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THE ELIZABETH-YALAKOM GOLD PROSPECT, BRIDGE RIVER MINING CAMP (92O/02)

By R. G. Gaba, M. J. Hanna and B. N. Church

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INTRODUCTION

The Elizabeth-Yalakom property (MINFILE 0920-012) is centred at approximately latitude 51°02′ north, longitude 122°35′ west, 6.7 kilometres west of the junction of Blue Creek and the Yalakom River in the Shulaps Range (Figure 2-6-1). A gravel road links the property to the Yalakom River road at a point approximately 23 kilometres north of the Carpenter Lake (Bridge River) all-weather highway; the junction of the Yalakom River and Carpenter Lake roads is

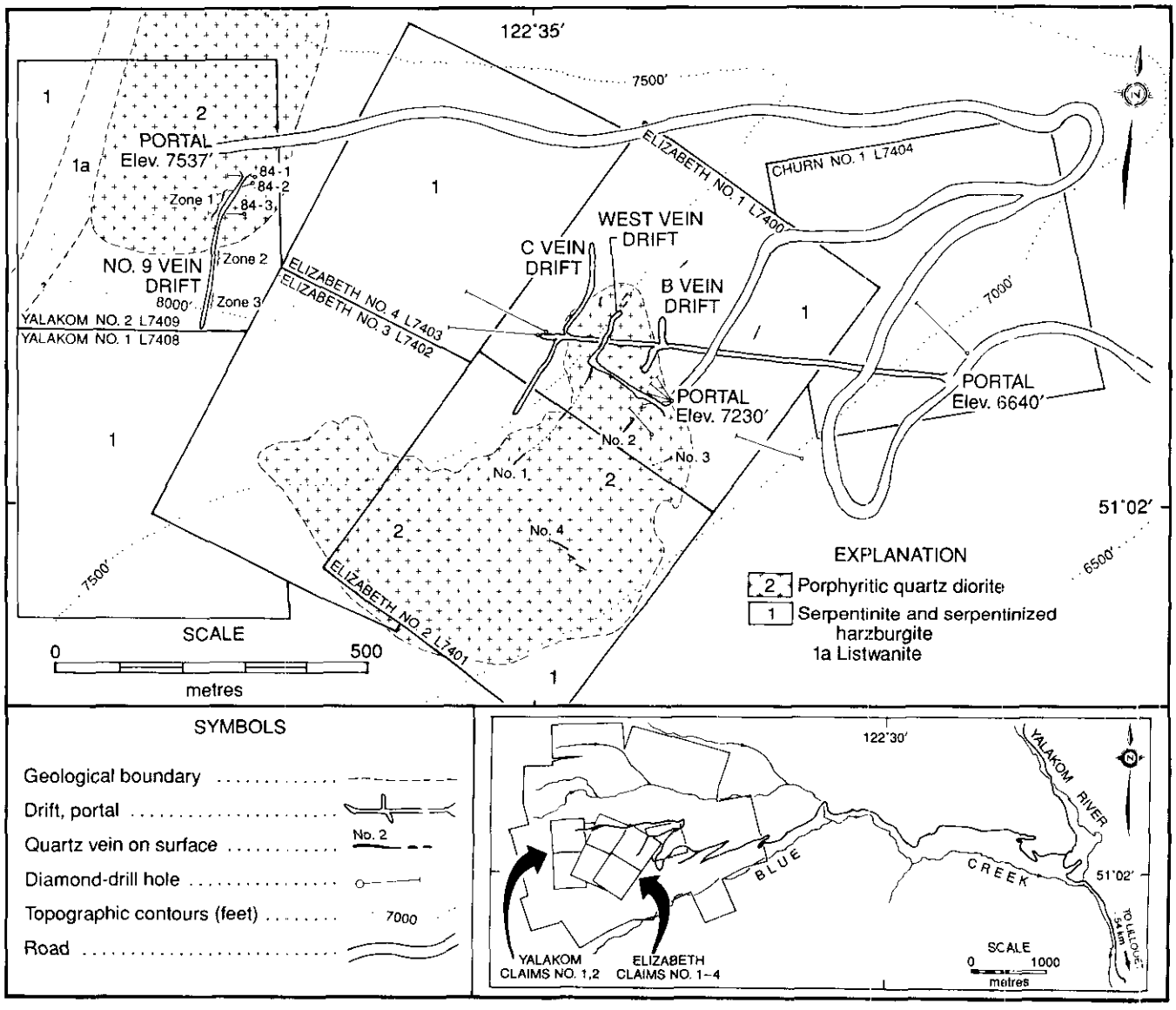

Figure 2-6-1. Location and geology of the Elizabeth-Yalakom prospect [includes information from Bralorne Mines Ltd. (1953), Leech (1948), McCammon (1946b), and Thompson (1957a, b)].

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approximately 18.5 kilometres west of Lillooet. All workings are at or above treeline (1980 metres elevation).

EXPLORATION AND DEVELOPMENT HISTORY

Auriferous quartz veins were first discovered in 1934 (Hedley, 1941) and subsequently rediscovered and staked in 1940 and 1941 as the Crown-granted Elizabeth mineral claims. Surrounding claims staked at this time include the Yalakom, Churn and Plateau claims. Bralorne Mines Limited optioned the Elizabeth and adjoining claims and staked additional claims in the vicinity. A total of 232 metres of diamond drilling at five sites and 534 metres of surface stripping was completed, to explore four quartz veins (the Nos. 1, 2, 3 and 4 veins) exposed on the Elizabeth 1 and 2 claims (*Minister of Mines, B.C.*, Annual Report, 1941).

Wartime conditions delayed further work until 1947, at which time a portal was collared on the Churn 1 claim at 2025 metres elevation (6640 feet). A crosscut was driven nearly due west toward the Elizabeth 1 claim, to test the downward extension of the No. 1 vein (also later known as the High-grade or West vein) 230 metres below its surface exposure (Peck, 1948). By 1948, this main crosscut was extended a total length of 672 metres. Two quartz veins, the B and C veins, were intersected 490 metres and 641 metres respectively from the portal. In addition to 266 metres of diamond drilling, drifts were put in to follow these veins (Figure 2-6-1; Merrett, 1948). The B and C veins are not exposed on surface and their relationship to No. 1 vein, the intended target, is not known.

The following year a raise was driven up a 1.2-metre section of the B vein to a point 82.5 metres above the level. In addition, a raise was driven 23 metres up the C vein. No significant gold concentrations were encountered during this work. At this time, surface work on the Yalakom 2 claim uncovered a quartz vein 0.6 to 0.9 metre thick and continuous for more than 61 metres, known as the No. 9 vein (Merrett and Stephenson, 1950).

During 1951 and 1952 a drift was excavated from a portal collared on the Yalakom 2 claim at an elevation of 2299 metres (7537 feet) southward along the No. 9 vein for a distance of 246 metres. Gold content of the vein is variable; assays as high as 17.5 grams per tonne gold over a length of 8.5 metres and a thickness of 0.6 metre, and 15.4 grams per tonne gold over a length of 19.8 metres and thickness of 0.8 metre were reported (National Mineral Inventory 920/2-AU2). Surface trenches exposed the No. 9 vein in two cuts north of and below the portal. Overall, the thickness of the auriferous quartz vein was considered to be too narrow and the gold distribution too erratic to constitute ore (Merrett 1952, 1953). Bralorne Mines Limited subsequently abandoned the option and its adjacent claims in 1953 (Merrett, 1954).

Work was resumed by the owners (T.W. Illidge and W. White) in 1956 and a crosscut collared on the Elizabeth 1 claim at an elevation of 2205 metres (7230 feet) was driven at azimuth 110 degrees for 142 metres, to further explore quartz veins exposed on surface. The Main vein and West vein (No. 1 vein) were intersected at 33.5 metres and 138.8 metres from the portal respectively (Patterson, 1956; Figure 2-6-1). The following year the West vein was followed an additional 97.6 metres (King, 1957). During this time a geological study of surface and underground workings was carried out by R. Thompson (Thompson, 1957a, b). Nine tons (8.2 tonnes) of rock excavated from the West vein drift was custom processed at Trail, British Columbia and yielded 155 grams gold, 155 grams silver, 24 kilograms lead and 8 kilograms zinc (King, 1959). No further work has been done on the Elizabeth claims and the portals have subsequently caved.

The claims remained dormant until 1978 when Southern Lights Resources Ltd. acquired the Yalakom claims and did additional staking in the area. In 1983 an option to earn a 40-per-cent interest was given to Cal-Denver Resources Ltd. and the same year the No. 9 vein drift was rehabilitated, sampled and subsequently drilled. Both drift sampling and drilling yielded encouraging results (George Cross News Letter, August 26, 1984; Culbert and Leighton, 1986). During the summer of 1987 a total of 600 metres of diamond-drill core was recovered from four holes drilled from surface to test the down-dip extension of the veins (Vancouver Stockwatch, 1987a). During a visit by the authors, the No. 9 vein portal (Plate 2-6-1) was being de-iced as a prerequisite for further underground exploration planned for the fall of 1987 in conjunction with Vanguard Mining Exploration Ltd. (Vancouver Stockwatch, 1987b).

Plate 2-6-1. The No. 9 portal, 2297-metre (7537-foot) elevation, Yalakom 2 claim.

GEOLOGICAL SETTING

The Shulaps Range in the area of the Elizabeth-Yalakom gold prospect is composed of ultramafic rocks, specifically serpentinite and serpentinized harzburgite, with porphyritic quartz diorite intrusions. The geology of the area has previously been described by McCammon (1947) and Leech (1953).

The two largest outcrop areas of porphyritic quartz diorite [refered to as the Blue Creek porphyry by Leech (1953)] are on the Elizabeth 1, 2 and 3 claims and on the Yalakom 2 claim on the southeast and north slopes of the ridge that forms the main topographic feature in the area (Figure 2-6-1). The porphyritic quartz diorite is typically grey, with plagioclase (2 to 5-millimetre) and hornblende (2 to 3-millimetre) phenocrysts in a finer grained groundmass of plagioclase, hornblende, quartz and some biotite; altered porphyritic quartz diorite also contains epidote as well as hornblende partly occupied by biotite to completely pseudomorphed by chlorite.

The outline of the porphyritic quartz diorite bodies is more complex than as shown in Figure 2-6-1. Peripheral areas contain irregular offshoots and satellitic bodies of intrusive rocks similar in appearance to the main masses but variable (in texture and composition) from porphyritic to equigranular diorite to quartz-rich diorite. Abundant white aplite veinlets occupy irregular fractures in porphyritic quartz diorite on the northwest part of the Elizabeth 1 claim.

Serpentinized ultramafic rocks, typical of the Shulaps ultramafic body, surround the porphyritic quartz diorite. Glacial debris consists predominantly of unlayered to slightly layered yellow rusty surfaced serpentinized harzburgite and dark green serpentinite, and obscures much of the ultramafic bedrock exposure. Ultramafic rocks adjacent to porphyritic quartz diorite are well-foliated serpentinite.

The porphyritic quartz diorite contact along the west side of the Yalakom 2 claim is occupied by rusty coloured carbonate, talc, quartz, green mica rocks or listwanite (Boyle, 1979, page 210). These rocks resemble harzburgite on weathered surface but are more physically resistant and form a 9 to 21-metre-thick rib along the northwest slope of the main ridge (previously referred to as the Bralorne dyke by Leech, 1953). These rocks are most likely the hydrothermally altered equivalent of surrounding serpentinized harzburgite.

AURIFEROUS QUARTZ VEINS

The important gold-bearing quartz veins at the Elizabeth-Yalakom prospect are confined to porphyritic quartz diorite (McCammon, 1947), although some are along or adjacent to contacts with ultramafic rocks (Leech, 1953; Thompson, 1957b).

Alteration of porphyritic quartz diorite along vein margins is slight; plagioclase phenocrysts, originally andesine, contain albite-oligoclase, sericite, epidote, clinozoisite and clay-like material. A greater pyrite and quartz content is also noted (Leech, 1953).

Auriferous quartz veins on the Elizabeth-Yalakom prospect include: the Nos. 1, 2, 3 and 4 veins and the B and C veins on the Elizabeth 1 and 2 claims and the No. 9 vein on the Yalakom 2 claim (Table 2-6-1). Surface and underground

TABLE 2-6-1
AURIFEROUS QUARTZ VEINS OF THE ELIZABETH-YALAKOW PROSPECT

Vein Name	Claim	*Dimensions (approx.)* Length (m) (max.)	Width (cm)	Attitude	*Exposure and/or* Access	References
No. 1 vein (also High-grade vein, West vein)	Elizabeth 1, 2	183	117	030/vertical	Exposed in trenches; access at depth in West vein drift via 2200-m (7230-ft.) elevation portal	McCammon (1945a) Thompson (1957a)
No. 2 vein	Elizabeth 1	73	61	038/70 NW	Exposed in trenches; access at depth in drift via 220-m (7230-ft.) elevation portal	McCammon (1946a)
No. 3 vein	Elizabeth 1	28	94 to 107	070/79 S	Exposed in trenches	McCammon (1946a)
No. 4 vein	Elizabeth 2	75	7.5 to 19	120/65 NE	Exposed in trenches	McCammon (1946a)
B vein	Elizabeth 1	76	up to 122	000/015	Access at depth in B-vein drift via 2020-m (6640-ft.) elevation portal	Merrett (1948) Merrett and Stephenson (1949)
C vein	Elizabeth 1, 2	275	?	000/025	Access at depth in C-vein drift via 2020-m (6640-ft.) elevation portal	Merrett (1948) Merrett and Stephenson (1949)
No. 9 vein	Yalakom 2	245	60 to 90	000/70 W	Exposed on surface in trenches; accessed by No. 9 drift via 2300-m (7537-ft.) elevation portal	Merrett and Stephenson (1949) Merrett (1952)

exploration of veins on the Elizabeth claims has resulted in the delineation of gold concentrations considered too erratic and vein widths too narrow to constitute ore. At present, the No. 9 vein is the only vein with underground workings that are accessible and is being actively explored.

THE NO. 9 VEIN

The No. 9 vein is within the porphyritic quartz diorite body northwest of the main body that contains the Elizabeth veins; it is not known whether the diorite is continuous between the two areas beneath the surface. The No. 9 vein is exposed at depth along much of the length of the No. 9 drift. It is generally less than 0.5 metre wide although continuous for more than 245 metres and is actually a system of parallel veins rather than a single vein.

Vein quartz is massive and milky white and contains a variable amount of calcite and ankerite with disseminated sulphide minerals (as observed in vein material on the dump). However, much of the vein quartz is ribboned with laminations and styolitic partings of chlorite and carbonaceous material. Metallic mineral concentrations tend to coincide along the ribbons (Plate 2-6-2). Small fragments of what appears to be altered porphyritic quartz diorite are common within ribboned domains. Ribbons are generally parallel to vein walls and separate massive to fractured, partly rusty, milky white quartz that contains only sparsely disseminated metallic minerals and a variable calcite and ankerite content.

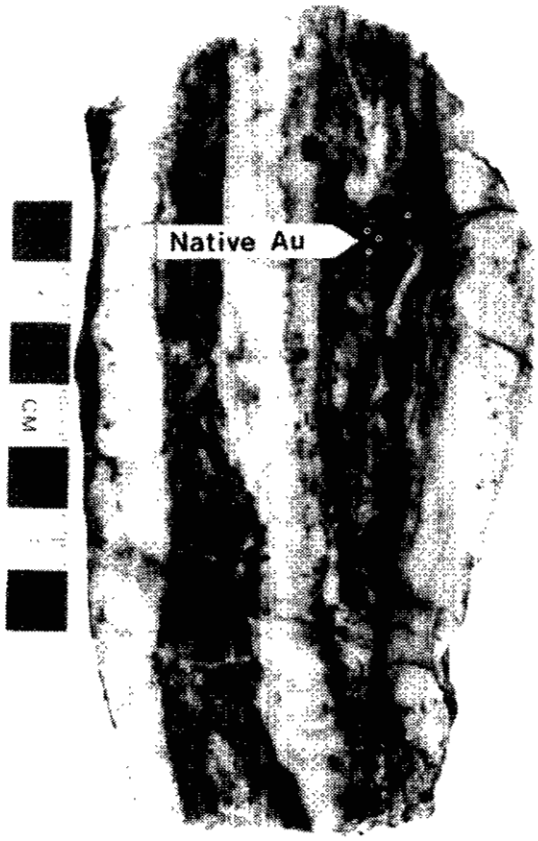

Plate 2-6-2. Ribboned quartz from the No. 9 vein. Note concentration of metallic minerals and native gold along ribbons.

Metallic minerals are mostly arsenopyrite, pyrite and chalcopyrite (accompanied by malachite and azurite), with lesser galena, sphalerite, pyrrhotite, magnetite and molybdenite. Native gold occurs as visible blebs within and as thin surface coatings along chloritic carbonaceous ribbons (Plate 2-6-2) and only rarely as isolated visible blebs within inter-ribbon quartz. Total metallic mineral content of the veins rarely exceeds a few per cent.

An underground sampling program carried out in 1983 by Southern Lights Resources Ltd. (Balsam Resources Inc. as of March 1987) along the length of the No. 9 drift delineated three auriferous zones (Figure 2-6-1; Table 2-6-2). Three diamond-drill holes were subsequently drilled to test the continuity of the auriferous zones and intersected numerous auriferous quartz veins adjacent to the No. 9 vein (Table 2-6-3). Combined drift sampling and diamond drilling results indicate reserves to be approximately 3850 tonnes with a mean gold content of 41.1 grams per tonne (George Cross News Letter, August 26, 1984).

Four additional diamond-drill holes completed in 1987 and totalling 600 metres, yielded gold concentrations of 4.94, 4.18 and 3.57 grams per tonne over unknown thicknesses. Grab samples taken from the rock dump outside the No. 9 portal contain up to 24.5 grams per tonne (Vancouver Stockwatch, 1987a).

DISCUSSION

Auriferous quartz veins at the Elizabeth-Yalakom prospect are essentially confined to porphyritic quartz diorite and generally strike north or slightly east of north with a steep dip. The location of auriferous quartz veins indicates that,

TABLE 2-6-2
AURIFEROUS ZONES ALONG NO. 9 DRIFT
(1983 SAMPLING PROGRAM)

Zone	Distance from Portal (m)	Length (m)	Average Width (cm)	Uncut g/t Au	Diluted* g/t Au/ width
1	32-81	49	27.2	69.2	44.4/42.5 cm
2	111-127	16	46.7	33.7	25.4/61.9 cm
3	183-194	11	28.4	31.7	20.6/43.5 cm

* Addition of 7.6 centimetres on either side of sample width.
See Figure 2-6-1 for zone locations.
Information from Culbert and Leighton (1986); Vancouver Stockwatch (1987a).

TABLE 2-6-3
DIAMOND-DRILL CORE GOLD ASSAYS
(1984 DRILLING PROGRAM)

Hole No.	Vein Intersection (m)	Vein Width (cm)	Au (g/t)/ Width
84-1	95.5	21	37.4/21 cm
84-2	88.5-89.1	60	7.1/60 cm
84-3	76.3-76.9	60	0.2/60 cm

See Figure 2-6-1 for hole locations.
Information from Culbert and Leighton (1986).

under stress, the porphyritic quartz diorite acted as a competent medium and was brittley deformed, in contrast to surrounding incompetent ultramafic rocks which behaved in a ductile manner. As a consequence, diorite-ultramafic contacts are mostly well foliated and yield little information on relative age relationships.

The ribboned texture of the quartz veins suggests repeated fracturing during emplacement and vein growth. The concentration of metallic minerals (including native gold) along chloritic carbonaceous ribbons may have resulted from fluid penetration and metal precipitation during vein-fracturing episodes. Inclusions of altered wallrock within ribboned quartz suggest stoping and partial consumption of adjacent wallrock during fracturing and vein growth.

Surrounding serpentinite may have acted as an important impervious barrier, restricting fluid movement and circulation to within the porphyritic quartz diorite.

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