



J & L  
A STRATABOUND GOLD-ARSENIC DEPOSIT  
SOUTHEASTERN BRITISH COLUMBIA  
(82M/8)

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### INTRODUCTION

The J & L prospect is a stratabound gold-silver-lead-zinc-arsenic deposit in a highly sheared quartzite-schist-limestone sequence, located 32 kilometres north of Revelstoke. It is 11 kilometres east from Highway 23 along a gravel road that follows the south side of Cairnes Creek. Surface exposures are restricted to a number of pits and trenches on a steep, heavily wooded slope at elevations of 820 to 1 220 metres between the north (McKinnon Creek) and south forks of Cairnes Creek.

The J & L was staked in 1896, and has undergone intensive but intermittent exploration and development work since. In 1924, Porcupine Goldfields Co. drove two 20-metre adits, and from 1941 to 1946 Raindor Gold Mines Ltd. sank two shallow shafts and extended the upper '3200-foot level' adit to 150 metres. Westair Mines Ltd. optioned the property from the present owner, T. E. Arnold, in 1965 and drove approximately 300 metres of drifts and crosscuts on the lower '2700-foot level.' The present operator, the Selco Division of B.P. Canada, Ltd., has done an extensive amount of rehabilitation work, extended the 2700-foot level to 830 metres, and drilled a number of underground holes from crosscuts on this level.

The purpose of this note is to overview the geology of the J & L deposit, based primarily on recent work by B.P.-Selco geologists, and to describe a section measured across the main mineralized zone.

### GEOLOGY

J & L is within a highly deformed slice of Hadrynian and Palaeozoic metasedimentary and metavolcanic rocks in the hangingwall of the Columbia River fault (see Fig. 28 of Gibson and Höy, this volume). Rocks in the Cairnes Creek area have been assigned to the Lower Palaeozoic Lardeau Group (Wheeler, 1965), and host rocks to the J & L are the upper part of the Lower Cambrian Hamill Group (Grant, 1984). These include a number of cycles, 10 to 20 metres thick, that grade up from quartzite, through quartz-rich schist, to chlorite and sericite schist (R. Pegg, personal communication, 1984; Grant, 1984). A grey to carbonaceous limestone at the top of one of these cycles is immediately overlain by the main band of sulphides. Hangingwall rocks are highly sheared quartz-sericite and quartz-chlorite schists. These rocks, and the mineralized zones, trend northwest and dip northeast at about 55 degrees into the hill.

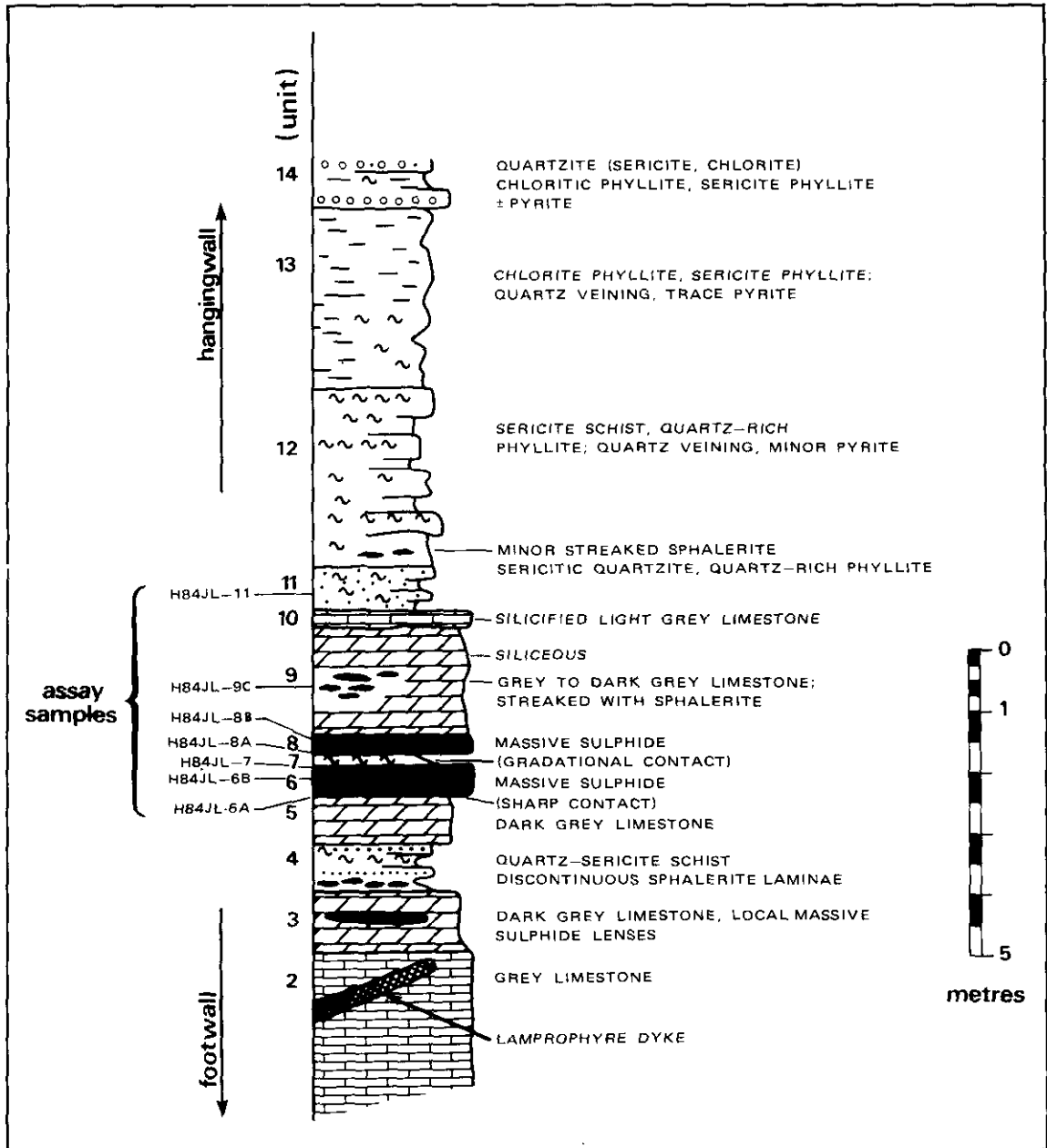


Figure 27. J & L section, 10+350E crosscut.

The main mineralized band has been traced 1.9 kilometres along strike on surface and 830 metres underground. One underground zone is 190 metres in length and an average of 3 to 4 metres in width; it contains 4.5 grams gold per tonne, 49.5 grams silver per tonne, 1.43 per cent lead, 2.84 per cent zinc, and 3.5 per cent arsenic (Grant, 1984).

A number of other mineralized zones that occur on the property, such as the West zone, Far East, and North showings, may be extensions or fold repetitions of the main zone (Grant, 1984) or may be separate occurrences at a different stratigraphic level. Sulphides include pyrite, arsenopyrite, sphalerite, galena, and trace amounts of chalcopyrite and pyrrhotite; they are locally massive or occur as stringers, lenses, and disseminations in a quartz-sericite schist or a dark carbonaceous footwall limestone.

A detailed section through the main sulphide band in the 10+350-metre East crosscut is illustrated on Figure 27 and described in detail below. A thick, grey, well-banded limestone (unit 2) is overlain by a dark, impure carbonaceous limestone (unit 3) that locally contains discontinuous massive sulphide lenses. The overlying light grey quartz-sericite schist and sericitic quartzite (unit 4) have thin streaks and discontinuous laminations of reddish sphalerite, as well as disseminated grains of pyrite and arsenopyrite. The black, carbonaceous footwall limestone (unit 5), which is lithologically similar to unit 3, also contains minor amounts of disseminated sulphides and laminated sulphide lenses. The contact with the overlying massive sulphide layer (unit 6) is sharp. The sulphide layer consists of approximately 10 centimetres of laminated, reddish brown sphalerite, arsenopyrite, and coarse granular pyrite (unit 6A, Fig. 27; sample H84JL-6A, Table 1) that is overlain by 0.5 metre of more massive sphalerite and arsenopyrite (unit 6B). The sulphide content of unit 6 gradually decreases toward the top. Essentially massive sulphides (unit 6B) grade through sericite quartzite and quartz-sericite schist interlaminated with sulphides, to schist with only thin discontinuous streaks of sphalerite and arsenopyrite (unit 7). Unit 8 is a second massive sulphide layer approximately 0.5 metre thick. Coarse-grained arsenopyrite-sphalerite-pyrite occurs near the base (unit 8A, sample H84JL-8A) and finer grained sulphides near the top (sample H84JL-8B). Quartz 'eyes' and irregular quartz-sericite lenses are common throughout unit 8. A grey, laminated limestone (unit 9), approximately 2 metres thick, overlies the unit 8 massive sulphide layer in the 10+350 east crosscut. It is barren near the base, but darkens and becomes streaked with pink-coloured sphalerite near the middle (sample H84JL-9C); at the top it is a competent, light grey, silicified 'limestone' (unit 10). The calcareous interval is overlain by interlayered sericite schist, quartz phyllite, and quartzite of units 11 and 12. Irregular, discontinuous streaks and disseminations of pyrite, sphalerite, and lesser arsenopyrite are common throughout unit 11 and in the basal part of unit 12. Unit 13 includes chlorite phyllite with minor amounts of pyrite disseminated throughout; chloritic phyllite units begin appearing in unit 13.

TABLE 1  
ASSAYS OF SELECTED HAND SAMPLES, J & L DEPOSIT, 10+350 METRE EAST CROSSCUT  
(See Fig. 27 for sample localities)

Sample No.	Au ppm	Ag ppm	Cu per cent	Pb per cent	Zn per cent	As per cent	Sb per cent	Fe per cent
H84JL-6A	13	60	0.11	1.47	14.5	14.7	0.05	18.1
H84JL-6B	10	60	0.21	2.37	0.22	29.5	0.22	26.5
H84JL-7	<0.3	<10	0.02	0.03	0.02	0.24	<0.004	2.9
H84JL-8A	20.6	88	0.14	1.13	29.1	10.0	0.14	18.1
H84JL-8B	42.5	1 942	3.14	3.55	1.1	6.25	1.28	37.8
H84JL-9C	<0.3	<10	0.02	0.40	5.21	0.002	0.02	1.0
H84JL-11	<0.3	<10	0.04	0.06	0.01	0.015	<0.001	3.0

## DISCUSSION

The J & L is an unusual 'massive' sulphide deposit. Intense regional deformation and associated regional metamorphism have obliterated virtually all primary structures, making conclusions regarding its origin subjective. Grant (1984) concluded that it is a 'sedex' or exhalitive sulphide deposit that accumulated syngenetically in a marine environment. Supporting evidence includes its form, a narrow thickness and great lateral extent, as well as locally its 'bedded' nature. Associated 'cherty' quartzites could also be of exhalitive origin and indicate a 'sedex' origin for the deposit. Earlier workers, however, interpreted the deposit to be a sheared replacement or vein deposit (Gunning, 1928; Wheeler, 1965). The mineralogy and its occurrence in an intensely sheared package of rocks supported this interpretation. However, arsenopyrite does occur in some exhalitive sedimentary deposits (for example, Sullivan) and in some volcanogenic deposits (for example, Bathurst camp deposits, New Brunswick). In conclusion, considerably more detailed petrography, structural studies, and perhaps isotopic analyses are needed to better understand and interpret the J & L deposit.

## ACKNOWLEDGMENTS

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