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Ministry of Energy, Mines and Petroleum Resources

OPEN FILE 1990-3

GEOLOGY AND MINERAL OCCURRENCES OF NORTHERN TEXADA ISLAND

NTS 92F/9,10,15

BY I.C.L.WEBSTER AND G.E.RAY

SCALE 1:20 000

0 500 1000 1500 METRES

GEOLOGY, STRUCTURE AND MINERALIZATION.

Texada Island lies at the eastern edge of both the Wrangellia Terrane and the insular Belt. It is mostly underlain by volcanic rocks of the Middle to Late Triassic Texada Formation which, in the northern part of the island, is conformably overlain by 60 to 500 metres of massive limestone belonging to the Late Triassic Marble Bay Formation. These are respectively correlated with the Karmutsen and Quatsino formations of the Vancouver Group. Poorly exposed Cretaceous sediments (Unit Kns) of the Nanaimo Group crop out around Gillies Bay; these represent the eastern margin of the Comox basin.

The Texada Formation largely comprises pillowed and massive, amygdaloidal and spherulitic basaltic flows (Units p and m) with thick sequences of pillowed breccias (Unit pb); in the Surprise Mountain area it includes a 15-metre-thick subhorizontal unit of columnar jointed basalt (Unit c). Near the top of the formation the flows and pillow breccias contain thin, impersistent beds of fossiliferous limestone (Unit L).

Various stocks and minor intrusions, ranging in composition from gabbro through diorite to quartz monzonite, intrude the volcanics and limestones. The more mafic stocks, which tend to be concentrated along the northwest-trending Marble Bay fault, are characterized by mafic xenoliths and coarse hornblende crystals; some, such as the Cornell stock, which has yielded a preliminary zircon U-Pb radiometric age of 175 Ma, are associated with copper-gold skarn mineralization. The felsic stocks include the Gillies, Little Billy and Pocahontas stocks. The Gillies stock has yielded a zircon U-Pb radiometric age of 178 Ma (Ettlinger and Ray, 1989), and is associated with several magnetite-rich skarn deposits. The Little Billy stock is spatially associated with copper-gold skarn mineralization at the Little Billy mine but the Pocahontas stock is not related to any known skarn mineralization. A distinct, easterly trending quartz porphyry dyke (Unit Uq), that transects the island from Limekiln Bay to the east coast, appears to postdate the major northwest trending faults.

The limestones and volcanics have been deformed into a series of broad, northwest trending open folds that plunge gently to moderately northwards. However, within three subparallel, northwesterly striking structural lineaments the rocks have undergone more intense ductile and brittle deformation. These lineaments coincide with the Ideal, Holly and Marble Bay faults, and the brittle transcurrent sinistral offset along these faults is atypical of the mostly dextral fractures present elsewhere in the province. The emplacement of some of the Jurassic intrusions and their associated skarn mineralization has apparently been controlled within these structural lineaments.

The mineral deposits and occurrences on northern Texada Island are listed on this map. Mineralization mainly comprises either skarns or veins, both of which carry base and precious metals. Between 1896 and 1976 the polymetallic skarns produced 10 000 000 tonnes of magnetite concentrate (from 20 800 000 tonnes of iron ore mined), 35 898 tonnes of copper, 3.3 tonnes of gold and approximately 40 tonnes of silver; by contrast, the quartz-carbonate veins have been relatively unproductive. After 1976, mining virtually ceased, but large scale quarrying of the pure limestone to produce cement and lime still continues.

Skarn mineralization is marked by garnet-pyroxene-wollastonite-amphibole alteration assemblages; it can be divided into iron-rich, which is spatially associated with the felsic Gillies stock, and copper-gold-rich, which is mostly related to a suite of mafic intrusions. Iron skarn mineralization is seen at the Prescott, Yellow Kid, Paxton and Lake mines, while the copper-gold skarns are more widely distributed and include the Marble Bay, Little Billy, Copper Queen, Cornell, Loyal and Florence mines. All of the iron and some of the copper-gold skarn mineralization lies close to the base of the Marble Bay Formation where the limestones are less pure. However, some copper-gold skarn mineralization, including that at the Marble Bay and Little Billy mines occur throughout the 500 metre thick limestone succession.

The iron skarns contain abundant magnetite with minor chalcopyrite and pyrite; there is local cobalt enrichment but gold values are low. The main ore minerals in the copper-gold skarns are chalcopyrite and bornite with minor to trace amounts of molybdenite, pyrite, magnetite and sphalerite. Gold generally occurs as minute 20 to 50 micron blebs. The Little Billy includes traces of galena, scheelite, tellurides and native silver, while the Paris includes rare crystalline native arsenic. The iron and copper-gold skarns are believed to be coeval and related, and both formed within a similar high level, oxidized to intermediate environment. The local presence of extensive bleaching in the limestones is believed to indicate skarn alteration at depth

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LIST OF MINERAL OCCURRENCES

Number on Map	Occurrence Name	Commodity	92 F (MI) Minfile Number	Type
1	Grise Point	lst	*	quarry
2	B.C. Cement	lst	*	quarry
3	Loyal	Cu,Ag,Pb,Zn	265	skarn
4	Blubber Bay#1,2,3	lst	*	quarry
5	Limekiln Bay	lst	407	quarry
6	Paris	Fe,Cu,Zn	266	skarn
7	Blubber Bay #6	lst	39	quarry
8	Canada	Fe,Cu	267	skarn
9	Hieshott	lst	*	quarry
10	un	Au,Pb	*	vein
11	Variegated Marble	lst	*	quarry
12	Oke	Cu,Zn,Ag	374	vein
13	Boilvar	Au	364	un
14	Marjorie	Ag,Au	109	vein
15	Sturt #1	Cu	*	skarn
16	Marble Bay	lst	95	quarry
17	Little Billy	Cu,Au,Ag	105	skarn
18	Beale	lst	*	quarry
19	Volunteer	Fe	268	skarn
20	Marble Bay	Au,Ag,Cu	270	skarn
21	Gladys C Cadet	Fe,Zn,Cu	368	un
22	Charles Dickens	Cu,Zn	295	un
23	Copper Queen	Cu,Ag,Au	271	skarn
24	Saga	Au	*	vein
25	Security	Au?e,Cu	269	skarn
26	Florence	Au,Ag,Cu,Zn,Pb	147	skarn
27	LaFarge-Beale	lst	396	quarry
28	Yew	Cu,Au,Fe	*	skarn
29	Cornell	Cu,Au,Ag	112	skarn
30	Molly	Fe,Co	*	un
31	Wolfe	un	*	un
32	Johnson	lst	*	quarry
33	Imperial	lst	394	quarry
34	un	un	*	un
35	Victoria	Au	264	vein
36	Belle	Cu,Au	*	un
37	Raven	Cu,Fe	111	skarn
38	Good Hope	Fe,Cu	272	un
39	Malaspina	Fe	273	un
40	Lucky Lead	un	*	vein
41	un	un	*	un
42	Iron Horse	un	*	vein
43	Gem (Nutcracker)	Au	*	vein
44	Maude Adams	un	*	un
45	un	un	*	un
46	Laurendale	Au	297	vein
47	Holly	Au	321	vein
48	Lucky Jack	Fe	*	un
49	Golden Rod	un	*	vein
50	Lion	Cu	*	vein
51	Tyee	Cu,Au	*	vein
52	X Ray	un	*	vein
53	Vauxhall	Au,Ag,Cd	*	un
54	Silver Tip	Au,Ag,Cu,Zn	261	vein
55	Nancy Bell	Au,Cu,Pb	*	vein
56	Surprise	Au,Ag,Cu,Zn	262	vein
57	un	un	*	un
58	Copper King	Au,Ag,Cu	263	vein
59	Manto	Au,Zn,Pb,Cu	*	un
60	Tip Top	un	*	un
61	Ideal	lst	395	quarry
62	Sandy	Zn,Pb,Ag,Au,Cu	373	un
63	un	un	*	un
64	Sentinel	Cu,Pb,Zn	113	vein
65	Aladdin	Pb,Zn,Cu	*	vein
66	Porpoise	un	*	vein
67	Francis #1	Au	*	vein
68	Francis #2	Au	*	un
69	Golden Slipper	Au	260	vein
70	Ram	un	*	un
71	Retriever	Cu,Ag,Au	357	vein
72	un	un	*	un
73	White Rock	lst	*	quarry
74	Cap Sheaf	Cu,Fe	274	skarn
75	Black Prince	Au,Cu,Ag	108	skarn
76	un	un	*	vein
77	Carter & Son(un)	un	*	un
78	Prescott	Fe,Cu	106	skarn
79	Yellow Kid	Fe,Cu,Au,Ag	258	skarn
80	Paxton	Fe,Cu	107	skarn
81	Lake	Fe,Cu	259	skarn
82	un	sand & gravel	*	pit

* = no Minfile number un = unknown lst = limestone

LEGEND

QUATERNARY

ALLUVIUM

UNKNOWN AGE

Uq — QUARTZ PORPHYRY

CRETACEOUS

NANAIMO GROUP

Kns — SANDSTONE

MIDDLE JURASSIC

DIORITE STOCKS, HORNBLENDE PORPHYRY

DIORITE DIKES; f = FELDSPAR PORPHYRY; h = HORNBLENDE PORPHYRY; d = UNDIFFERENTIATED

QUARTZ MONZONITE, GRANODIORITE

MIDDLE TO UPPER TRIASSIC

MARBLE BAY FORMATION

LIMESTONE, MOSTLY MASSIVE, COMPACT GREY TO WHITE RECRYSTALLIZED

TEXADA FORMATION

L — LIMESTONE, FOSSILIFEROUS, WITH MINOR SILTSTONE

p — PILLOWED VOLCANICS

c — COLUMNAR JOINTED VOLCANICS

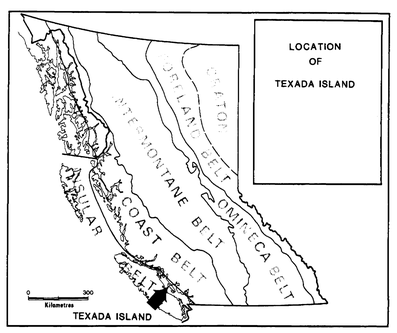
pb — PILLOW BRECCIAS

m — MASSIVE VOLCANIC ± AMYGDALOIDAL & SPHERULITIC

SYMBOLS

- Geological boundary (approximate)
- Bedding (horizontal,inclined, vertical)
- Layering in volcanics and intrusions
- Foliation (inclined, vertical)
- Dike
- Fault (approximate, assumed)
- Geological station
- Location of U/Pb zircon samples with age (A)
- Open-pit mine or quarry limit
- Quarry (active,abandoned)
- Mine (active,abandoned)
- Mineral occurrence (location known, uncertain)

LOCATION OF TEXADA ISLAND



NOTE: Due to the use of several series of topographic base maps, altitude contours at various localities on this geological map are given in either feet or metres.

Geological field mapping completed in July and August 1989 by I.C.L.Webster assisted by B.Paul. Additional data supplied by G.E.Ray, C.N. Forster, K.Glover, J.Bradford, M.Ryan, S.Beale, P.Sargeant, H.M.Diggon, R.M.Grainger, E.Johanson, R.Duker and D.Murphy..