Box 8

THE CAM PROJECT

CAMPBELL RIVER AREA,

VANCOUVER ISLAND, B.C.

BY

R. W. WOOLVERTON

92-F

92-K-3

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Vancouver, B. C.
June 1, 1967

I N D E X

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INTRODUCTION

The following report outlines a limited exploration program proposed for the Campbell River area during the fall of 1967.

SUMMARY

A recent compilation of geological data and interpretation of linear structures suggest the program area may be favourable for:

(a) copper-molybdenum mineralization associated with young intrusive stocks.

(b) copper-skarn deposits associated with Quatsino-type limestone.

An initial two-month field examination of the area is recommended. Geological and geochemical reconnaissance will be carried out by a four-man crew at an estimated cost of $16,000.00.

LOCATION AND ACCESS

92-K,L

The area, covering approximately 700 square miles, may be defined as that part of Vancouver Island lying north of 50° North latitude and east of 126° West longitude.

For the most part, the region is readily accessible by a network of lumber haulages and waterways from Campbell River (refer to accompanying Lands and Forests four-mile map). Except for a few private roads in the extreme south and west, unrestricted public use of the roads is allowed. Permission to use the private haluages may be obtained from MacMillan-Bloedel.

GEOLOGY

No published geological maps are available for the immediate area. A compilation of the regional studies by Jeffrey (B. C. Department of Mines) and Muller (Geological Survey of Canada) is presented on the accompanying "Geological and Showings" overlay map.

The area is indicated to be mainly underlain by Upper Triassic (Karmutsen?) volcanics with some local acid intrusives.

A northwest trending belt of favourable Quatsino limestone has been postulated by Jeffrey. Scattered exposures of Quatsino have been mapped along the south boundary of the area and similar limestones are reported at the Orecan and Lucky Jim properties, near the west boundary.

To the southeast, Muller's mapping has established a series of Tertiary stocks which may continue into the program area. A brief reconnaissance trip through the area by the writer in mid-May verified the presence of some younger, complex, acid intrusives as well as Coast Range plutons.

The fracture interpretation study (refer to accompanying map 1 inch = 10 miles) indicates an anomalous concentration of linear structures within the program area. Some of these structures undoubtedly represent extensions of faults mapped by Muller in the Buttle Lake area to the south.

MINERALIZATION

Significant mineral occurrences are indexed on the geology compilation map and are briefly described in the attached appendix.

Within the program area, a number of small copper-bearing veins, shear structures and "Quadra Island" type showings have been reported. On the reconnaissance trip in May, an outcrop of copper-stained, hydrothermally altered intrusive was located by the writer.

The fracture intensity, younger intrusives and possible limestone environment are encouraging exploration criteria. Elsewhere on the Island, substantial copper production has been obtained from skarn-type deposits. Similarly, the association of significant copper-molybdenum mineralization with fractured younger acid intrusives has been well established.

PREVIOUS WORK

In researching the area, no evidence of prior intensive exploration was encountered. Earlier reconnaissance geochem programs appear to have been restricted to the coast and some limited aeromagnetic prospecting may have been carried out for magnetite deposits. These techniques would not have effectively tested the area for non-magnetic skarn deposits or disseminated copper-molybdenum mineralization in the interior.

PRESENT PROGRAM

In the writer's opinion, most of the area can effectively be tested by moderate interval stream sediment geochem sampling. Abundant

drainages are available and overburden, although extensive, is relatively shallow.

A two-month silt sampling program employing three one-man crews is proposed. Samples, taken at half mile intervals will be analysed for hot HCl extractable copper and total molybdenum. During the field investigation, the writer will carry out general geological reconnaissance to direct the sampling coverage.

A truck, two Honda trail bikes and a light boat will be used for transportation.

The area was recently re-photographed (1965 - 66) and revised quarter-mile Interim sheets are to be released in mid-June. These will be used as a base for plotting geological and geochemical results.

BUDGET

(a)	General Expenses:		
	Advance expenses (research, etc.)	$ 1000	
	Accounting, legal fees	400	
	Final report preparation	300	
	Assaying 1200 samples at $1.65	1980	
	Insurance	400	
		4080	$ 4080
(b)	Wages:		
	3 men at $1580/month for 2 months	$ 3160	
	1 man at $ 900/month for 3 months	2700	
	W.C., U.I., C.P., H.P., at 15%	880	
		6740	6740
(c)	Supplies:		
	Groceries (240 man-days at $4.00)	$ 960	
	Air Photos	400	
	Maps, office supplies	200	
		1560	1560
(d)	Transportation:		
	Truck (rental & operation, 2 months at $400)	$ 800	
	Honda rentals (two for 2 months at $100)	400	
	Boat and motor rental	400	
	Trailer rental	400	
	Miscellaneous	400	
		2400	2400
	Sub-Total		$ 14780
	Contingency		1220
	Total		$ 16000

Respectfully submitted,

R. W. Woolverton

Vancouver, B. C.
June 1, 1967

A P P E N D I X

LIST OF PROPERTIES

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The following descriptions are summarized from the B. C. Minister of Mines publications. Locations are plotted and indexed by number on the accompanying "Geology and Showings" map.

1) Western Mines: The presently producing ore bodies are massive zones of pyrite, chalcopyrite, sphalerite and galena replacing the schistose rock of a northwest trending shear zone in Palaeozoic volcanics.

2) Gem Lake: A breccia pipe containing magnetite and chalcopyrite, intruding Triassic volcanics.

3) Mount Washington: Magnetite and chalcopyrite occur at the contact between quartz diorite, its related breccias and Cretaceous sediments. Carson concludes in his recent thesis that magnetite was deposited during an early brecciation period and that chalcopyrite was introduced during a later, more violent explosive, intrusive breccia stage.

4) Iron Hill: Several million tons of magnetite were mined from this skarn deposit near a Triassic limestone-tuff contact.

5) Iron River: Although there is no limestone present, this deposit is a magnetite-chalcopyrite skarn.

6) Sumpter: This is a silver-bearing magnetite-chalcopyrite bornite skarn assemblage.

7) The Big 'G': Pyrite, chalcopyrite and pyrrhotite occur in a fractured andesite.

The chalcocite on Quadra Island occurs as fracture filling and replacements of Triassic volcanics. Replacements usually favour the more porous ash beds which are generally only a few feet thick. Unless the beds are extremely porous, replacement does not extend for more than a few feet into the rocks on either side of the shear zones. Prospects 8 to 12 are of this type.

8) Bluebird: A small showing of copper in sheared volcanics.

9) Slaver Group: A few pits have exposed copper in the sheared volcanics.

10) Copper Cliff: A 92-foot adit has been driven on a shear zone cutting volcanic beds which strike northeasterly and dip about 20 degrees to the southwest.

11) Copper Mountain: Chalcocite has replaced the ash beds for up to 30 feet on either side of the fault. Some quartz is present.

12) Menzies Bay: Chalcocite occurs in thin, interbedded tuffs.

13) Inca: A quartz vein cutting andesite carries pyrite and chalcopyrite.

14) Wanderer: Chalcopyrite, with some chalcocite and bornite occurs in quartz vein cutting volcanics near the contact with metamorphosed argillites.

15) Lucky Jim: Gold tellurides (sylvanite) occur as small stringers in a diabase dyke cutting limestone. Pyrrhotite and chalcopyrite are exposed as narrow, irregular bands along the contact.

16) Ottawa Central: A little molybdenite was found in limestone near a volcanic contact.

17) Santa Ana: About 200 feet of drifting along a limestone-granitic contact exposed pyrite, pyrrhotite and chalcopyrite with some silver values.

18) Black Warrior and Elsie: Fairly pure magnetite occurs in shears in the porphyritic granodiorite as well as in the adjacent limestone.

19) Dawn Group: A 15-inch quartz vein carries pyrite, minor chalcopyrite and erratic gold and silver values. The vein follows a granodiorite-argillite contact.

20) Sonora Gold Mines: A 1000-foot wide pendant of argillite and limestone is mineralized with lenses of quartz containing pyrite with poor gold values.

21) Douglas Pine: A narrow quartz vein is mineralized with pyrite. Gold values of up to $12 per ton were obtained.

22) Blue Bells: A pendant of shale, argillite, tuff, and limestone is cut by quartz veins. Free gold as well as auriferous pyrite are present.

23) Sunbeam (Nimrod): A few small pits were blasted on the extension of the Bluebells zone.

24) Colossus (Lagoon): Chalcopyrite and minor molybdenite occur in a fractured diorite associated with dykes. The fractures are widely spaced (examined by the writer) and the diorite is not noticeably altered.

25) Alexandra: A quartz vein cuts meta-sediments. Gold occurs both with the pyrite and as free gold.

26) Doratha Morton: Gold, silver and copper occur in a quartz vein Ten thousand tons of $12 ore was mined before 1914.

27) Tidewater: A narrow shear zone in the volcanics contains magnetite.

28) Monte Cristo and Amethyst: Gold, silver and copper occur in a skarn zone in Marble Bay limestone (Bancroft) at the contact with an andesite dyke.

29) Galena: A quartz vein and silicified breccia zone in granodiorite carries minor pyrite and galena.

30) Shoo Fly: A 100-foot adit cuts 50 feet of magnetite in volcanics.

31) Loughborough Gold Mines: Coast Range hornblende diorite is intruded by northeasterly trending irregular bodies and dykes of acid intrusives. Quartz veins and silicified shear zones follow the contact zones. Traces of copper with gold and silver values are present.

32) Union Group: Slaty sediments have been mineralized with pyrite. No economic values were found.

33) Princess Group: Chalcopyrite and bornite occur in garnetite along a limestone volcanic contact.

34) Constitution: Limestone is mineralized with sphalerite and erratic gold and silver.

35) Copper King (Queen?): A 45-foot drift follows a quartz vein in greenstone. Some chalcopyrite is present.

36) Iron Mike (Orecan Mines): A contact metamorphic magnetite deposit. An open pit operation was started but the company is now in receivership.

37) Lucky Jim: A 70-foot adit follows a hornblende-calcite rich brecciated contact zone between limestone and granodiorite. The zone is mineralized with pyrite, arsenopyrite and chalcopyrite with values in gold and silver.

QUEEN CHARLOTTE STRAIT

JOHNSTONE STRAIT

CAM SYNDICATE PROGRAM AREA

possible limestone belt

CAMPBELL RIVER

STRAIT OF GEORGIA

PACIFIC OCEAN

BUTTLE LAKE

50°

126°

LEGEND

TERTIARY
- a sediments
- b intrusives

CRETACEOUS
- c sediments (Nanaimo Us)

JURASSIC & CRETACEOUS
- d intrusives (Coast & Vancouver Is.)
- e sediments } Bonanza, Parson Bay
- f volcanics }

TRIASSIC - Upper Triassic
- g limestone (Quatsino, Marble Bay)
- h volcanics (Karmutsen, Tzuhalo)
- i Sicker gabbro, diorite, diabase

PERMIAN & OLDER
- j sediments (limestone, greywacke) } Sicker Group
- k volcanics }

TYPES OF SHOWINGS

Shear Zones: ▲ replacement, △ fracture filling

Disseminated Zones: ● 'porphyry' type, ○ fracture filling

Contact Metamorphic Zones: ■ magnetite skarn, ▨ copper skarn, □ other

Quartz Veins: ◍ copper, ○ gold-silver

CAM SYNDICATE	
GEOLOGY AND SHOWINGS	
Scale: 1 in. = 4 mi.	Drawn by: RWW
Date: May, 1967	Dwg. No: 1
N.T.S. 92-K-3,4,5,6	