**11.9**	**1.4**	**2.2**	**0.6**	**24.6**	**2.7**	**206.6**	**1.4**	**0.84**	**4888**	**1.4**	**15**	**0.3**	**324**
Max	63.4	27.5	10000	40	1.37	620.0	40	0.9	226	0.5	6.82	9.3	0.5	243	29.0	3.0	3.5	0.9	25.0	5.5	389.0	2.0	1.80	10000	5.8	30	0.6	470
Min	7.5	3.2	1995	<10	0.23	1.5	10	0.1	20	0.04	0.21	1.4	0.1	39	1.4	1.0	1.0	0.4	21.9	0.5	60.0	0.6	0.04	155	0.2	5	0.2	140
Std. Dev	19.5	8.6	2767	13	0.4	275.4	11	0.3	73	0.2	2.4	3.5	0.2	66	9.7	0.8	1.0	0.2	1.2	1.9	124.9	0.6	0.73	3933	2.0	8	0.2	122

Bonanza Ledge: pyrite in replacement ore

Sample	Au	Ag	As	Hg	Al	Sb	Ba	Be	Bi	Cd	Ca	Ce	Cs	Cr	Co	Cu	Ga	Ge	Fe	La	Pb	Li	Mg	Mn	Mo	Ni	Nb	P
	g/tonne	ppm	ppm	ppb	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	ppm	ppm	ppm	ppm
2K-19-20	25.0	1.8	876	2370	10.3	1.4	1720	3.9	5	0.16	2.74	32.6	7.4	44	91.7	7.0	29.5	1.9	10.9	14.5	39.5	8.2	1.07	690	0.8	153	12.6	1790
2K-19-21	8.3	1.2	953	1110	11.85	0.8	2360	3.4	8	0.01	1.62	87.8	7.5	77	78.2	8.0	32.4	1.8	11.8	39.5	43.5	11.6	0.83	485	0.8	160	2.6	570
2K-19-22	1.5	0.7	729	270	13.05	0.7	2600	4.1	7	0.02	0.53	87.5	8.0	111	89.2	4.0	35.9	2.1	9.5	39.0	20.5	13.0	0.44	140	1	154	2.4	600
2K-19-23	31.8	8.6	845	4350	11.05	5.2	1180	3.1	7	0.04	0.34	47.7	6.9	68	36.2	16.0	27.7	1.5	16.2	19.5	61.0	9.2	0.35	85	1	88	1.4	380
2K-19-13	4.7	1.2	708	6610	7.49	2.8	1670	2.1	13	0.1	1.82	58.5	5.1	57	36.8	13.0	17.9	1.2	21.1	25.5	45.5	6.6	0.74	475	2	71	1.0	960
2K-29-6	4.2	0.7	847	3660	11.25	1.8	1710	3.3	11	0.12	1.7	34.7	5.9	71	82.6	1.0	29.4	1.7	12.5	13.5	19.0	10.6	0.63	630	2.2	175	8.2	3070
2K-29-17	14.0	1.8	1180	3230	10.2	1.5	1280	2.6	5	0.1	0.89	45.4	4.6	29	110.0	26.0	27.3	1.5	15.0	18.0	86.5	7.0	0.33	290	0.8	309	12.0	2510
2K-29-20	24.8	3.3	1295	2030	7.01	1.1	530	1.7	11	0.24	1.98	35.1	3.9	58	63.2	42.0	18.9	1.2	21.1	14.0	129.5	5.0	0.77	935	1.4	170	5.2	1010
Avg (n = 8)	**14.3**	**2.4**	**929**	**2954**	**10.275**	**1.9**	**1631**	**3.0**	**8**	**0.11**	**1.45**	**53.7**	**6.1**	**64**	**73.5**	**14.6**	**27.4**	**1.6**	**14.7**	**22.9**	**55.6**	**8.9**	**0.65**	**466**	**1.25**	**160**	**5.7**	**1361**
Max	31.8	8.6	1295	6610	13.1	5.2	2600	4.1	13	0.2	2.7	87.8	8.0	111	110.0	42.0	35.9	2.1	21.1	39.5	129.5	13.0	1.1	935	2.2	309	12.6	3070
Min	1.5	0.7	708	270	7.0	0.7	530	1.7	5	0.0	0.3	32.6	3.9	29	36.2	1.0	17.9	1.2	9.5	13.5	19.0	5.0	0.3	85	0.8	71	1.0	380
Std. Dev	11.5	2.6	208	1989	2.1	1.5	657	0.8	3	0.1	0.8	22.6	1.5	24	26.3	13.5	6.2	0.3	4.5	10.8	36.9	2.7	0.3	288	0.6	71	4.7	991

TABLE 2B CONTINUED
COMPARATIVE ANALYTICAL DATA OF PYRITE-RICH SAMPLES FROM MASSIVE REPLACEMENT MINERALIZATION: MOSQUITO CREEK DEPOSIT & THE BONAZA LEDGE GOLD ZONE
(FOR SAMPLE DESCRIPTION *SEE* TABLE 2C)

Mosquito Creek Deposit: pyrite in replacement ore

Sample	K	Rb	Na	Sr	Ta	Te	Tl	Th	Ti	W	U	V	Y	Zn	Cu/Au	Au/Ag	As/Au	Bi/Au	Al2O3	CaO	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SiO2	TiO2	LOI	TOTAL
	%	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm					%	%	%	%	%	%	%	%	%	%	%	%
GR00-34	0.44	21	0.01	8	0.05	1.05	0.22	2.8	0.01	1.2	0.6	10.0	1.0	1.0	0.040	3.2	108.4	1.6	1.70	0.26	41.00	0.54	0.06	0.06	0.26	0.14	30.40	0.06	24.36	98.84
GR00-39	0.10	5	0.01	40	0.05	2.2	2.92	0.8	0.01	0.5	1.2	4.0	2.3	8.0	0.047	3.3	43.4	2.2	0.48	5.38	53.00	0.18	0.72	0.46	0.24	<0.01	2.48	<0.01	32.48	95.42
MC2	0.25	9	0.05	32	0.05	4.1	0.08	1.2	0.01	1.1	0.8	8.0	4.0	12.0	0.027	1.3	71.4	6.1	0.98	5.26	48.70	0.34	0.74	0.36	0.26	0.04	7.30	0.02	30.37	94.37
MC3	0.36	12	0.08	70	0.05	0.8	0.06	1	0.01	48.3	1.2	12.0	9.1	24.0	0.051	4.7	77.2	2.3	1.48	14.02	31.50	0.48	2.36	1.20	0.28	0.08	14.82	0.06	20.57	86.85
MC4	0.29	10	0.12	109	0.05	0.25	0.1	4	0.01	5.0	1.0	7.0	7.0	36.0	0.134	2.3	266.7	3.7	1.06	9.84	39.60	0.38	2.76	1.74	0.26	0.02	11.16	0.04	25.11	91.97
MC6	0.60	24	0.08	66	0.05	0.5	0.1	6	0.01	5.0	1.0	15.0	10.0	18.0	0.061	2.8	609.8	1.2	2.42	11.64	36.00	0.80	2.28	1.02	0.28	0.06	8.86	0.06	25.82	89.24
MC10	0.38	15	0.03	9	0.05	1.35	0.1	1.4	0.01	70.2	1.0	12.0	2.4	28.0	0.020	4.3	69.0	1.3	1.52	1.16	52.20	0.50	0.18	0.14	0.28	<0.01	14.46	0.04	27.73	98.21
Avg (n = 7)	**0.35**	**13**	**0.05**	**48**	**0.05**	**1.9**	**0.68**	**1.44**	**0.01**	**18.8**	**1.0**	**9.7**	**3.8**	**18.1**	**0.054**	**3.1**	**178.0**	**2.6**	**1.38**	**6.79**	**43.14**	**0.46**	**1.30**	**0.71**	**0.27**	**0.07**	**12.8**	**0.05**	**26.6**	**93.6**
Max	0.60	21	0.12	109	0.05	4.1	2.92	2.8	0.01	70.2	1.2	15.0	9.1	36.0	0.134	4.7	609.8	6.1	2.42	14.02	53.00	0.80	2.76	1.74	0.28	0.14	30.40	0.06	32.48	98.84
Min	0.10	5	0.01	8	0.05	0.8	0.06	0.8	0.01	0.5	0.6	4.0	1.0	1.0	0.020	1.3	43.4	1.2	0.48	0.26	31.50	0.18	0.06	0.06	0.24	0.02	2.48	0.02	20.57	86.85
Std. Dev	0.16	6	0.04	36	0.00	1.3	1.3	0.8	0.00	28.4	0.3	3.7	3.2	12.1	0.038	1.1	204.4	1.8	0.62	5.22	8.30	0.19	1.13	0.62	0.02	0.05	8.87	0.02	3.96	4.47

Bonanza Ledge: pyrite in replacement ore

Sample	K	Rb	Na	Sr	Ta	Te	Tl	Th	Ti	W	U	V	Y	Zn	Cu/Au	Au/Ag	As/Au	Bi/Au	Al2O3	CaO	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SiO2	TiO2	LOI	TOTAL
	%	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm					%	%	%	%	%	%	%	%	%	%	%	%
2K-19-20	4.48	246	0.42	248	0.75	0.05	4.74	3.8	0.50	14.2	0.8	280.0	11.8	22	0.280	14.3	35.0	0.2	20.03	4.09	19.42	6.43	1.98	0.09	0.24	0.49	25.87	4.02	15.94	98.60
2K-19-21	5.11	257	0.53	179	0.20	0.05	5.02	15.2	0.12	4.1	3.4	128.0	10.1	10	0.964	6.9	114.8	0.9	22.31	2.25	19.52	6.50	1.58	0.07	0.37	0.16	30.26	0.99	14.76	98.77
2K-19-22	5.63	300	0.55	118	0.15	0.15	4.66	15	0.14	5.1	4.0	157.0	9.5	10	2.667	2.3	486.0	4.7	25.77	0.71	15.15	7.69	0.92	0.02	0.36	0.17	34.20	1.29	11.86	98.14
2K-19-23	4.78	238	0.44	77	0.05	0.05	7.54	15	0.09	3.3	3.6	128.0	8.4	16	0.503	3.7	26.6	0.2	20.57	0.51	26.41	6.55	0.73	0.01	0.29	0.12	26.07	1.09	16.22	98.57
2K-19-13	3.17	149	0.29	162	0.05	0.3	6.14	8.6	0.07	2	1.8	91.0	8.6	12	2.766	4.1	150.6	2.7	13.74	2.60	35.72	4.11	1.36	0.06	0.15	0.22	17.65	0.71	22.28	98.60
2K-29-6	4.95	184	0.43	104	0.45	0.5	6.08	2	0.36	8.3	0.6	240.0	11	30	0.238	6.0	201.7	2.7	21.02	2.39	20.32	6.78	1.19	0.09	0.30	0.77	27.72	3.38	14.40	98.36
2K-29-17	4.67	198	0.31	65	0.65	0.05	2.38	3.4	0.51	12.4	1.0	340.0	9	22	1.857	7.8	84.3	0.4	19.39	1.32	25.03	6.36	0.56	0.04	0.20	0.61	24.97	4.53	15.54	98.55
2K-29-20	3.06	133	0.23	93	0.25	0.05	2.46	2.8	0.24	7.8	0.6	227.0	6.3	42	1.694	7.6	52.2	0.5	12.40	3.10	35.92	3.92	1.33	0.12	0.04	0.27	15.87	3.09	22.46	98.52
Avg (n = 8)	**4.48**	**213**	**0.40**	**131**	**0.32**	**0.15**	**4.88**	**8.23**	**0.25**	**7.15**	**2.0**	**198.9**	**9.3**	**20.5**	**1.371**	**6.6**	**143.9**	**1.5**	**19.40**	**2.12**	**24.69**	**6.04**	**1.21**	**0.06**	**0.24**	**0.35**	**25.33**	**2.39**	**16.68**	**98.51**
Max	5.6	300	0.6	248	0.8	0.5	7.5	15.2	0.5	14.2	4.0	340.0	11.8	42.0	2.766	14.3	486.0	4.7	25.8	4.1	35.9	7.7	2.0	0.1	0.4	0.8	34.2	4.5	22.5	98.8
Min	3.1	133	0.2	65	0.1	0.1	2.4	2.0	0.1	2.0	0.6	91.0	6.3	10.0	0.238	2.3	26.6	0.2	12.4	0.5	15.2	3.9	0.6	0.0	0.0	0.1	15.9	0.7	11.9	98.1
Std. Dev	0.9	57	0.1	62	0.3	0.2	1.8	6.0	0.2	4.4	1.5	86.5	1.7	11.1	1.025	3.7	150.6	1.7	4.4	1.2	7.7	1.3	0.5	0.0	0.1	0.2	6.1	1.5	3.8	0.2

Note: when assay values are below detection, then half the detection limit was used to calculate the averages etc.
All sample analysed by ALS Chemex, Aurora Laboratory Services Ltd., 212 Brookbank Ave, Vancouver, BC, V7J 2C1
Methods used for all data in this table: Major oxides = XRF.
Au = Fire assay and AA finish; As = AAS; Hg by cold vapour with ICP-MS rechecks. Other elements = ICP-MS

TABLE 2C
DESCRIPTION OF PYRITE-RICH SAMPLES LISTED IN TABLES 2A & 2B
MOSQUITO CREEK & CARIBOO GOLD QUARTZ DEPOSITS AND THE BONANZA LEDGE GOLD ZONE

	MOSQUITO CREEK DEPOSIT
Sample No.	**Pyrite in or adjacent to quartz veins**
MC1	Underground; 10 cm wide, steeply dipping vein that strikes 120 degrees
MC5	Underground; 0.4m wide quartz vein
MC7	Underground; 15cm wide vein that strikes 350 and dips 70E
MC8	Underground; 1.3m thick quartz vein that strikes 070 degrees & dips 60NE
MC9	Underground; 1.3m wide vein that strikes 070 and dips 60NE
GR00-31	No.1 adit mine dump; float of coarse pyrite in a quartz vein
GR00-32	Surface outcrop near No. 1 adit; massive pyrite on margins of quartz vein
	CARIBOO GOLD QUARTZ DEPOSIT
	Pyrite in or adjacent to quartz veins, 1200 level workings.
CGQ1	Underground; fine grained pyrite in white quartz vein
CGQ2	Underground; pyrite in a 0.6m wide quartz vein
CGQ3	Underground; massive pyrite in centre of a 7cm quartz vein
CGQ4	Underground; 10 cm-wide, steeply dipping quartz vein that strikes 020 degrees
CGQ5	Underground; coarse grained pyrite from a 15cm wide, steeply dipping vein that strikes 360
CGQ6	Underground; pyrite in 3cm wide, steeply dipping quartz vein that strikes 040
CGQ7	Underground; coarse pyrite in 1m wide quartz vein that strikes 040
CGQ8	0.2m wide quartz vein near the 1200 level adit.
	MOSQUITO CREEK DEPOSIT
	Pyrite in massive replacement ore
GR00-34	No. 1 adit mine dump; float of massive, fine grained pyrite.
GR00-39	No. 1 adit mine dump; float of massive, fine grained pyrite.
MC2	Underground; massive pyrite
MC3	Underground; coarse grained massive to semi-massive pyrite
MC4	Underground; coarse grained massive to semi-massive pyrite
MC6	Underground; coarse grained massive to semi-massive pyrite
MC10	Underground; coarse grained massive to semi-massive pyrite
	BONANZA LEDGE GOLD ZONE; Drillholes BC-2K-19 & 29
	Semi-massive to stringer pyrite mineralization
2K-19-20	Semi-massive to stringer pyrite with sericite, carbonate & minor rutile @ 294 feet
2K-19-21	Semi-massive to stringer pyrite with sericite @ 323 feet
2K-19-22	Semi-massive to stringer pyrite with sericite @ 318 feet
2K-19-23	Massive to semi-massive pyrite with sericite, dolomite & trace tourmaline & rutile @ 309 feet
2K-19-13	Tan, sericitic phyllite with blebs & veins of pyrite @ 365 feet
2K-29-6	Tan sericitic metasediment with pyrite stringers and disseminated dolomite & pyrite porphyroblasts @ 215 feet
2K-29-17	Semi-massive pyrite with abundant muscovite-sericite & trace rutile @ 235 feet
2K-29-20	Massive to semi-massive pyrite with sericite & trace rutile @ 243 feet

TABLE 2D
AVERAGE CHEMICAL VALUES OF AURIFEROUS PYRITE SAMPLES, MOSQUITO CREEK & CARIBOO GOLD QUARTZ MINES & THE BONANZA LEDGE GOLD ZONE
(DATA FROM TABLES 2A & 2B)

	Au	Ag	As	Hg	Cu	Sb	Ba	Bi	Pb	P	Nb	Ce	Cs	Ga	La	Al	K	Au/Ag	Cu/Au
VEINS	g/t	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%		
Mosquito Creek Mine n=7	28.2	25.0	3856	6	1.3	10.3	37	121	1000.0	85	0.5	14.5	0.5	3.7	7.6	1.21	0.51	2.4	0.19
Cariboo Gold Quartz Mine n=8	27.2	3.8	1110	11	3.6	4.6	26	185	175.3	96	0.2	5.3	0.2	1.4	2.8	0.50	0.22	9.7	0.19
REPLACEMENTS																			
Mosquito Creek Mine n=7	34.2	12.0	3809	11	1.4	127.5	31	87	206.6	324	0.3	5.6	0.3	2.2	2.7	0.81	0.35	3.1	0.05
Bonanza Ledge n=8	14.3	2.4	929	2954	14.6	1.9	1631	8	55.6	1361	5.7	53.7	6.1	27.4	22.9	10.28	4.48	6.6	1.37

TABLE 3A
GEOCHEMISTRY OF MISCELLANEOUS SAMPLES COLLECTED IN THE WELLS-BARKERVILLE AREA

Sample	Au ppb	Au g/tonne	As ppm	Hg ppb	Al %	Sb ppm	Ba ppm	Be ppm	Bi ppm	Cd ppm	Ca %	Ce ppm	Cs ppm	Cr ppm	Co ppm	Cu ppm	Ga ppm	Ge ppm	Fe %	La ppm	Pb ppm	Pb %	Li ppm
IWE-00-4	<5	-----	<1	80	7.24	1.5	4560	1.9	0.32	0.16	0.14	83	7.85	111	8.4	33	19.8	2.2	3.56	43	6.5		65.6
IWE-00-5	<5	-----	20	100	0.49	2.7	5340	0.05	0.03	0.06	0.01	4.49	0.2	19	<0.2	34	0.9	0.3	0.56	3.5	10		1.6
IWE-00-6	1545	-----	1240	<10	0.56	0.9	60	0.4	0.13	0.1	0.34	3.75	0.3	19	9.8	9	1.6	2	8.92	2	270		2.4
IWE-00-8	<5	-----	4	<10	2.22	0.2	270	0.4	<0.01	0.02	0.55	21.9	1.1	60	7.8	45	6.7	1.2	2.12	9.5	5		19.4
GR-00-50	<5	-----	3	<10	2.63	0.1	100	0.35	0.19	0.08	1.44	24.5	0.8	25	4.2	19	5.7	1.1	1.69	11.5	20.5		12.4
GR-00-51	<5	-----	4	<10	1.69	<0.1	10	0.05	0.08	0.04	0.98	18.75	0.15	18	1.4	1	1.3	1.1	0.76	8	13.5		0.8
GR-00-52	10	-----	13	<10	0.64	0.2	30	0.05	4.24	0.16	1.44	3.73	0.25	21	9.2	23	1.2	1.1	1.43	1.5	90		1.4
GR-00-53	<5	-----	<1	<10	0.95	<0.1	40	0.3	0.06	0.02	0.08	3.55	0.35	19	2.6	7	2.2	1.5	1.34	1.5	7.5		9.6
GR-00-54	5880	-----	5	<10	0.08	13	60	<0.50	68	5	0.03	3.5	<.5	12	3	2	<1	3	0.84	<5	>10000	3.49	4
GR-00-55	1885	-----	92	<10	0.28	1.3	20	<0.05	4.16	0.08	0.02	1.67	0.15	21	11.2	4	0.6	1.3	2.32	0.5	412		1.6
GR-00-57	2390	-----	575	<10	1	17.8	70	0.25	0.29	0.16	<0.01	15.95	0.5	71	1.2	60	2.7	2.5	2.54	7.5	84.5		1.6
GR-00-58	>10000	83.18	20	10	0.54	0.4	40	<0.05	0.15	0.14	<0.01	5.43	0.3	26	0.8	1	1.2	1.6	0.84	2.5	198.5		0.6
GR-00-59	15	-----	18	<10	0.04	0.4	<10	<0.05	0.02	<0.02	<0.01	0.22	0.05	18	<0.2	1	<0.1	1.1	0.05	<0.5	11		0.2
GR-00-61	165	-----	75	<10	0.38	0.1	130	0.15	0.18	<0.02	0.01	1.56	0.2	21	1.4	<1	0.9	1.3	0.95	0.5	3.5		1.4
GR-00-64	7220	-----	498	<10	10.3	0.5	50	4.3	2.63	<0.02	0.06	101.5	4.2	91	23.2	<1	27.6	1.5	7.2	45	71.5		12.4
GR-00-65	7680	-----	1010	30	0.11	1.6	10	0.05	11	0.8	0.99	5.94	0.05	4	61.4	<1	0.3	0.8	>25.0	1.5	91		0.8
GR-00-66	15	-----	108	<10	3.98	0.4	1290	0.6	0.14	0.12	9.03	19.55	3.85	1460	73.2	96	10.5	0.9	3.67	9	5.5		8.4
GR-00-72	>10000	29.59	2450	<10	1.64	2	30	0.4	95.9	0.04	0.64	9.67	0.4	16	34.6	<1	4.6	1	22.2	5	79		1
GR-00-74	125	-----	1075	10	0.48	8.7	40	0.15	4.43	0.14	0.84	61	0.3	21	39.2	348	1.2	1	6.1	33.5	253		0.6
GR-00-75	575	-----	239	<10	1.66	0.1	440	0.35	0.23	<0.02	0.05	18.9	0.7	19	1.6	1	3.6	1.3	1.69	9	9.5		1.8
GR-00-78	805	-----	205	<10	1.27	0.3	100	0.45	0.85	0.02	0.3	154	0.75	23	6	8	3.1	1.4	2.97	87	71		1.4
GR-00-82	2540	-----	7230	10	0.06	120	10	<0.50	156	19	0.01	1.3	<.5	11	1	3	<1	4	0.66	<5	>10000	13.6	<2
GR-00-83	4370	-----	1835	<10	0.32	1.9	20	<0.05	0.55	0.06	0.08	1.9	0.2	16	17.8	<1	0.8	1.6	7.79	1	445		1.4
GR-00-86	>10000	49.97	2150	<10	1.41	2.3	20	0.5	65.9	0.12	1.88	15.9	0.3	6	139.5	<1	3.9	0.6	>25.0	8	91		1.2
GR-00-87	5760	-----	523	<10	0.1	1.7	<10	<0.05	5.46	<0.02	0.03	1.06	0.1	9	63.8	87	0.3	1.4	13.45	0.5	42.5		0.4
GR-00-93	85	-----	<1	50	2.93	2.9	20	0.6	1.35	1.8	11.5	30.8	0.75	28	29	263	4.9	0.5	19.55	15	2250		3.6
GR-00-95	20	-----	1	<10	3.21	1.8	10	0.35	1.25	0.16	1.28	9.72	0.05	18	21.8	362	5.8	1.2	5.52	5	341		5.8
GR-00-96	40	-----	590	<10	4.85	1.7	10	0.2	0.15	0.02	0.11	21.5	0.15	10	21	1	6.9	1.1	11.15	10.5	25.5		0.6
GR-00-97	<5	-----	3	<10	8.54	0.3	870	1.25	0.12	0.14	3.71	28	0.8	12	40	17	15.9	1.5	8.2	13.5	46.5		58.4
GR-00-98	20	-----	1	<10	0.05	38.7	10	<0.05	54	10.7	0.01	0.73	0.05	20	1.4	16	0.1	1.2	0.82	<0.5	>10000	3.53	0.2
GR-00-99	5	-----	8	40	7.45	0.8	620	2.55	0.68	0.08	9.33	159.5	4.15	1	30.6	<1	22.3	1.6	7.69	74.5	165		112
GR-00-100	<5	-----	<1	<10	0.27	0.3	20	0.05	0.14	0.02	0.06	2.57	0.1	20	1.6	9	0.7	0.7	0.33	0.5	110.5		2
GR-00-101	<5	-----	3	<10	3.55	0.4	630	1.15	0.09	0.02	0.32	23.7	2.25	51	2.8	37	9.8	1.3	1.98	14	17.5		20.2
GR-00-102	<5	-----	52	31200	3.97	13.1	330	0.95	0.25	0.02	0.01	45.4	2.25	30	3.2	9	9.1	1.9	4.88	22	18		16.4
GR-00-103	<5	-----	<1	<10	0.05	0.4	<10	<0.05	0.15	<0.02	<0.01	0.63	0.05	18	<0.2	1	<0.1	3.3	0.06	<0.5	8.5		2.4
GR-00-104	30	-----	26	1460	4.06	1.3	260	0.7	2.76	5.3	0.04	15.45	0.85	8	2.6	59	7.7	1	0.94	8.5	592		3.6
GR-00-105	<5	-----	1270	<10	7.98	2.9	920	0.8	0.17	0.5	8.18	25	2.4	2410	115.5	5	20.7	1.2	8.72	14	22.5		43.4
GR-00-106	1920	-----	2130	10	0.81	0.5	40	0.4	6.73	0.1	5.09	3.75	0.25	24	8.8	<1	2.1	1.2	9.44	2	29.5		0.6
GR-00-107	880	-----	62	<10	0.03	831	<10	<0.50	2490	137	0.16	5.7	<.5	4	<1.0	37	<1	2	0.3	5	>10000	79.3	<2

TABLE 3A CONTINUED
GEOCHEMISTRY OF MISCELLANEOUS SAMPLES COLLECTED IN THE WELLS-BARKERVILLE AREA

Sample	Mg %	Mn ppm	Mo ppm	Ni ppm	Nb ppm	P ppm	K %	Rb ppm	Ag ppm	Na %	Sr ppm	Ta ppm	Te ppm	Tl ppm	Th ppm	Ti %	W ppm	U ppm	V ppm	Y ppm	Zn ppm
IWE-00-4	1.13	230	1.4	33.4	9.8	450	2.26	128	0.55	0.05	33.2	0.6	0.05	0.68	14.2	0.28	1.3	2	143	7.4	86
IWE-00-5	0.01	5	1.6	1.4	<0.2	80	0.13	4.4	0.7	<0.01	15.4	<0.05	<0.05	0.02	<0.2	0.01	<0.1	0.2	9	1.3	12
IWE-00-6	0.14	180	<0.2	42.4	<0.2	200	0.23	13.8	0.75	0.01	18.2	<0.05	<0.05	0.06	0.4	<0.01	2	0.2	5	2.4	26
IWE-00-8	0.82	385	0.2	18.2	2.2	190	0.61	34.6	0.15	<0.01	20.8	<0.05	<0.05	0.18	2.6	0.18	0.7	0.6	65	4.8	48
GR-00-50	0.92	735	<0.2	8	1	150	0.52	29	0.25	0.68	83	<0.05	<0.05	0.14	3.4	0.05	0.1	0.8	17	3.2	44
GR-00-51	0.39	380	0.2	3.6	0.2	120	0.04	2	0.1	0.96	64.3	<0.05	<0.05	<0.02	1.6	0.01	0.1	0.4	1	1.6	4
GR-00-52	0.55	980	<0.2	19.4	<0.2	200	0.17	9	0.95	0.15	88.1	<0.05	0.25	0.04	0.2	<0.01	<0.1	0.2	4	2.7	10
GR-00-53	0.13	130	<0.2	5.8	<0.2	100	0.18	10.2	0.05	0.07	28.2	<0.05	<0.05	0.06	1.6	<0.01	<0.1	0.2	6	1.4	34
GR-00-54	0.07	205	<1.0	3	<2	<10	0.01	<2	47	<0.01	<1.0	<.5	3	<.2	<2	<0.01	<10.0	<2	<1	1	48
GR-00-55	0.07	45	<0.2	7	<0.2	40	0.07	3.8	5.95	0.01	3.6	<0.05	0.25	<0.02	<0.2	0.02	<0.1	0.2	6	0.6	52
GR-00-57	0.02	35	0.8	4.6	2.6	90	0.35	21.6	2.1	0.05	14.6	<0.05	0.05	0.12	1	0.09	3.6	1	22	1.4	152
GR-00-58	0.01	190	<0.2	2	<0.2	10	0.19	9.6	0.55	0.02	6.4	<0.05	<0.05	0.04	<0.2	0.01	0.1	0.2	5	0.9	18
GR-00-59	<0.01	5	<0.2	1	<0.2	<10	0.01	0.6	0.15	<0.01	1.8	<0.05	<0.05	<0.02	<0.2	<0.01	<0.1	<0.2	<1	<0.1	<2
GR-00-61	0.01	30	<0.2	3.6	<0.2	<10	0.17	7.2	0.05	<0.01	4.8	<0.05	<0.05	0.02	<0.2	<0.01	0.6	<0.2	3	0.1	<2
GR-00-64	0.23	30	<0.2	34.8	5.8	130	3.46	209	0.9	0.31	34.6	0.25	0.05	1.02	14	0.18	9.4	1.8	135	6	12
GR-00-65	0.37	600	<0.2	242	<0.2	350	0.04	1.8	3.25	<0.01	31.2	<0.05	0.6	0.06	0.6	<0.01	6.2	<0.2	2	3.3	104
GR-00-66	3.09	990	0.2	160.5	1.8	160	1.54	62.2	0.2	0.18	294	0.05	<0.05	0.4	1	0.14	0.7	0.2	147	5.2	30
GR-00-72	0.1	395	<0.2	41.6	0.8	350	0.73	33.2	14.15	0.01	11	<0.05	1.4	0.12	4	0.03	1.1	1	12	1.3	<2
GR-00-74	0.34	940	0.2	154	0.2	170	0.2	9.2	2.3	0.01	29.2	<0.05	0.15	0.6	1.8	0.01	0.5	0.6	6	2.4	14
GR-00-75	0.05	25	<0.2	3.8	0.6	30	0.64	32.8	0.35	0.04	9.4	<0.05	<0.05	0.16	3.8	0.03	1.3	0.6	11	1.2	2
GR-00-78	0.12	230	0.6	29.6	0.2	110	0.5	25.4	0.8	0.03	23.8	<0.05	<0.05	0.14	3.4	0.01	1	0.8	13	3.6	2
GR-00-82	<0.01	<5	<1.0	<1.0	<2	50	0.03	<2	228.0	<0.01	9	<.5	2.5	<.2	<2	<0.01	<10.0	6	<1	<1	26
GR-00-83	0.1	200	<0.2	17.8	<0.2	40	0.13	6.8	1.1	<0.01	4.2	<0.05	<0.05	0.02	1	<0.01	1.2	<0.2	3	0.8	6
GR-00-86	0.44	1640	0.6	145.5	0.6	230	0.64	30.4	10.45	0.01	24.4	<0.05	1.15	0.14	5.4	0.03	1	1	12	3.1	<2
GR-00-87	0.01	30	<0.2	53.8	<0.2	<10	0.04	2.2	1.05	<0.01	2.6	<0.05	0.15	0.02	0.2	<0.01	0.2	<0.2	1	0.3	<2
GR-00-93	0.26	980	0.4	119.5	1	150	0.63	30	4.25	1.09	535	<0.05	<0.05	0.3	7	0.03	0.4	2.4	22	10.5	416
GR-00-95	0.45	535	1.4	34	0.2	70	0.04	1.4	1.8	2.35	114	<0.05	0.15	0.18	2	0.01	1.3	0.6	6	2.1	14
GR-00-96	0.03	20	<0.2	79.6	0.2	30	0.04	1.4	0.15	3.77	89.1	<0.05	0.05	0.06	6	<0.01	0.6	0.6	1	1.6	<2
GR-00-97	1.02	1535	<0.2	12.4	0.6	1220	0.42	17.8	0.15	3.09	777	<0.05	<0.05	0.08	4.6	0.09	0.6	0.8	256	5.2	100
GR-00-98	0.01	30	<0.2	2.2	<0.2	50	0.06	1.2	76.4	0.01	5.2	<0.05	3	0.02	<0.2	<0.01	0.1	<0.2	2	0.1	716
GR-00-99	2.35	915	2.8	5.2	21.8	6800	1.87	74.8	0.65	1.01	1015	1	<0.05	0.3	8.4	0.91	0.7	1.2	181	24.7	156
GR-00-100	0.1	60	<0.2	5.2	<0.2	50	0.06	2.8	0.35	<0.01	6.2	<0.05	<0.05	<0.02	<0.2	0.02	<0.1	<0.2	9	0.8	8
GR-00-101	0.66	225	0.8	6.8	7.6	620	1.3	69.2	0.2	0.01	15.6	0.4	<0.05	0.36	4.2	0.36	1	1.2	109	7.6	50
GR-00-102	0.1	10	2.4	8.8	2	80	1.31	65.8	0.75	0.21	57	0.1	<0.05	7.32	9.8	0.06	0.5	2	28	4	26
GR-00-103	<0.01	<5	<0.2	0.6	<0.2	<10	0.01	0.8	0.05	<0.01	2.4	<0.05	<0.05	0.08	<0.2	<0.01	<0.1	<0.2	<1	<0.1	<2
GR-00-104	0.08	5	<0.2	2.2	6.2	110	0.93	49	1.65	1.77	43.8	0.5	0.1	0.22	4.8	<0.01	0.5	1.2	<1	1.1	2800
GR-00-105	4.3	1235	1.6	945	2.2	500	1.72	85.4	0.15	1.16	469	0.1	<0.05	0.48	4.4	0.11	1.8	1.4	193	9.7	234
GR-00-106	0.32	2120	<0.2	11.4	<0.2	590	0.37	16	0.7	0.01	66.4	<0.05	0.85	0.06	0.8	0.01	0.6	1.4	10	3.7	10
GR-00-107	0.03	100	<1.0	1	<2	10	<0.01	<2	1935.0	<0.01	26	<.5	30	1.6	<2	<0.01	<10.0	<2	1	3	6

All sample analysed by ALS Chemex, Aurora Laboratory Services Ltd., 212 Brookbank Ave, Vancouver, BC, V7J 2C1
Methods used for all data in this table:
Au = Fire assay and AA finish; As = AAS; Hg by cold vapour with ICP-MS rechecks. Other elements = ICP-MS

TABLE 3B
DECRIPTION & LOCATION OF MISCELLANEOUS SAMPLES COLLECTED IN THE WELLS-BARKERVILLE AREA

Sample	Description	UTM (E)	UTM (N)
IWE-00-4	Pyritic grey phyllite with ankerite & quartz veins	588858	5891008
IWE-00-5	Float of quartz vein in black phyllite; trench near Mt Tom	588121	5889542
IWE-00-6	Quartz vein at Prosperpine adit: hosted in silicified quartzite	602167	5876126
IWE-00-8	Quartz vein cutting Island Mt Amphibolite, Adit at head of Coulter Creek, west side of Island Mt.	590677	5884954
GR-00-50	Float of quartz vein with malachite, trace pyrite, sericite & ankerite, Lower Perkins adit	589076	5877469
GR-00-51	Float of white quartz vein with disseminated pyrite. Lower Perkins adit dump.	589076	5877469
GR-00-52	Float of white quartz vein with sericite & ankerite. Lower Perkins adit dump.	589076	5877469
GR-00-53	Float of rusty quartz vien with pyrite & sericite. South end of Perkins trench.	588743	5877799
GR-00-54	Flloat of quartz vein with pyrite & galena. Middle part of Perkins trench	588721	5877885
GR-00-55	Float of rusty quartz vein with pyrite & sericite. North end of Perkins trench	588742	5877973
GR-00-57	Vuggy, 1.5 m wide quartz vein with disseminated pyrite. Shaft at Standard Location vein.	589559	5879180
GR-00-58	Narrow quartz vein with coarse pyrite. Trench below Standard Location veins	588990	5878244
GR-00-59	Black Bull quartz vein with sericite but no pyrite	596891	5881398
GR-00-61	Float of white quartz vein & abundant pyrite. Canusa mine dump.	597330	5881044
GR-00-64	Coarse pyrite in wallrock near brecciated quartz vein, Lowhee Creek	596403	5882475
GR-00-65	Coarse massive pyrite in quartz vein. Lowhee Creek	596403	5882475
GR-00-66	Brown phyllite with shears & mariposite-fuchsite. Lowhee Creek	596485	5882190
GR-00-72	Massive pyrite replacement ore outcropping near Mosquito Creek mine headframe.	593640	5885105
GR-00-74	Float of white quartz vein with pyrite, sericite & graphite. Lower Warspite adit dump	601406	5877003
GR-00-75	Float of grey quartz vein with coarse disseminated pyrite. Lower Warspite adit dump	601406	5877003
GR-00-78	Float white quartz vein with coarse pyrite & graphite. Lower Warspite adit dump,	601406	5877003
GR-00-82	Float of white quartz vein with pyrite, arsenopyrite & galena. Upper Warspite adit dump.	602178	5876111
GR-00-83	Float of white quartz vein with pyrite, arsenopyrite & galena. Upper Warspite adit dump.	602178	5876111
GR-00-86	Float of massive pyrite replacement ore, Island Mountain mine dump.	595138	5884383
GR-00-87	Float of white quartz vein with pyrite. Island Mountain mine dump	595138	5884383
GR-00-93	Underground outcrop, 8 cm wide pyrite-pyrrhotite layer. Island Mountain mine.	-	-
GR-00-95	Pyrite in 0.25m wide quartz vein trending 145/43NE. Dukes adit, Mosquito Creek area.	-	-
GR-00-96	Underground, Pyrite on margins of a 15 cm wide quartz vein trendind 040/SV, Island Mt mine.	-	-
GR-00-97	Outcrop of altered tuff with disseminated pyrite. Grouse Creek area.	603584	5877659
GR-00-98	Float of white quartz vein with galena, pyrite & sericite. Grouse Creek.	602801	5875660
GR-00-99	Altered, orange phyllite with pyrite-pyrrhotite veinlets. Coulter Creek area.	589942	5882889
GR-00-100	Quartz vein cutting Island Mt Amphibolite. Adit entrance, head of Coulter Creek	590672	5884944
GR-00-101	2 m-wide boulder float of rusty vuggy quartz vein above adit, head of Coulter Creek	590708	5884961
GR-00-102	Float of pyritic altered metasediment, dump outside old adit below the BC shaft	597043	5881343
GR-00-103	White quartz vein from south side of BC vein	597278	5981356
GR-00-104	Cleaved, sugary quartzite, Lightning Creek, Castle Minerals sample site 114547	589642	5874917
GR-00-105	Listwanitic, fuchsite-rich boulder float. Frank Nestles placer camp	598939	5889465
GR-00-106	Massive pyrite replacement. Outcrop near Mosquito Creek adit.	593706	5885133
GR-00-107	Float of galena-quartz sample. Mosquito Creek mine adit dump	593700	5885120

Binary plots comparing the chemistry of the Mosquito Creek deposit replacement ore and the Bonanza Ledge auriferous pyrite are presented in Figures 6A, 6B and 6C. These illustrate some of the chemical differences described above and also show that in both deposits there is a positive correlation between Au:Ag, Au:Pb, Au:Bi and Au:As. However, the Mosquito Creek ore tends to be more Ag-rich and Cu-poor than the Bonanza Ledge mineralization (Table 2D).

One of the most surprising findings of this study was the discovery of elevated Hg in the Bonanza Ledge mineralization and its alteration envelope. Apart from two notable exceptions (Table 3A), no Hg-enrichment is seen in any other samples collected throughout the district. However, Hg-rich Au placers are reported in a few creeks in the district (McTaggart and Knight, 1993) which raises possibilities that these streams drain areas containing unexposed Bonanza Ledge-type Au deposits.

OTHER MISCELLANEOUS SAMPLES COLLECTED FROM THE WELLS-BARKERVILLE AREA

In addition to the samples already described above, a number of altered or mineralized samples were collected from throughout the Wells-Barkerville area during this project. The assay data, description and location of these samples are presented in Tables 3A and 3B. They include samples from Mosquito Creek and Island Mountain mines that were taken too late to include in our comparative database listed in Tables 2A and 2B. The Perkins and Standard Location veins in the Mount Burns area were also sampled, as were the Warspite and Prosperpine veins south of Barkerville, and the Canusa, BC and Black Bull quartz veins in the Bonanza Ledge area (Figure 1).

The data in Table 3A reveals large variations in the Au, Ag, As, Pb and Zn contents of the samples, although all have low to very low quantities of Cu and W. Very high Au assays are seen in some of the Perkins and Standard Locations veins, with one sample (GR-00-58) con-

TABLE 4
ASSAY OF STREAM SEDIMENT PAN CONCENTRATE TAKEN FROM LOWHEE CREEK, WELLS-BARKERVILLE (SAMPLE GR-00-63)

		Sample GR-00-63			Sample GR-00-63
Au	g/t	380	Li	ppm	9.8
Pt	g/t	<0.07	Mg	%	0.14
Pd	g/t	<0.07	Mn	ppm	870
Rh	g/t	<0.03	Mo	ppm	3.6
As	ppm	297	Ni	ppm	128.5
Hg	ppb	10	Nb	ppm	1.2
Al	%	1.84	P	ppm	1200
Sb	ppm	6.7	K	%	0.6
Ba	ppm	190	Rb	ppm	34.6
Be	ppm	0.95	Ag	ppm	6.6
Bi	ppm	80	Na	%	0.11
Cd	ppm	0.46	Sr	ppm	80
Ca	%	0.33	Ta	ppm	<0.05
Ce	ppm	>500	Te	ppm	1.4
Cs	ppm	1.25	Tl	ppm	0.22
Cr	ppm	85	Th	ppm	153.5
Co	ppm	105.5	Ti	%	0.68
Cu	ppm	102	W	ppm	5000
Ga	ppm	11	U	ppm	10.6
Ge	ppm	2.4	V	ppm	193
Fe	%	>25.0	Y	ppm	40.3
La	ppm	>500	Zn	ppm	106
Pb	ppm	1010			

Sample collected on Lowhee Creek (UTM 596384E; 5882421N) by placer miner, Wilf Frederick
Methods: Au = Fire assay and AA finish; As = AAS; Hg by cold vapour with ICP-MS rechecks.
Pt, Pd & Rh = Fire assay-ICP. Other elements = ICP-MS
Sample description:
stream sediment pan concentrate with abundant, fine grained black magnetite, quartz and some coarse grains of scheelite

taining 83 g/t Au. The other highly Au-rich samples represent massive replacement ore at the Mosquito Creek and Island Mountain mines.

Galena ± arsenopyrite are present in some of the Perkins and Warspite veins which accounts for the sporadically high Pb and As values. A galena-rich sample (GR-00-107) from the Mosquito Creek Mine adit dump is very Ag-rich (1935 ppm) and contains elevated amounts of Au, Bi and Cd.

Apart from two notable exceptions, all the samples listed in Table 3A have a very low Hg content. One Hg-rich sample (GR-00-102) comprises barren pyritic meta-sedimentary float collected from a dump (UTM 597043E; 5881343N) near an old adit that lies immediately below the BC shaft and the BC Vein, approximately 300 m northwest of the Bonanza Ledge Zone. This sample assayed > 31 000 ppb Hg and suggests that a Hg-rich zone could extend parallel to the BC Vein for some distance northwest of Bonanza Ledge. Another sample (GR-00-104 containing 1460 ppb Hg) was taken from a cleaved, sugary quartzitic metasediment in Lightning Creek at UTM 589642E; 5874917N. It suggests this vicinity should be checked for possible Bonanza Ledge-type mineralization.

One quartz vein sampled at the head of Coulter Creek on Island Mountain (Figures 1 and 2; UTM 590672E; 5884944N) deserves mention because it may be important regarding the timing of the quartz veins in relation to the structural emplacement of the Island Mountain Amphibolite. This unnamed, east to east-southeast-trending vein was not recorded in the BC MINFILE. It has been explored underground along a 2 m high adit for at least 50 m. The 7 m thick quartz vein cuts sheared and chloritic rocks of the mafic Island Mountain Amphibolite. Slickenslides in the wallrock indicate that the structure controlling the vein has undergone late subhorizontal sinistral movement. The vein largely comprises both white and clear quartz. Locally, along its margins, it splits and interdigitates with the hostrocks. The vein includes both massive and annealed brecciated textures that are similar to the brittle textures seen in other veins in the structurally underlying Snowshoe Group, including the BC Vein and those at the Mosquito Creek Mine. The small dump close to the portal contains float of rusty quartz with coarse brown carbonate, some muscovite and trace quantities of fine grained disseminated pyrite. Samples taken from the vein and dump were barren (Table 3A). Despite the absence of Au however, this vein closely resembles parts of the BC Vein; if it belong to the same generation then it implies that the auriferous quartz veining in the district occurred after the structural emplacement of the Island Mountain Amphibolite klippe (Figure 2).

The assay data of a heavy mineral pan concentrate sample collected from Lowhee Creek (UTM 596384E;

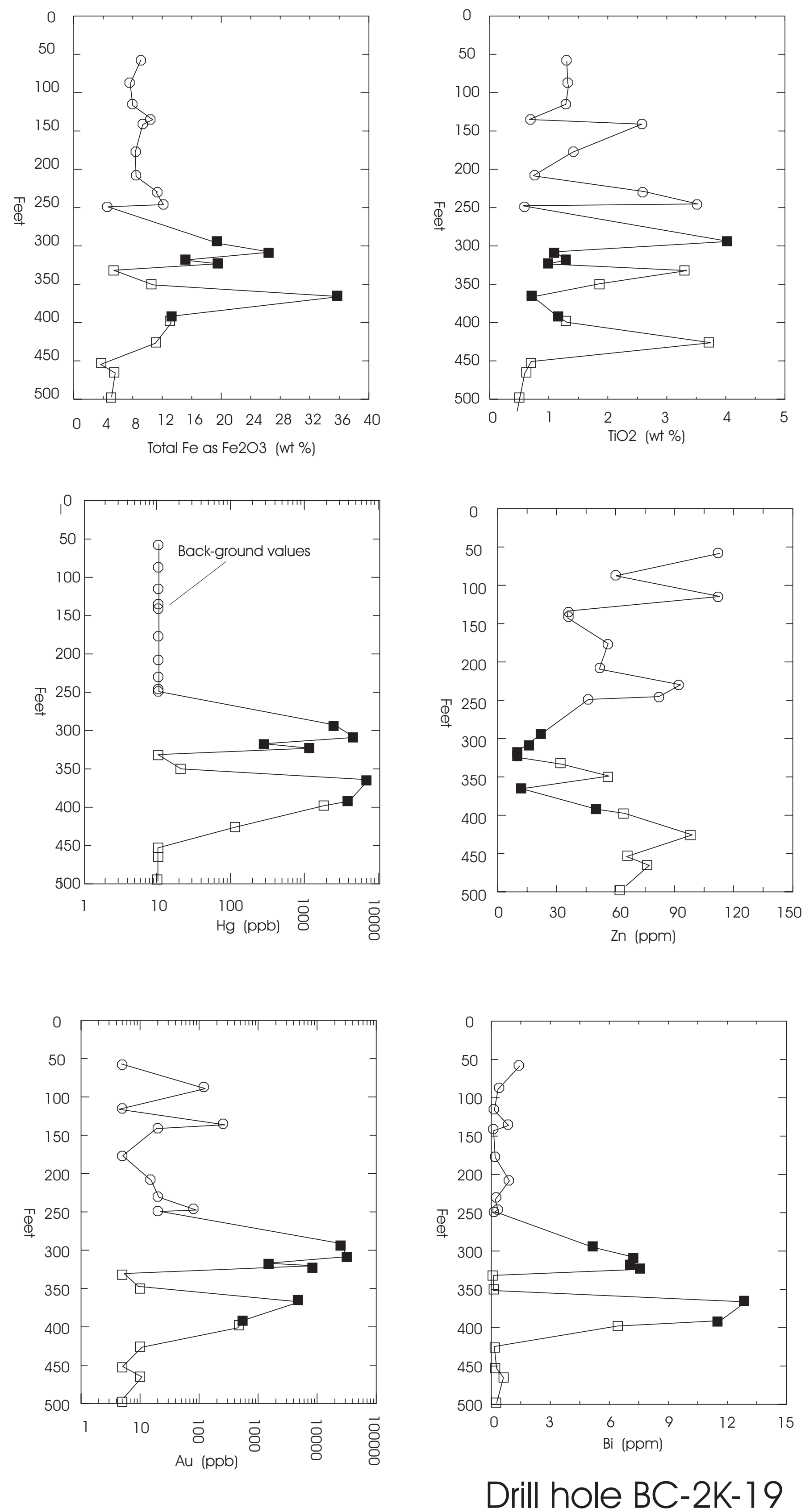


Figure 4A. Changes in the content of Fe_2O_3, TiO_2, Hg, Zn, Au and Bi down drill hole DH-2K-19, Bonanza Ledge. Open circles = hanging wall rocks; open squares = footwall rocks; solid squares = samples containing > 500 ppb Au.

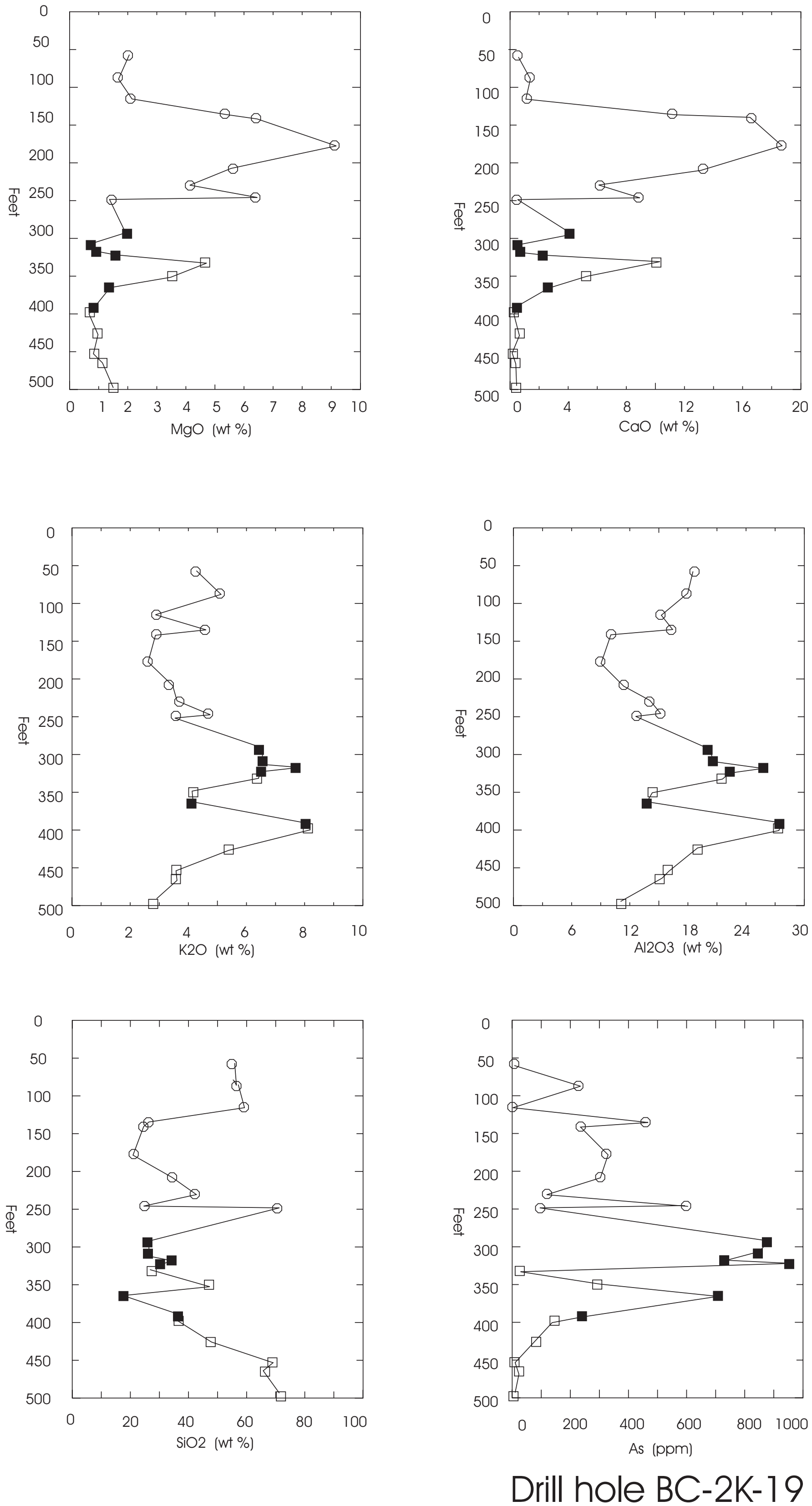


Figure 4B. Changes in the content of MgO, CaO, K_2O, Al_2O_3, SiO_2 and As down drill hole DH-2K-19, Bonanza Ledge. Open circles = hanging wall rocks; open squares = footwall rocks; solid squares = samples containing > 500 ppb Au.

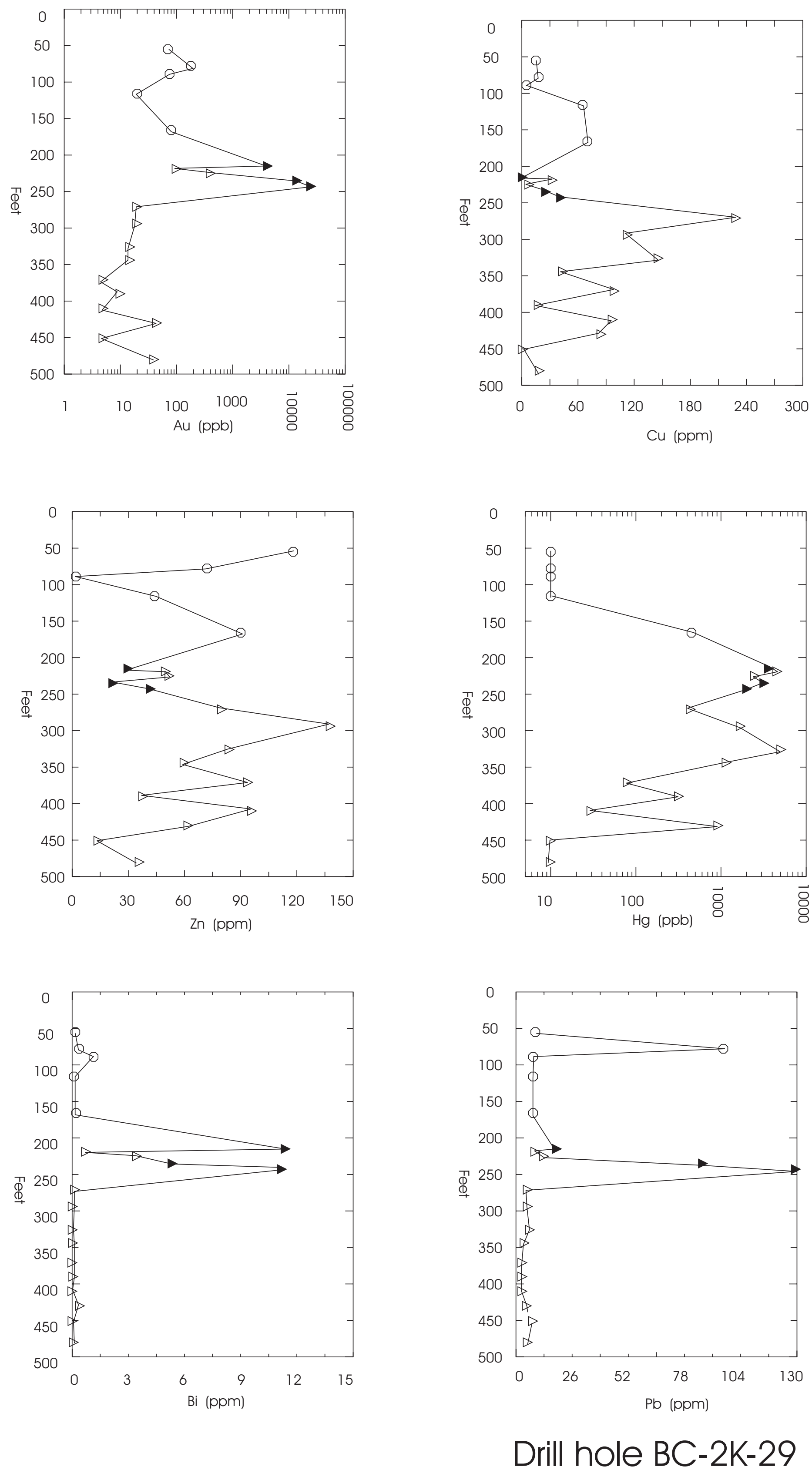


Figure 4C. Changes in the content of Au, Cu, Zn, Hg, Bi and Pb down drill hole DH-2K-29, Bonanza Ledge. Open circles = hanging wall rocks; open triangles = footwall rocks; solid triangles = samples containing > 500 ppb Au.

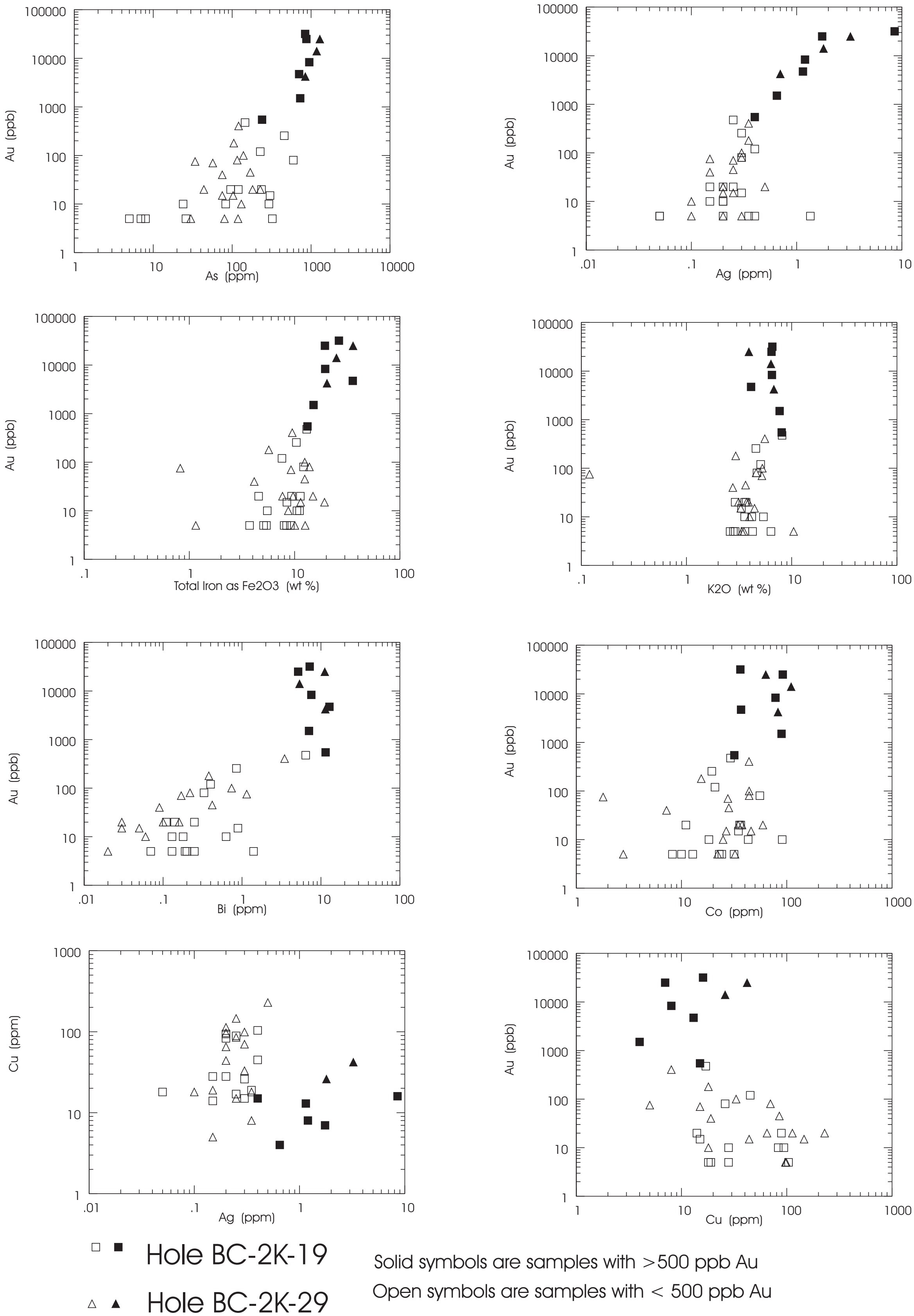


Figure 5A. Binary plots of geochemical data listed in Table 1A for drill holes BC-2K-19 & 29, Bonanza Ledge Gold Zone.

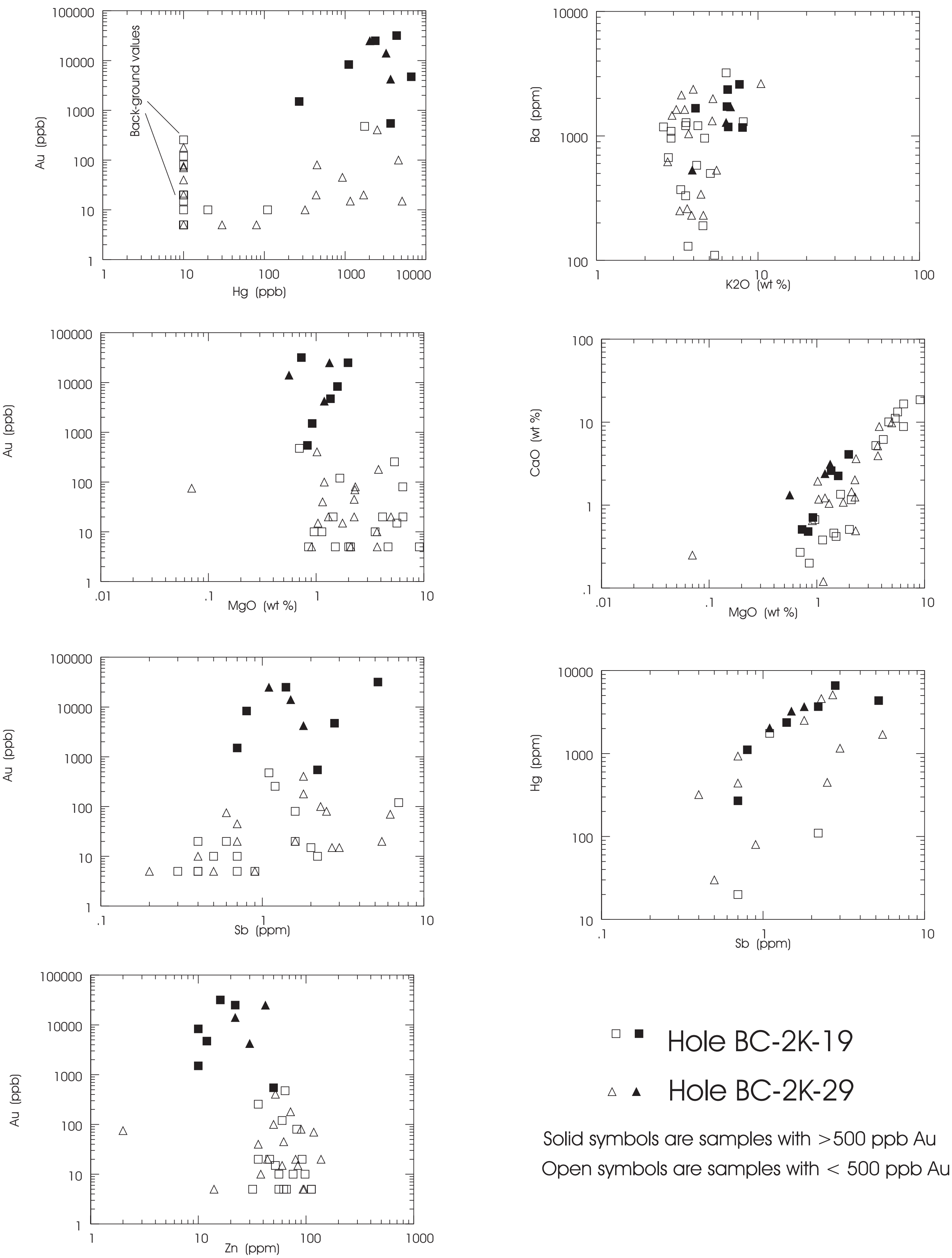


Figure 5B. Binary plots of geochemical data listed in Table 1A for holes BC-19 & 29, Bonanza Ledge Gold Zone.

5882421N) by placer miner Wilf Frederick is presented in Table 4. This sample was taken from a 0.75 kg composite of heavy mineral material collected over a period of time during Mr. Fredericks' placer operation. It contained abundant, fine grained magnetite and quartz, some very fine grained gold and larger fragments of scheelite up to 0.4 cm in diameter. Due to the sporadic presence of fuchsite-mariposite in the Wells-Barkerville district, this Lowhee Creek sediment sample was assayed to specifically test for ultramafic-related elements such as Cr, Pd, Pt and Ni. The data in Table 4 shows no enrichment in these elements, although enhanced quantities of Au, As, Bi, Co, Pb and W are present. The abundance of REE's such as La and Ce may indicate the presence of apatite or monazite. Although Lowhee Creek drains part of the area underlain by the BC Vein (Figure 1), the sample has a very low Hg content (10 ppb), suggesting that the element is relatively immobile in this area.

SUMMARY AND CONCLUSIONS

This preliminary study has involved the collection of relatively few samples. Consequently, our conclusions are tentative, although the following points can be made:

- As noted by many previous workers, the Wells-Barkerville district contains two types of auriferous pyrite mineralization: (1) pyrite that is intimately associated with at least four different sets of quartz veins and (2) pyrite in massive to semi-massive "replacement" bodies that mostly plunge gently northwest parallel to the axes of tight, ductile F2 folds. The newly discovered Bonanza Ledge Zone is thought to represent the latter type.
- For a number of reasons, Bonanza Ledge represents an exciting and significant new gold discovery: it occurs some distance from other known deposits, it lies in a different structural, stratigraphic and lithological setting to the massive replacement mineralization at the Mosquito Creek and Island Mountain mines (Rhys, 2000), and it has a different chemistry and gangue mineralogy. Thus it probably represents a newly recognized sub-type of the auriferous replacement pyrite mineralization in the district.
- Although the massive to semi-massive auriferous pyrite bodies at the Mosquito Creek and Island Mountain mines resemble the Bonanza Ledge mineralization, the latter is characterized by a gangue containing abundant sericite-muscovite, more quartz and rutile, and trace amounts of tourmaline.
- Despite the presence of sporadic chalcopyrite, both types of auriferous pyrite mineralization throughout the district generally have very low Cu contents, ranging from 1 to 8 ppm Cu in the veins and 1 to 42 ppm Cu in the replacements (Tables 2A and 2B).
- The average Au grades in our samples of vein-related pyrite from the Mosquito Creek and Cariboo Gold Quartz mines show little overall difference in grade to the massive pyrite replacement at the Mosquito Creek mine (avg. 27-28 g/t Au in the veins and 34 g/t Au in the Mosquito Creek replacement ore; Table 2D).
- There are chemical differences between the quartz-vein pyrite at Mosquito Creek and the quartz vein pyrite at the Cariboo Gold Quartz mine, despite their similar Au grades. The vein-associated pyrite at Mosquito Creek has higher quantities of Ag, As, Sb, Pb, Zn, W and As and lower Au/Ag ratios (2.4 versus 9.7; Table 2D).
- The replacement auriferous pyrite at the Mosquito Creek mine is chemically different to the similar looking mineralization at the Bonanza Ledge. The latter contains higher quantities of Al, K, Si and Ti, reflecting the greater abundances of quartz, sericite and rutile at Bonanza Ledge. It also has, on average, higher quantities of Cu, Co and Hg, as well as having more Ba, Be, Ce, Cs, Ga, Ge, Hg, La, Li, Nb, Ni, Sr, Th, Ta, Rb, V and Y. By contrast, the replacement mineralization at Mosquito Creek has higher quantities of As, Pb, W, Te, Bi and Cr. Some, but not all of these geochemical differences noted above probably reflect the contrasting sedimentary hostrock lithologies at the various properties.
- At Bonanza Ledge, there are strong correlations between Au:Bi, Au:As, Au:Pb, Au:K_2O and Au:Al_2O_3. By contrast, the correlations between Au:Zn and Au:Cu are poor to negative.
- One of the most distinctive geochemical differences between the replacement mineralization at Mosquito Creek and Bonanza Ledge is the latters' higher Hg content. Elevated Hg values occur not only in the Bonanza Ledge auriferous pyritic horizons but extends down into the barren footwall rocks (Figures 4A and 4C).
- The source, significance, nature, and host mineral of the Hg enrichment at Bonanza Ledge are unknown. However, the strong correlation between Fe and Hg and the poor to moderate correlation between Au and Hg suggests that the latter element is hosted by both barren and auriferous pyrite.
- There are at least three possible reasons for the apparent Hg enhancement at Bonanza Ledge, namely: (1) it is temporally and genetically related to the pyritic Au mineralization, (2) it represents a chemical overprint related to younger hydrothermal fluids that were channeled along the BC vein-fault system, or (3) it accumulated syngenetically during deposition of the organic-rich sediments and is thus an inherited feature of the rocks now hosting the Bonanza Ledge.
- The lack of intrusive rocks in the district, the low Cu and W contents of the auriferous pyrite and its development during the F2-related metamorphism, and findings of the recent fluid inclusion study (Dunne and Ray, 2001, this volume) are supportive evidence that the fluids responsible for the Wells-Barkerville Au were metamorphic in origin, rather than magmatic-hydrothermal.
- The potential for other Bonanza Ledge-type bodies in the district is high, given that large parts of the area are covered by glacial till. Exploration criteria would include looking for: (1) BC Vein-type structures, (2) hostrocks that include carbonates and organic-rich argillites, (3) magnetite porphyroblasts

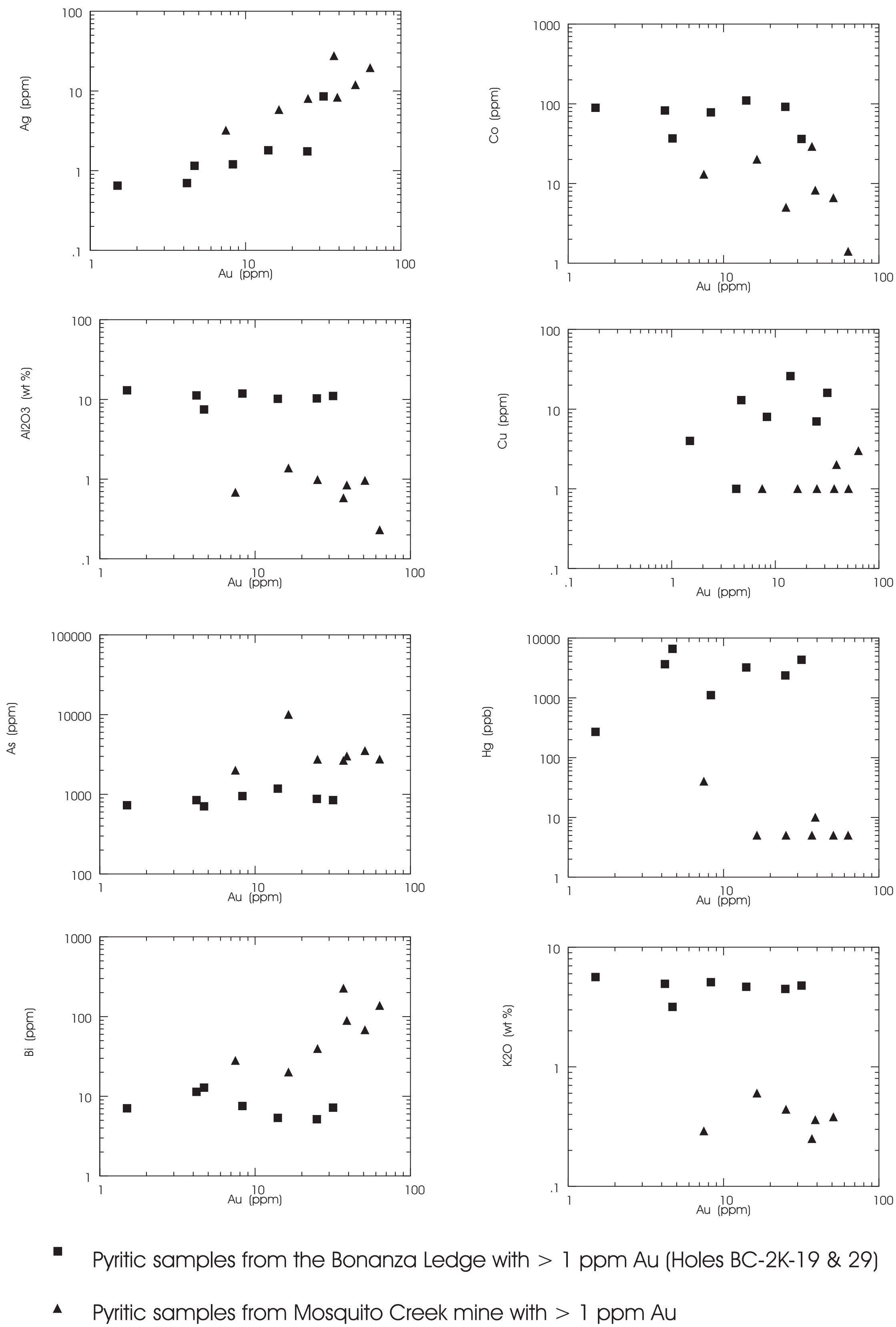


Figure 6A. Binary plots of data listed in Table 2B comparing the chemistry of the auriferous replacement pyrite at Bonanza Ledge and Mosquito Creek.

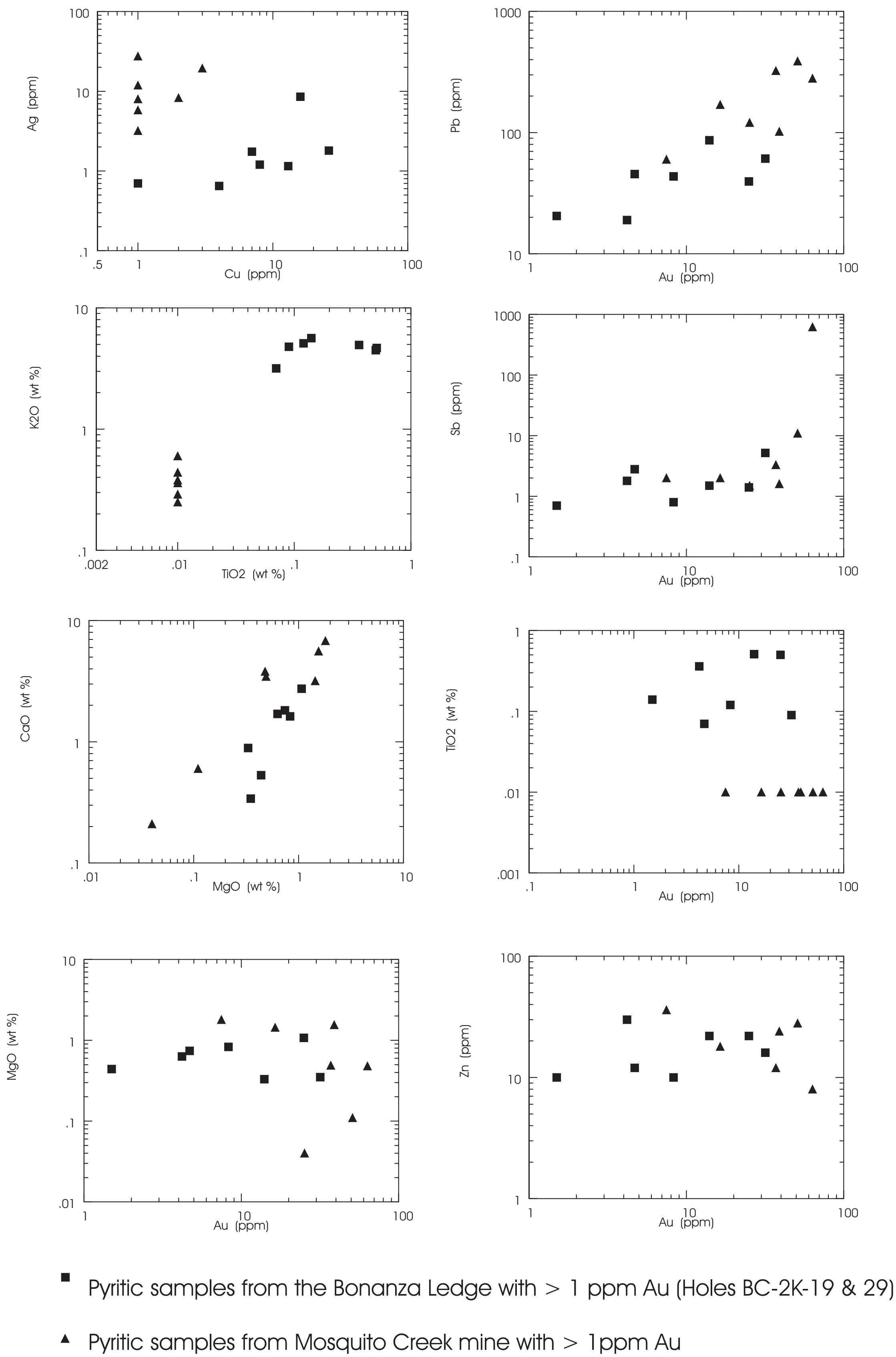


Figure 6B. Binary plots of data listed in Table 2B comparing the chemistry of the auriferous replacement pyrite at Bonanza Ledge and Mosquito Creek.

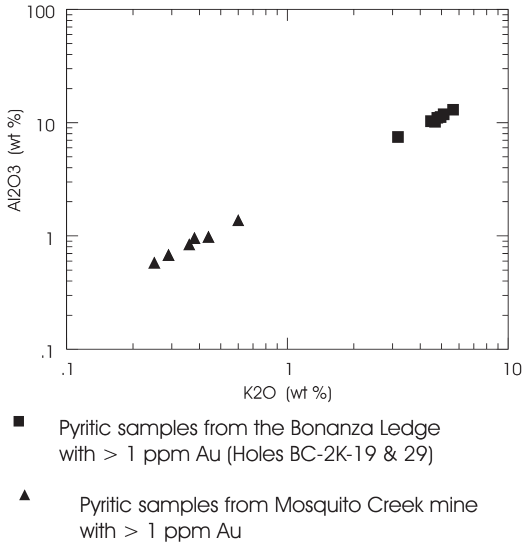
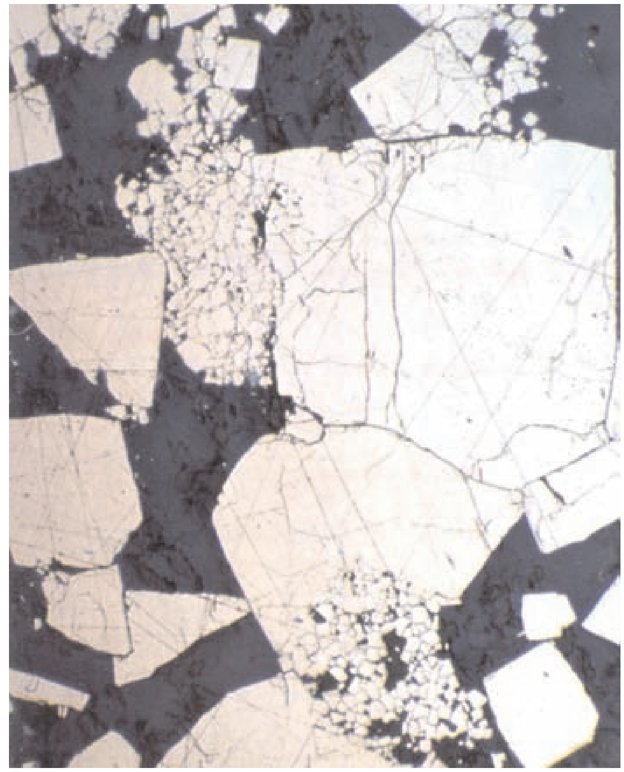


Figure 6C. Binary plot of data listed in Table 2B comparing the chemistry of the auriferous replacement pyrite at Bonanza Ledge and Mosquito Creek.



Photos 11 and 12. Replacement pyrite ore at the Island Mountain Mine. ?Early fine grained pyrite being replaced and overgrown by coarse pyrite. Sample GR-00-86. Photomicrograph, reflected light, crossed polars, and long field of view is 2.5 mm.

Photo 10. Replacement pyrite ore at the Island Mountain Mine. Coarse auriferous pyrite cubes in a gangue dominated by quartz, lesser sericite and trace rutile. Sample GR-00-86 assaying 49.9 g/t Au. Pyritic float sample taken from the Island Mountain Mine dump. Photomicrograph, reflected light, crossed polars, and long field of view is 2.5 mm.

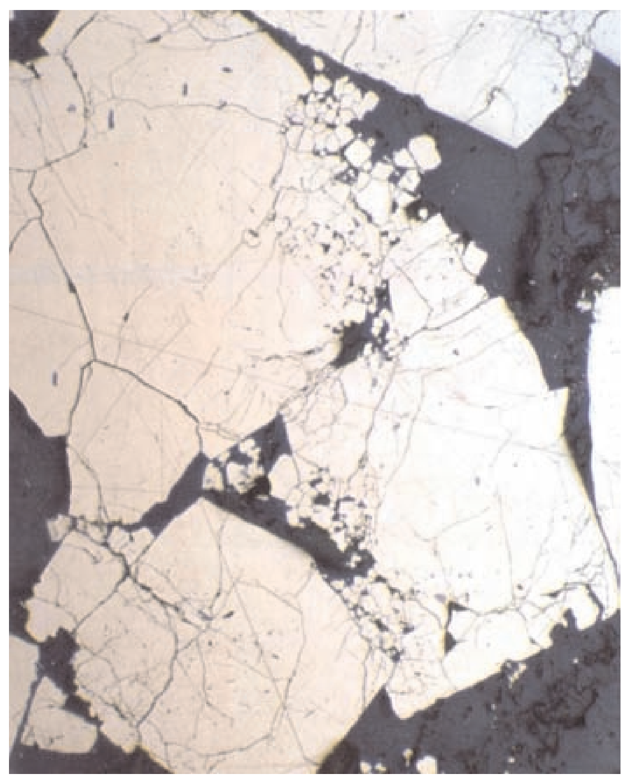


Photo 12.

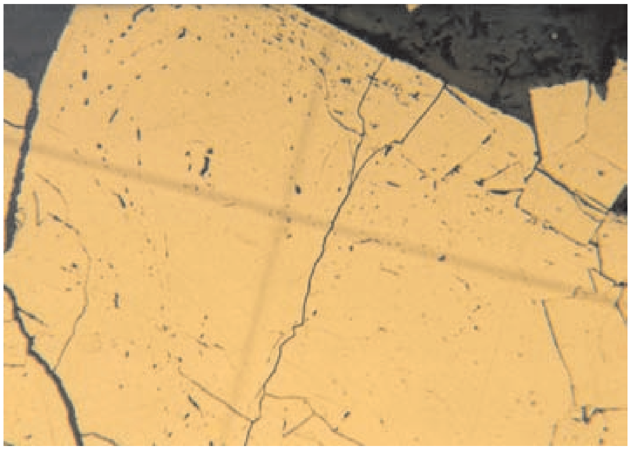


Photo 13. Replacement pyrite ore at the Mosquito Creek Gold Mine. Coarse, euhedral pyrite crystals with margins containing growth zones marked by trails of small silicate inclusions. Sample GR-00-34 assaying 25.2 g/t Au. Pyritic float from the No. 1 adit mine dump. Photomicrograph, reflected plane light, and long field of view is 2 mm.

and pervasive sericite-dolomite-pyrite-albite ± rutile ± tourmaline alteration, and (4) Au-Bi-As-Ti-Hg geochemical anomalies. In addition, Rhys (personal communication, 2000) reports a strong association between replacement Au mineralization and enhanced Pb values.

- Besides conventional geophysical and geochemical soil-sediment surveys, biogeochemical sampling for certain pathfinder element could be a useful tool to locate other Bonanza Ledge-type bodies in the till-covered areas.
- To summarize, the two most important recent findings regarding exploration in the Wells-Barkerville area are: (1) the recognition (Rhys and Ross, 2000; Rhys, 2000) that replacement mineralization can be hosted by a variety of metasedimentary lithologies and is not necessarily confined to the Rainbow-Baker members, and (2) that two types of replacement mineralization may exist in the district, as represented by Mosquito Creek on the one hand and Bonanza Ledge on the other. Elements such as Au, Bi, As, Pb and Hg could be useful pathfinder element to locate Bonanza Ledge-type orebodies. McTaggart and Knight (1993) note that several streams in the district have Hg-rich gold placers derived from unknown bedrock sources. These authors conclude that in most cases the Hg is primary and not due to human contamination. Drainages with Hg-rich placers in the Wells-Barkerville region include those along Mary (Toop), Frye, Jerry, Sugar, Dragon, Montgomery and Nelson creeks as well as in the Quesnel Canyon (McTaggart and Knight, 1993). These streams warrant exploration for Bonanza Ledge-type replacement Au mineralization.

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Photo 14. Replacement pyrite ore at the Mosquito Creek Gold Mine. Coarse pyrite crystal with embayed margins in a quartz-carbonate rich gangue. Sample GR-00-34. Pyritic float from the No. 1 adit mine dump. Photomicrograph, reflected light, crossed polars, and long field of view is 2 mm.

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